Quantifying the Economics of Medical Malpractice

A View from a Civil Law Perspective

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Quantifying the Economics of Medical Malpractice:

A View from a Civil Law Perspective

Een kwantitatieve analyse van medische aansprakelijkheid

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Contents

Introduction

Life is full of uncertainties. Legal rules should have a clear intention, motivation and purpose in order to diminish daily uncertainties. However, practice shows that their consequences are complex and hard to predict. For instance, tort law has the general objectives of deterring future negligent behavior and compensating the victims of someone else's negligence. Achieving these goals are particularly difficult in medical malpractice cases. To start with, when patients search for medical care they are typically sick in the first place. In case harm materializes during the treatment, it might be very hard to assess if it was due to substandard medical care or to the patient's poor health conditions. Moreover, the practice of medicine has a positive externality on the society, meaning that the design of legal rules is crucial: for instance, it should not result in physicians avoiding practicing their activity just because they are afraid of being sued even when they acted according to the standard level of care.

The empirical literature on medical malpractice has been developing substantially in the past two decades, with the American case being the most studied one. Evidence from civil law tradition countries is more difficult to find. The aim of this thesis is to contribute to the empirical literature on medical malpractice, using two civil law countries as a case-study: Spain and Italy.

The goal of this thesis is to investigate, in the first place, some of the consequences of having two separate sub-systems (administrative and civil) coexisting within the same legal system, which is common in civil law tradition countries with a public national health system (such as Spain, France and Portugal). When this holds, different procedures might apply depending on the type of hospital where the injury took place (essentially whether it is a public hospital or a private hospital). Therefore, a patient injured in a public hospital should file a claim in administrative courts while a patient suffering an identical medical accident should file a claim in civil courts. A natural question that the reader might pose is why should both administrative and civil courts decide medical malpractice cases? Moreover, can this specialization of courts influence how judges decide medical malpractice cases?

In the past few years, there was a general concern with patient safety, which is currently on the agenda of several national governments. Some initiatives have been taken at the international level, with the aim of preventing harm to patients during treatment and care. A negligently injured patient might present a claim against the health care provider with the aim of being compensated for the economic loss and for

pain and suffering. In several European countries, health care is mainly provided by a public national health system, which means that if a patient harmed in a public hospital succeeds in a claim against the hospital, public expenditures increase because the State takes part in the litigation process. This poses a problem in a context of increasing national health expenditures and public debt. In Italy, with the aim of increasing patient safety, some regions implemented a monitoring system on medical malpractice claims. However, if properly implemented, this reform shall also allow for a reduction in medical malpractice insurance costs.

This thesis is organized as follows. Chapter 1 provides a review of the empirical literature on medical malpractice, where studies on outcomes and merit of claims, costs and defensive medicine are presented. Chapter 2 presents an empirical analysis of medical malpractice claims arriving to the Spanish Supreme Court. The focus is on reversal rates for civil and administrative decisions. Administrative decisions appealed by the plaintiff have the highest reversal rates. The results show a bias in lower administrative courts, which tend to focus on the State side. We provide a detailed explanation for these results, which can rely on the organization of administrative judges career. Chapter 3 assesses predictors of compensation in medical malpractice cases appealed to the Spanish Supreme Court and investigates the amount of damages attributed to patients. The results show horizontal equity between administrative and civil decisions (controlling for observable case characteristics) and vertical inequity (patients suffering more severe injuries tend to receive higher payouts). In order to execute these analyses, a database of medical malpractice decisions appealed to the Administrative and Civil Chambers of the Spanish Supreme Court from 2006 until 2009 (designated by the Spanish Supreme Court Medical Malpractice Dataset (SSCMMD)) has been created. A description of how the SSCMMD was built and of the Spanish legal system is presented as well.

Chapter 4 includes an empirical investigation of the effect of a monitoring system for medical malpractice claims on insurance premiums. In Italy, some regions adopted this policy in different years, while others did not. The study uses data on insurance premiums from Italian public hospitals for the years 2001-2008. This is a significant difference as most of the studies use the insurance company as unit of analysis. Although insurance premiums have risen from 2001 to 2008, the increase was lower for regions adopting a monitoring system for medical claims. Possible implications of this system are also provided.

Finally, Chapter 5 discusses the main findings, describes possible future research and concludes.

List of Abbreviations

AE	Adverse Event
AMI	Acute myocardial infarction
ANIA	Italian Association of Insurance Companies
ASA	American Society of Anesthesiologists
CNST	Clinical Negligence Scheme for Trusts (UK)
CPSC	Compensation Supreme Court
DD	Differences-in-Differences
DoH	Department of Health (UK)
CENDOJ	Centro de Documentación Judicial (Spain)
EHL	Empirical Health Law
FP	Family Physicians
GDP	Gross Domestic Product
GPs	General Practitioners
HMPS	Harvard Medical Practice Study
IH	Independent Hospital / AO - Azienda Ospedaliera (Italy)
IPHCPD	Italian Public Health Care Providers Dataset
IHD	Ischemic heart disease
IOM	Institute of Medicine (U.S.)
IStat	Italian National Institute of Statistics
LEAs	Essential levels of services (Italy)
LHU	Local Health Unit / ASL - Azienda Sanitaria Locale (Italy)
OR	Odds ratio
OTA	Office of Technology and Assessment (U.S.)
MdS	Ministry of Health / Ministero della Salute (Italy)
Med mal	Medical malpractice
MRSA	Methicillin resistant staphylococcus aureus
MoJ	Ministry of Justice
NHS	National Health System
NHSLA	National Health Service Litigation Authority (UK)
QAHCS	Quality in Australian Health Care Study
RH	Research Hospital / IRCCS - Istituto di Ricovero e Cura a Carattere Scientifico (Italy)

SC	Supreme Court
SIMES	Sistema informativo per il monitoraggio degli errori in sanità
SIMPAS	Sistema informatizzato di monitoraggio delle Polizze Assicurative in Sanità
SSCMMD	Spanish Supreme Court Medical Malpractice Dataset
SSN	Servizio Sanitario Nazionale / National Health Service (Italy)
TH	Teaching Hospital / AOU - Azienda Ospedaliera Universitaria (Italy)
UCMPS	Utah-Colorado Medical Practice Study
UK	United Kingdom
U.S.	United States of America

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Chapter 1

Medical Malpractice: Review of the Empirical Literature

1.1 Introduction

Two of the main objectives of tort law consist in deterring future negligent behavior and compensating victims of someone else's negligence.[1] The same applies to cases of medical malpractice, where the tort system should deter physicians' negligence and compensate victims who suffered harm due to medical malpractice. In reality, the medical liability system based on fault should be designed in such a way that doctors have the correct incentives to provide standard level of care. However, some advocates of tort reform argue that the system performs those functions imperfectly and at a high cost.[2] Others go further, and state that when it comes to compensation, the results obtained in the system can be considered random.[3]

Where it seems to be more agreement is on the statement that the tort system is unable to compensate victims of medical negligence, since only a small proportion is able to receive some form of compensation. Nevertheless, the current system based on fault also has some benefits, namely if we compare it with the most cited alternative option, the no-fault system. Under a no-fault system, injured patients receive compensation independently of the physician's level of care, as long as there is an injury involved. This can be considered essentially an administrative system with no involvement from courts. Some costs are naturally reduced under this system, such as the costs of litigation. However, physicians' incentives to provide due care can now be diminished, since

[1] See, for instance, Trebilcock and Dewees (1992).

[2] See Danzon (1994a).

[3] U.S. Department of Health and Human Services (2002).

the level of care is not a variable to be taken into account when deciding to attribute compensation. Actually, physicians will not bear the consequences of their substandard level of care. Moreover, although there are more people being compensated they are not necessarily being better compensated. In other words, there are cases involving permanent and/or serious injuries which can receive approximately the same amount of compensation[4] as other cases that involve a much lower severity level or shorter injury length.[5]

With the aim of providing estimations and results closer to reality instead of anecdotal evidence, empirical literature on medical malpractice has developed substantially in the past two decades. Researchers might have different backgrounds of expertise, such as law and economics, health economics, legal medicine, medicine and statistics. Empirical studies about medical negligence have focused on several topics: the impact of liability reforms (namely on the supply of physicians[6] and insurance premiums), the capacity of the tort system to deliver outcomes consistent with claims merit, the costs of medical malpractice, the evaluation of defensive medicine, the medical malpractice 'crisis',[7] to name only a few.

The U.S. has been by far the most studied case in the empirical law and economics literature. One possible explanation for the discrepancy in the number of studies between the U.S. and other countries might be the requirement, from the American National Practitioner Data Bank,[8] to submit a report every time a health care provider pays for a medical malpractice case. Therefore, gathering information in some cases is, under some limitations, possible and easier. Still, obtaining complete and comparable data can be a problem, which translates into an obstacle for many empirical works. For this reason, research tends to be focused on small samples, such as a few hospitals, insurance companies or a country's region. Additionally, it is sometimes possible to obtain information about the cases that arrive to court only, meaning that information on those cases that involve negligence but that were settled is lost.[9] Nevertheless, it is not

[4]Notice that in case of no-fault, the interval range between the highest and lowest amount of compensation becomes smaller.

[5]Recently Kessler (2011) points to the benefits and disadvantages of alternative options to the tort system, namely a no-fault system.

[6]Klick and Stratmann (2007), Matsa (2007), Mello, Studdert, Schumi, Brennan and Sage (2007), Klick and Stratmann (2005), Kessler et al. 2005, Helland and Showalter (2006), Encinosa and Hellinger (2005).

[7]Black et al. (2005) describe that the medical malpractice crises of the 1970s, 1980s and 2000s have involved sharp spikes in insurance premiums, and all lead to the "*same political effect: demands by doctors and hospitals for liability-reducing reforms*", p. 208. To refute the evidence of such a crisis, see Vidmar et al. (2005) or Black et al. (2005).

[8]For more information, see http://www.npdb-hipdb.hrsa.gov, last access August 30, 2011.

[9]See, for instance, Priest and Klein (1984), Gertner (1993), Clermont and Eisenberg (1998), on the

only a problem of data that scholars face when they want to make empirical studies in medical malpractice. Specificities of the subject, namely on assessing causality, make the analysis sometimes difficult.

1.2 Outcomes and merit of claims

It is frequently claimed that tort litigation produces outcomes that do not match merit when it comes to negligence of health care providers. This means that the tort system attributes compensation to cases in which there was no fault of the health care provider or refuses to pay when there was negligence or substandard care involved. In line with this view is the claim that there are too many frivolous cases that receive compensation and that are putting the medical system into a crisis, which makes some people believe that other options should be considered, such as a change to a no-fault system.[10]

To clarify this debate, empirical studies try to assess the capacity of the legal system to provide correct decisions. One way of doing this is by comparing *correct outcomes* (meritorious cases that receive payment and nonmeritorious cases to which compensation is denied) with *wrong outcomes* (meritorious cases that do not receive payment and nonmeritorious cases that receive payments). Having correct outcomes is particularly important: if negligence[11] is a necessary condition for making the injurer liable and it is assessed correctly, health care providers will have the incentives to provide optimal medical care, and to prevent substandard care. Nonetheless, this does not imply that incentives for providing the efficient quality level will be given, since it is enough for

American case. We will study Supreme Court cases in Spain in the next chapter, and provide explanations for legal differences that make this analysis interesting and less biased (namely the fact that the State cannot settle).

[10]Virginia approved a close to a no-fault program for severe neurological birth injuries only, named Virginia Birth-Related Neurological Injury Compensation Act (Code of Virginia, §§38.2-5000 to 38.2-5021 (LEXIS 2003)). The Code is available on-line at http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+TOC (last access August 30, 2011). Florida also adopted a similar program, designated by Florida Birth-Related Neurological Injury Compensation Plan (Florida Chapter 88-1, §§60-75). Freeman and Freeman (1989) refer that none is a truly no-fault, in the sense that both "*require a determination of whether the cause of CP [cerebral palsy] was anoxia or mechanical injury*". See Dute et al. (2004), Studdert and Brennan (2001), among others. For a discussion of four alternatives to conventional common-law tort systems (*i.e.*, guidelines-based systems, enterprise liability, binding alternative dispute resolution and no-fault), see Kessler (2007).

[11]When analyzing different countries, Schwartz (1992) notices that "*it is revealing to realize that negligence - rather than no liability or strict liability - is just about the* universal *liability standard in suits against doctors. That is, negligence seems to be the liability criterion currently relied on by almost every tort system*", p. 52.

the health care provider to set the quality care at the minimum level that allows her to escape from being liable.[12]

1.2.1 The Evaluation Process

A natural question is how to find an indicator to evaluate the tort system. One possible way is to compare the tort system outcome with some other indicator: if both give the same results, then the system is likely to be correct. The common practice in several studies (see Figure 1.1) is to ask reviewers to examine claim files, which can be the hospital record[13] or the entire process that the insurance company collects.[14] The reviewer, normally a physician,[15] must attribute a "score" according to her level of confidence on the existence of an adverse event. Therefore, the first step is to realize if there is an adverse event, *i.e.*, "*an injury resulting from a medical intervention, or in other words, it is not due to the underlying condition of the patient,*" (Kohn et al. (2000)) and this is the process that allows checking for causation.[16] In case there is no evidence of an adverse event, the claim file will not be considered further in the analysis and the review stops here. However, if there is evidence of an adverse event, this is a necessary but not a sufficient condition for liability. Consequently, the reviewer will then have to check if that adverse event was due to medical negligence or error, which can be defined as "*the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim*".[17] Determining the existence of substandard care in medical malpractice cases is different than in other cases of accidents. According to the U.S. standard, the idea is that it should be determined if the "*physician's treatment of the patient comported with the standards of professional practice followed by other physicians in the same field of medical practice in that community at the time that the injury*

[12] See Shavell (1978), Shavell (1987) and Danzon (1985).

[13] Baker (2005a) points out some of the advantages of the research on the medical malpractice epidemic that is based on reviewing hospital records. The first is that "*researchers can easily preserve the anonymity of the hospitals*", and therefore hospitals are more likely to participate. The second is that "*researchers can look at records from many hospitals*", p. 24. One drawback of this method is that not all mistakes will appear in the record. Moreover, medical mistakes also happen outside hospitals.

[14] We can expect incomplete or biased results due to the reliance on these records.

[15] In several studies there is also a previous step: trained nurses check for evidence that the patient was injured from medical treatment. In order to help them, a list of criteria associated with adverse events is normally provided.

[16] Causation in medicine is particularly difficult to assess. Patients normally seek medical care because they have some medical condition. Therefore, it is not always straightforward to conclude if the patient suffered a mishap or if it is the result of his medical condition. See Khoury (2006) and Young et al. (2004).

[17] Kohn et al. (2000). Notice that, as the authors state, "*errors can happen in all stages in the process of care, from diagnosis, to treatment, to preventive care*", p. 4.

occurred".[18] Not every adverse event is a result of a substandard care, in the same way that the absence of adverse events does not imply that good quality care was provided to the patient. Brennan et al. (1991a) present a good example of the difference. A drug reaction occurring in a patient to whom the drug was appropriately prescribed for the first time is an adverse event. Nevertheless, it is unavoidable and no negligence should be found. But if "*on the other hand, the drug reaction occurs in a patient who is given the drug despite a known sensitivity to it, the adverse event is properly judged to be due to negligence*".[19]

Ideally, the reviewer should not have access to the final outcome, so that an independent judgment can be made. This judgment will be finally confronted with the result delivered by the tort system. A correct outcome should be that the health care provider is liable if both causation and negligence are present. In fact, just like Sloan and Hsieh (1990) state, "*[t]o prove liability, a plaintiff must prove (1) that the plaintiff was injured (2) because of the acts or omissions of the defendant (causation) and (3) that the defendant's acts or omissions failed to meet a standard of care maintained by reasonably competent health care providers in the community (negligence)*".[20] Reviewers frequently check for the degree of disability[21] that the negligent adverse event caused to the patient, due to the fact that while the quality of care is important to the determination of liability, the severity of the harm is crucial for the amount of damages to be awarded to the victim.

Obviously, each study might provide different designs, but this is, broadly speaking, the most common procedure in the field. The main limitations of this method are the possible disagreement between different reviewers and the so-called 'close-calls'. Given that it is possible to find substantial variation in the judgments of the reviewers, kappa statistic is often calculated. This is an indicator of how much observers agree beyond

[18] In Vidmar (1995), p. 124. While referring to the U.S., the author provides a clear example: "*under the law, a general practitioner living in a rural community might be held to a less rigorous standard of treatment than a neurosurgeon practicing in an urban teaching hospital. The latter has access to more technology and updates in medical developments and through training should know more than the general practitioner. The standard of care also varies according to the health provider's specialty. For example, podiatrists or osteopaths will be held to the standards of their particular field and not the standards of general medicine*". Other jurisdictions might adopt a different definition.

[19] Brennan et al. (1991a), p. 373.

[20] Sloan and Hsieh (1990), p. 1009.

[21] When referring to the Florida case, Vidmar et al. (2005) point out one drawback of the attribution of a disability rate, since "*A patient who suffered a severe psychological trauma or even psychosis might be classified as suffering "emotional trauma only" and receive a rating of 1, but in reality the medical and income losses may be very high*", p. 328.

an expected agreement due to chance.[22] The closer it is to one (or 100%), the higher the degree of agreement among reviewers.[23] In the 'close-call range' stand those cases in which the reviewers have a confidence in causation of just under or just over 50-50. For example, in the Harvard Medical Practice Study (HMPS) that we will analyze next, "*close-call adverse events are cases with scores of 3.0 to 4.0 in a six-point scale*".[24] But to be considered an adverse event in this study, there must be a composite adverse event score greater than 3.5. The problem with these cases is that a small difference in the scoring could change (sometimes dramatically) the results. With these methods, the most popular questions that several studies tried to assess were "what is the incidence of adverse events?", "what is the proportion of injured patients that file a claim?", and "what is the proportion of correct decisions delivered by the tort system?".

1.2.2 The Harvard Medical Practice Study

Although it was not the first study in the area,[25] the Harvard Medical Practice Study[26] is one of the most cited studies[27] in medical malpractice and probably the one with the highest impact in the literature, having the State of New York as case-study. Even though it was published in 1990, it keeps being highly cited, criticized and it serves as basis for debate even today,[28] and several countries use essentially the same methods (sometimes with some improvements) to assess the epidemiology of medical malpractice. The idea of the HMPS was to make estimates for New York based on a random

[22] McGinn et al. (2004).

[23] See also Landis and Koch (1977).

[24] For definitions, see the glossary in "Patients, Doctors and Lawyers: Medical Injury and Patient Compensation in New York - The Report of the Harvard Medical Practice Study on the State of New York", (1990), best known as the Harvard Medical Practice Study.

[25] For previous examples of studies, see for instance Danzon (1985) and references herein, namely on the pioneering study made jointly by the California Medical Association and the California Hospital Association, the "Report on the Medical Insurance Feasibility Study" (1977). Baker (2005a) argues that the reason why the California study was not highly publicly or used for lobbying for a new no-fault medical injury compensation fund was because its results showed that there was not only an "*epidemic of medical injuries*" but also an "*epidemic of medical malpractice*", and "*by far the largest share of medical malpractice costs fall on injured patients and their families, not on doctors and hospitals*", p. 27.

[26] See "Patients, Doctors and Lawyers: Medical Injury and Patient Compensation in New York - The Report of the Harvard Medical Practice Study on the State of New York", (1990).

[27] When referring to the study, Studdert and Mello (2007) state that it is "*the best-known study of the epidemiology of medical injury and malpractice claiming*".

[28] Studdert, Thomas, Burstin, Zbar, Orav and Brennan (2000) call attention to changes and specificities of New York that would require a validation of the study in case we want to make use of its results nowadays.

sample of hospitalizations. From these results the authors estimated that,[29] in New York in 1984, 3.7% of hospitalizations resulted in adverse events, of which 27.6% were due to negligence[30] from the health care providers (or 1% of all hospital discharges),[31] as it can be seen in Table 1.2.

When it comes to the ability of the tort system to deliver correct results, and having in mind the frequency of malpractice claims that patients file per year, the authors "*estimate that eight times as many patients suffer an injury from medical negligence as there are malpractice claims*" and "*[b]ecause only about half of the claimants receive compensation, there are sixteen times as many patients who suffer an injury from negligence as there are persons who receive compensation through the tort system*". Therefore, most of the injured patients due to a failure in medical care do not make a claim. In fact, after matching all the medical malpractice claims in New York with the hospitalizations, the HMPS found that the number of claims coming from those hospitalizations was only 47. Going further, there had been 8 claims out of those 47 in which there has been a negligent medical management injury involved.

1.2.3 Empirical Studies after the HMPS

Instead of looking at the high number of negligent adverse events or at the low proportion of injured patients that received compensation that the HMPS estimated, it seems that what attracted attention was the high quantity of frivolous cases in medical malpractice. We think caution should be taken when assuming that there are too many frivolous cases, essentially for three reasons. First, just like the authors mention, no conclusions should be made in this respect because the legal system had not resolved many of the cases by the time the study took place. Medical malpractice cases take nor-

[29] Studdert, Thomas, Burstin, Zbar, Orav and Brennan (2000) refer that the HMPS was standing as the "*sole population-based study in this area*", which can be explained by the high costs of developing a study of this kind (in year 2000 dollars, the total cost was approximately $4.7 million - p. 1647, footnote 20). The advantage of population based studies is that they allow drawing inferences about the population from the sample, just like the HMPS allowed.

[30] Additionally, the HMPS found that the severity of the negligent injuries was quite worrying since "*Negligent adverse events resulted, overall, in greater disability than did non-negligent events and were associated with 51% of all deaths from medical injury*". McDonald et al. (2000) are quite critical about the estimations that refer to deaths in high-severity patients and for whom an adverse event was found. The idea is that since there is no control group for those patients or information on their risk of death, it can not be claimed that "*there would be no deaths in a group with similar baseline risks who avoided all adverse events*".

[31] See HMPS (1990), p. 6-10. Baker (2005a) mentions that the approaches used produced low estimates.

mally some years[32] to be decided. Second, health care service is a typical example of a credence good: to start with, patients do not know which service quality they need;[33] furthermore, they can verify ex post if the problem still exists or not, but they might not be able to confirm if the suggested quality of treatment was actually provided.[34] This credence good problem would probably not exist if patients could perform a diagnostic test themselves, which proves to be difficult. Besides, there is a high level of asymmetric information and expertise[35] that physicians have in their relationship with patients, which means that sometimes patients must first file a lawsuit if they want to gather more information about the received care. Finally, at least for the American case, plaintiff's lawyers are supposed to function as gatekeepers[36] when deciding if they accept medical malpractice cases and if they take them ahead during the discovery process. The high costs of pursing a medical lawsuit, together with the contingent fee that attributes money to lawyers only in case there is a pro-plaintiff outcome, seem to be good reasons to believe that lawyers are not interested in taking frivolous cases to court.[37]

Despite of all these remarks, what perhaps turned out to be more discussed were some conclusions in studies by several of the authors of the HMPS a few years later on the validity of paid claims by the American medical liability system. The 1993 study refers that "*[m]edical litigation appears, then, to be sending as confusing a signal as would our traffic laws if the police regularly gave out more tickets to drivers who go through green lights than to those who go through red lights*".[38] Three years after, Brennan *et al.*[39] conducted a 10 year follow up study of the medical malpractice claims identified in the HMPS as arising from the hospitalizations. The result of the multivariate analysis was that the only predictor of payment to the injured patient was the presence of a permanent disability,[40] and not the evidence of negligent care.

[32] Vidmar et al. (2005) find that 46% of cases in Florida filed between 1990 and 2003 were closed within three years and 96% were closed within six years. Studdert et al. (2006) provide similar results.

[33] *I.e.*, the provision of a too low quality compared to the needed one if insufficient and the provision of a too high quality does not add extra value. See Dulleck and Kerschbamer (2006).

[34] See Dulleck and Kerschbamer (2006). In case of medical treatment, the patient might be cured and have received overtreatment, the standard level of care or even a substandard level of care (but is now well due to luck).

[35] Self-regulation plays a role on trying to reduce all these problems. See Garoupa (2004), Faure and Verhulsdonck (2004) and Olsen (2000).

[36] See for instance Farber and White (1991). In 2009, Weiss refers to the possibility that lawyers are becoming more selective as one possible explanation for an apparent recent reduction in claims frequency.

[37] We will see in the next chapter why this does not hold for Spain, at least during the period that we examined.

[38] See Weiler et al. (1993), p. 75.

[39] See Brennan et al. (1996).

[40] Baker starts by questioning this result when a comparison with the HMPS is made: "*For the reasons*

In spite of these results, the majority of the empirical studies that arise after the mid 90's do not lend support to such a bleak view of the tort system. In fact, empirical studies provide evidence that negligence matters to predict outcomes of claims and that, in global terms, the system eliminates frivolous cases.[41] The problem seems to be the incapacity of the tort system to compensate negligently injured patients. Moreover, the existence of a high degree of medical negligence is problematic as well. Therefore, some research was executed regarding the option of a change to a no-fault system of compensation for medical injuries and on how to improve patients' safety.[42] The Utah-Colorado Medical Practice Study (hereinafter UCMPS)[43] started with the initial idea of checking for a support of a no-fault liability system of compensation for medical injuries, that the authors considered to be a superior alternative to the tort regime. Nevertheless, Studdert, Brennan and Thomas claim that "*[t]he policy focus had clearly shifted to the uninsured and consumer protection issues in managed care*". According to this population-based study that uses a quite similar methodology to the HMPS,[44] up-weightening the adverse events (AEs) results to the state populations, the estimates are a rate of 2.9% of AEs in both states. The proportion of negligence in those AEs is 32.6% in Utah and 27.5% in Colorado. After matching patients from the medical record review who filed malpractice claims during or after 1992, only 18 malpractice claims arise from the records, 8 in Utah and 10 in Colorado. Probably even more surprising is the fact that from the 18 matches, only 4 involved identifiable instances of negligence.[45]

One outcome that is in line with the findings of the HMPS was that "*slightly more than one-half of all negligent adverse events in both studies [HMPS and UCMPS] occurred*

just explored, this characterization of the results of the earlier study is questionable". See Baker (2005b) for the main limitations of this study.

[41] See Rosenblatt and Hurst (1989), Cheney et al. (1989), Farber and White (1991), Sloan and Hsieh (1990), Taragin et al. (1992), Sloan et al. (1993), Farber and White (1994). The presentation of the main results and limitations of these studies and the HMPS can be found in Baker (2005b) and Studdert and Mello (2007).

[42] For some examples of successful changes in aviation and nuclear power plants and possible applications to medicine, see Liang (1999).

[43] See Thomas et al. (1999), Studdert, Thomas, Burstin, Zbar, Orav and Brennan (2000), Thomas, Studdert, Burstin et al. (2000) and Studdert, Brennan and Thomas (2000). We will refer essentially to Studdert, Brennan and Thomas (2000) since this is the publication that presents more detailed explanations and descriptions of the study.

[44] The physicians' review process suffered some changes. To start with, only two investigators, Dr. Thomas and Dr. Brennan, trained the physician-reviewers. Regarding "outlier" physicians, their charts would be re-reviewed. 500 records randomly sampled were re-reviewed, which showed an agreement of 84% among reviewers.

[45] According to the authors, the "*reviewers had not even flagged the occurrence of an adverse event in ten of them*".

in the emergency department, and a very high proportion of all adverse events attributed to emergency physicians were judged to be due to negligence (70.4% in New York and 52.6% in Utah and Colorado)".[46] This result can be helpful in improving patient's safety, although it can be considered in some way expected,[47] given that physicians must react quickly, frequently without any previous contact with the patient and sometimes working with sleep deprivation. Furthermore, a multivariate analysis was undertaken in order to compare the main different socio-demographic characteristics between the groups of patients that suffered an adverse negligent event and sued and a patient that suffered the same type of harm but did not present a claim.[48]

In November 1999, the Institute of Medicine (IOM) published the report "*To Err is Human - building a safer health system*", the starting point for the full impact of the HMPS to be felt[49] and for the safety of the health care to become one main variable in the debate. The authors use the results from the HMPS and the UCMPS[50] to extrapolate to the admissions in American hospitals, concluding that "*Deaths due to preventable adverse events exceed the deaths attributable to motor vehicle accidents (43,458), breast cancer (42,297) or AIDS (16,516)*". Having these impressive estimates in mind, several policy recommendations were made with the aim of improving patients' safety, which can also be seen as a mechanism to prevent negligence. Emphasis was put on a reporting program of adverse events linked to accountability systems. If these new recommendations are properly designed, then, together with the tort system, should result in lower negligent adverse events.

1.2.4 Do Claims' Outcomes Match Claims' Merit?

The empirical literature published after 2000 on the American case presents some interesting results on the ability of the tort system to provide correct decisions in medical malpractice cases. While predicting if the plaintiff drops the case or if the case is settled, Spurr and Howze (2001) came out with the result that the defendant's fault is the

[46] See Studdert, Brennan and Thomas (2000).

[47] See Cohen et al. (2009).

[48] See Studdert, Brennan and Thomas (2000), Table 3. The results suggest that the elderly and the poor are less likely to present a claim, although caution must be taken given the small sample size.

[49] "*Despite the considerable weight of its findings, the full impact of the HMPS was not felt until the release of the Institute of Medicine (IOM) report, To Err is Human*", Baker (2004a). The author adds the interest of other countries for similar studies as another impact of the HMPS. See for instance Thomas, Studdert, Runciman et al. (2000), Runciman et al. (2000) and Vincent et al. (2001).

[50] Notice that although the Utah and Colorado study was published in 2000, its results were available before and therefore the authors of "To Err is Human" could use them for their estimations.

only significant variable. The authors also conclude that the initial reserve[51] is not a predictor of the settlement payment and that the quality of care has a greater effect on the settlement than on the mediation award. This gives support to the importance of the discovery process in gathering information about the defendant's fault.

In 2002, Peeples, Harris and Metzloff presented a study where they found a strong connection between standard of care and settlement.[52] Besides, this connection is stronger than the one between causation and settlement. Therefore, the standard of care is the most important variable for the insurer to determine if a settlement will be proposed or not, decided mainly according to the reviewers' evaluation. Also in this study, reviewers' opinions[53] have an important role: the insurer's decision of making a settlement offer highly relied on it.

Phillips et al. (2004) conducted a study focusing on negligent and adverse events in primary care.[54] In negligent adverse events' claims, payment was made in 86% of cases. Regarding those claims considered as not involving negligence, payment was made in only 7%, and the majority involved the highest harm levels. The article provides several interesting findings that can also be used in order to improve patients' safety, namely that problems with records is a contributing factor for 7% of the claims.

Studdert *et al.* published an article in 2006 in a medicine journal in which a random sample of 1,452 malpractice claims closed from 1984 to 2004 were studied. From the reviewed claim files, 97% involved injury, of which negligence was found in 63% of the cases. In turn, payment was made in 73% of these cases. Regarding cases involving injury but where no error was involved, payment was made in 28% of them.[55] This means that "*[o]verall, 73 percent (1054 of 1441) of all claims for which determinations of merit were made had outcomes concordant with their merit*".[56] Several interesting results

[51] "*The initial reserve represents the risk manager's estimate of the amount that will ultimately be paid to satisfy the claim*", in Spurr and Howze (2001), p. 497.

[52] The reviewed files on which conclusions are based were not a randomly selected sample, given that the criterion for selection was the existence of a court order directing the case to mediation prior to trial. For this reason, the authors state that "*This criterion probably resulted in an oversampling of "durable" cases - i.e., lawsuits that had progressed at least beyond complaint and answer. Thus, our sample may not reflect accurately the number of "nuisance" or purely speculative malpractice cases filed in the trial courts*", p. 881.

[53] Insurance companies often use outside reviewers as expert witnesses. See Peeples et al. (2002) for a description of the insurer action in medical malpractice cases (in the U.S.).

[54] Providers of primary care in the U.S. are family physicians and general practice doctors (FP/GPs), general internists and pediatricians.

[55] Additionally, for the 3% of the reviewed files that did not involve injury, payment was made in 16% of them. See Studdert et al. (2006), Figure 1.

[56] At p. 2028.

were also presented concerning cases that involved injury:[57] the most frequently sued physicians[58] in the sample were obstetrician-gynecologists (19%) followed by general surgeons (17%) and primary care physicians (16%); 80% of the claims involved injuries that caused significant disability, major disability or death; the average time span between the occurrence of the injury and the closure of the claim was five years; a small percentage of cases arrived in court, and in these plaintiffs rarely won damages.

Two of the researchers of the previous study, Studdert and Mello, published an article in 2007 using the same database but taking a different approach: this time, they analyzed the characteristics of the cases with discordant outcomes, *i.e.*, cases in which the reviewer's judgment disagreed with the case outcome.[59] First a bivariate analysis was done, in which the results point to the fact that payments in non error claims are more common if they involve infants, nurse defendants, major injuries, obstetrics injuries or institutional codefendants. It was furthermore less likely to receive a payment in nonerror claims if they involved elderly plaintiffs, orthopedic surgeons, emotional injuries, allegations of missed or delayed diagnosis, and claims that reached a trial verdict.[60] Cases that arrived to court and involved error had more than twice the rate of nonpayment as those decided out of court. Subsequently, a multivariate analysis was performed, where many of the results found in the bivariate analysis were corroborated. The main finding of the study was that approximately one in every four cases presented discordance between outcome and merit. Although the authors found several differences in terms of discordant outcomes regarding payment of nonerror claims and unpaid error claims, resolution by trial verdict was the only significant predictor

[57] The authors eliminated claims that had no evidence of an injury, those that disputed informed consent issues exclusively and two claims in which the reviewers did not record a determination of error, which resulted in a sample of 1,404 claims.

[58] Some studies try to address the most problematic specialties, *i.e.*, those that have higher rates of adverse events and that therefore must pay higher premiums. Brennan et al. (1991a) found that neurosurgery, cardiac and thoracic surgery, and vascular surgery had higher rates of adverse events but not higher rates of negligence and that "*variations among specialties in rates of litigation do not reflect differing levels of competence, but rather differences in the kinds of patients and diseases for which the specialist cares*", p. 374. Using the Florida Closed Claims Medical Malpractice dataset, Klick and Stratmann (2007) identify 10 specialties exhibiting the highest average medical malpractice awards per doctor: neurological surgery, thoracic surgery, obstetrics and gynecology, general practice, emergency room, plastic surgery, radiology, anesthesiology, general surgery, and cardiovascular disease.

[59] As far as we know, this is the first study analyzing predictors of discordant outcomes.

[60] There are differences among liability insurers in the discordance percentage of paid nonerror claims and unpaid error claims. Additionally, the likelihood of discordance in both discordant outcomes increases when there are close-calls involved, but they are less likely when the reviewer is more confident about the presence of error or not.

present in both types of discordant outcomes.[61] One implication of this discovery is that it does not support the view that juries are too generous to plaintiffs when a medical malpractice case arrives in court.[62]

In addition to studies that analyze several specialties, others have focused on one specialty only. Obstetrics is among the clinical specialties that attracts more attention, eventually because substandard care can cause severe injury to a newborn (many cases involve birth-related neurological damage), and high damages[63] are normally awarded in these cases (which might have a subsequent effect on obstetricians' insurance premia). In 2009, a new study was published focusing on cases of obstetric anesthesia.[64] By looking at cases that involved newborn death/permanent brain damage during 1990 or later, the researchers find that[65] there was a significant association between payment by the anesthesiologist and possible anesthesia contribution to the newborn injury - and not the severity of the injury.

1.2.5 Studies Outside the U.S.

In spite of the fact that empirical analysis of medical malpractice has been a much more current practice for the American case, the results from the HMPS and the UCMPS raised curiosity among scholars from other countries. Using the same methodology of the two studies cited above, new research on adverse events in hospitals has been published, using other jurisdictions as case-studies. Nevertheless, these studies are more focused on the quality of care and preventability of those events than on the

[61] This means that not only "*[t]he odds of error claims not receiving payment were four times higher when the claim was resolved by verdict rather than by settlement*" but also that "*verdicts were less prone to paying nonerror claims*" Studdert and Mello (2007), p. S65.

[62] Some of the defenders of this view are doctors, insurers and scholars. But empirical evidence does not seem to support it. See Vidmar (1995), and Danzon and Lillard (1983) for evidence regarding medical malpractice cases in trial. For general cases that arrive to court and possible problems with their selection, see Gertner (1993) and Priest and Klein (1984).

[63] Freeman and Freeman (1989) claim that although 60% of malpractice premiums paid by obstetricians are used to cover suits for alleged birth-related cerebral palsy, substantially less than that money is given to the victims and less than 10% of children with cerebral palsy receive some kind of compensation from tort suits.

[64] See Davies et al. (2009). Several changes were performed in the practice of obstetric anesthesia, what might have led to changes in the liability profiles. Closed claims from the American Society of Anesthesiologists Closed Claims database were analyzed by a practicing anesthesiologist at the professional liability insurance company.

[65] Delays in anesthesia care and poor communication between the obstetrician and the anesthesiologist were found to be some of the potentially avoidable causes of newborn injury.

correctness of the tort system, at least as far as we are aware.[66] Table 1.1 presents some of the studies and their main findings.[67] As the table shows, the percentage of patients suffering adverse events ranges from 6% to 16.6%, of which from 30% to 64% were preventable. But how close should these results be so that we can consider them as similar, or how accurate it is to make comparisons among them? Caution is needed if we want to make a comparative analysis, due to several reasons. Even though they highly rely on the methods and procedures of the HMPS and the UCMPS, many differences can be found. Differences in the sample size, type of hospitals involved (teaching hospitals, different specialties), the threshold for an event to be considered adverse can vary, the time at which the study was taken (from 1992 to 2004 new discoveries implied changes in medical procedures) are some of the particularities that make us reluctant in making that kind of analysis. Actually, it should not be surprising that comparative analysis is not so developed in empirical medical malpractice.

Although most of these studies do not demonstrate that the tort system is able to deliver correct results or to compensate victims, it would be interesting to "match" the standard of negligence that each country has with the compensation that the system attributes. For example, Schwartz (1992) reports that the standard of duty of care is high in Japan. Hagihara et al. (2003) estimate that from a total of 421 court decisions, 31.8% were decided in favor of the patient. While studying the case of the U.S., Studdert et al. (2006) came out with the result that only a small percentage of cases arrived in court and, in these, plaintiffs rarely won damages. Previously, Vidmar (1992) had presented a win rate of 20% for plaintiffs in North Carolina from 1984 to 1987 and a win rate of 16% from 1987 to 1990. Therefore, it would be interesting to study if there is evidence that courts attribute compensation to patients differently, depending on whether they are in a more 'flexible' or a more 'rigid' jurisdiction, *i.e.*, a jurisdiction that makes it more difficult or easier to obtain compensation or to take physicians to court.

[66] The exception is the work of Hagihara et al. (2003) on Japan, where some predictors of payments are presented. The conclusions on the effectiveness of medical malpractice litigation in improving the quality of medical care in Japan should be taken with caution though, since a causal link between a decrease in the number of medical malpractice cases and the incentive to avoid negligence due to a high financial penalty is difficult to prove. Other factors might also play a role.

[67] Notice that these studies use essentially the same methods that the HMPS and the UCMPS. Therefore, we do not present their main limitations here.

1.3 Costs

Over the last two decades there have been several attempts to estimate the costs of medical malpractice. The main questions are: 'How much does the actual medical malpractice system cost?', 'How much do negligent adverse events cost?', 'How much does it cost to defend a medical malpractice case?', 'From each dollar spent on compensation how much goes to administrative expenses' or 'How much would the same care and adverse events cost in case a different liability regime was adopted?'.[68] Several studies regarding the costs of medical malpractice have been executed, but it is often the case that they answer different questions, which reduces the possibility of comparisons among them. Additionally, and in case we are actually able to find studies that have the same underlying question, it is hard to find comparable databases or definitions.[69]

The design of costs related studies is quite demanding, due to the requirement of several items that need to be calculated:[70] the premium doctors pay to the insurance companies, the cost of filing a claim (administrative costs, lawyers expenses, experts witnesses expenses, physicians' emotional costs for facing a lawsuit), costs to the patients that suffered harm (physical, emotional, future health care costs, for the patients and for their families). Besides, estimating the full costs inherent to the health care system or clinical negligence involves making several assumptions, namely on inflation rate, injured patient's life expectancy, duration of the injury, lost income and lost household production.

Advocates of tort reform claim that the current system is too costly and that it reaches only a small proportion of the negligently injured patients. The main arguments are the following: the actual system is very slow, which implies that negligently injured patients must wait years to receive compensation; even if frivolous cases do not receive payments, there are defense costs involved, which are very high; some patients receive compensation even if there was no negligence in the care provided by the physician; juries are attributing higher amounts of compensation, some of them exorbitant. As a result, they claim, insurance premiums are having a spiral increase and some doctors are not able to find insurance. Eventually, physicians are moving to other states or are retiring earlier. Moreover, doctors might be so afraid of facing a lawsuit that they incur

[68] We are not focusing on the insurance side in this work.

[69] We have in mind, for instance, the case of defense costs, where some authors include insurers´ indirect costs (such as marketing and administration) in their calculations and others do not.

[70] Studdert, Brennan and Thomas (2000) refer essentially to two ways of identifying the costs of medical injuries: by surveying the injured patients or by asking experts to estimate them.

in defensive medicine,[71] which also raises costs without bringing any positive effect to the patient.

Although it seems clear that the current medical liability regime based on fault in several countries is not perfect,[72] empirical evidence does not lend support to the main arguments presented above (see Table 1.2). The Utah-Colorado Medical Practice Study (UCMPS) extrapolated its finding about Utah and Colorado to all discharges from American hospitals in 1992, which resulted in an annual cost of AEs of near $38 billion. If preventable AEs have been avoided, this would mean a reduction in health care costs of approximately $20 billion, which was near 4% of national health expenditures in 1996.[73]

When analyzing closed claims in Florida, Vidmar et al. (2005) came out with several interesting results. To start with, paid claims frequency increased from 1990 to 2003, but when adjusting for the number of doctors and total population those figures remained stable. There was a considerable increase in the mean and median of payments since 1991, but it was accompanied by an enlargement in the severity of the injury involved.[74] If we focus on cases that involved at least $1 million payment, we can see that, from 1990 to 2003, 19.2% of the paid claims refer to permanent grave disability and that "*almost 93% of million-dollar payments to claimants were settled rather than adjudicated*". From 1990 to 1997, the mean transaction costs[75] for paid ($39,719) and non-paid ($22,205) claims remained stable, with the costs of the later being about 1.7 times greater than the former. Although there was an increase in the mean cost of paid claims in 2003 (to $44,407), it is not sufficient to state that mean transaction costs have increased (the mean of paid claims for the period 1990-1993 was $40,853 and for 2000-2003 was $39,158).

Black et al. (2005) examine medical malpractice claims in Texas, and they are quite

[71] See the next section for more on defensive medicine.

[72] We have in mind some of the variables presented already in the previous section, such as the lag between filing a claim and receiving compensation or the incapacity of providing compensation to negligently injured patients only. With respect to the capacity of the system to induce physicians to exercise due care, see Arlen and MacLeod (2003). As the authors mention, in medicine it is impossible to drop the physician´s probability of error to zero, even if the physician invests a lot in expertise.

[73] See also Kohn et al. (2000).

[74] In 2003, claims referring to permanent major disability, permanent grave disability and death accounted for 45.4% of paid claims. The same type of claims accounted for 32.8% in 1990. See Vidmar et al. (2005).

[75] These involve all costs of defending the claim, such as with lawyers and experts.

skeptical in accepting the existence of a crisis.[76] Some of their main findings are:[77] there is a high frequency of claims closed with zero payment; it is common to find multiple defendants; adjusting for population growth, the total of closed claims from 1990 to 2002 was stable; for the same period and adjusting for the number of physicians or growth in real health care spending, the total number of paid claims and large paid claims declined; physician's risk of facing a claim is much higher than the risk of facing a payout; total payouts to patients were roughly constant over time (and near $515 million in 2002); total costs (payout and defense costs) per large paid claim rose from 0.8 to 1.2% per year; defense costs rose gradually and their absolute size relative to payouts is small.

While considering defense costs arising from closed claims from five malpractice insurance companies in four U.S. regions, Studdert et al. (2006) reach some different results. Their main conclusion regarding costs is that administrative expenses in medical malpractice cases are exorbitant comparing to the indemnity payment to the negligently injured patient. Basically 54% of the compensation is for defense costs and contingency fees. The authors defend that changes should be made in the system, but that the main worry should regard cases involving error instead of frivolous cases.[78] Notice that although these results might seem contradictory with the ones presented by Black et al. (2005), this is not necessarily the case. In fact, when studying the case of Texas, the authors had access only to defense costs for claims involving a payment higher than $10,000, and their analysis is on defense costs incurred by insurers. Therefore, they do not estimate plaintiffs' defense costs. Additionally, Black et al. (2008)[79] tried to make the results for the defense costs comparable, and obtain that in the study of Studdert et al. (2006), "*for paid claims, legal fees and expenses were 11 percent of the sum of payouts plus defense costs*".[80] And comparing on the same basis for Vidmar et al. (2005), legal fees and expenses in paid claims in Florida were 14% of the sum

[76] Given the time lag between initial claim and payout the authors state that, theoretically, it is possible that "*the spike in insurance premiums was driven by a spike in number of new claims or expected cost per claim that is not yet reflected in the closed claims that we study. But the more likely explanation is that much of the rise in premiums reflects insurance market dynamics, not litigation dynamics*", at p. 210.

[77] See Table 1.3 for more detailed results.

[78] Frivolous cases account for nearly 20% of the costs, and therefore a change in these cases only would have a limited effect on total costs only.

[79] The authors actually use the same database that they used previously in Black et al. (2005), but they extended it until 2004. Some results for bodily injury claims in other commercial insurance areas than medical malpractice are also presented.

[80] Black et al. (2008), p. 190.

of payouts and defense costs.[81] When referring to cases involving positive payouts, Black et al. (2008) find that the mean and median defense costs per large paid claim is $43,000 and $27,000, respectively, in 1988 dollars. The authors convert the results given by Studdert et al. (2006) to 1988 dollars, and obtain a comparable result of a mean defense cost for cases with positive payout equal to $36,000.

Black et al. (2008) came out with several interesting results. In order to have an idea of how expensive the tort system can be, authors found that "*it costs a bit over a dollar in legal fees and expenses for the plaintiff to end up with $1 in his pocket*". Comparing with other areas of insurance (such as auto, general commercial, multi-peril), medical malpractice cases are more expensive to defend. Moreover, and perhaps the most striking part of the study, is that medical malpractice insurers fail to adjust their reserve estimates to reflect rising defense costs. Even worse than that is the fact that defense costs per case almost doubled during the period of study, but per case reserves were lower at the end of the study than at the beginning. And although several hypothetical explanations are presented,[82] none can actually explain the reason why this happens in medical malpractice insurance.[83]

The debate about the costs of the current compensation system in medical malpractice cases has taken in several countries, where other options[84] started being considered. Sweden,[85] New Zealand[86] and Finland[87] are countries that have actually implemented no-fault regimes. Having in mind the Swedish scheme that provides compen-

[81] The time period of each study is different.

[82] As Black et al. (2008) state, they would expect this to happen due to increasing hourly legal fees, rising payouts, rising exposure (*i.e.*, "*expected payout assuming an average level of defense spending*", Black et al. (2008), p. 187) even if payouts are not rising, cases that are taking longer to close or are being solved at a latter procedural stage, or insurers that are spending more in an attempt to win a larger fraction of cases.

[83] See Table 1.3 in the Appendix for additional results.

[84] For some studies during the 1990's, see Fenn et al. (1994), Sloan et al. (1997), Bovbjerg et al. (1997), Studdert et al. (1997), Danzon and Towse (1999) and references therein. Regarding other options, we have in mind essentially offset of awards against collateral sources reimbursement or compensation received by the injury, caps on damages attributed to plaintiffs and to attorneys, and no-fault compensation schemes.

[85] See Danzon (1994b). When referring to the case of Sweden, we should bear in mind that it has one of the most generous and comprehensive social insurance systems of the world. See Studdert et al. (1997). Additionally, Fenn and Rickman (2001) refer to a tight criteria for offering compensation and low awards under the Swedish scheme. See also Dute et al. (2004).

[86] See Miller (1992). When referring to the estimation of New Zealand's low legal costs for medical malpractice cases, Fenn and Rickman (2001) argue that "*this result has been achieved by effectively 'rubber-stamping' claims and paying with only limited investigation. The hidden costs of this, in terms of reduced deterrence and increased costs, is unknown*".

[87] See Brahams (1988).

sation based on the preventability of the event, Studdert et al. (1997) estimate what would be the costs for Utah and Colorado in case a similar scheme were adopted. Using a prerequisite of an eight week disability period, the Swedish scheme would cost[88] $76.79 million to Utah and $100 million to Colorado. The costs of the current medical malpractice systems are respectively $25-30 million and $45-50 million. Additionally, it would be possible to compensate 889 injured patients in Utah, compared with estimates of 210-240 of successful claimants today, and 973 injured patients in Colorado, compared to 270-300 of current successful claimants. The authors defend that the adoption of a Swedish scheme would be affordable and would allow more patients to be compensated. Nevertheless, they also argue that "*the applicability of the overseas experience to the U.S. health care system is a concern. Specifically, differences in wider social insurance arrangements, the price of medical care, and the incidence and costs of medical injuries may well exert unique pressures on the operating costs of a no-fault system in the United States*".

Excluding the U.S., probably the country where more attempts were made regarding the estimation of the costs of the actual negligence system (and a potential change to a different regime) was the UK,[89] essentially by the works of Fenn[90] and his colleagues. In 2004, Fenn, Gray and Rickman published an article that estimated the costs that the UK would incur in case the no-fault Swedish scheme or a small claims scheme as proposed by the Department of Health[91] were adopted. Estimations show that more patients can be compensated but, regarding the costs, the results are: the Swedish no-fault compensation scheme would imply a cost six times higher than the actual system, due to an increase in the number of claimants; using the proposal of the DoH of a £30,000 ceiling, the 'small claim' scheme would imply an additional annual costs of approximately £42 million.[92] Therefore, it seems that the reduction in admin-

[88]The estimates change considerably if there is a reduction in the disability period, if a cap on pain and suffering is imposed, or if no household production is allowed. See Studdert et al. (1997), Table 3.

[89]There were some legal changes in the UK in the 1990's: since hospitals are better suited than physicians to institute risk management policies, after 1990 the NHS assumed responsibility for physician's negligence. The hospital must solve the principal-agent problem that arises from this change. This also brought difficulties in estimating the costs of the NHS in the UK. See Fenn and Rickman (2001), Fenn et al. (2004) and Danzon and Towse (1999) for changes in the UK.

[90]See Fenn et al. (1994), Fenn et al. (2000), Fenn and Rickman (2001), Fenn (2002), Fenn et al. (2004). See also Danzon and Towse (1999).

[91]The proposal of the DoH is that "*cases valued below a given threshold are offered speedy access to compensation based on the administrative assessment of fault, while larger ones pursue the traditional tort route*", see Fenn et al. (2004). In 2001, the National Audit Office figured out that "*for settlements up to £50,000 the costs of reaching the settlement are greater than the damages awarded in over 65 per cent of the cases*".

[92]This estimation does not include additional costs of a no-fault system for birth-related injuries. Other

istrative costs is more than offset by the increase of patients that are expected to seek compensation in these proposed schemes.

The impossibility of reaching a perfect system, able to deter negligent care and to compensate negligently injured victims, by making a correct balance between the costs and benefits of additional care, is not new. There are naturally a lot of costs involved in case of medical practice, for the physician and for the injured patient but also for society. Several studies have tried to estimate the actual costs of medical malpractice and to eventually predict what would be the costs if another system were in practice. As we can see from the above, this is very demanding work, but it should be done before moving to other systems, that also have their flaws.

1.4 Defensive Medicine

The practice of defensive medicine is one of the arguments most frequently cited by proponents of tort reform. The main claim is that the fear of being sued leads doctors to change their practice patterns to more defensive ones, namely by asking for extra diagnostic exams[93] that do not bring any benefit to the patient but imply very high medical bills. Moreover, these procedures start to be viewed as standard care and therefore will be largely implemented by physicians, leading to a change in the level of due care, only because physicians are afraid. But what is defensive medicine after all? We can think about defensive medicine as denoting actions taken by the physicians that are used "*primarily as a protection against potential medical malpractice claims*".[94] Two distinct types of behavior can be found: when physicians perform tests or procedures primarily to reduce exposure to liability, they are practicing *positive defensive medicine*; when they avoid certain patients or procedures, they are practicing *negative defensive medicine*.[95] Being able to make a quantification of defensive medicine is quite complicated due to the fact that it is necessary to distinguish "*between the good, injury-prevention effects of malpractice lawsuits and the bad, wasteful effects. Drawing that line turns out to be very difficult*".[96] However, as noted by Sloan and Shadle (2009), for law and economics it is the care for which expected costs exceed expected benefits that is excessive and defensive.

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results are achieved by using a different ceiling.

[93] Baicker et al. (2007) found that the threat of tort, measured by the growth in medical malpractice payments in a state, was highly related to increasing in imaging.

[94] See Baker (2005a), p. 119.

[95] See Klingman et al. (1996), p. 189.

[96] See Baker (2005a), p. 119.

Having all this in mind, the next step is to measure defensive medicine. One of the most common procedures that attempt to quantify defensive medicine are surveys made to physicians. Obviously, this approach has some drawbacks:[97] physicians might act defensively but in an unconscious way; they can see the survey as a test to their knowledge; or they can see the survey as an opportunity to achieve political goals. Moreover, it is unfeasible to create an inquiry in which all possible scenarios are presented and it is also likely that physicians respond in one way but would react differently in practice. Other options include studying the effects of law reforms or linking malpractice claims to physicians' behavior. It is quite unlikely to infer causation from this. In addition, Baker (2005a) discusses another approach, based on a comparative analysis of hospital records, that aims at measuring defensive medicine directly, by using hospital records to see what doctors are doing and by comparing it afterwards with the risk of medical malpractice faced in different areas and hospitals. Although this approach provides "*a more reliable measure of what doctors actually do*", the truth is that it "*cannot tell us whether the doctors' efforts are beneficial or wasteful*" and "*measuring the extent of defensive medicine in one area of medical practice may not tell us very much about the extent of defensive medicine in another area*".[98]

The results of the studies on defensive medicine have provided mixed results so far, as for example the case of obstetric care. Obstetrics-gynecology has been analyzed in several studies concerning defensive medicine, mainly because it is believed that defensive behavior is common among physicians in this specialty. Many studies relate the effect of malpractice risk[99] to the probability of a cesarean section or a natural delivery.[100] However, the studies present diverse results: Kim (2007), Sloan et al. (1997) and Baldwin et al. (1995) found no link between an exposure to liability and the type of delivery; Currie and MacLeod (2008) and Tussing and Wojtowycz (1992) found a negative relationship between fear of litigation and cesarean section rates; Dubay et al. (2001) found a positive relationship between malpractice fears and section rates. A more recent study from Dranove and Wanabe (2010) finds short-lived and small effects in different periods of time: the first effect is felt when after an injury a hospital receives a request for medical records, and there is a "*very small and short-lived hospital-wide increase in the cesarean section rate*" (which might reflect temporary defensive medicine measures taken by the hospital); the second effect is felt approximately nine

[97] See Klingman et al. (1996).

[98] Baker (2005a), p. 126.

[99] See each study to check how they take into account malpractice risk or fear of litigation, since there are different approaches.

[100] Practicing a cesarean section is believed to be more likely when the risk of liability is higher.

months later, and "*there is a larger increase in the cesarean section rate for the responsible physician*" (which might reflect an effort from the obstetrician to "lobby" new patients in favor of cesareans).[101]

The extent of defensive medicine among cardiologists, obstetricians and gynecologists, and surgeons was assessed by Klingman et al. (1996)[102] using clinical scenario surveys. The scenarios were chosen by the panels of experts in each specialty and included, among others, hypothetical situations in which a minor condition had a small chance of being serious or fatal for the patient. Given that not every possible scenario could be included, the authors adopted a strategy that would allow them to get an upper bound to the frequency of the defensive medicine. There was also a "control" version of each case scenario that would provide more information to the physicians and would increase "*the clinical appropriateness of specific interventions*", meaning a reduction of the importance of malpractice concerns. Notice that a "*critical limitation of clinical scenario surveys is that their results cannot be generalized beyond the specific situations described*"[103] and those situations are limited. Some of the most interesting results were the difference in answers when comparing close-ended questionnaires with open-ended questionnaires, the lower evidence of practice of defensive medicine and the variability of practices across clinical situations. Regarding the first, in the open-ended[104] questionnaires there was a lower percentage of respondents citing malpractice concerns as "*the primary reason for choosing a given action*" when comparing to answers in closed-ended surveys. Klingman et al. (1996) estimate the percentage of procedures that were performed primarily because of malpractice concerns, and they obtain an upper bound estimate of 8%.[105] Therefore, although the results cannot be generalized to all clinical situations, there seems to be evidence of positive defensive medicine, but to a lower level than anecdotal evidence suggests. Baker (2005a) commented these results, by writing: "*What was the OTA researchers' bottom line? Despite the fact that doctors say in opinion surveys that malpractice lawsuits affect how they practice, defensive medicine is not likely to explain very much of the huge growth in health-care expenses over the past quarter century*".

Kessler and McClellan (1996)[106] compare health care expenditures and adverse

[101] See Dranove and Wanabe (2010), p. 92.

[102] This study is also cited in the literature as the OTA (1996) study, since it was the U.S. Congress that asked the Office of Technology and Assessment to measure the extent of defensive medicine in the early 1990's. See Baker (2005a), pp. 118-119.

[103] Klingman et al. (1996), p. 192.

[104] See Table 3, p. 200 for the comparison among different scenarios.

[105] See Appendix D, pp. 213-217 for the results for each clinical action.

[106] The authors also describe some of the problems present in earlier studies that tried to assess physicians'

health events in some states that adopted tort law changes (that can be direct or indirect[107] reforms) and states that did not adopt any kind of reform. If a state adopts a tort law change that leads to less malpractice pressure (*i.e.*, to less benefits to plaintiffs and/or lower costs to physicians) and the results are a reduction in health expenditures without an increase in adverse events,[108] then there is evidence that physicians were practicing defensive medicine before the reform. For that purpose, they analyze elderly cardiac disease patients hospitalized due to a new AMI (acute myocardial infarction - heart attack) or a new IHD (ischemic heart disease) that suffered cardiac complications or death within one year of the initial event. By confronting Medicare payments for hospital care in states adopting direct reforms with those made in states adopting indirect reforms - for patients in the clinical situation described above - it was possible to find a decline from 5 to 9% in medical expenditures, and this reduction was equal to 1.8% in states adopting indirect reforms. This expenses' reduction had no consequential effects for the patients, meaning that defensive medicine seems to have been present in those treatments. Given the specific type of health problems studied and also the population, we think caution is needed when extrapolations to the total cost of defensive medicine are made. In 2002, Kessler and McClellan expand their dataset by including an extra year of data (1994) and study the effect of tort reforms and managed care (the authors do confirm that doctors practice defensive medicine in the sample they analyze). By interacting the adoption of tort reforms (direct and indirect) and levels of managed care (high or low), the main conclusions of this study are the following: direct reforms had a long-run reduction effect in medical expenditures for AMI and IHD patients, without substantial implications for patients' health (*i.e.*, direct reforms reduce defensive medicine behaviors in areas with low and high levels of managed care); the estimated long-run independent effect of reforms on health expenditures for AMI is smaller in high managed-care environments (-3.1%) but is not statistically different from the in-

behavioral response to malpractice pressure, such as selection bias.

[107] Direct reforms are those that directly reduce malpractice awards, *i.e.*, those that truncate the upper tail of the distribution of payments per claim. Examples include caps on damages and collateral source rule reforms (the collateral source rule, that "*prohibits presentation to the jury of evidence of compensation payable to the tort plaintiff from sources other than the defendant*", has been modified or abandoned in medical malpractice suits in some U.S. states, as described in Danzon (1982), p. 40.). Indirect reforms are those that reduce malpractice awards indirectly, such as the imposition of mandatory periodic payments and statute of limitations' reductions.

[108] Remember that, following the economics definition of defensive medicine, the care provided in that case should be of zero or low marginal benefit. The effect on the increase of AEs can be seen as a proxy for this, although it is not possible to quantify, as in an ideal setting, the amount of marginal care that exceeds marginal benefit.

dependent effect in low managed-care environments (-3.8%), which means that these policies are not substitutes nor complementary; as for IHD patients, the estimated long-run effect of direct reforms on health expenditures is -7.1% for high managed-care levels and approximately -2.9% for low managed care levels, which seems to show that these policies are substitutes (in other words, the reduction of defensive medicine practices due to high managed care is lower in case direct reforms are in effect already).

In a recent article, Sloan and Shadle (2009) reassess the evidence provided by the study published by Kessler and McClellan (1996), but with some differences.[109] The authors evaluate the effects of direct or indirect tort reforms on total inflation-adjusted Medicare payments, for the first year after one of the following five situations: a hospital admission[110] of any diagnosis, primary diagnoses of AMI, stroke, breast cancer, and diabetes. The probability of survival for one year following the date of the index event is also assessed, in order to check the benefit to patients. Contrarily to the results obtained by Kessler and McClellan (1996), Sloan and Shadle (2009) conclude that direct reforms did not significantly reduce one year Medicare payments in any setting. Regarding indirect reforms, the only statistical significant coefficient is the one for "Any hospitalization", with a parameter estimate implying a reduction in total payment of 9.4%. The probability of survival one year after the index event is not affected by direct or indirect reforms, meaning that there were no consequences for beneficiaries' health. Just like stated by the authors, one striking conclusion is that there seems to be evidence that liability is not able to deter medical injuries.

Instead of focusing on one specialty only as many studies, Studdert et al. (2005) analyze the practice of defensive medicine among six high risk specialists[111] in Pennsylvania. Although we cannot generalize the results to other specialties or states, the respondents of the survey provided several interesting answers. To start with, 9 out of each 10 respondents mentioned that they had engaged in at least one form of defensive medicine presented in the survey. Regarding assurance behavior, 59% of the physicians answered that they "*often ordered more diagnostic tests than were medically indicated*"[112] but the proportion was higher for emergency physicians. With respect to avoidance behavior, 39% "*reported that they 'definitely will/already decided to' avoid caring for high-risk patients*",[113] with this response being less likely among emergency

[109] See Sloan and Shadle (2009) pp. 483-484 for the description of the differences.

[110] The authors were able to control for health prior admission and demographic factors of the patients.

[111] The six specialties are emergency medicine, general surgery, obstetrics/gynecology, orthopedic surgery and radiology.

[112] P. 2612.

[113] P. 2613.

physicians. Specialist physicians' confidence in the adequacy of their liability coverage and their perceptions of premium burdens were the strongest predictors across all types of defensive practice. However, the authors are not able to confirm whether the results are exaggerated and, if so, in which direction. Moreover, Studdert et al. (2005) mention that since there are defensive procedures that can actually pose some risk of harm and that "*obstetrics and breast cancer detection are high-liability fields, women´s health may be particularly affected*".[114]

The existence and practice of defensive medicine is being regarded as one main argument to implement malpractice reforms, given the high costs it imposes and the eventual harm to patients. However, the empirical results are mixed and can vary considerably across specialties. Nevertheless, it seems that even if positive defensive medicine does exist[115] - as it seems to be supported by some studies-, it is not to such a high extent as it is frequently claimed.

1.5 Conclusions

While it seems quite acceptable that most of the patients who suffered negligent harm do not sue, the discussion about the merit and outcomes of the claims is more contentious. Several variables should be taken into account if we want to draw conclusions about the capacity of the tort system to deliver correct outcomes. First of all, and due to a great extent to data restrictions, there is no perfect study design. Each design has limitations and authors are normally aware of the problems. Besides, even physicians disagree among themselves when having to decide if the care provided was according to the standard and if the harm that the patient suffered could have been avoided. While trying to find an answer to the question 'How often do juries "get it right" with respect to their verdicts on liability?', Vidmar (1995) replies that "*It should be clear by now that there can be no definitive answer to this question because, in the end, legal negligence is a matter of human judgment*".[116]

Due to the specificity of the studies' design, there is the danger of generalizing the results to other jurisdictions, which can lead to misleading conclusions and result in inappropriate policy changes. Health care has so many specificities which make it difficult to judge, and no jurisdiction is able to deliver correct decisions only. An

[114] P. 2617.

[115] Some studies find no evidence of negative defensive medicine. See, for example, Dranove and Gron (2005) and Baicker and Chandra (2005).

[116] The author was obviously excluding cases under the doctrine of *res ipsa loquitor*, such as operating the wrong site, for instance.

additional obstacle is the differences among specialties, that require diverse treatments. Judgments regarding the existence of negligence should be made by physicians within the same specialty. As we saw, the high costs normally involved in these kinds of studies can be a major obstacle.

The time span between the injury, filing a claim and the outcome of the claim can also give rise to biased results, since the consequences of an injury or claim today will be only reflected after some years in the closed or settled claims. Additionally, there is variation across specialties,[117] types of hospitals, time, region, jurisdictions, among others, that require caution when drawing conclusions, especially if these imply policy changes. This can as well explain partially the differences of the estimations found by the studies.

Estimating the costs of the medical malpractice system is highly difficult, and calculations must rely on several assumptions. Although imprecisions are unavoidable in studies that estimate the costs of medical negligence, it does not seem reasonable to move to other kind of schemes without trying to estimate the potential costs involved in a new regime. There is no perfect scheme: when considering the Swedish option, policymakers must bear in mind the fact that Sweden has a very generous social security system; and with respect to New Zealand, "*the leading proponent of no-fault accident compensation among the developed nations*",[118] if the system was working so well, it would not have been necessary to reject its own no-fault approach by restricting the cases that can receive compensation. Although we can expect a no-fault system to provide compensation to a higher number of patients, it is also recognized that injurers should face at least part of the costs in order to provide incentives to take care. But just like Fenn et al. (2004) state, "*[i]n the health care sector, this issue is complicated by the fact that patients may be injured due to the interaction of multiple factors leading to organizational, rather than individual, failures*".[119] Therefore, hospital managers should be provided "*with incentives to take responsibility for identifying system failures and implementing risk management procedures*". Additionally, it is possible to design a no-fault scheme that is able to reduce the costs of defending claims and the costs for the health care system. It is more difficult to create a system that will certainly reduce societal

[117] For instance, one common problem related to anesthesia is awake paralysis. Domino et al. (1999) analyzed which were the most common causes for it and when it was more likely to happen. Cheney (1999) also writes on the effort made by the American Society of Anesthesiologists Closed Claims Project, as a way to improve patient safety given the possibility of obtaining more information via closed claim data on anesthesiology.

[118] See Miller (1992), p. 16.

[119] Fenn et al. (2004), p. F278.

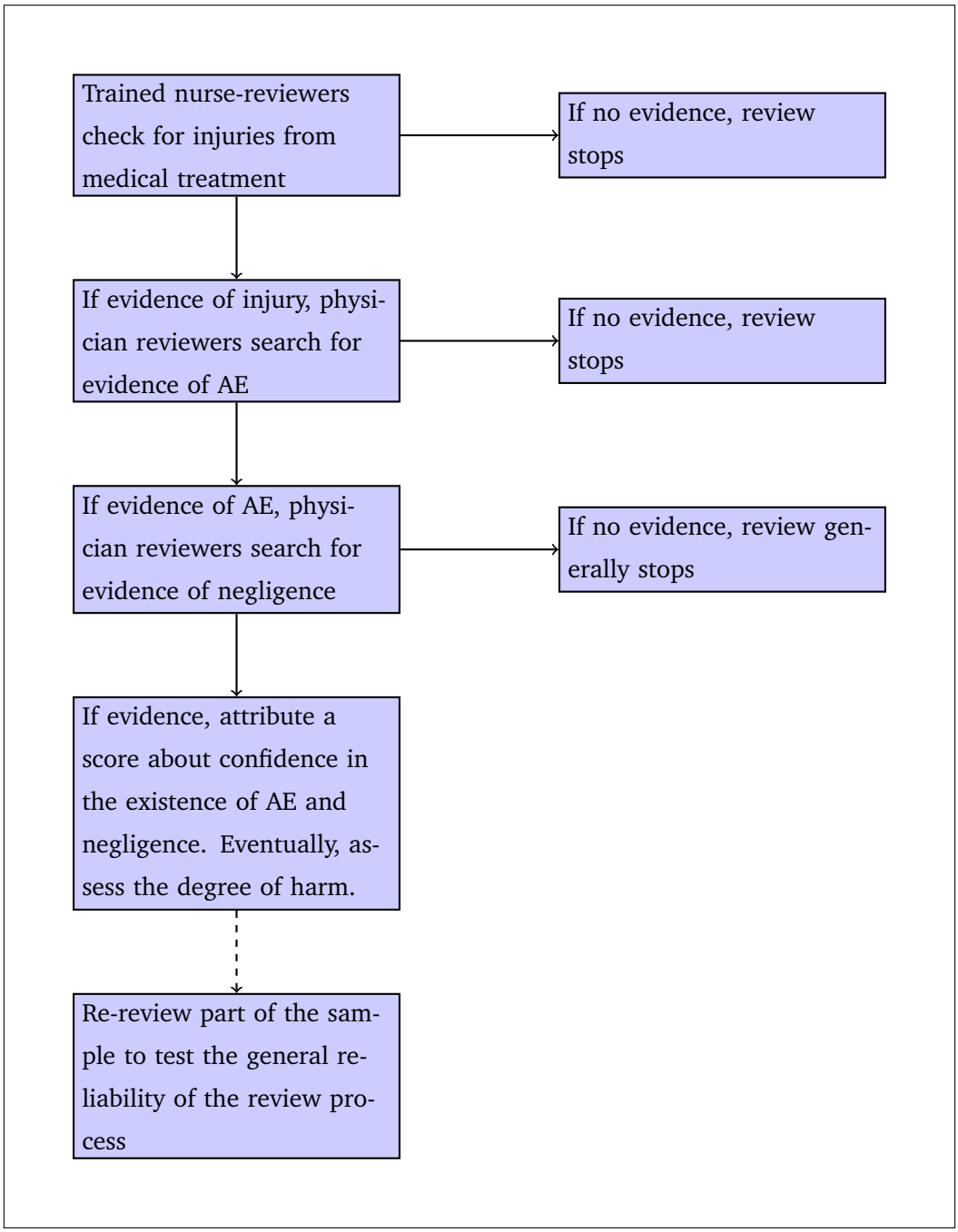
costs.

Baker (2005a) states that "*[o]f all the parts of the medical malpractice myth, claims about defensive medicine are the most difficult to pin down. Part of the problem lies in defining 'defensive medicine'.*"[120] Even after surmounting that barrier, the approaches available to measure it have some flaws. Defensive medicine is viewed by many as an enormous waste of resources that does not imply a benefit to patients. However, the results of empirical studies in this area do not lend support to such a strong claim, since the results are mixed regarding not only the existence of defensive medicine but also its extent. There is some evidence that defensive medicine exists, but to a much lower extent than argued and it varies considerably per specialty. Defensive medicine does not seem to be able to explain the growth in health care costs, as it is frequently claimed by supporters of malpractice reform.

[120] P. 118.

1.6 Appendix

Figure 1.1: General Review Process



Note: This figure aims at helping to understand the common practice in the review process. It does not mean that every study exactly followed these rules.

Table 1.1: Studies on the incidence of (preventable) AEs outside the U.S.

Study	**Sample**	**%Patients with AE /%Preventable AEs**
Wilson et al. (1995), **Australia**[121]	14,179 admissions to 28 hospitals in 1992	16.6% /51%
Thomas et al. (2000), **Update for Australia**[122]	14,179 admissions to 28 hospitals in 1992	10.6% / NA[123]
Baker et al. (2004), **Canada**	3,745 eligible admissions of 20 hospitals in 2000	7.5% / 36.9%
Schioler et al. (2001), **Denmark**	1,097 admissions in 17 acute care hospitals	9% / 40.4%
Michel et al. (2004),[124] **France**	778 patients in 7 hospitals	14.5%(RM)-15.4%(PM) /40%(RM)-64%(PM)
Davis et al. (2002 and 2003), **New Zealand**[125]	6,579 medical records from 13 generalist hospitals in 1998	12.9% / 37%
Aranaz-Andres et al. (2008), **Spain**	5,624 medical records from 24 hospitals, patients discharged between 4 and 10 June 2005	9.3% (8.4% if we consider hospital care only) / 42.8%

Continued on next page...

[121] Wilson et al. (1995), p. 467, also estimated the AEs ratio using the HMPS definition. The authors find an estimate of approximately 13% of AEs ratio, which is still much higher than the HMPS ratio of 3.7%.

[122] This update study used the methods of the UCMPS, in order to make comparisons possible. The authors state that differences between the Quality in Australian Health Care Study (QAHCS) and the UCMPS are "*consistent with the contrasting goals of each study*", p. 376.

[123] The authors present five methodological differences that might explain the discrepancy of the results when comparing with Utah and Colorado. See also Runciman et al. (2000) for a "*qualitative analysis using a specially developed classification for incidents and AEs*", and for an examination of the distribution of AEs with respect to severity.

[124] Michel et al. (2004) estimate the proportions of AEs and preventable AEs using three different methods: cross sectional, prospective and retrospective. In this table we refer to these last two methods as PM and RM respectively. The results from the cross sectional method is not presented since the other methods are preferred. For France see also Michel et al. (2005), but for serious AEs only.

[125] See Davis et al. (2001) and Davis et al. (2001b) for a regional study in Auckland.

Study	Sample	%Patients with AE /%Preventable AEs
Zegers et al. (2005), **The Netherlands**	332 cases from 3 hospitals, patients discharged between October and November 2003	6% or 2%, depending on reviewers' level of agreement
Vincent et al. (2001), **UK**	1,014 randomly drawn records from two acute hospitals in the London area[126]	10.8% / 47%[127]
Sari et al. (2007), **Update for UK**	Random sample of 1,006 NHS hospital admissions between January and May 2004	8%-10% / 30%-55%

[126] In site 1, there was a total of 500 records reviewed (between July and September 1999), while in site 2 there was a total of 514 records (between December 1999 and February 2000). The review included records from general medicine (including geriatrics), general surgery, orthopedic surgery and obstetrics.

[127] This numbers change to 11.7%/48% if we look at the total number of AEs instead of the total number of patients with AEs (in order to allow for multiple AEs suffered by the same patient). Extrapolation for the total of patients in England and Wales that are admitted to hospitals and that suffer an AE yields that approximately 5% of the hospitals' patients suffer a preventable AE each year, which in turn leads to an additional three million bed days (this extrapolation can not be done with precision, as explained by the authors). The total cost for the NHS of these extra beds (excluding all other costs), would be around £1bn per year. See p. 518.

Table 1.2: Previous Research on Merits and Outcomes of Claims

Study	Sample	Main results	Main limitations
HMPS (1990)	The HMPS started by drawing a probability sample of more than 31,000 hospital records, having analyzed 30,121 records out of 31,429 from 51 hospitals in New York.	3.7% of hospitalizations in New York in 1984 resulted in AEs, of which 27.6% were due to negligence (or 1% of all hospital discharges). There are 16 times as many patients who suffer an injury from negligence as there are persons who receive compensation trough the tort system.	Small sample when only claims arising from hospitalization are considered. Reviewers did not always agree on which records contain evidence of AE and even less on which records present evidence of negligence.[128] Different classifications might have tripled the percentage of claims with findings of negligence.

[128]For a detailed description of the results, see HMPS, pp. 5-28/29. The fact that the methodology does not allow to reach consensus in identifying the same set of AEs led to the comment that "*It is troubling that such a study is so widely cited to prove that medical malpractice is common*", Anderson (1996). Studdert, Thomas, Burstin, Zbar, Orav and Brennan (2000) hypothesize that one possible explanation for the differences is the fact that the HMPS had six different directors for the record review. Anderson (1996) goes further, and mentions that there was no apparent effort to match reviewers' specialties to those of the medical problems at issue.

Table 1.2 – continued from previous page

Study	Sample	Main results	Main limitations
Brennan et al. (1996)	This was a 10 year follow up study of the medical malpractice claims identified in the HMPS as arising from the hospitalizations.	The result of the multivariate analysis was that the only predictor of payment to the injured patient was the presence of a permanent disability.	Small sample; the "observer effect"; some conclusions in the univariate analyses were made according to the mean of the payments; the logistic regression[129] treated the cases in which the only payment was a "write off" of the unpaid hospital bill in the same manner as those cases in which the plaintiff received a large payment, treating it as a settlement in favor of the plaintiff instead of in favor of the defendant; some disagreement among physicians' review.
UCMPS - Studdert, Thomas, Burstin, Zbar, Orav and Brennan (2000)	Nurses reviewed 4,943 of the 5,000 sampled records in Utah which lead to 842 reviews by physicians. Nurses reviewed 9,757 of the 10,000 sampled records in Colorado which lead to 1,978 reviews by physicians.	2.9% of AEs in both states. In Utah, 32.6% of the AEs were due to negligence and in Colorado 27.5%. After matching patients from the medical record review who filed malpractice claims during or after 1992, only 18 malpractice claims arise from the records, 8 in Utah and 10 in Colorado. Only 4 of the 18 involved identifiable instances of negligence.	The sample for hospitals was loaded with institutions that would be expected to play key roles in the development of a no-fault insurance plan in each state. Although it was not the purpose of this study, it does not present predictors of the correctness of the medical malpractice system.

[129] Baker (2005b) at p. 15, footnote 99 suggests that "*it would be interesting to reanalyze the Brennan [et al. (1996)] data using Probit*", since it is a well-suited analysis to dependent variables like settlement amounts in which there are a large number of $0 payments and a large spread among the other payments.

Table 1.2 – continued from previous page

Study	Sample	Main results	Main limitations
Spurr and Howze (2001)	165 closed claims (from 1987 to 1995), brought against one hospital in Michigan. 91 of these cases were settled, 65 abandoned by the plaintiff and 9 tried to verdict.	The defendant's fault is the only significant variable in predicting whether the plaintiff drops the case or whether the case is settled.	The defendant's care is judged by the hospital's risk management staff. Small sample.
Peeples et al. (2002)	81 closed claim files corresponding to medical malpractice lawsuits filed in North Carolina between 1991 and 1995 were reviewed.	Strong correlation between the judgment of breach of the standard of care and insurer's decision of making an offer to the plaintiff. An offer was made in 96.3% of the cases in which the insurer concluded there was a breach of the standard of care, and money was paid in 93.1% of the cases. When the insurer concluded that there was no fault involved, payment was made in only 14.8% of the cases (for claims going to court, defendants had a winning rate of 90% if there was no fault involved). Finally, payment was made in 36.8% of the cases in which there was uncertainty on the evidence of negligence.	Small Sample.

Table 1.2 – continued from previous page

Study	Sample	Main results	Main limitations
Phillips et al. (2004)	From a total of 49,345 claims settled between 1985 and 2000 involving primary care physicians, 26,126 were peer reviewed and 5,921 were assessed as negligent. These last ones are the focus of the study.	In the negligent AEs' claims, payment was made to 86% of claims, of which 37% involved death and 19% severe injury. Regarding those claims considered as not involving negligence, payment was made to only 7%, and the majority involved the higher degrees of harm. The most common diagnoses and underlying causes associated with negligent claims, contributing factors and relative risk of negligent AE for a specific medical condition becoming a claim are also presented.	Focus on the claims arising from negligent events, the "recognition bias" and the inability to calculate standard errors or confidence intervals for the relative risk assessments due to lack of data. Studdert et al. (2006) mention that this study relies on the "*insurer's view of the defensibility of the claim as a proxy for merit rather than on independent expert judgments*", p. 2029.
Studdert et al. (2006)	Random sample of 1,452 closed malpractice claims closed from 1984 to 2004. The claims were obtained from five liability insurers in four regions of the U.S. and related to obstetrics, surgery, missed or delayed diagnosis, and medication.	The most frequently sued physicians in the sample were obstetrician-gynecologists (19%) followed by general surgeons (17%) and primary care physicians (16%); 80% of the claims involved injuries that caused significant disability, major disability or death; the average time span between the occurrence of the injury and the closure of the claim was five years; a small percentage of cases arrived to courts, and in these plaintiffs rarely won damages.	Reviewers knew the result of the litigation process; moderate agreement regarding the existence of error; "*the sample was drawn from insurers and involved clinical categories that are not representative of malpractice claims nationwide*", p. 2031.

Table 1.2 – continued from previous page

Study	Sample	Main results	Main limitations
Davies et al. (2009)	426 claims related to obstetric anesthesia during and after 1990, and 190 before 1990.	In the 91 cases that involved newborn death/permanent brain damage during 1990 or later, there was a significant association between payment by the anesthesiologist and possible anesthesia contribution to the newborn injury. Regarding the 17 (out of those 91) cases that involved anesthesia payment, the existence of payment was associated with a substandard level of anesthesia care (payment was made in 9 cases in which care was found to be substandard and in 7 cases in which care was appropriate). From the 63 cases that involved no payment, 3 were regarded as involving substandard care and 52 as appropriate.	The data does not allow risk's estimations for specific injuries and populations as it does not contain claims on all adverse anesthetic events nor the number of anesthetics performed annually. The authors mention hat there was "*modest interobserver agreement regarding appropriateness of care and outcome bias in the judgment of standard of care*" (at p. 136). Small subsamples.

Table 1.3: Previous Research on the Costs of Medical Negligence

Study	Sample	Main results
Studdert et al. (1997)	Random sample of 13 hospitals in Utah (5,000 discharges) and 15 in Colorado (10,000 discharges) in 1992. Two types of injuries were detected: those that would be compensated in a no-fault regime using Swedish compensation criteria and those that would be compensated under the current regime based on negligence.	Using expert's judgment, the authors estimate: lost wages and lost household production, health care costs, consumption deduction for cases of death, social security disability benefit deduction for injured patients that could not work for more than 12 months, non-economic costs, and costs of injuries to newborns. Using the Swedish avoidability criteria and a prerequisite of 8 week disability period, the Swedish scheme would cost $76.79 million to Utah and $100 million to Colorado, where in both states more than 55% of that cost would be for household production loss. The costs of the current medical malpractice systems are $25-30million in Utah and $45-50 million in Colorado. Using the same 8 week disability period, it would be possible to compensate 889 injured patients in Utah, compared to estimates of 210-240 of successful claimants today, and respectively 973 compared to 270-300 in Colorado. These estimates are dramatically reduced if a $100,000 cap on pain and suffering, a four week disability period, no household production and a 66% wage replacement are assumed. Compensating new born injuries was estimated to cost $9.69 million in Utah and $14.20 million in Colorado.

Table 1.3 – continued from previous page

Study	Sample	Main results
Studdert, Thomas, Burstin, Zbar, Orav and Brennan (2000), Thomas et al. (1999) UCMPS	Random sample of 13 hospitals in Utah (5,000 discharges) and 15 in Colorado (10,000 discharges) in 1992.	By using expert's judgment to evaluate the costs of medical injuries due to AEs, the authors estimate a total of $661.9 million or $132 per capita (for residents in both states) in 1992 in Utah and Colorado ($348 million for health care costs and $160.9 million for lost household wages). Preventable AEs had a cost of $308.3 million or $61 per capita (for residents in both states). Post-operative complications and adverse drug events were the most expensive ones. Extrapolating to all discharges from U.S. hospitals in 1992, this implies an annual cost of AEs of near $38 billion. If preventable AEs have been avoided, this would reduce health care costs in approximately $20 billion, which was almost 4% of national health expenditures in 1996.
Fenn et al. (2000)	All negligent claims arising from treatment in Oxfordshire Health Authority (data on one major hospital, some general /acute hospitals and specialist units).	Adjusting for hospital activity, the rate of closed cases per 1,000 finished consultant episodes in England increased from approximately 0.46 in 1990 to 0.81 in 1998, which means a rate of increase of 7% per annum. The specialty that registered the higher increase was obstetrics/gynecology. In 1998, the overall expenditures on clinical negligence by the NHS in England were estimated to be £84 million,[130] including legal costs (£61 million for damages and £23 million for defense costs).

[130] Fenn (2002) mentions that this was an underestimate, since there was a small number of very large claims in the sample (at p. 233).

Table 1.3 – continued from previous page

Study	Sample	Main results
Fenn et al. (2004)	Sample size of 8,206 interviews, by means of a population study. The aim is to estimate the costs that the UK would have in case it would change to the Swedish scheme or to the small claims proposal.	34% of the inquired said that the remedy they were searching for was an apology or explanation, and only 11% repplied that financial compensation would be the most suited response. The authors estimate an increase of 80% on the number of patients that seek compensation if faster access was provided by the new system. The costs of a Swedish no-fault system in the UK are estimated to have total annual costs near to £2.1b, which is over six times the costs of the current system. The total costs of the small claims scheme proposed by the DoH range from £498m to £533m, depending on the ceiling value for small claims. By using the suggested ceiling of £30,000, the total costs would be £517.5m (£116.4m for the small claims and £401.1m for those that would use the tort system). The authors mention that the estimates are sensitive to a change in some of the parameters.
Vidmar et al. (2005)	31,521 reported closed claims from 1990 through 2003, in Florida.	From 1990 to 1997, the mean transaction costs for paid ($39,719) and non-paid ($22,205) claims remained stable, with the costs of the latter being about 1.7 times greater than the former. Although there was an increase in the mean cost of paid claims in 2003 (equal to $44,407), it is not sufficient to state that mean transaction costs have increased (the mean of paid claims for the period 1990-1993 was $40,853 and for 2000-2003 was $39,158).

Table 1.3 – continued from previous page

Study	Sample	Main results
Black et al. (2005)	Closed medical malpractice claims from the Texas Department of Insurance (TDI) from 1988 until 2002. A total of 14,697 reports for medical professionals without duplicates were found (with payout of over $10,000 in nominal dollars).	There is a high frequency of claims closed with zero payment; it is common to find multiple defendants; adjusting for population growth, the total of closed claims from 1990 to 2002 was stable; for the same period and adjusting for the number of physicians or growth in real health care spending, the total number of paid claims and large paid claims declined; physician´s risk of facing a claim is much higher than the risk of facing a payout; although the distribution of payouts is skewed (the mean is much greater than the median), total payouts to patients were roughly constant over time (and near $515 million in 2002); defense costs rose gradually (from 4.2 to 4.5% per year and per large claim) and their absolute size relative to payouts is small; total costs (payout and defense costs) per large paid claim rose 0.8 to 1.2% per year; small paid claims declined.
Studdert et al. (2006)	Random sample of 1,452 malpractice claims closed from 1984 to 2004 were studied. The claims were obtained from five liability insurers in four regions of the U.S. and related to obstetrics, surgery, missed or delayed diagnosis, and medication.	The average amount of compensation was $485,348 and the median was $206,400. Plaintiffs rarely received payment in cases that went to trial, but the awards were higher than those outside court ($799,365 mean, and $462,099 median). Administrative (overhead) costs for defending the claims averaged $52,521 per claim (the mean for those resolved in court was $112,968 and for those resolved out of court was $42,015). The total system costs were equal to $449 million, of which $376 refer to indemnity payments and $204 million to administrative costs ($73 million for the defense and $132 million for the plaintiff, on the basis of a contingency fee of 35% on indemnity payments). The great majority of these costs refers to cases involving negligence."*For every dollar spent on compensation, 54 cents went to administrative expenses (including those involving lawyers, experts, and courts)*" (at p. 2024).

Table 1.3 – continued from previous page

Study	Sample	Main results
Black et al. (2008)	Closed medical malpractice claims from the Texas Department of Insurance (TDI) from 1988 until 2004. A total of 14,241 reports for medical professionals without duplicates were found (with payout higher than $25,000 in 1988 dollars).	The mean and median defense costs per large paid claim is $43,000 and $27,000, respectively, in 1988 dollars; from the 14,241 non duplicated cases, the mean defendants per case was 2.4, the mean (median) days the claim was open was 923 (807), and only 2.7% of the cases had a full trial; if we compare these results with those for auto, general commercial, multi-peril and other professional liability, medical malpractice cases present the higher mean defendants per case, the second highest mean and mean days of open claim (after general commercial) and are, together with auto, the type with the lowest percentage of cases with full trial. Moreover, medical malpractice cases have the highest payouts, are the most expensive to defend but they present similar ratios of defense costs to payouts as the other types of cases studied here. From the total of claims that involve medical professional liability (77,575), 81.9% involve a $0 payout, 6.3% a payout below $25,000, and 11.8% a payout higher than $25,000 (this refers to claims from 1995 to 2004 only). Case-level initial reserve predicts variation in actual defense costs quite poorly (see Black et al. (2008), Table 5). Regarding expense reserves, "*Med mal insurers not only failed to raise their expense reserves over time, to correspond to rising defense costs, they reduced them!*" (at p. 216). Most of Texas medical malpractice insurers rely on outside counsel.

Table 1.4: Previous Research on Defensive Medicine

Study	Sample	Main results
Kessler and McClellan (1996)	Elderly Medicare beneficiaries admitted to a U.S. hospital with a new primary diagnosis of either acute myocardial infarction (AMI) or ischemic heart disease (IHD) in 1984, 1987 or 1990. The sample size consisted of more than 200,000 AMI patients and more than 350,000 IHD patients in each year studied.	Referring to AMI outcomes, the authors estimate an expenditure/benefit effect for a higher pressure liability regime of "*over $500,000 per additional one-year AMI survivor in 1991 dollars*", pp. 378-379. Direct reforms had the effect of reducing AMI expenditures of approximately 4% within two years of adoption, but the long-term effect is close to zero. The effects of both direct and indirect reforms on mortality and readmissions with complications for AMI cases are trivial and not significant. As for IHD, direct reforms are associated with a 7.1% reduction in expenditures by two years after adoption and 8.9% reduction by five years after. There were no significant differences in mortality between states adopting direct or indirect reforms. The pattern is similar to that present for the AMI outcomes, which means that direct reforms have larger effects on expenditures. Direct malpractice reforms resulted in reductions in hospital expenditures with no consequential effect on mortality, or on significant cardiac complications.

Table 1.4 – continued from previous page

Study	Sample	Main results
Klingman et al. (1996) - OTA Study	From a population of 11,541 cardiologists, there were 352 respondents from a 622 sample; from a population of 20,832 obstetricians /gynecologists, there were 1,230 respondents from a 1,983 sample; from a population of 12,972 general surgeons and 1,384 neurosurgeons, there were 1,793 and 503 respondents from a sample of 3,004 and 859 respectively.	In the case scenarios results, the lower and higher percentages of doctors in each scenario that cited malpractice concerns as the main reason for choosing one or more clinical actions were 4.9 and 29. But the most cited reason for executing a procedure was medical indication. Additionally, most doctors that cited medical malpractice concerns cited it for only one procedure. An important result of the surveys was the difference in answers when comparing close-ended questionnaires with open-closed questionnaires: in the open-ended questionnaires there was a lower percentage of respondents citing malpractice concerns as "the primary reason for choosing a given action". 8% is the simple median of those procedures that were performed primarily because of malpractice concerns. Nevertheless, the authors refer that the "true percentage" is certainly less than that.
Studdert et al. (2005)	824 Pennsylvania physicians completed the survey. The physicians were from 6 specialties identified as being "especially affected by high and rising liability costs", which are: emergency medicine, general surgery, obstetrics/gynecology, orthopedic surgery and radiology.	93% of the respondents stated that they had engaged in at least one form of defensive medicine presented in the survey. Regarding assurance behavior, 59% of the physicians stated that they "often ordered more diagnostic tests than were medically indicated" but the proportion was higher for emergency physicians. With respect to avoidance behavior, 39% "reported that they "definitely will/already decided to "avoid caring for high-risk patients", with this response being less likely among emergency physicians. Specialist physicians' confidence in the adequacy of their liability coverage and their perceptions of premium burdens were the strongest predictors across all types of defensive practice.

Table 1.4 – continued from previous page

Study	Sample	Main results
Sloan and Shadle (2009)	U.S. individuals aged over 65. The sample for Medicare payments and survival is (for 1985-2000), respectively: 58,578 and 59,689 for total hospitalizations; 2,643 and 2,905 for AMI; 3,166 and 3,562 for stroke; 1,470 and 1,298 for breast cancer; and 6,057 and 6,258 for diabetes.[131]	Direct reforms did not significantly reduce 1-year Medicare payments in any setting, *i.e.*, for any hospitalization, for AMI, for stroke, for breast cancer or for diabetes. Regarding indirect reforms, the only statistical significant coefficient is the one for "Any hospitalization", with a parameter estimate implying a reduction in total payment of 9.4%. The probability of survival 1 year after the index event is not affected by direct or indirect reforms. There seems to be evidence that liability is not able to deter medical injuries.

[131] The number of Medicare payments can be less than the number of survivals due to missing data.

Chapter 2

Appeals from Civil and Administrative Courts: Reversal Rates at the Spanish Supreme Court

2.1 Introduction

Different medical malpractice liability systems provide diverse incentives to physicians when they have to deliver health care.[1] Physicians' insurance might, among other things, distort deterrence of negligent behavior and influence the availability of compensation amounts to patients suffering losses due to substandard care.[2] The design of the liability system also provides distinct incentives for patients to present a claim. The costs of litigation, the duration[3] until a decision is made and the compensation that the patient expects to recover are some of the variables that influence the decision of filing a claim. The level of injury is an essential variable to calculate indemnity amounts if compensation is provided to patients. Therefore, and because malpractice litigation involves costs and delays, presenting a claim is more appealing for patients with higher levels of injury.[4]

The implications of a liability system become more blurred when two separate subsystems imposing different procedures to similar problems coexist within the same system. This is actually common in some civil law tradition countries with a public national

[1] For a general discussion of liability law, see Cooter (1991). For medical liability, see Danzon (1991), Trebilcock and Dewees (1992), Studdert et al. (2004), Shavell (1978).

[2] Zeiler et al. (2007).

[3] Rickman and Fenn (2001), Studdert et al. (2004) and Hyman and Silver (2006).

[4] See Hyman and Silver (2006) for more details regarding patient behavior when bringing claims to the legal system.

health system. In Spain, different jurisdictions and procedural rules apply to a medical accident according to the place of injury. A patient[5] suffering harm in a public hospital must try his case in the administrative jurisdiction while a patient harmed in a private hospital must go to the civil jurisdiction. Physicians injuring patients in a public hospital will be subject to different regulations and procedural rules than their colleagues causing the same injury in a private hospital. A strict liability rule seems to apply to public hospitals under tort law, while a general standard of liability based on fault is applied to medical accidents occurring in private health care hospitals.[6] However, what case law shows is that courts apply a liability rule based on fault independently of the type of institution where the accident took place. Therefore, two similar cases should not have a different outcome if the only difference between them is the type of hospital.[7]

Strict pre-determined procedural rules in Spain are essential in determining the duration of the process, leaving less space for lawyers or judges to intervene. Although the Spanish Constitution refers to the right of a trial without unreasonable delays,[8] practice shows that cases can take several years to be decided. Additionally, the application of different procedural rules can have an impact on the litigation process when parties have an *a priori* idea about an eventual patient or defendant bias, differences in compensation amounts and duration.

In this study we analyze Supreme Court decisions to assess differences between administrative and civil jurisdictions in medical malpractice cases in Spain. We construct a unique dataset with detailed information on patient's characteristics, medical treatment and legal procedure. The dataset includes decisions from 2006 to 2009. As far as we are aware, this is the most complete and detailed dataset on medical malpractice court decisions in a civil law tradition country.

Two important legal reforms[9] took place in 1998 and 1999 with implications for cases judged by the Supreme Court (some of which are included in our dataset). Until 1999 injured patients in a public hospital could chose between the civil and administrative jurisdiction. From 1999 onwards, the administrative jurisdiction became the only one that can try a case of injury in public hospitals. The main motivation claimed by the legislator to implement such reforms was the extraordinary increase in litigation

[5] In this study the plaintiff is the patient; the defendant can be a doctor, hospital or the State (this last one in case of administrative suits). Having several defendants in the same lawsuit is also possible.

[6] A more detailed explanation on the legal system for medical malpractice cases is presented in Section 2.8.

[7] We refer to outcome only because it is based on the same liability rule. Other differences can be expected given the procedural differences, namely with respect to duration.

[8] Spanish Constitution of 1978, Art. 24.2

[9] Law 29/1998 of July 13 and Law 4/1999 of January 13.

between citizens and the State that brought delays to the judicial system.[10] But can we exclude the possibility of a stronger preference for having cases of litigation against the State being tried by administrative courts only? The practical result of those reforms is that they eliminate, in cases of litigation against the State, the option of choosing the jurisdiction that citizens might prefer. Some arguments favor the existence of administrative courts such as judges' training as specialist in administrative law, although these arguments are hardly applicable to medical malpractice cases. If administrative courts have more expertise and can provide better decisions when the State is involved, this could be a reason to support the legal reform held in Spain. Additionally, the legislator might argue that even if a potential bias in favor of the State exists, this reform introduces higher speed in court decisions. Hence, and according to this view, the legislator might claim that this reform allows citizens to have a faster trial, when in reality this change favors the State.

The separation between administrative and civil courts has the drawback of making capture by the State or by special interests easier, given that in this setting the "*marginal cost for the judge of deciding against the state is much higher in administrative than in ordinary judicial courts*".[11] One of the reasons is that administrative judges have a special knowledge of administrative law which is a "*specific asset in human capital for the judges and therefore they are more dependent on (or more easily constrained by) the government (state officials)*".[12] This represents a cost for the system. Unless there are other incentives for administrative judges to decide a case without fearing the consequences of going against the State, such as providing decisions that will not be reversed by higher courts in the future, we can expect to find more administrative decisions in which the State prevails,[13] *ceteris paribus*. Were this to be confirmed, patients could refrain from presenting a claim against the State in administrative courts, given the suspicion of a

[10] This is actually the main motivation published in the new laws. Nevertheless, Mir (1999) refers that Law 4/1999 was introduced given that the previous one regulating administrative procedure suffered from several ambiguities. Law 29/1998 of July 13 presents many arguments to favor citizens in litigation with the State, namely the possibility of appeal when the State is inactive in providing an answer (*i.e.*, when it takes too much time to make a decision). Law 4/1999 of January 13 refers to the exoneration of citizens from bureaucratic duties, in order to ensure judicial security more intensively.

[11] Dari-Mattiacci et al. (2010), p. 28.

[12] Dari-Mattiacci et al. (2010), p. 28.

[13] When looking at a sample of 2006 Spanish Supreme Court cases, Dari-Mattiacci et al. (2010) find that in tort decisions the plaintiff prevailed in 69% of the decisions by the Civil Chamber; while in State liability cases the plaintiff prevailed in 35% of the decisions by the Administrative Chamber. The authors draw attention to the fact that caution is needed given that many factors may be at play. Still, this is a large discrepancy.

pro-defendant bias. Arguments for a pro-plaintiff bias[14] can also be offered in medical malpractice cases. Judges might feel empathy for the victim and awarding damages will not make a big difference in hospitals' deep-pockets. In our study, this last argument does not apply in the vast majority of cases: health care is provided essentially by public hospitals that have no deep-pockets because they are State owned. But judges might feel empathy for the victim for other reasons: for instance, the judge might think that public hospitals, paid by tax payers, are not providing good quality health care. Therefore, it is not clear if a bias exists and, if so, in which direction it goes.

Patients filing a medical malpractice lawsuit start by presenting a first claim and can appeal[15] all the way to the Supreme Court.[16] Appeals to the Spanish Supreme Court are in points of law only, formally similar to what happens in the American Supreme Court. However, the Spanish Supreme Court looks again at the facts when making a decision (it can correct gross mistakes of fact if properly asked to). Furthermore, the Supreme Court has no control over its docket given that admission is based on legal grounds and a decision must always be made. For this reason, the argument that there is a strong selection bias when analyzing Supreme Court decisions becomes less problematic. The impediment of the State of taking part in settlements goes in that direction as well. Additionally, the costs involved in litigation are much lower in Spain than in the U.S. The costs[17] of appealing to the Supreme Court represent a small fraction of the entire costs of the litigation process.[18] Moreover, the Supreme Court might decide to set a maximum amount[19] for the transferable legal costs, *i.e.*, the legal costs incurred by one party that can be transferred to the other party in case the latter loses the case.

We are conscious that Supreme Court judgments are not representative of medical malpractice lawsuits in Spain, in the same way that they are not representative in any other country. There is already a selection bias when we refer to cases that reach lower courts,[20] which means that this bias is even greater when studying appeals to the

[14] See Clermont and Eisenberg (1999).

[15] See Herzog and Karlen (1982).

[16] The appeal process in Spain presents differences between civil and administrative jurisdictions in medical malpractice cases. See Appendix for more details. For a matter of simplification we will refer to the trial court as the court making the last judgment before the appeal to the Supreme Court, although it is not the same court for civil and administrative claims.

[17] See Appendix for a detailed description of the main costs of bringing a claim to courts in Spain.

[18] The fact that appeals in general imply a low cost after going to trial is not specific to the Spanish case.

[19] In our dataset, the highest amount set by the Supreme Court was €1,500. These costs include lawyer and bailiff's fees (Art. 241.1, *Ley Enjuiciamento Civil*, January 7, 2000).

[20] See Vidmar (1992), Danzon and Lillard (1983) for evidence regarding medical malpractice cases in trial. For general cases that arrive to court and possible problems with their selection, see Gertner (1993) and Priest and Klein (1984), Clermont and Eisenberg (1998), Hylton and Lin (2010).

Supreme Court. The first problem of analyzing medical courts decisions to assess the problem of medical harm relies on the fact that only a small proportion of negligently harmed patients decide to present any sort of claim[21] against a medical professional or institution. However, this is not a problem in this study because our main objective is to make a comparison between civil and administrative appeals to the Supreme Court, rather than explaining suits in medical malpractice.

Supreme Courts present differences among countries. Nevertheless, common characteristics remain that make Supreme Courts' decisions important, such as by making new law, clarifying the law, producing precedents, harmonizing conflicting lower court decisions, benefiting many parties in the future and allowing for error correction.[22] In civil law countries, parties' right to appeal to the Supreme Court makes the number of appeals high and the majority of appeals might actually fail.[23] These reasons make the study of Supreme Court decisions particularly interesting in civil law countries.

The main results of this study with respect to medical malpractice judgments at the Spanish Supreme Court from 2006 to 2009 are the following:

- The proportion of reversed cases by the Administrative Chamber (28.2%) is higher than that for the Civil Chamber (12%) and this difference is statistically significant. Reversal rates by appellant party are higher when the patient appeals[24] (31.6%) and the difference in proportion with respect to civil decisions (14.4%) is statistically significant.

- The odds that the Supreme Court reverses previous decisions at the Administrative Chamber is approximately twice as large than having a decision reversed by the Civil Chamber ($2.1 < [\text{OR}] < 2.4$), which is robust across different specifications. This seems to point to a pro-State bias from lower administrative courts.

- The type of hospital (public *vs.* private), the type of defendant (individual, an institution or both), physicians' specialties and patient's gender, have no impact on reversal rates. Were a pro-State bias at the Supreme Court level to exist, we should observe the type of hospital being an important variable. Therefore, this result makes us more confident that indeed there is no pro-State bias at the Supreme Court level.

[21] Hughes and Snyder (1989) show why caution is needed while interpreting claims data.

[22] Shavell (2010).

[23] Shavell (2010).

[24] Notice that when the patient appeals and the Supreme Court overturns the previous decision this is a pro-plaintiff outcome.

This chapter proceeds as follows: Section 2.2 reviews previous empirical studies on medical malpractice claims with a focus on appeals; Section 2.3 briefly describes the medical malpractice liability system in Spain and the Supreme Court; Section 2.4 describes the dataset, data limitations and empirical approach; Section 2.5 presents the main results that are then discussed in Section 2.6; conclusions follow in Section 2.7.

2.2 Past Research on Medical Malpractice Litigation

The empirical literature on medical malpractice claims is quite extensive by now. Some examples refer to the frequency and merits of medical claims, patient's characteristics that predict damages, whether it is the patient or physician that tends to prevail, and litigation costs. This literature draws essentially on the U.S. experience and the majority of the studies are focused on medical malpractice claims at the insurance level. We are not aware of any empirical study that analyzes differences between administrative and civil claims in courts. The only paper that we know focusing on Supreme Court claims in a civil law country is that by Grembi and Garoupa (2010), which studies duration in criminal and civil claims.

2.2.1 Who presents a claim?

Empirical work on American cases point out that the incidence of medical malpractice claims is very low:[25] although it was conducted several years ago, the Harvard Medical Practice Study (1990) estimated that only a reduced number of injured patients presented a claim and that the number of patients receiving compensation was even lower. Danzon (1985) estimates that, for patients admitted to hospitals in California in 1974, approximately 1 in 126 suffered a negligent adverse event and of these at most one in 10 presented a claim. The existence of a permanent injury increases the likelihood of filing a claim, followed by a temporary injury and finally by death. Studdert, Thomas, Burstin, Zbar, Orav and Brennan (2000) suggest that the elderly and the poor are less likely to present a claim, although caution must be taken given the small sample size they study.

The yearly frequency of malpractice claims in Spain is not known, although it would be interesting to be acquainted with the proportion of claims arriving to courts and to the Supreme Court. The same holds with respect to the total number of claims until a final decision was made. Health care typically involves a high degree of asymmetric

[25] Please see Chapter 1 for a detailed description of the results provided by these studies.

information, in which the doctor is much better informed about the quality of the care provided to the patient given her expertise.[26] For this reason, patients might need to file a claim to gather more information about the care that has been provided to them. After getting more information, they can choose to drop the case[27] if they believe that harm was suffered but it was not due to negligent care. Due to these problems we will not attempt to draw any inference on medical malpractice claims being filed in Spain: we focus on Supreme Court judgments only.

2.2.2 Who goes to trial and who wins?

The decision to proceed with a claim is not the end of the story: parties might settle or they might go to trial. If the cases that end up in court are not representative of the legal disputes, relying on court results to analyze how courts decide might be dangerous. It is crucial to understand which cases end up going to trial if we want to interpret correctly trial outcomes, and this holds for all types of litigation.[28] In case courts receive a random selection of claims, we can exploit courts' results to assess how courts decide in general. Normally we do not expect this to hold. Therefore, when we analyze trial judgments and realize that courts decide in favor of the defendant in 90% of the cases, can we say that there is a pro-defendant bias? No, unless we are sure that cases arriving to courts[29] are a random sample of all cases. If the cases that go to court are essentially those in which there is no evidence of negligence,[30] then having decisions favoring the defendant is a signal that courts are making correct decisions, and not that they exhibit

[26] Self regulation is important to mitigate this problem. See for instance Garoupa (2010), Faure and Verhulsdonck (2004) and Olsen (2000).

[27] Other reasons might also lead the patient to remove the claim, such as the cost of litigation or delays. See Hyman and Silver (2006).

[28] For a review of trial selection theory, see Hylton and Lin (2009). The authors also describe models of settlement, which we do not present here as they are not the focus of our work.

[29] This is where trial selection theory comes in, by trying to explain which characteristics distinguish cases that are settled from cases that go to trial and the implications of this process, namely on the rate of plaintiff victory. Hylton and Lin (2009) "*use the term "trial selection theory" to refer to models that attempt to explain or predict the characteristics that distinguish cases that are litigated to judgment from those that settle, and the implications of those characteristics for the development of legal doctrine and for important trial outcome parameters, such as the plaintiff win rate*", p. 1. They also provide a review of trial selection theory.

[30] In order for the plaintiff to prove liability, three things must be proven: i) the plaintiff was injured (harm); ii) due to acts or omissions of the defendant (causation); and iii) the defendant's acts or omissions failed to meet a standard of care maintained by reasonably competent health care providers in the community (negligence). If courts decide correctly, compensation should be attributed only to patients that were negligently injured. See Sloan and Hsieh (1990).

a pro-defendant bias.

Studies on trial rates and plaintiff win rates show some similarities for medical malpractice cases, which are often different from other types of litigation.[31] Trial rates were found to be from approximately 10% up to 15% and the defendant tends to prevail in court (at a higher rate than in settlements). These studies do not support the claim that juries or judges have a pro-plaintiff bias.

Danzon (1985) points to a trial rate of less than 10% for California. The defendant prevailed in 3 out of 4 cases that reached courts, which is a higher rate than the one verified in settlement out of court. Vidmar (1992) studies malpractice suits filed in North Carolina and finds a trial rate of 10%. Trial outcomes show that the defendant prevailed in 4 out of 5 cases. Sloan and Hsieh (1990) came out with the result that from 6,612 closed claims in Florida, only 11.5% were decided at verdict or on appeal. The plaintiff win rate was 22% from cases decided at verdict and that were not appealed.

When analyzing charges of medical malpractice presented after 1977 and solved by the end of 1989 against a single hospital, Farber and White (1991) had a sample of 252 cases. Of these, 20 started trial, but only 13 had a trial decision, which was in favor of the defendant in all cases. Hagihara et al. (2003) estimate that from a total of 421 court decisions made from 1986 until 1998 in Japan, 31.8% were decided in favor of the patient. Studdert et al. (2006) came out with the result that only 15% of the closed malpractice claims from five liability insurers went to trial. In these cases, plaintiffs rarely won damages at trial: just in 21% of the cases, comparing to 61% of the cases resolved out of court. Studdert and Mello (2007) study predictors of discordant outcomes in medical malpractice cases, *i.e.*, predictors of denying payment when there was a medical error involved and predictors of attributing compensation when there is no clear evidence of negligence. The authors find not only that jury verdict was a highly significant predictor of discordant outcomes but also that it was the strongest predictor of meritorious claims' rejection. The probability of payment in settlements was higher than the probability of payment at trial, and the difference could be as high as 40%, depending on the specification.

Clermont and Eisenberg (1992) use data from federal courts to study some interesting differences between judge and jury trials[32] from 1979 to 1989, finding that the plaintiffs' win rate is higher for judge trials (50%) than for jury trials (29%) in medi-

[31] See for instance Clermont and Eisenberg (1992) (that find some similarities for medical malpractice and product liability) or Saks (1992).

[32] Differences between judge and jury trial will not be relevant for the Spanish case as there are no jury verdicts.

cal malpractice cases. Selection of cases to those two types of trial might explain the differences between win rates in the sense that litigants and their attorneys tend to misperceive how juries and judges decide medical malpractice cases. Since attorneys believe that the jury is pro-plaintiff, they end up submitting cases to the jury with lower chances of winning. In the end, there is a high proportion of jury trials in which the defendant prevails.

2.2.3 Appeals: Who Appeals and who wins?

Finally, a last decision might be taken by parties that engaged in trial litigation,[33] which is the decision of appealing the trial decision. We can expect plaintiffs to appeal if they are not happy with the judgment: compensation was refused and the plaintiff appeals expecting the decision to be reversed, or the compensation amount was too low and the plaintiff tries to get a more favorable outcome (taking the risk that the appeal court might reverse the previous decision and refuse any type of compensation). We can expect defendants to appeal in case the lower court awarded compensation to the patient. In order to assess correctly how appellate courts decide we would need to know which cases are appealed. Having a random sample of cases arriving to appellate courts would allow us to analyze how those courts decide in general, but usually we do not have such a sample. The conclusion to take from here is not that the analysis of trial or appealed decisions is irrelevant, but instead that we must be careful with extrapolations to the general case. Therefore, we cannot make a judgment about the legal system based on such decisions.

The study of supreme court judgments is indeed of much relevance for several reasons. Supreme court[34] decisions[35] clarify the law and establish doctrine that will be followed by trial courts; harmonize conflicting lower court decisions; benefit many parties in the future; allow for error correction; dominate casebooks; are more available for research than unappealed cases. In civil law countries, appealing to the supreme court might be particularly attractive: after taking a case to trial verdict, "*the cost and effort in appealing must seem comparatively insignificant*"[36] and, moreover, appeal is "*as*

[33] This is a very simplified example as the stages of the litigation process can be much more complex and show differences between countries and jurisdictions.

[34] There are obviously differences between supreme courts in civil and common law tradition countries on which we do not focus here. See Merryman and Pérez-Perdomo (2007).

[35] See Shavell (2010), Shavell (1995), Merryman and Pérez-Perdomo (2007), and Eisenberg and Heise (2009). For a review of appeal and supreme courts with a focus in the American case, see Kornhauser (2000).

[36] Clermont and Eisenberg (1999), p. 6. Although the authors are not referring to civil law countries,

of right".[37]

In the 1990 study by Sloan and Hsieh, plaintiff win rate on appeals of medical malpractice cases was 44%, which is higher than the 22% plaintiff win rate for cases decided at verdict but not appealed. Additionally, the authors find differences in plaintiff win rates, which tend to be higher for high severity levels of harm. Clermont and Eisenberg (1999) compare success in appeals of civil trials by appellant party in jury and judge trials. Defendants succeed more than plaintiffs in several types of cases, especially in appeals from jury trials. For medical malpractice, the reversal rate was 21.4% when the defendant was the appellant party, while it was 15.9% when the plaintiff was the appellant party. In 2009, Eisenberg and Heise study state court appeals. From the medical malpractice state appealed cases, the reversal rate was 33.3% for trials appealed by defendants while it was 23.9% for cases appealed by plaintiffs (the difference between these reversal rates is not statistically significant). While studying several types of civil cases that present similar reversal rates differences between defendants and plaintiffs, these authors rely on the attitudinal model[38] as the most likely explanation, preferred to the selection theory. The idea is that appeal judges perceive that trial outcomes favor plaintiffs. Therefore, since they are aware of this innacuracy, reversal rates are higher when the defendant appeals. Other plausible explanations exist, although the incompleteness of the data does not allow checking for those alternative explanations.

2.3 Medical Malpractice in Spain

In this section we briefly introduce the medical malpractice liability system in Spain. More detailed information is provided in the Appendix. Some particularities of the Spanish case that make it much different from the American case are also presented.

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the same argument holds.

[37] Shavell (2010), given that the "*the right of appeal (even at supreme courts) tends to be constitutionally guaranteed*" in civil law countries, p. 93.

[38] "*The attitudinal model represents a melding together of key concepts from legal realism, political science, psychology, and economics. This model holds that the Supreme Court decides disputes in light of the facts of the case and vis-à-vis the ideological attitudes and values of justices. Simply put, Rehnquist votes the way he does because he is extremely conservative; Marshall voted the way he did because he was extremely liberal*", Segal and Spaeth (2003), p. 86.

2.3.1 Medical Malpractice Liability System

Spain does not possess a specific law to regulate the physician-patient relationship. The first distinction to be made in the Spanish liability system in case of medical injury depends essentially on the type of institution responsible for the health care, *i.e.*, if the medical injury took place in a public or in a private health care service.[39] If a patient was harmed in a public hospital,[40] and independently of the relationship or activity that it resulted from, administrative regulation applies and patients can only present their claims in administrative courts. Moreover, the public administration is formally strictly liable in tort for the harm caused by the personnel. In case of harm in a private hospital, the Civil Code is the main body of law to be applied. A general standard of liability based on fault is applied and cases involving private health care providers are tried by civil courts. Although apparently there are different liability rules to be imposed according to the place of accident, case-law shows that these differences have no effect. Courts base their decisions on the evidence of negligence,[41] and even if the injury took place in a public hospital a strict liability rule will not be applied. Although the line that makes the distinction between civil and administrative jurisdictions seems to be clear nowadays, it has not been the case until the legislative reforms that were adopted in 1998 and 1999. The 1998 reform makes it clear that liability cases of public administration can only be tried by the administrative jurisdiction, interdicting the civil jurisdiction to judge those cases. Some months after, in 1999, new legislation was put into force, stating that medical liability in cases involving social security's institutions must be tried in the administrative jurisdiction as well. Therefore, it is possible to find civil courts' decisions of medical injuries taking place in public hospitals if the accident happened before that legislation entered into force. By analyzing Supreme Court's decisions related to medical injuries taking place before the new legislation was into force, we expect to provide some insights about the motivation of plaintiffs to opt for the civil jurisdiction when they were injured in a public hospital (*i.e.*, reasons that might have taken patients to prefer one jurisdiction to the other, when they could still do so. We are not aiming at explaining preferences). We would expect injured patients to opt for civil courts in case it is cheaper, takes less time to be decided, makes it more likely to receive compensation, it is believed that administrative courts have a pro-State bias,

[39] See Gómez-Pomar and Sánchez Álvarez (2006) for problems arising from the Spanish liability regime.

[40] For state liability in general, see Dari-Mattiacci et al. (2010).

[41] There are several decisions from the Supreme Court arguing this. See, for instance, STS 7800/2009, where it is claimed that a strict liability rule in medical cases will not be applied: would it be applied, the State would become a universal insurer, even in cases where there was no evidence of negligence.

it is perceived that civil courts have a pro-plaintiff bias or a combination of these.

2.3.2 Supreme Court

The Spanish Supreme Court is the court of last appeal on points of law only. It is possible to consider a specialization of the Supreme Court in the sense that civil decisions of medical malpractice cases are issued by the First Section of the First (Civil) Chamber; administrative decisions are issued by the Sixth and (recently) Forth Sections of the Third (Administrative) Chamber. This creates problems as well, because identical medical accidents can be tried in different jurisdictions and decided in different chambers of the Supreme Court, when the only difference between them is the place of accident. Gómez-Pomar and Sánchez Álvarez (2006) argue that the "*polycentric character*" of the Spanish law of torts is responsible for several problems. As described by the authors, it generates uncertainty because the court that will judge the case, the legal rules that apply and, to a certain extent, the final result might depend on random factors, difficult to predict *a priori*; victims might be subject to different treatments with respect to the quantification of damages, which is against the constitutional principle of equality; and it creates a loss of efficacy in terms of deterrence.

The Supreme Court has the power to deny the admission of the appeal, to confirm the decision made by the lower court, to totally reverse the previous decision or to reverse part of the previous decision, with or without remittal. As argued in several Supreme Court's decisions, the court is not a *second court of appeal* and new facts cannot be brought in appeal. Therefore, the information about the case that arrives to the Supreme Court is essentially the same as the information available at the lower court. Lower courts try to follow the same interpretation of the law as the Supreme Court, and they frequently cite its decisions.[42] According to Spanish law, the amount of compensation should be set by the lower court. Supreme Court's decisions that modify the amount of compensation from lower courts are rare, given that there must be evidence of an unreasonable amount set by the previous court.

The Spanish Supreme Court *de facto* produces precedents that will be followed by lower courts, which also hold for medical malpractice cases. Even taking into account that there is no formal rule of *stare decisis*, judges are influenced by prior decisions, especially if they come from the Supreme Court. In fact, "*[e]verybody knows that civil law courts do use precedents. Everybody knows that common law courts distinguish cases*

[42] Obviously, lower courts can make mistakes while interpreting Supreme Court decisions, even when using previous sentences as a guide.

they do not want to follow, and sometimes overrule their own decisions".[43]

The specialization of the Supreme Court chambers in Spain in medical malpractice lawsuits should allow for consistency and less uncertainty in terms of decisions, although the legal organization of the tort system might create some problems, as stated above. But this is not a full specialization, given that the distinction between civil and administrative jurisdiction still holds at the Supreme Court level, where judges assigned to the Civil Chamber decide civil claims and judges assigned to the Administrative Chamber decide administrative claims. This separation would be desirable if the benefits from the administrative specialization outweigh the costs of capture.[44] We will try to analyze if, according to the Spanish medical malpractice liability system, there are strong reasons to have this distinction when it comes to medical negligence cases.

2.3.3 Particularities of the Spanish case

Several additional characteristics, besides the existence of a national public health system and the application of different procedural rules, make the Spanish case much distinct from the American case:

- insurance for medical malpractice liability is mandatory since 2003 but only for doctors working in private institutions;[45]

- contingent fees for lawyers are not used.[46] For this reason, lawyers do not function as gatekeepers[47] when they have to decide whether to accept a medical malpractice case;

- there are no jury trials in civil and administrative litigation;

- compensation is allowed for economic losses and pain and suffering, but punitive damages do not exist;

- the vast majority of citizens do not have a health insurance, precisely because of the National Health System (NHS) that grants universal access to the population. The percentage of private insurance coverage depends on which type of insurance is considered:[48] i) voluntary insurance, which works essentially as a supplement for services that are not covered by the NHS or which are more difficult to access, covered up to 7.9%

[43] Merryman and Pérez-Perdomo (2007), p. 47.

[44] Dari-Mattiacci et al. (2010).

[45] Law 44/2003 of November 21 on Sanitary Profession.

[46] Currently contingent fees might be applied (especially in civil cases where lawyers can typically receive from 20 up to 30% of the payout). This does not affect our analysis given that the present study refers to cases taking place much earlier than this change has occurred.

[47] Farber and White (1991).

[48] Ministry of Health and Consumer Affairs (2004).

of the Spanish population[49] in 2004; (ii) employer-purchased insurance, which covered 3.8% of the Spanish population in 2004; (iii) civil servants' mutual funds (publicly funded). These three types of insurance overall covered up to 15% of the population in 2004.[50]

2.4 Dataset and Empirical Approach

This chapter adds to the empirical literature in medical malpractice by analyzing Supreme Court's decisions on medical negligence cases in Spain. To build this unique and rich dataset, we started by collecting medical malpractice cases decided by the Spanish Supreme Court from 2006 to 2009.[51] The Spanish Supreme Court must publish all the decisions, but obtaining judgments on medical malpractice (or decisions on a specific issue in general) is not straightforward or immediate. Judgments are not grouped into categories, so we cannot base the analysis on the search with the keywords "*medical malpractice*" given that we would take the risk of excluding some decisions in which the judge did not use that precise expression. Therefore, several searches were performed using different keywords and expressions, with the intent of getting a large sample of cases and then excluding those that were not related to medical malpractice.[52] We are quite confident with the sample we get: to start with, we checked with the CENDOJ[53] (the institution that manages the publication of on-line decisions) all the different combinations of keywords that we should use. Moreover, we also looked at academic publications that study Supreme Court decisions and at the website of the Patients' Association to check if the decisions they refer to were already included in our dataset (which they were). After excluding decisions that were not related to medical care, we inspected the court's decisions[54] in order to code them.

The next sections present the data collected, the main limitations and some descriptive statistics.

[49] Notice that this type of insurance presents regional differences: for Barcelona and Madrid, it can be up to 20-25% of the population (Ministry of Health and Consumer Affairs (2004)).

[50] Ministry of Health and Consumer Affairs (2004). See Mossialos and Thomson (2004) for voluntary health insurance practices in several european countries.

[51] See Appendix for more detailed information on the construction of the dataset.

[52] For instance, in the broad search we could get cases in which some party was negligent (*e.g.*, a teacher or parents) and for that reason someone else had to receive medical treatment (for example, a student or son).

[53] CENDOJ stands for *Centro de Documentación Judicial*.

[54] The Spanish Judicial council is in charge, among other competences, of ensuring the publication of the Supreme Court's sentences (Art. 107.10, *Ley Orgánica 6/1985, de 1 de julio, del Poder Judicial*). This was the main source to build the dataset.

2.4.1 The Spanish Supreme Court Medical Malpractice Dataset (SSCMMD)

We construct a medical malpractice dataset that includes[55] decisions in which the Supreme Court made a judgment regarding the evidence of medical negligence. For a matter of simplicity the plaintiff in this study is considered to be the patient, although claims could be brought by third parties on behalf of the patient, as it is the case of claims involving death or a minor patient.[56]

In order to classify the level of harm suffered by the patient, we followed a 9-point injury severity scale as presented by previous literature.[57] To simplify the analysis and presentation of the results, we grouped the 9-point injury severity scale in four groups:[58] temporary/emotional (score 1 up to 4), permanent minor (scores 5 and 6), permanent major (scores 7 and 8) and death (score 9). Our database consists of 256 Supreme Court's decisions that contain information on several variables of interest. Inspection of lower courts' decisions was sometimes needed in case some variable was not sufficiently specified.

2.4.2 Data Limitations

The data collected present a few limitations. Some involve the availability of data that might limit the analysis we can make. Some are related to the fact that the SSCMMD is composed by decisions from 2006 until 2009. We expect to extend the SSCMMD in the future. Moreover, the number of cases available by now allows us already to analyze medical malpractice judgments by the Supreme Court.

Time Period: We have four years of data. Although the number of years is not impressive, the number of decisions during this period is somehow remarkable. We are basically analyzing 256 decisions made by the higher court in four years. Would the number of decisions be similar during those years, it would imply that approximately 64 judgments were being made per year. This allows us to speculate that patients do file medical malpractice lawsuits and do appeal to the Supreme Court in Spain. Obviously, it is not possible to recover the proportion of patients that sue with respect to those

[55] See Appendix for a list of the type of cases that we excluded and a justification of why they are not relevant for this work.

[56] A dummy variable equal to 1 if it was the patient himself bringing the claim and 0 if the claim was brought by relatives was also included.

[57] We categorized the levels of injury severity by following the same methodology as Sloan and Hsieh (1990), in accordance with the National Association of Insurance Commissioners. See Appendix for details.

[58] Studdert and Mello (2007) grouped the score into five categories, and that was our initial idea. The reduced number of observations for lower levels of injury made us opt for four groups instead of five.

suffering harm from the available information. Similarly, nothing can be said regarding the proportion of patients that appeal to the Supreme Court compared to those that filed a lawsuit in lower courts.

Open Lawsuits: The data presented here refers to judgments already made. Therefore, we cannot exclude the possibility that some of the trends that we found can just change in decisions being made after 2009. We consider it to be unlikely, though. There are no reasons to believe that the number of Supreme Court's decisions will suffer significant changes every year.

Moreover, it was not possible to test the effect of the 1998 and 1999 reforms given that there are only a few decisions corresponding to medical accidents taking place after that date. It would be interesting to test if the reform had any impact in terms of court's decisions and plaintiffs' incentives to file a claim, but for the time being we cannot test its implications.

Patient's Age: Some variables were not specified, and although we have a considerable amount of information, the analysis could be improved if some of them were better defined. We have in mind, for instance, the patient's age at the time of the accident: it was possible to divide the age variable into three groups (*newborn, child* and *adult/elderly*), but it was not possible to obtain the exact age of the patient for every decision. Alternatively, we would like to be able to distinguish between adult and elderly patients, which was also not feasible for a considerable number of cases (especially for those not receiving compensation).

Medical malpractice rate: We are not trying to draw any conclusion regarding the tort system's capacity of making correct decisions, *i.e.*, to attribute compensation to negligently injured patients and to refuse compensation if there was no negligence involved. There is no way of measuring the rate of medical negligence since it is not possible to check whether medical negligence actually occurred. If medical encounters that really involve substandard level of care increase, the number of lawsuits might increase. But given the costs involved in litigation, that proportion might decrease as well if patients are not willing to sue. Moreover, there can be different rates of medical malpractice among public and private hospitals and even different litigation behavior for patients suffering harm in public or private hospitals.

2.4.3 Hypothesis

As basic research strategy we compare Administrative Chamber judgments with Civil Chamber judgments from the Supreme Court, controlling for several observable case characteristics. A medical malpractice case being tried at the Civil Chamber should not

have a different result from a case being tried at the Administrative Chamber if that is the only difference between them. Before performing the empirical analysis we tested for equality of distributions[59] of civil and administrative decisions with respect to the variables we believe to be the more relevant ones: the level of harm and patient age. The distribution of administrative and civil decisions in terms of age and level of harm do not show significant differences.[60]

One concern while performing the regression analysis is that civil decisions might differ systematically from administrative decisions along a dimension we do not control for. We include an extensive list of covariates namely the level of harm, patient age and gender, physician's specialty, type of defendant (individual *vs.* institution) and type of hospital (private *vs.* public), to reduce that risk. We also control for previous court decision.

After performing the regression analysis, we expect to provide useful insights with respect to medical malpractice cases appealed to the Supreme Court. First, Supreme Court reversal rates allow us to study how are lower courts deciding medical malpractice cases. Therefore, we can say if the Supreme Court tends to agree with the previous court decision and if there are significant differences between reversal rates of administrative and civil decisions. Additionally, we can test if there are case characteristics that make the decision of reversing the lower court decision more likely. As we referred above, we are controlling for important case characteristics, aiming to assess if they are relevant to reverse cases by the Supreme Court.

Medical malpractice cases are difficult to judge, given the problem of causation.[61] Therefore, unless there is strong evidence that the patient suffered a negligent treatment, it is hard to know for sure if negligence occurred or not. When we study Supreme Court decisions, we cannot say that they are "the correct" decisions. However, as it will be discussed in more detail, there are reasons to believe that these decisions might involve less errors than those being made by lower courts,[62] especially from a legal perspective.

We also add to the literature of Law and Economics by investigating if, according to the information available, there are strong motives to have civil and administra-

[59] We performed Kolmogorov-Smirnov tests.

[60] Additionally, we performed the same test for those specialties that received the higher number of claims and that are seen as more risky (obstetrics/gynecology, orthopedics and neurosurgery). There are no significant differences between the proportion of cases involving those specialties in the Civil and Administrative Chambers of the Supreme Court.

[61] See Chapter 1 for a detailed description of the problem.

[62] See Shavell (2010).

tive courts judging medical malpractice cases. Dari-Mattiacci et al. (2010) argue that "*[s]pecialization between regular and administrative courts encourages specialization in state liability*" but, on the other hand, "*separation makes capture by the state or by special interests easier*".[63] Therefore, the authors claim that specialization of courts makes sense when "*the determination of state liability is substantively different from tort liability*".[64] The authors use the case of an accident with a school bus or police car owned by the state as an example of substantial similarities (in terms of legal issues) with ordinary tort cases, namely with respect to causation, determination of fault and estimation of harm. This example shares similarities with medical malpractice cases. The way to access causation, to determine fault and to estimate harm is essentially the same, whether there is a public or a private hospital involved. Therefore, our aim in this chapter is not to provide a design of how the legal system should be organized. Our objective is to confront civil and administrative decisions, so that we can clarify some potential implications of having such system.

2.5 Results

In this section we present the main results with respect to the differences we find in administrative and civil decisions. We start by describing the Supreme Court caseload in both Administrative and Civil Chambers from 2006 to 2009. Reversal rates are studied subsequently.

2.5.1 Supreme Court Caseload

Table 2.1 presents the total caseload of the Supreme Court for 2006, 2007, 2008 and 2009 by the Administrative and Civil Chambers, which we compare to the caseload of those chambers in medical malpractice cases[65] only. This allows us to have an idea of the proportion of alleged medical negligence cases in the total number of decisions.

The total number of Supreme Court's medical malpractice decisions, by chamber, is shown in Table 2.2. A distinction is made regarding medical accidents taking place before and after the 1998 Reform. For 2006, 2007, 2008 and 2009, there was a higher proportion of cases being tried by the administrative jurisdiction. This is not surprising: Spain has a national public health system[66] and universal access to health services

[63] Dari-Mattiacci et al. (2010), pp. 27-28.

[64] Dari-Mattiacci et al. (2010), p. 28.

[65] According to our dataset.

[66] For several years the management and administration of the public health services was made at the national level, by the INSALUD (Health National Institute), but those functions were transferred to the

Table 2.1: SC Total Caseload and Med Mal only

	Adm. Judgments by the SC	*Civil Judgments by the SC*
2006	4,624	1,340
2007	4,732	1,339
2008	4,441	1,154
2009	5,132	828
Total 2006-2009	18,929	4,661
% Med Mal on Total	0.8%	2.1%

SOURCE: Spanish Judicial Council (2006, 2007, 2008 and 2009). NOTE: Medical Malpractice Judgments are the total judgments in our database.

is granted by the Constitution.[67] Currently, the majority of Spanish citizens use the national health care system and only a reduced proportion of patients has a private health insurance, although this proportion varies among regions.

Table 2.2: Total Number of SC decisions on Compensation for Med Mal

		Pre 1998	*Post*	*All*
Positive Payout	Administrative	64	14	78
	Civil	50	1	51
	Total	114	15	129
Zero Payout	Administrative	55	23	78
	Civil	45	4	49
	Total	100	27	127
Total	**Administrative**	**119**	**37**	**156**
	Civil	**95**	**5**	**100**
	Total	**214**	**42**	**256**

The reform[68] held in 1998 can explain the yearly differences between the number of decisions by the Administrative and Civil Chambers. We calculated the number of cases that would have been tried by the administrative jurisdiction if the 1998 reform would already have been in force. In other words, we calculated how many cases would have

autonomous' regions, a process that started in 1981 and finished in 2002 (*Real Decreto* 840/2002, August 2). Currently there is another institution, the INGESA (National Institute of Health Management), which is in charge of health care in Ceuta and Melilla.

[67] Art. 43, Spanish Constitution of 1978.

[68] We hope to study the impact of this reform in the future. From 2006 until 2009 the number of decisions involving medical accidents happening after the reform has been adopted is very reduced. Therefore, it is not possible to make this analysis for the moment.

been decided in 2006, 2007, 2008 and 2009 by the Administrative Chamber if medical accidents taking place in public hospitals could not be tried at civil courts. We get similar percentages for each of the four years: 74% to 80% of cases would have been decided by the Administrative Chamber and 20% to 26% of the cases would have been decided by the Civil Chamber every year. Overall, in 39 lawsuits the patients opted for the civil jurisdiction when a public hospital was involved (and when they were still allowed to do so). Within these 39 cases, both a public and private hospitals were involved in 2 cases.

2.5.2 Reversal Rates

In our dataset, compensation was attributed in approximately 50% of cases and this rate was similar for administrative and civil decisions. An interesting comparison that can be made is between Supreme Court decisions and lower courts decisions with respect to the attribution of compensation to patients. In other words, are lower courts' decisions generally the same as the Supreme Court decisions? If not, can we see a prevalence of defendants or plaintiffs? Our dataset allows us to study the reversal rate of cases arriving at the Supreme Court. When the Supreme Court does not fully agree with the previous court decision, it can make small changes to the previous decision: it can modify the amount of compensation, revise the legal fees (for instance, say that one party shall pay for the entire court's costs); or it can absolve one of the defendants in cases with multiple defendants. We look essentially at the decision of awarding damages to the patient and the amount of compensation, if any. Therefore, to calculate reversal rates at appeal, we considered a judgment reversed in case the lower court decided that the patient was entitled to receive compensation and the Supreme Court decided that he was not entitled to it (or the other way around) and if the respective amounts of damages were altered. Thus, judgments in which the Supreme Court maintains the decision that the patient is entitled to receive compensation but absolves one of the defendants are not considered reversed here.[69] This implies that the reversal rates that we present[70] are not an exact measure of Supreme Court reversal rates. Decisions in which the Supreme Court absolved one of the defendants are obviously relevant for

[69] We are not claiming that these decisions are not important. Actually, they are in the sense that they allow to correct erroneous decisions. For more on "*The Appeals Process as a Means of Error Correction*" see Shavell (1995).

[70] We also coded reversal rates considering the entire decision. In this work the variable of interest is if the decision of compensation was reversed or confirmed, and not the decision with respect to legal fees, for instance.

both defendants: the guilty defendant will now have to pay for the entire damages while the absolved defendant is not responsible and will not have to pay anything.

From the 256 decisions (214 if we look at pre-1998 reform only) made by the Supreme Court, there was an agreement with respect to lower court decisions in 200 cases (170 cases) (Table 2.3). Therefore, the overall reversal rate for medical malpractice cases decided by the Supreme Court was approximately 21.9% (20.6%). If we separate civil and administrative cases, the reversal rate is higher for the last ones: 28.2% (26.9%) of the administrative lower court decisions are reversed by the Supreme Court, compared to 12% (12.6%) in civil cases. Reversal rates show some differences according to the appellant party. As we can see in Table 2.4, and considering both jurisdictions, losing plaintiffs appealing to the Supreme Court obtain a higher reversal rate than defendants: plaintiffs obtain a reversal rate of 25.7%, while defendants can only get a 6.3% reversal rate.

Table 2.3: Total Number of Decisions and Reversal Rates by Jurisdiction

		Adm.	*Civil*	*Both Jurisdictions*
Pre 1998	Reversed Decisions (N)	32	12	44
	Total Decisions (N)	119	95	214
	Reversal Rate (%)	26.9	12.6	20.6
Post 1998	Reversed Decisions (N)	12	0	12
	Total Decisions (N)	37	5	46
	Reversal Rate (%)	32.4	0.0	28.6
Pre and Post 1998	Reversed Decisions (N)	44	12	56
	Total Decisions (N)	156	100	256
	Reversal Rate (%)	28.2	12.0	21.9

Within cases appealed by patients, the reversal rate is higher at the Administrative Chamber (31.6%) than it is at the Civil Chamber (14.5%) (Table 2.4), and this difference is statistically significant. Therefore, the agreement rate is higher for cases in which the lower court decided that the plaintiff should receive compensation, with small differences between administrative and civil decisions. It seems that civil judges "get it right" more often than administrative judges. Moreover, administrative judges are more likely to "get it wrong" in case they absolved the State, which seems to point to a pro-State bias. This possibility will be further investigated in the regression analysis.

We also check for reversal rates in civil decisions by type of hospital, *i.e.*, public or private hospital. The main objective is to check whether cases involving a public hospital can be more difficult to judge and therefore we might expect higher reversal rates. Alternatively, we should not expect cases involving a public hospital to be more diffi-

Table 2.4: Two-sample tests for differences in proportions of reversed decisions (Civil *vs.* Adm.)

		All Decisions	*Plaintiff Appeals+*	*Defendant Appeals+*
Administrative	SC Reverses (N)	44	42	2
	Reversal Rate (%)	*(28.2)*	*(31.6)*	*(7.4)*
Civil	SC Reverses (N)	12	10	2
	Reversal Rate (%)	*(12.0)*	*(14.5)*	*(5.4)*
z-stat for differences in proportions of Rev. Rates (Adm. *vs.* Civil)		-3.06	-2.63	-0.84
Probability		*0.002*	*0.008*	*0.401*
Both Jurisdictions	Total Number of decisions(N)	256	202	64
	Reversal Rate (%)	*(21.9)*	*(25.7)*	*(6.3)*

+ The sum of these cases is different than 256 because in 10 of them both parties appealed to the Supreme Court. These results are robust if we exclude cases in which both parties appealed.
NOTE: We use a two-group test on the equality of proportions as we are dealing with a dummy variable. Would we use a *t-test* instead, the t-statistic would be even higher (except for cases in which the defendant appeals, in which the difference between reversal rates at the Administrative and Civil Chamber would not be statistically significant).

cult to judge and consequently there should not be significant differences in reversal rates even when that type of hospital is involved. Table 2.5 shows the results for these cases. Considering only cases tried by the civil jurisdiction in which a public hospital was involved we can see that the reversal rate was 15.4%, and that it shows no differences between appellant parties. The reversal rate is lower (approximately 10%) for civil cases in which a public hospital is not involved. Among these cases, no decisions were reversed when the defendant appealed. Although it would be preferable to have more observations to perform this test, there are no statistically significant differences between cases having a public hospital as defendant and cases having a private hospital as defendant in the civil jurisdiction. So far, we did not find evidence that cases of litigation with the State are more difficult to judge and, because of that, we might expect higher reversal rates.[71]

Another comparison we can make is between Supreme Court reversal rates in medical malpractice cases and Supreme Court reversal rates for the entire civil and admin-

[71] Tests for the difference in proportions of reversal rates were also performed between civil and administrative jurisdictions. In this case, we consider for the civil jurisdiction only cases with a public hospital as defendant and reversal rates are then compared to those from the administrative jurisdiction. We get a *z=-1.62*, *P-value=0.106*. We did not rely much on this result as the number of observations is very different: 39 for civil jurisdiction and 146 for administrative jurisdiction.

Table 2.5: Two-sample tests of differences in proportion of reversed decisions (Civil with Public Hospital *vs.* Civil without Public Hospital)

		All Decisions	*Plaintiff Appeals+*	*Defendant Appeals+*
Civil Decisions with Public Hospital	Reversed Decisions (N)	6	4	2
	Total Number of decisions (N)	39	26	13
	Reversal Rate (%)	*(15.4)*	*(15.4)*	*(15.4)*
Civil Decisions with NO Public Hospital	Reversed Decisions (N)	6	6	0
	Total Number of decisions (N)	61	43	23
	Reversal Rate (%)	*(9.8)*	*(14.0)*	*(0.0)*
z-stat for diff. in proportions of Rev. Rates (Civil with Public Hosp. *vs.* Civil with NO Public Hosp.)		-0.83	-0.16	-
Prob		*0.4*	*0.87*	-
Total Civil Decisions	Reversed Decisions (N)	12	10	2
	Total Number of decisions (N)	100	69	37
	Reversal Rate (%)	*(12.0)*	*(6.9)*	*(5.4)*

+ The sum of these cases is different than 100 because in 6 of them both parties appealed to the Supreme Court. These results are robust if we exclude cases in which both parties appealed.

istrative jurisdictions. Statistics for the overall jurisdiction are available[72] according to the appellate court (Table 2.6). Also here, decisions from civil courts have a lower reversal rate when compared to administrative decisions,[73] although it is not possible to say anything in detail about these reversed decisions (*i.e.*, it is impossible to know in favor of which party was the decision reversed). What we can say when we look at the results provided by Table 2.6 is that, using the same terminology as above, civil lower courts "get it right" more often than administrative lower courts. In fact, for each 100 cases arriving at the Civil Chamber, only 9 to 11 have been reversed. If we do the same calculation for administrative decisions, for each 100 cases arriving at the Administrative Chamber, approximately 10 to 25 have been reversed. Moreover, Civil Chamber's reversal rates[74] are more stable than the Administrative Chamber's reversal rates.[75]

We developed a set of *logistic* regressions[76] to further investigate the differences

[72]"*La Justicia Dato a Dato - Estadistica Judicial*", Spanish Judicial Council (*Consejo General del Poder Judicial*) - (2006, 2007, 2008 and 2009).

[73]We are not able to provide an explanation for the high variability regarding appeals of decisions coming from the National Court (*Audiencia Nacional*) as an explanation is not provided in the report. Moreover, it is unexpected to have precisely the same rate of appeals for the Higher Court of Justice for 2008 and 2009.

[74]From 2006 until 2009, the difference between the minimum and maximum reversal rates is 3.1%

[75]From 2006 until 2009, the difference between the minimum and maximum reversal rates is 15.3%.

[76]In these regressions, the dependent variable is equal to one if the Supreme Court reverses the lower

Table 2.6: Reversal rates at the Supreme Court according to Lower Court

Jurisdiction	**Appellate Court**	**2006**	**2007**	**2008**	**2009**
Civil	Provincial Courts *(Audiencias Provinciales)*	10.8	10.7	7.7	7.9
Adm.	National Court *(Audiencia Nacional)*	25.2	16.5	9.9	24.9
Adm.	Regional Superior Courts of Justice *(Tribunales Superiores de Justicia)*	10.1	17.2	23.2	23.2

SOURCE: Spanish Judicial Council (2006, 2007, 2008 and 2009).

between the Civil and Administrative Chambers of the Spanish Supreme Court. We also added which party was appealing to the Supreme Court, the plaintiff or the defendant.[77] If the defendant appealed to the Supreme Court, it means that the lower court attributed compensation to the patient. If the plaintiff appealed to the Supreme Court, it means one of two things: either the lower court decided that there was no evidence of negligence and causation and therefore the patient is not entitled to receive compensation (the vast majority of cases); or the patient is not happy with the compensation amount.[78] If we consider Supreme Court decisions as a proxy for correct decisions (in the sense that they allow correcting errors from previous courts), analyzing reversal rates according to the appellant party offers the possibility to check if lower courts are making more mistakes when they decide that the patient is not entitled to receive compensation or if they are making more mistakes when they consider the defendant guilty.[79]

Table 2.7 summarizes the main results, where we present the estimated *logit* models, first for the overall dataset and then considering cases involving accidents before the 1998 Reform only. As anticipated, the patient's gender is not relevant for Supreme Court decisions. Regarding other patient's characteristics, and considering the results for regressions in a simple version, we can see that the odds of having a judgment reversed by the Supreme Court was up to three times higher for claims involving injury to newborns (Regression (1) and Regression (2), odds ratio[80] [OR]=3.01, p=0.005;

court decisions, and is equal to zero if the Supreme Court agrees with the previous decision.

[77] In 10 cases both plaintiff and defendant appealed to the Supreme Court.

[78] As stated above, Supreme Court's case law points to the fact that compensation amounts should be set by lower courts.

[79] Just as considered above, this is just a proxy as we look at the Supreme Court's decision of reversing the attribution of compensation to the patient. In case the Supreme Court absolved one of the defendants but maintained all the rest, this is not considered as reversed from the point of view of attributing or refusing compensation.

[80] The odds ratio is simply the odds of one event occurring in one group divided by the odds of that same event occurring in another group. Let us suppose that the probability of having an administrative decision

[OR]= 2.66, p=0.024, respectively).

Having a lawsuit being tried at the Administrative Chamber seems to have an impact on the reversal probability at the Supreme Court. The odds of having a reversal from the Supreme Court at the Administrative Chamber is more than two times as large as the odds of having a reversal from the Civil Chamber ($2.06 < [OR] < 2.43$) and this result is robust across different specifications. Regressions (5) and (6) seem to contradict this result, but the fact that the coefficient on *Administrative* is not significant owes to the inclusion of variables characterizing the type of defendant, some of them with a very high correlation with the *Administrative* variable.

Table 2.7: Regression Results

	Dependent Variable: SC Reverses					
	(Reg. 1)	(Reg. 2)	(Reg. 3)	(Reg. 4)	(Reg. 5)	(Reg. 6)
Administrative	2.427**	2.088*	2.133**	2.064*	2.789	1.642
	(0.017)	(0.059)	(0.042)	(0.068)	(0.154)	(0.508)
Plaintiff Appeals	4.119**	5.253***	4.395***	5.145**	4.240**	5.041**
	(0.011)	(0.009)	(0.009)	(0.011)	(0.012)	(0.013)
Male	1.160	1.785				
	(0.647)	(0.117)				
Newborn	3.005***	2.663**				
	(0.005)	(0.024)				
Child	0.430	0.796				
	(0.281)	(0.780)				
Permanent Minor			5.003	5.119	5.231	5.434
			(0.130)	(0.127)	(0.124)	(0.119)
Permanent Major			6.921*	5.723	5.403	4.582
			(0.071)	(0.108)	(0.125)	(0.175)
Death			4.106	5.846	4.975	7.231*
			(0.197)	(0.109)	(0.150)	(0.080)
Other Controls	No	No	No	No	Yes *Doctors Specialty Defendant Type*	
N	255	213	255	213	255	213
Log Likelihood	-120.3	-96.57	-123.0	-98.78	-119.0	-94.94
LR Chi Square	27.92	23.85	22.46	19.45	30.38	27.13

Exponentiated coefficients; *p*-values in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
The dependent variable is a dummy variable equal to 1 if the Supreme Court reverses lower court decision and 0 if it agrees. All regressions were estimated using all decisions first and then using decisions before the 1998 Reform only.

reversed is 0.30. Suppose as well that the probability of having a civil decision reversed is 0.15. The odds ratio is equal to (0.30/(1-0.30))/(0.15/(1-0.15))=2.4. Therefore, the odds of having an administrative decision reversed is 2.4 times higher than the odds of having a civil decision reversed.

The type of hospital (public *vs.* private) and having as defendant an individual (doctor or nurse) or an institution (*e.g.*, health care center or insurance company) does not have any impact on the probability of having the previous decision reversed (Regressions (5) and (6)). We look at physician's specialty by considering those specialties that received at least ten claims. Obstetrics/gynecology, neurosurgery/orthopedics, anesthesiology/reanimation, general surgery and emergency are the specialties considered. We can see that physician's specialty is not relevant.

Taking into account these results, we did not find reasons for patients to opt for the civil jurisdiction when the injury took place in a public hospital if he is taking into consideration Supreme Court decisions.[81] There is no evidence of a possible bias towards the State by Supreme Court's judges when a public hospital is involved. In fact, were this bias to exist, we should observe the type of hospital being an important variable, which is not. Which reasons could take patients to present their claims in the civil jurisdiction when they could still chose? To start with, if the patient does not take into consideration the Supreme Court, then there are incentives to prefer the civil jurisdiction given the pro-State bias that we suspect to exist at lower administrative courts. We should add that civil decisions take longer and that indemnity amounts do not show significant differences between civil an administrative decisions.[82]

2.6 Discussion of the Results

Priest and Klein (1984) suggest that appealed decisions should present near 50% success for both defendant and plaintiff. The main reason why it should be so has to do with case selection, which works similar to selection of cases to litigation. The idea is that there is a selection effect: cases clearly in favour of the plaintiff or in favour of the defendant are settled; cases involving an unclear outcome cannot be settled, and these cases are won by the defendant and by the defendant equally. As Priest and Klein (1984) mention, the "*50 percent implication derive from the assumption of symmetric stakes to the parties from litigation*".[83] As described by the the authors, medical malpractice cases might involve assymmetric stakes for the parties, as "*[a]n adverse judg-*

[81] Considering claims being made before the reform, when the patient could chose in which jurisdiction to present a claim.

[82] The mean duration of administrative cases is lower than those tried in the civil jurisdiction, and the difference is statistically significant. Overall, there is no evidence of differences in compensation amounts between civil and administrative jurisdictions. See Chapter 3 for an analysis of compensation attributed to patients by the Spanish Supreme Court.

[83] At p. 20.

ment may harm the reputation of the doctor, which would meant that the doctor would have more to lose from a defeat at trial than the dollar judgment the plaintiff gains".[84] In these cases, we could expect a plaintiff success rate at trial lower than 50%, as defendants might settle cases with high probability of defeat, and litigate cases with higher probability of victory. Other studies show different results for trial outcomes, both in empirical[85] and theoretical works. Shavell (1996) presents a formal model of trial selection showing that "*any frequency of plaintiff victory at trial is possible*". We find that plaintiffs prevailed in 50% of the appeals to the Supreme Court, although we could have seen any other result, as Shavell (1996) points out.

Administrative decisions present a reversal rate of 28.2% and civil decisions 12%. If litigants believe that civil decisions are difficult to overturn on appeal, they should appeal strong cases only. One should expect a lower appeal rate for civil decisions and eventually a higher reversal rate. It is not possible to compute appeal rates for medical malpractice cases (neither for civil nor for administrative cases). From the information gathered it does not seem to be strong evidence suggesting that civil appeal rates are much lower than the administrative ones. Approximately 2.1% of the Supreme Court caseload was for medical malpractice civil decisions, while it was 0.8% for administrative decisions. Moreover, if the majority of the population searches medical care through the national public health system, the number of cases arriving at the Civil Chamber does not seem to be so small. This conclusion still holds if we consider those cases in which a public hospital was involved but the patient opted for the civil jurisdiction. As for the reversal rate, it is actually higher for administrative decisions than it is for civil decisions. From here we can speculate either that there is indeed a low appeal rate for civil decisions that we cannot confirm from the data we have - which seems to be unlikely; or that selection theory of cases that are appealed[86] does not apply here, which seems to be the most plausible option.[87]

[84] At p. 40.

[85] Some empirical studies are presented in Section 2.2.2.

[86] A final alternative explanation is that the difference in reversal rates is driven by case's difficulty, in the sense that the most difficult cases go to the Administrative Chamber. The results that we have showed do not seem to support this hypothesis. In fact, and as pointed previously, there are no significant differences in the distribution of cases arriving at the Civil and Administrative Chambers in terms of level of harm, age of the patient, and specialties that tend to receive the higher number of claims (and that could be seen as more risky). Besides, the easier civil cases could be settled, a possibility that is not allowed in litigation with the State. Therefore, and would this hypothesis be true, we would expect the most difficult cases to arrive to civil courts and cases of different difficulty levels to arrive to administrative courts.

[87] The alternative explanation that the difference in reversal rates is caused by a selection effect of lawyers, according to which civil lawyers are better than administrative lawyers, does not seem to play a

The strategic model might provide some explanations for the results we find. The idea is that judges decide taking into account the expected reaction from the administration and the legislator. In civil cases, there is no expected reaction unless a massive number of cases arrives to courts and it creates a strong public opinion, which is not what we see for Spain. As for administrative cases, we can expect two things: 1) the judges believe that they can get some retribution from the State and therefore they are pro-defendant; 2) the judges think that the State is incompetent, in the sense that public health care is not provided according to the standards of care, and they are pro-plaintiff as a way of "punishing" the State. From our data, the first explanation seems to be the more suitable one, but the pro-State bias is from lower courts. Why do we believe that in case there is a bias it is less likely to be at the Supreme Court level? To start with, the "*Spanish Supreme Court justices operate in a traditional civil law setup which disfavors division, dissent and public controversy within the bench*".[88] Therefore, we can expect to find a vast majority of unanimous decisions at the Supreme Court, in which several justices vote.[89] This means that it is more likely to find a legal error in decisions made by lower judges (there is only one judge deciding), than in decisions made at the Supreme Court level (several judges decide the same case). To corroborate this possibility, a description of how judges are appointed to the Supreme Court can be provided: "*one out of five justices are selected among career judges that possess at least ten years of experience at the appellate courts* (magistrado)*, and at least fifteen years of experience as career judges. One out of the five positions is to be held by law professors possessing renowned competence for the position and more than fifteen years of professional experience*".[90] Appointment is similar for justices from the Administrative and Civil Chamber, which means that we should not expect diverse behavior between these judges.

Judges from administrative courts might think that if they go against the State they may have some problems in terms of promotion in their careers.[91] They are public servants and one of the parties involved in the litigation is the State. In the end, judges maximize "*the same thing everybody else does*",[92] which means that income is part of the

role in this setting. To start with, and given the public national health system, we cannot say that patients who search for health care in public hospitals have a lower possibility of paying for a good lawyer than those patients going to a private health care provider. Moreover, the State's lawyers (*Abogados del Estado*) are highly reputed lawyers.

[88] Garoupa et al. (2011), p. 3.

[89] In the SSCMMD, dissident votes were found in 3 decisions.

[90] Garoupa et al. (2011), p. 8.

[91] See Posner (2008).

[92] Posner (1993).

judges' utility function. If judges think that deciding systematically against the State might refrain them from being promoted and receiving a higher income, it is natural to expect that they prefer not doing so. This becomes particular important for administrative judges because they acquire a specific asset on human capital (knowledge of administrative law) which makes them more dependent from the State.[93]

Furthermore, and the reason why we point to a bias at the administrative lower courts is because the same does not follow with Supreme Court judges, as they typically retire after being at the Supreme Court. To support this argument, Supreme Court judges should be more concerned with the future effect of their decisions than trial judges.[94] Moreover, decisions from the Supreme Court are more easily known by the public, simpler to attack in terms of public opinion and are generally followed by lower courts.[95] In case we would see in our data that the Supreme Court reverses more decisions in which the defendant appealed, we could not explain whether it was because lower courts were pro-plaintiff or if the Supreme Court was pro-defendant. The same would hold if the type of hospital was important for reversal rates, which is not the case.

With the results we get from this analysis, we can add to the Law and Economics' debate on the specialization of courts, by trying to answer to the following question: why should both civil and administrative courts judge medical malpractice cases? As previously explained, there are no strong reasons to believe that medical accidents taking place in public hospitals are much different from medical accidents occurring in private hospitals (not only with respect to the case itself, but also from a legal perspective). If we consider the results obtained in this chapter, we see that there are disadvantages and costs if specialized administrative courts judge medical malpractice cases when the State is involved.

Administrative judges from lower courts perceive that they might suffer some retaliation in terms of promotion if they decide against the State, which makes them thinking that they have a higher cost of deciding against the State than civil judges. This might lead them to have a pro-State bias. Although we cannot draw from here all the benefits from the specialization of administrative courts, the cost of capture should not be disregarded, as apparently lower administrative judges show a higher proportion of wrong decisions which bring a cost to the party suffering from it. This might have other impor-

[93] See Dari-Mattiacci et al. (2010).

[94] Tigar (1993).

[95] The Supreme Court decisions included in our dataset generally provide a transcription of parts of the lower court decision. In all of them, there are references to previous Supreme Court decisions. However, lower courts sometimes make mistakes when applying them.

tant implications as well, namely in terms of a loss of deterrence when public hospitals are involved.[96] However, the full implications of this system and the way it should be designed are beyond the scope of this chapter, as further research and data would be needed.

2.7 Conclusions

This chapter studies evidence from lawsuits appealed to the Supreme Court in Spain, and we add to previous literature on empirical medical malpractice studies of claims in civil law tradition countries. The "*polycentric character*" of the Spanish law of torts is responsible for several problems, namely for creating a loss of efficacy in terms of prevention of negligent care. By analyzing Supreme Court's decisions from 2006 to 2009 related to medical malpractice we see that reversal rates are higher for administrative decisions. When patients appeal administrative decisions, the reversal rate is even higher. Lower courts "get it right" more often in judgments attributing compensation to patients, as these are the decisions with lower reversal rate at the Supreme Court. Lower court judges exhibit some differences as adjudicators of medical malpractice cases. There is evidence of a pro-State bias from administrative lower courts which could explain the option of some patients for the civil jurisdiction. Before 1998, patients harmed in public hospitals could use their perceptions of the differences between civil and administrative judges to choose in which jurisdiction to file the lawsuit, but this option is no longer available. We do not find strong reasons to have both civil and administrative courts deciding medical malpractice cases.

[96] Similar to what has been argued by Gómez-Pomar and Sánchez Álvarez (2006), although the authors refer to cases involving the State in general.

2.8 Appendix: Spanish Medical Liability System and the SC

2.8.1 Criminal Jurisdiction

The criminal jurisdiction can also have a role in medical malpractice cases, independently of the place of harm. If that is the case, the Criminal Code's liability rules apply and the final decision will make a judgment regarding the criminal and civil liabilities. The plaintiff is able to reserve his claim of damages to a civil court, but this rarely occurs.[97] Martín-Casals et al. (2004) refer to the fact that the 1998 and 1999 reforms gave rise to an "*increase in penal lawsuits, which allow the victim to obtain a quick and free preliminary investigation into the case, a swift ruling on tort liability within the criminal proceeding itself and, moreover, a way out from the jurisdiction of the administrative courts*".[98] The option for the criminal jurisdiction is allowed by Art. 146, Law 4/1999, and is appealing to the plaintiff due to delays in the administrative jurisdiction and to a possible bias towards the State.[99] But would a pro-State bias be confirmed, it would also mean two things: it is appealing for the plaintiff to opt for the civil jurisdiction, giving that the patient is expecting to have a lower probability of prevailing over the State in administrative courts; it is a motivation for the legal reform that voids the possibility of choosing in which jurisdiction to present a claim, precisely because all the claims against the State will be presented at the courts that favor it the most.

2.8.2 Burden of Proof and Standard of Care

In case of allegation of medical malpractice from the plaintiff, a judgment will be made about the evidence of fault. The general rule is that the burden of proof[100] lies with the patient, not only regarding the existence of fault but also on the proof of causation,[101] although it is possible to apply a reversal of the burden of proof in exceptional cases. Cases with a disproportional harm in comparison with the risk of the medical intervention (*daño desproporcionado*) or cases in which the defendant is in a better position to provide evidence (such as that the patient signed the informed consent sheet), are the most common examples on which a reversal of the burden of proof[102] can be granted.

[97] See Coderch et al. (2006), p. 7.

[98] It was possible to find Supreme Court's decisions at the civil or administrative chambers regarding cases that had previously been tried in the criminal jurisdiction by lower courts.

[99] Gómez-Pomar and Sánchez Álvarez (2006).

[100] See Luna Yerga (2004) for burden of proof in civil cases. For burden of proof in cases related to pharmaceutical products (although we are not covering these cases here) see Ramos González (2004).

[101] See STS 11.3.1991, RJ 1991/2209 and Art. 217, Law 1/2000 on Civil Procedure, of January 7.

[102] For some Supreme Court's decisions on this issue see STS 18.12.2009, STS 23.10.2007. The reversal of the burden of proof in medical accidents is recent when compared with its application to other cases.

The standard of care shall be met in each and every stage of medical care: (i) *pre-treatment phase of care*, such as diagnosis and informed consent;[103] (ii) *intra-treatment* phase of care, such as performing a surgery according to the standards of care; (iii) *post-treatment* phase of care, such as supervising the patient during recovery, checking the patient's evolution and reaction to the treatment.

The standard of care for medical care providers is set by the *lex artis ad hoc* criterion,[104] which implies that the general standard of care required for medical treatment *(lex artis)* shall be considered according to the specificities of the case *(ad hoc)*. The standard of care is high in the sense that it is set considering a skilled medical professional, taking into account the specific characteristics of the case, namely the profession's characteristics, the complexity of the patient's condition, but also his family's condition and health organization's circumstance.[105] Medical care providers do not have an obligation of outcome *(obligación de resultados)*, in the sense that they are not obliged to cure the patient from his poor health condition (which is impossible to ensure). But medical care providers do have an obligation of means *(obligación de medios)*, meaning that the doctors are required to take reasonable measures while performing health care treatments, taking into account the probability of some foreseeable risks and their eventual level of harm. Some Supreme Court's decisions might seem at first sight to impose an obligation of outcome for *medicina satisfactiva o voluntaria*,[106] *i.e.*, for medical treatments that are not vital to the patient. Vasectomies, plastic surgeries and odontological surgeries are considered to be part of this type of medicine, on which the patient searches for medical care on a voluntary basis and not due to an essential need. The obligation of the physician in these cases, that is an obligation of means, comes closer to an obligation of outcome because otherwise the patient would not search for that medical treatment. But this does not imply that the physician is strictly liable in case the final desired outcome is not achieved: it simply implies that the physician must act according to the *lex artis ad hoc*, to inform the patient about the risks, but additionally to inform the patient about the possibility that the treatment might not bring the expected result.

See Gómez-Pomar (2001) and Luna (2003) - both in Spanish.

[103] Regulated by Law 41/2002, November 14, on Patient's autonomy, rights and obligations regarding clinical information and documentation. Notice that informed consent implies that the patient was informed not only about the risks and procedures in case medical intervention is needed (and gives medical authorization to the intervention) but also about the alternatives to the proposed treatment, so that he can make a choice.

[104] See STS 11.3.1991, RJ 1991/2209.

[105] STS 11.3.1991, RJ 1991/2209.

[106] See STS 29.6.2007, STS 23.10.2008 or STS 30.6.2009.

2.8.3 Damages

Patients can recover damages for economic losses and pain and suffering, and compensation due to a loss of a chance[107] is being applied with some frequency by Spanish courts. There is no clear rule to calculate the amount of compensation that the patient is entitled to receive due to a medical accident, but sometimes damage schedules for automobile accidents[108] are followed by courts instead. This allows for less discretion in terms of the amount set and accounts already for pain and suffering, the part of compensation generally regarded as being the more difficult to assess. Nevertheless, there is no homogeneity in courts' decisions for quantifying medical malpractice damages:[109] some decisions specify the amount for economic losses and for pain and suffering separately, others claim that they use the scheduled damages table for accidents (that includes compensation for both economic losses and pain and suffering), and others present an overall amount without specifying the calculation of those monetary amounts. This holds for lower courts but also for the Supreme Court (in case the Supreme Court reverses the previous lower court decision of refusing compensation to the patient; otherwise, the compensation amount is set by the lower court). Moreover, although patients must provide some facts to the court about their injuries, they have an incentive to exaggerate (Cooter (1991)).

2.8.4 Costs

The main costs of bringing a claim to courts are the following:

- i) Procedural fees - appealing to the Supreme Court has a fixed fee of €600 and the variable part can go up to €500 if the value of the claim is up to €1,000,000;[110]

- ii) Lawyers' fees - which are negotiable, regulated by the bar of each autonomous region, and vary according to the type of case and litigation stage. For Barcelona, the fees should decrease in higher stages of litigation, *i.e.*, the fee for first instance is higher than the fee to appeal to a higher court and to the Supreme Court as long as the lawyer is the same;

[107] For a description of the introduction of the loss of a chance doctrine by the Spanish Supreme Court, applied by the first time in 1998 by the Civil Chamber, see Luna (2005).

[108] Real Legislative Decree 8/2004, October 29, on civil responsibility and insurance on motor vehicles' circulation (*Responsabilidad Civil y Seguro en la Circulación de Vehículos a Motor*). For a discussion of the use of these tables, see Ramos González and Luna Yerga (2004).

[109] See Chapter 3.

[110] Art. 35, Law 53/2003 of December 30, *Medidas Fiscales, Administrativas e del Orden Social*.

- iii) Bailiff's fees[111] - in civil litigation, a claim with a value up to €601,012 implies a bailiff's fee of €1,540. According to Spanish law, both lawyer and bailiff are mandatory in trial[112]: the lawyer defends the party and the bailiff is a technical representative of the parties in court that has to deal with the various costs incurred during the judicial proceedings;[113]

- iv) Legal experts' fees.

According to a report from the European Commission (2007), the proportions of these costs on the value of a disputed claim are: Court fees 10%-30%; Bailiff fees 5%-20%; Lawyer fees 80%-95%; Expert fees 5%-15%.

2.8.5 Supreme Court

The Spanish Supreme Court is the court of last appeal on points of law only, for civil, criminal, administrative, social and military jurisdictions. It is composed by five chambers, one for each of the jurisdictions just mentioned.[114] Decisions from the Administrative Chamber of the National Court (*Audiencia Nacional*)[115] or Superior Courts of Justice[116] can be appealed to the Administrative (Third) Chamber[117] of the Supreme Court whereas decisions from the Civil Chambers of Provincial Courts (*Audiencias Provinciales*)[118] can be appealed to the Civil (First) Chamber[119] of the Supreme Court. It is possible to consider a specialization of the Supreme Court in the sense that civil decisions of medical malpractice cases are issued by the First Section of the First Chamber; administrative decisions are issued by the Sixth and (recently) Forth Sections of the Third Chamber. This creates problems as well because, as previously described, identical medical accidents can be tried in different jurisdictions, be subject to different rules

[111] *Real Decreto* 1373/2003.

[112] *Ley Enjuiciamento Civil*, January 7, 2000.

[113] See European Commission - Spain (2007), p. 13.

[114] Therefore, the Spanish Supreme Court is composed by the First Chamber (Civil), the Second Chamber (Criminal), the Third Chamber (Administrative), the Fourth Chamber (Social) and the Fifth Chamber (Military). Each chamber is composed by a President and the number of judges is determined by law. Moreover, the chamber can be organized by sections. For more detailed information, see www.poderjudicial.es (in Spanish) - last access on September 2011.

[115] The National Court, which exercises jurisdiction over all Spanish territory, does not have a Civil Chamber.

[116] The Superior Courts of Justice *(Tribunales Superiores de Justicia)* are composed by three chambers: Civil and Criminal Chamber, Administrative Chamber and Social Chamber. These courts exercise jurisdiction over the autonomous regions.

[117] Art. 86, Section III "*Recurso de Casación*", Law 29/1998, on Administrative Procedure, of July 13.

[118] The Provincial Courts exercise jurisdiction over provinces.

[119] Arts. 477 and 478, Chapter V "*Del recurso de casación*", Law 1/2000 on Civil Procedure, of January 7.

and decided in different chambers of the Supreme Court, when the only difference between them is the place of accident.[120]

2.9 Appendix: Construction of the Dataset

In order to build the dataset, we started by searching decisions made by the Spanish Supreme Court on medical malpractice. As explained previously, several searches were performed at the general Supreme Court dataset.[121] We first got a broad list of judgments and excluded those in which the main concern was not a judgment of medical malpractice. For instance, a case in which the Supreme Court decides if the insurance company must pay damages for the patient is not interesting for us. In this situation, the decision being made is not related to the existence of medical malpractice: the court is only deciding who is paying for it, since the decision on the evidence of medical malpractice had been previously done. We excluded decisions[122] related to the following cases:

- *blood infection*: we can view these cases as a defective product problem. The reasoning of the Spanish Supreme Court is that if the blood transfusion has been performed before the mid 90's - as it happened in the vast majority of the decisions from 2006 until 2009 - when there were no technologies to detect the infection, the patient is not entitled to receive compensation, at least from the tort system;

- *psychiatric patients that tried suicide*: these cases are not relevant for the current study. Moreover, the problem is essentially a lack of supervision of the patient (from nurses mainly, not doctors), and not a delayed diagnosis or wrong medication. Therefore, the question being analyzed is not related to a judgment of medical negligence;

- *limitation period*: the limitation period is 15 years for contracts[123] and one year for actions in tort.[124] The *dies a quo* is the day that the victim knew the con-

[120] See Gómez-Pomar and Sánchez Álvarez (2006). See also Section 2.3.2.

[121] Available at www.poderjudicial.es., last access on September 2011.

[122] We would like to present the number of cases we excluded. Unfortunately, as we explain above, the fact that the decisions are not categorized make it too much time consuming to check it, as we need to open each decision to see what it is about. When performing a broad search, we ended up with a list of cases that were not related to medical malpractice (*e.g*, a student having to receive medical care because the teacher was negligent during a school trip).

[123] Art. 1964 of the Civil Code

[124] Art.1968.2 of the Civil Code.

sequences of the harm instead of the day of the medical accident. Therefore, the Court makes a distinction between "*danos permanentes y continuados*", *i.e.*, between permanent and continuous injuries. In the first type of harm, the consequences are known, and unchangeable; the second type is characterized by the fact that there is an evolution, and the patient might have to wait a certain period of time until the consequences are fully known. For this reason, the difference lies in the moment at which the full consequences are recognized.[125] Again, the main discussion is not a judgment about medical malpractice as such;

- "*unificacion de doctrina*": we can see these cases as *stare decisis*. It applies to administrative cases only and we believe these cases are not relevant for the current study;

- and *jurisdictional competence*: in these cases the Supreme Court decides which is the jurisdiction that shall pronounce a judgment about the case, not if there was evidence of medical malpractice.

In order to classify the level of harm suffered by the patient, we followed a 9-point injury severity scale as presented in previous literature. We categorized the levels of injury severity by following the same methodology as Sloan and Hsieh (1990), in accordance with the National Association of Insurance Commissioners. The levels are the following:

- *One*: Emotional only-fright, no physical damage.

- *Two*: Temporary-insignificant-lacerations, contusions, minor scars, rash, no delay.

- *Three*: Temporary-minor-infections, misset fracture, fall in hospital; recovery delayed.

- *Four*: Temporary-major-burns, surgical material left, drug side effect, brain damage; recovery delayed.

- *Five*: Permanent-minor-loss of fingers, loss or damage to organs; includes nondisabling injuries.

- *Six*: Permanent-significant-deafness, loss of limb, loss of eye, loss of one kidney or lung.

[125] See for example STS 14.7.2009.

- *Seven*: Permanent-major-paraplegia, blindness, loss of two limbs, brain damage.
- *Eight*: Permanent-grave-quadriplegia, severe brain damage, lifelong care or fatal prognosis.
- *Nine*: Death.

Patients claiming medical malpractice damages due to a badly performed vasectomy that resulted in an unwanted child were grouped in the lowest level of harm.

2.10 Appendix: Descriptive Statistics

Table 2.8: Reversal Rates by Jurisdiction According to the Level of Harm

		Temporary Emotional	*Permanent Minor*	*Permanent Major*	*Death*
Adm.	Affirms (N)	8	42	42	20
	Reverses (N)	0	17	20	7
	Reversal Rate (%)	*(0.0)*	*(28.8)*	*(32.3)*	*(25.9)*
Civil	Affirms (N)	10	37	17	23
	Reverses (N)	1	6	2	3
	Reversal Rate (%)	*(9.1)*	*(14.0)*	*(10.5)*	*(11.5)*
Total	**Affirms (N)**	**18**	**79**	**59**	**43**
	Reverses (N)	**1**	**23**	**22**	**10**
	Reversal Rate (%)	***(5.3)***	***(22.5)***	***(27.2)***	***(18.9)***

Table 2.9: Reversal Rates by Level of Harm (Paid *vs.* Unpaid Decisions)

		Paid		*Unpaid*	
		Adm.	*Civil*	*Adm.*	*Civil*
Temporary/Emotional	Affirms (N)	1	4	7	6
	Reverses (N)	0	1	0	0
	Reversal Rate (%)	*(0.0)*	*(20.0)*	*(0.0)*	*(0.0)*
Permanent Minor	Affirms (N)	10	18	32	19
	Reverses (N)	16	4	1	2
	Reversal Rate (%)	*(61.5)*	*(18.2)*	*(3.0)*	*(9.5)*
Permanent Major	Affirms (N)	20	11	22	6
	Reverses (N)	20	2	0	0
	Reversal Rate (%)	*(50.0)*	*(15.4)*	*(0.0)*	*(0.0)*
Death	Affirms (N)	5	8	15	15
	Reverses (N)	6	3	1	0
	Reversal Rate (%)	*(54.5)*	*(27.3)*	*(6.3)*	*(0.0)*
All Levels of Harm	**Affirms (N)**	**36**	**41**	**76**	**46**
	Reverses (N)	**42**	**10**	**2**	**2**
	Reversal Rate (%)	***(53.8)***	***(19.6)***	***(2.6)***	***(4.2)***

NOTE: A reversed paid decision means that the SC decided to reverse a decision in which the lower court refused compensation.

Table 2.10: Number of decisions (Affirms, Reverses and All Decisions) by Level of Harm and Appellant Party

		Defendant		*Plaintiff*		*Both Defendant and Plaintiff*	
Level of Harm	Decision	Adm.	Civil	Adm.	Civil	Adm.	Civil
	Affirms	0	3	8	6	0	1
Temporary/Emotional	Reverses	0	0	0	1	0	0
	All Decisions	0	3	8	7	0	1
	Affirms	2	13	37	22	3	2
Permanent Minor	Reverses	1	2	16	4	0	0
	All Decisions	3	15	53	26	3	2
	Affirms	17	9	25	6	0	2
Permanent Major	Reverses	0	0	19	2	1	0
	All Decisions	17	9	44	8	1	2
	Affirms	2	4	18	18	0	1
Death	Reverses	1	0	6	3	0	0
	All Decisions	3	4	24	21	0	1
	Affirms	**21**	**29**	**88**	**52**	**3**	**6**
All Levels of Harm	**Reverses**	**2**	**2**	**41**	**10**	**1**	**0**
	All Decisions	**23**	**31**	**129**	**62**	**4**	**6**

NOTE: The sum of the cases is 255 because in one decision the patient did not specify the level of harm and the Supreme Court argued that it is not possible to know it.

Chapter 3

Compensation in Medical Malpractice Cases

3.1 Introduction

The number of patients presenting claims is lower than the number of patients suffering harm, as evidence has shown.[1] Several reasons might be presented to explain this situation, one being simply that patients are not aware that they were victims of substandard care levels. In fact, as described by Sage (2003), "*[e]ven fatal injuries may not be recognized as errors because of patients' underlying diseases*".[2] Another reason is that patients do respond to incentives. Consequently, given that the malpractice system is costly, presents delays and can be cumbersome, "*it is hardly surprising that it is appealing primarily to patients with severe injuries and large damages*".[3] Although patients must provide some facts about their injuries to the court, they have an incentive to exaggerate.[4]

The complexity of medical malpractice cases with respect to causation is also an important variable: for each patient we can only observe the final outcome given the treatment received (*i.e.*, whether the patient is cured or if harm materialized) but we cannot go back in time, put the patient under a different treatment, see the outcome and compare it to the previous one. Moreover, patients might need to file a claim in order to get more information about the case. In spite of all the critics to the current liability system, empirical literature does not support the claim that the system is performing

[1] See Chapter 1.
[2] At p. 30.
[3] Hyman and Silver (2006), p. 1116.
[4] Cooter (1991).

very badly.[5]

When patients file a claim for medical malpractice in a tort liability regime based on fault, the system should be able to provide (among other things) an outcome in due time.[6] Moreover, whenever the medical treatment is found to have caused the harm suffered by the patient, only negligently injured patients should be compensated for their loss. In other words, the evidence of negligence should be the only variable predicting the attribution of damages.[7] Additionally, patients should be compensated for their loss in a similar and predictable manner. This means that patients suffering similar accidents with equivalent levels of harm should receive the same payout, and that patients suffering a minor severity injury should receive lower compensation amounts than patients suffering a permanent grave injury. In case there is evidence of medical negligence, a calculation should be made for the amount of damages that the patient shall receive.[8] The quantification of damages[9] is crucial for medical malpractice cases: the compensatory goal of tort law requires making the injured patient 'whole'[10] and should deter negligent medical care. Given the importance of accuracy and fairness of awards for non-economic damages, as argued by Bovbjerg et al. (1989), clearer signals of likely outcomes should, among other things, "*inspire greater confidence in the fairness and predictability of the tort recovery system (thereby helping to maintain the efficient operation of the deterrent function of tort law)*".[11] Therefore, the system should set compensation amounts in a consistent way. In addition, patients with similar characteristics suffering the same level of harm should receive an equivalent indemnity award.

However, the quantification of damages has been seen as randomly or to be set in a capricious and incoherent way[12] by some people. Recent decades are rich in tort reforms that set a cap for the amount of damages that patients' can recover in several American states, as a way of trying to solve the skyrocketing indemnity amounts.

[5] See Section 1.2.

[6] See Zhou (2010).

[7] See Section 1.2.

[8] In this chapter our aim is to compare awards of administrative and civil cases. Therefore, we will not assess how damages should be calculated or what is the fair compensation amount that victims shall receive. See, for instance, Bovbjerg et al. (1989). See also Ubel and Loewenstein (2008). For the use of QALY's, see Karapanou and Visscher (2010). Forensic economics can provide useful contributions to this area.

[9] For a survey of the literature on tort damages, see Visscher (2009) and Arlen (2000).

[10] Viscusi (1998) defines the 'make whole' amount as "*the level of compensation that is sufficient to restore the accident victim to the pre-accident level of utility*", p. 661. For more on this topic see, among others, Bovbjerg et al. (1989), Friedman (1982), Viscusi (1998).

[11] Bovbjerg et al. (1989), p. 909.

[12] See Abel (2006) for a discussion of cases attributing compensation.

Several empirical works that studied medical malpractice cases did not find support for a rapid increase in compensation amounts, although evidence of an increase in the proportion of cases involving higher levels of harm has been provided.[13] Interestingly as well is the anecdotal evidence in some European countries that patients are under-compensated. In Spain, the debate has tried to clarify this situation, namely by providing evidence of differences in compensation amounts between distinct jurisdictions (*e.g.*, civil and administrative) and by trying to assess if the use of scheduled damages[14] tends to have any impact on awards. By analyzing Spanish Supreme Court decisions on medical malpractice from 2006 until 2009, this chapter focuses on predictors of compensation and indemnity amounts. The aim is to assess if there are case characteristics that predict a positive payout and, among these cases, if there are differences in compensation between the Civil and Administrative Chambers of the Supreme Court. For the sake of fairness and equity, payouts attributed by civil courts should not present significant differences from payouts attributed by administrative courts, *ceteris paribus* (*i.e.*, after controlling for other variables, such as age and injury severity level). Moreover, we want to investigate if the use of scheduled damages has any impact on compensation levels.

Patients might be entitled to compensation for pain and suffering, medical expenses, loss of income and punitive damages.[15] The calculation of how much the patient shall receive for each of these items in order to get a final amount of compensation is difficult and implies several assumptions. Judges are aware that the patient should be fully compensated, but no guidance is normally provided on how damages should be calculated.[16] In medical malpractice cases, judges are essentially asked to compute compensation to irreplaceable commodities,[17] where health is included. Moreover, when doctors must choose among risky procedures, there are arguments that favor an attribution of damages lower than the harm suffered by the patient, as mentioned by Cooter and Porat (2006). The main idea is that doctors' activity has a positive externality and should not be discouraged. In the example provided by Cooter and Porat (2006), a

[13] *E.g.*, Vidmar et al. (2005).

[14] Mello and Kachalia (2010) present a definition for a schedule of noneconomic damages (table 4, p. 61), according to the Task Force on Noneconomic Damages (2005): a "*hierarchy or tiering system is created for purposes of categorizing medical injuries and creating a relative ranking of severity. A dollar value range for noneconomic damages is then assigned to each severity tier. The schedule is used by juries and judges either as an advisory document or as a binding guideline*".

[15] Awards for punitive damages are generally not possible in the vast majority of European countries.

[16] This is true for several countries. For the U.S., see Bovbjerg et al. (1989); for Italy, see Chapter 4; for Spain, more details will be provided along this section.

[17] "*[C]ommodities for which there are no perfect market substitutes*", Cook and Graham (1977), p. 143.

doctor must decide how to deliver a baby and both procedures have a risk of harm. In case harm materializes, the authors argue that the amount of damages should be equal to the difference of the harm between the two procedures, instead of being equal to the patient's actual harm. Were courts to apply this reasoning, they would also need to make calculations for the procedure that the doctor did not choose.

The Spanish liability system allows patients to recover damages for economic losses and pain and suffering. Under tort law, patients should receive full compensation for negligent harm.[18] Moreover, compensation due to a loss of a chance[19] is being applied more frequently by Spanish courts. It refers to situations in which, "*[f]or instance, a doctor makes a mistake, the patient suffers harm, this harm could have materialized as well without the mistake, but the mistake has ruined the chance of recovery. The recoverable losses consist of this loss of a chance. So if the patient suffers losses of 100.000 and the chance of recovery without the mistake is established at 25%, damages amount to 25.000*".[20] Unlike the American case, punitive damages are not allowed. There is no clear rule that courts should use to calculate the amount of compensation that the patient is entitled to receive due to a medical accident. Therefore, we have a situation in which full compensation shall be awarded but damage awards may vary unpredictably. When referring to automobile accidents, Pintos Agér (2000) argues that the unpredictability of damage awards produced some problematic effects, such as: inadequate compensation (that can arise from under or overestimation); "*distorted deterrence signal sent to potential injurers*"; an increase in liability system costs, especially in litigation costs; payments that take longer and a lower number of victims receiving compensation; and malfunctioning in the insurance market. When inspecting Supreme Court decisions in medical malpractice it was possible to see that scheduled awards for automobile accidents[21] can be followed by courts. This should help courts quantifying harm and should allow for less discretion because it accounts already for pain and suffering, the part of compensation generally regarded as being the most difficult to assess. Nevertheless, there is no homogeneity in courts' decisions for quantifying medical malpractice damages: some decisions specify the amount for economic losses and for pain and suffering separately, others claim that they use the scheduled damage

[18] Arts. 1106 and 1902, Civil Code.

[19] For a description of the introduction of the loss of a chance doctrine by the Spanish Supreme Court, applied by the first time in 1998 by the Civil Chamber, see Luna Yerga (2005).

[20] Visscher (2009), p. 177.

[21] Real Legislative Decree 8/2004, October 29, on civil responsibility and insurance on motor vehicles (*Responsabilidad Civil y Seguro en la Circulación de Vehículos a Motor*). For a discussion of the use of these tables, see Ramos González and Luna Yerga (2004).

table for accidents that includes compensation for both economic losses and pain and suffering, and others present an overall amount without specifying the calculation of those monetary values. Additionally, it is not clear if there are differences in compensation amounts due to the use of scheduled damages. In other words: does the use of scheduled damages for the calculation of compensation have any impact in the overall compensation amount? If so, which effect does it have?

As mentioned in the previous chapter, Gómez-Pomar and Sánchez Álvarez (2006) argue that the "polycentric character" of the Spanish law of torts is responsible for several problems. One of the problems that it might create is that victims might be subject to different treatments in terms of quantification of damages, which is against the principle of equality granted by the Constitution. According to Spanish law, the amount of compensation should be set by the lower court. Supreme Court's decisions that modify the amount of compensation from lower courts are rare, given that there must be evidence of an unreasonable amount set by the previous court.[22]

This chapter proceeds as follows: Section 3.2 revises some of the empirical literature on compensation of medical malpractice cases. Section 3.3 describes the dataset. The main findings are presented in Section 3.4, where a discussion of the main results is provided as well. Section 3.5 concludes.

3.2 Review of the Empirical Literature

Empirical literature on courts' compensation for medical malpractice has been proven useful to respond to two dominant questions: what are the predictors of a positive award and, conditional on a positive award, which factors lead to higher amounts of compensation?

Studdert and Mello (2007) find that payments in nonerror claims[23] are more common if they involve infants, nurse defendants, major injuries, obstetrics injuries or institutional codefendants. The authors also find that it was less likely to receive a payment in nonerror claims if they involved elderly plaintiffs, orthopedic surgeons, emotional

[22]The Supreme Court allows for changes only if at least one of the following situations holds: (i) the legal bases on which the determinants of the compensation amount were grounded are wrongly applied; (ii) there is a notorious factual error (*error de hecho*) when setting the amount of damages; (iii) the case resolution was done in a "capricious, disproportional or clearly unjust way". See Azagra-Malo and Gili Saldaña (2006).

[23]In this paper, the authors refer to payments in nonerror claims as being those cases in which compensation was attributed to patients but evidence of negligence has not been found. For a detailed explanation, please see Section 1.2.

injuries, allegations of missed or delayed diagnosis, and claims that reached a trial verdict. Cases that arrived to court and involved error had more than twice the rate of nonpayment as those decided out of court. In 2007, Studdert et al. studied closed malpractice claims from five liability insurers. From 15% of those cases that went to trial, two things are worth noticing: plaintiffs rarely won damages at trial (only in 21% of the cases, compared to 61% of the cases resolved out of court); when damages are awarded, the mean payment in court ($799,365) was almost twice the payment made out of court ($462,099). These results are in line with those found by Danzon (1985): using data from California from 1974 to 1976, the author finds that although defendants tend to prevail in cases tried to verdict, average awards are higher at verdict. In this sample, compensations amounts were, on average, higher for verdicts ($102,000) than for settlements ($26,000).

Sloan and Hsieh (1990) use data from Florida closed claims and a Florida-Kansas City jury verdict subsample to estimate which case characteristics influence the probability of payment. They find that the probability of payment is lower for minor injuries, is higher for cases considered as "avoidable" or "maybe avoidable" (in comparison to "unavoidable" cases), and is lower when the defendant was insured by a commercial stock company. When analyzing compensation levels, Sloan and Hsieh (1990) found variations in the expected payment according to the stage of disposition: $30,000 for cases decided at pre-suit, $67,000 for cases decided at pre-verdict suit, $95,000 for cases decided at verdict and $282,000 for cases decided on appeal. They also find that "*[p]ayments increased monotonically with injury severity level up through permanent grave injuries. Death cases paid less than most serious injuries*".[24] The following results were also found: patients that were 65 years old or more at the time of the accident generally received less awards, holding injury severity constant; when more defendants were involved, awards could be higher at verdict; having hospitals as defendants tended to be associated with lower payments. Sloan and Hsieh do not support the claim that compensation for medical malpractice is done randomly, nor that the increase in damage awards has been very high. As the authors state, it is hard to make judgments on the horizontal equity of payments, *i.e.*, if patients with similar levels of injuries receive similar payouts. Considerable dispersion was found in payments for the same levels of injury, although it is hard to draw judgments from here. Several uncontrolled characteristics might explain these differences. Eventually the use of a more detailed injury severity scale would imply less dispersion in the results for awards. Generally, courts lack objective criteria to quantify noneconomic loss and punitive damages which might

[24] Sloan and Hsieh (1990), p. 1008.

create inequities with respect to awards.

While studying data for Florida, Vidmar et al. (2005) assess that there was a considerable increase in the mean and median of payments since 1991: in 2003 real dollars, the mean (median) payment was $176,603 ($48,517) in 1990, while it was $300,280 ($150,000) in 2003. This increase was accompanied by an enlargement in injury severity. In 2003, claims referring to permanent major disability, permanent grave disability and death accounted for 45,4% of paid claims. The same type of claims accounted for 32,8% in 1990. Vidmar and co-authors find 801 claims from 1990 to 2003 that involved a payout over $1,000,000.

Black et al. (2005) examine medical malpractice claims in Texas, from 1988 until 2002. Total payouts to patients were roughly constant over time (and near $515 million in 2002). During the 2000-2002 period the mean (median) payout was equal to $351,000 ($134,000) per claim (considering payouts over $25,000 in real 1988 dollars, covered by medical liability insurance). If the analysis focuses on large payments only, there were 761 claims involving a payout over $1,000,000 from 1988 to 2002. Although these claims account for only 4.9% of paid claims over $10,000 (the total number of claims was 15,578), they represented 42.1% of dollar payments (*i.e.*, they involved a payout of $1,763 million, and the total payout for all claims was $4,185 million).[25]

Fenn et al. (2000) analyze all negligent claims arising from treatment in Oxfordshire Health Authority (includes data on one major hospital, several general / acute hospitals, and some specialist units) from 1974 to 1998. On average, approximately 30% of claims had a positive payout. The mean payment of claims was highly volatile: in 1996 the mean payout was £4,000 and in 1993 it was £50,000.

Comparisons of compensation awards are difficult to make. As pointed out by some studies, several variables might explain differences among patients. Moreover, the cases that end up receiving a positive award might have significant different characteristics from jurisdiction to jurisdiction. Still, what empirical studies have generally shown is that there is no evidence of skyrocketing compensation amounts in medical malpractice cases; when plaintiffs go to court or appeal, the probability of compensation is generally lower but, in case of compensation, awards tend to be higher; compensation amounts

[25] When looking at a broader dataset that includes zero-payment claims, it is possible to see that approximately 81% of claims were closed with no payout. The authors mention that this result might overstate the number of zero-payout claims because in this dataset some incidents involve several defendants. No extensive analysis is made on zero-payout claims because the Texas Department of Insurance collects limited data on this type of claims.

tend to increase with injury levels up to permanent grave injury (cases involving death usually receive lower payouts than these cases). When it comes to the claim that damages quantification is random, results are not always clear. On the one hand, there seems to be evidence that courts might not offer an indication of how to compute damages (*i.e.*, neither when judges themselves must make a computation nor when juries are asked to do so). On the other hand, evidence does not seem to lend support to the argument that setting awards is entirely random. Viscusi (2004) finds that, when jurors must set pain and suffering damages, "*jurors do not simply multiply the compensatory award by some factor, such as 1.5. The pain and suffering compensation is greater for accidents in which there is a larger economic damages amount, but the elasticity of the responsiveness of pain and suffering damages to the compensatory damages amount is less than one*".[26]

3.3 The SSCMMD for Awards

We use the Spanish Supreme Court Medical Malpractice Dataset (SSCMMD) that includes decisions from 2006 until 2009. A detailed explanation of this dataset is provided in the previous chapter. We are interested in assessing if there are case characteristics that influence the probability of a positive payout (or even if there is any variable that might be associated with a zero payout). Moreover, we also want to assess if there are differences in compensation levels. As previous literature has shown, we can expect to find a vertical inequality on compensation awards, which is plausible: patients suffering higher severity injuries should receive higher damages (normally up to the highest level of injury, excluding death. Cases involving death tend to receive lower damages than cases involving a permanent serious injury, such as quadriplegia). What we should expect, in case horizontal equity holds, is that patients with similar characteristics and suffering similar levels of injury should receive equivalent levels of damages.

3.3.1 Description of the Data for Compensation

The SSCMMD provides information for several variables of interest. We add in this chapter a description of those variables that are related to compensation, but that did not play a role for reversal rates (*i.e.*, for the previous chapter). While inspecting Supreme Court decisions, we included a variable that specifies how much the plain-

[26] Viscusi (2004), p. 12.

tiff asked to the court for damages. A variable for the award decided by the court was added as well. All financial variables are in 2009 real euros. A dummy variable SCHEDULED DAMAGES accounts for the use of scheduled table damages when the court calculated the indemnity amount.

3.3.2 Data Limitations

We face important data limitations, some of them already described in the previous chapter. We include here some of the limitations for variables related to compensation levels.[27]

Indemnity amount: In 4 cases it was not possible to recover the indemnity amount that the patient was entitled to receive. In these cases, the Supreme Court remitted the case to the lower court in order to set the amount of compensation. We believe that this is not a serious problem, given the reduced number of cases in which it holds (*i.e.*, 4 cases out of 129 that had a positive payout).

Compensation Request: When patients go to court, they typically ask for an amount that should compensate them for the harm suffered. In 49 cases out of 256 we could not recover the compensation asked by the patient. The lack of this information should not pose a problem though: the amount that patients asked for might reflect some strategic behavior that we can not explain from the data we have.

Injury Severity Levels: Injury severity levels had to be grouped in four categories. Although the initial idea was to have 9 different levels of harm, in some decisions it was not possible to make a precise distinction between all the 9 levels. Therefore, we opted for grouping them into four levels. In one case, the patient decided not to present any evidence regarding the injury severity. The Supreme Court did not award compensation in this case.

Calculation of Payout: In case patients are entitled to receive compensation, a final award must be set. When the Supreme Court decision does not present a calculation for payouts, there are two possibilities: courts did not make any calculation,[28] or some calculation was made but the decision does not show it. It would be useful to be able to distinguish the following: whether courts made any sort of calculation or not; in case a calculation was made, which amount corresponds to which type of damages (such

[27] Please see previous chapter for a description of data limitations not necessarily related to compensation awards.

[28] Which is possible and actually holds for some decisions. For instance, in some cases the decision refers that the plaintiff asked a certain amount that is reasonable and therefore that amount should be granted. No calculation is presented, but it is clear that no calculation was made.

as damages for pain and suffering, economic losses, medical expenses). Given that we want to assess differences in compensation amounts of cases appealed to the Supreme Court, it would be more accurate to have a full description of these variables.

However, there are good reasons to believe that this situation is not problematic in our case: to start with, and given the organization of the Spanish National Health System and Social Security, cases of loss of income can be supported by social security. Moreover, there are decisions in which the Supreme Court does not consider loss of income because the patient did not have a permanent working contract at the time of the accident, even though he was working at that time. With respect to medical expenses, social security will also have a role in these cases and the National Health System will provide treatment for the patients. Generally speaking, in the SSCMMD, when courts set an amount for medical expenses one of the concerns is with the need of a person to take care of the patient, in case the patient is in a situation that does not allow him to take care of himself. Another concern is in case some changes will have to be done at the patient's house so that a wheelchair can be used. All these reasons together provide a good support of the claim that the majority of damages are for pain and suffering and not for loss of income or medical expenses. We are not arguing that strong conclusions can be drawn as if this argument were to hold for each case, but it seems to be reasonable.

3.3.3 Data Description

Table 3.1 provides information on the total number of cases decided by the Administrative and Civil Chambers of the Spanish Supreme Court, according to the level of harm. A total of 52% of cases arriving at the Supreme Court involved the highest levels of harm (permanent major injuries or death). The Civil Chamber analyzed a higher proportion of cases involving death while the Administrative Chamber decided a higher proportion of cases involving permanent major injuries.[29] In both Chambers, the proportion of cases involving zero payouts was very similar: 50% for administrative decisions and 49% for civil decisions. Approximately 66% of the claims involving a permanent major harm received compensation, followed by permanent minor cases with 47% and death cases with 42%.

Descriptive statistics for non-zero payout claims are provided in Table 3.2. Claims involving the highest levels of harm (permanent major injury and death) account for

[29] We performed Kolmogorov-Smirnov tests for the equality of distributions with respect to the levels of harm. No statistically significant differences on the distribution of cases decided by Administrative or Civil Chambers were found.

Table 3.1: SC decisions on Med Mal (Paid *vs.* Unpaid, by Level of Harm)

		Temporary Emotional	*Permanent Minor*	*Permanent Major*	*Death*	*Total*
Adm.	Paid	1	26	40	11	78
	Unpaid	7	33	22	16	78
	Percentage Paid (%)	12.5	44.1	64.5	40.7	50
Civil	Paid	5	22	13	11	51
	Unpaid	6	21	6	15	49
	Percentage Paid (%)	45.5	51.2	68.4	42.3	51

NOTE: The total number of decisions at the Civil Chamber was 100. However, in one case the patient did not provide information on the harm suffered. For that reason we only have 99 decisions when we consider decisions by level of harm.

58% of the total number of paid claims but 82% of the total euro payout. At the Administrative Chamber these decisions account for 65% of paid claims and 84% of euro payout while at the Civil Chamber these values were respectively 47% and 77%. Consistent with previous empirical results, we find that patients suffering a permanent grave harm are those receiving the highest amount of compensation, even comparing to cases involving death.

Table 3.2: Summary Statistics for Non-Zero Payout Decisions (2009 €)

	Harm Level	*N. of Claims*	*% of Total*	*Total Payout*	*% of Total*	*Mean Payout*	*Median Payout*
Adm.	Temp. Emot.	1	1.3	18,051	0.1	18,051	18,051
	Perm. Minor	26	33.3	2,628,498	16	101,096	75,493
	Perm. Major	40	51.3	11,707,146	71.4	292,679	269,766
	Death	11	14.1	2,054,213	12.5	186,747	163,237
	All Levels	78	100	16,407,908	100	210,358	172,957
Civil	Temp. Emot.	5	10.2	185,546	2.9	37,109	40,533
	Perm. Minor	21	42.9	1,285,695	20	61,224	46,324
	Perm. Major	12	24.5	4,035,691	62.7	336,308	279,897
	Death	11	22.4	929,342	14.4	84,486	81,618
	All Levels	49	100	6,436,274	100	131,353	71,111

Before making comparisons between the two Chambers of the Supreme Court, one variable that should be taken into consideration is the decision of awarding compensation due to a loss of a chance, which necessarily implies lower awards than those considered as full compensation. Asymmetric information models in litigation rely on the fact that the amount of damages is actually known by both parties but the doctor has more information with respect to the evidence of negligence. This does not hold in case of loss of a chance: when courts award damages under the loss of a chance

argument, the doctor is liable but the patient will receive damages corresponding to the loss of a chance in recovery. The court will estimate the probability of recovery in case the doctor would not have been negligent and uses it to assess the final amount of compensation. Although this probability tends to be grounded on medical evidence, there is more uncertainty involved with respect to the overall compensation amount, in the sense that first a calculation must be done for the harm, and subsequently for the probability of recovery. However, it is possible to overcome the uncertainty over causation.[30]

Instead of looking at descriptive statistics per level of injury we can also group payouts in different categories and see which harm levels received awards within those categories. We can see these results in Table 3.3, that groups payouts in 5 categories: very small payout (lower than €10,000); small payout (€10,001-25,000); medium payout (€25,001-100,000); large payout (€100,001-250,000); and very large payout (> €250,000). We should expect to find lower injury cases receiving smaller payouts and no large payouts being awarded to these cases. In the same line of reasoning, cases involving higher levels of injury and being fully compensated (*i.e.*, excluding loss of a chance cases) should be associated with the highest payouts levels. This means that we should not find a temporary emotional injury receiving a high level of payout, in the same way that we should not find cases involving death or permanent major injury cases receiving a low payout. We find no striking results, but some remarks can be made. For instance, cases arriving at the Civil Chamber seem to be more consistent in terms of attribution of awards, in the sense that, in general, higher levels of compensation were granted to cases involving permanent major injuries or death. High payouts were not attributed to cases involving minor injuries, and there were no payouts below €10,000. At the Administrative Chamber there was one permanent minor case receiving more than €250,000 as payout, and a permanent major case getting less than €25,000. We shall consider that these differences can be a reflexion of the way injuries are categorized.[31]

Figure 3.1 allows getting a better idea of compensation amounts in cases arriving at the Administrative and Civil Chambers of the Spanish Supreme Court.[32] We should

[30] See Visscher (2009), 6.15, p. 176. For uncertainty over causation see, for instance, Ben-Shahar (2009), 3.7.

[31] For instance, the permanent minor injury case that received more than €250,000 was a case in which a woman lost the possibility of having children due to negligence. The court decided that a high level of damages for pain and suffering should be awarded: this woman never had a child and, because of a negligent medical treatment, she lost her capacity to conceive a child.

[32] This box-plot allows us to see the following summary statistics for the four groups of injury severity (by

Table 3.3: Payout Levels by Injury Severity (Excludes Loss of a Chance)

		<10,000€		10,001-25,000€		25,001-100,000€		100,001-250,000€		>250,001€	
	Harm	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*
Adm.	Temp. Emot.	0	0	1	18,051	0	0	0	0	0	0
	Perm. Minor	2	2,882	1	10,882	7	55,153	11	167,117	1	275,191
	Perm. Major	0	0	1	24,109	3	44,305	14	173,720	20	436,322
	Death	0	0	0	0	2	46,954	3	164,190	3	318,328
	All Levels	**2**	**2,882**	**3**	**17,680**	**12**	**51,074**	**28**	**170,105**	**24**	**414,859**
Civil	Temp. Emot.	0	0	2	17,561	3	50,141	0	0	0	0
	Perm. Minor	0	0	1	23,161	12	54,034	3	143,335	0	0
	Perm. Major	0	0	0	0	2	72,381	4	158,483	6	542,833
	Death	0	0	0	0	5	67,280	4	119,284	0	0
	All Levels	**0**	**0**	**3**	**19,428**	**22**	**58,182**	**11**	**140,098**	**6**	**542,833**

NOTE: When we include loss of chance cases, we have the following differences with respect to this table: for <€10,000 payouts, 3 Administrative cases with mean 4,921€; for €10,001-25,000 payouts, 5 cases with mean €17,738 for Administrative; for €25,001-100,000, 15 Administrative cases with mean €52,158 and 26 Civil cases with mean €56,067 ; for €100,001-250,000 payouts, 29 Administrative cases with mean €168,233 and 12 Civil cases with mean €138,440; for >€250,001, 26 Administrative decisions with mean €409,359.

not forget that we are looking at payouts by harm level, but several other variables do play a role when awarding compensation. Nevertheless, some comparisons can be made although at this stage these are only crude comparisons. For both chambers, the highest dispersion[33] is present for cases involving a permanent major injury. Excluding cases of loss of a chance, awards could be as low as €24,109 and as high as €704,756 at the Administrative Chamber; and as low as €57,904 and as high as €1,017,263 at the Civil Chamber.[34] The remaining injury levels have higher volatility if reaching Administrative courts.[35] Moreover, it seems that appealed cases involving death receive lower payouts in the civil jurisdiction: the median payout at the Administrative Chamber (€171,618) is higher than the maximum at the Civil Chamber (€143,679).[36] The biggest differences between Chambers seem to be for cases involving permanent minor injuries (22 administrative decisions and 18 civil decisions excluding loss of a chance cases) and death (8 administrative decisions and 9 civil de-

chamber): the minimum (left-hand whisker), the lower quartile (left line of the box), the median (central line of the box), the upper quartile (right line of the box), and the maximum (right-hand whisker).

[33] *I.e.*, the difference between the maximum and minimum values.

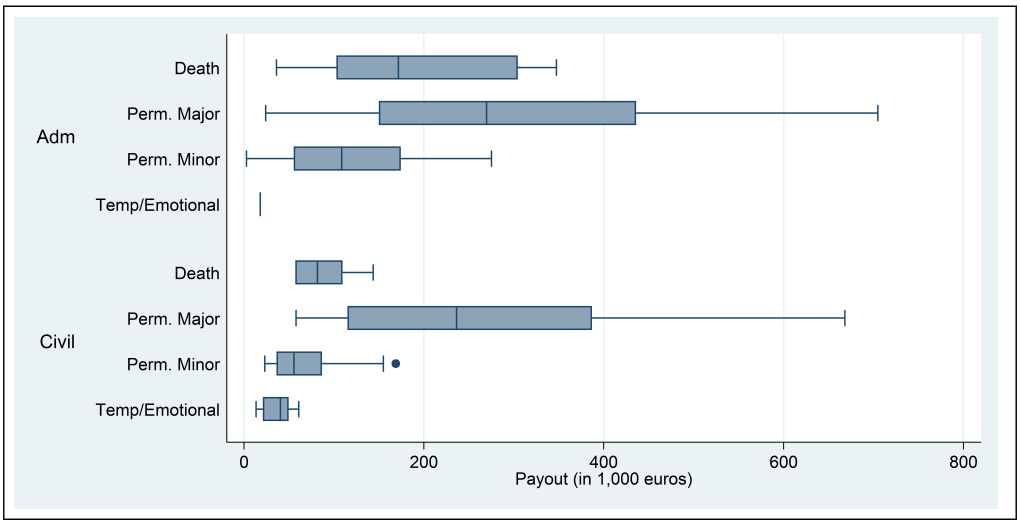
[34] This is the maximum payout awarded in the SSCMMD. It was a case involving serious negligence during a delivery of a baby, who suffered severe brain damage.

[35] We are excluding loss of a chance cases. Temporary/emotional cases are excluded from these considerations as well, given that only one case of this type received a positive payout at the Administrative Chamber.

[36] This difference also holds if we consider the mean payout at the Administrative Chamber for cases involving death, which was €192,683.

cisions excluding loss of a chance cases): for the first type of injury, the mean (median) was €114,372 (€108,641) at the Administrative Chamber and €61,308 (€49,830) at the Civil Chamber; for the later injury type, the mean (median) was respectively €192,683 (€171,618) and €90,393 (€81,618). Excluding cases involving temporary / emotional injury (given that they are only 6 in total), we can see that mean and median payouts were higher for permanent minor and death cases at the Administrative Chamber. Cases involving permanent major injuries have higher mean and median payouts at the Civil Chamber.[37]

Figure 3.1: Payouts per Harm Level



NOTE: Excludes loss of a chance and one case with payout higher than €1,000,000 (Civil Chamber, permanent major injury case).

While inspecting Supreme Court's decisions from 2006 until 2009, we did not find a clear and homogeneous rule for calculating the amount of damages that patients were entitled to receive. We found different ways of attributing payouts, which could be in one of the following ways: (i) scheduled damages were followed to quantify awards, although only a final award appears in the decision; (ii) scheduled damages were followed to quantify awards, and each level of harm was clearly translated into points according to the table; (iii) courts set an overall award without providing an explanation or set a total amount presenting as motivation that "it is believed to be a reasonable amount given the situation"; (iv) courts do not use scheduled damage tables but attribute a different value to different types of damages (*e.g.*, pain and suffering, costs for making changes at home because now the patient must use a wheelchair). The heterogeneity in setting compensation amounts is true for cases appealed to the

[37] Remember the figure excludes loss of a chance cases and a case with payout higher than €1,000,000.

Civil and Administrative Chambers. There is the possibility that courts might make calculations to quantify damages but that does not appear in the decision. For this reason, the only variable we were able to include when it comes to quantification of damages was a dummy variable for the use of scheduled damages, since courts do mention when they are using it or not.

The vast majority of plaintiffs going to court specified the amount of damages they were expecting to recover from defendants. In a very limited number of cases, the plaintiff reserved that consideration to the court. No serious analysis based on this variable should be made given that, as previously mentioned, it might simply reflect plaintiffs' strategic behavior. Still, it is worth noticing how plaintiffs are performing when setting their own payout. Plaintiffs tend to ask higher amounts of compensation than those awarded by courts.[38] On average, plaintiffs tend to make more accurate award predictions for cases involving higher injury levels. Notice that courts do not award higher damages than those requested by the plaintiff. For this reason, plaintiffs might have a tendency to exaggerate in the amounts they request.[39]

3.4 Empirical Strategy and Results

In this section we present various regression analyses which aim to assess if there are any case characteristics that might have an impact on the probability of receiving compensation.[40] Subsequently, we analyze awards received by plaintiffs. If compensation awards are fairly set, there should be horizontal equity in payments with respect to the level of harm. In other words, patients suffering similar injuries should receive comparable payouts (some case specific characteristics might have a role, which makes very unlikely to find exactly equal compensation amounts). Therefore, being a male *vs.* being a female, going to civil courts *vs.* going to administrative courts, coming from poorer regions *vs.* coming from richer regions should have no impact on compensation

[38] This is true even if we exclude cases in which the award was exactly the same as the requested amount, given that these cases drive the statistics up. A total of 14 administrative decisions received a payout equal to the requested amount, whereas there were 10 civil decisions of this type.

[39] Although our aim is not to explain how plaintiffs set compensation requests and how do courts react, we might anticipate that the best strategy is for plaintiffs to make a reasonable calculation. They might receive lower awards in case they set a too low request (because courts do not exceed requests), but the same might happen in case the plaintiff asks for an outrageous and unreasonable award, considering that courts can react by setting lower payouts.

[40] No claim will be made with respect to courts' ability of making correct or incorrect decisions. As stated previously, it is impossible to have such a variable in our dataset. See the previous chapter for reasons to rely on Supreme Court decisions as the closest to a correct decision.

Table 3.4: Differences between Compensation Requests and Payouts (Paid Claims only, Excludes Loss of a Chance)

	Harm Level	*Type of Claims*	*Request/Payout Mean %*	*Request/Payout Median %*	*Request–Payout Mean €*	*Request–Payout Median €*
	Temp. Emot.	All Claims	.	.	.	.
		(Request≠Payout)	.	.	.	.
Adm.	Perm. Minor	All Claims	47.4	37.5	-165,212	-152,355
		(Request≠Payout)	(33.4)	(30.0)	(-209,268)	(-215,93)
	Perm. Major	All Claims	52.8	40.8	-398,51	-289,669
		(Request≠Payout)	(39.3)	(34.7)	(-512,37)	(-446,051)
	Death	All Claims	61.7	67.4	-151,51	-159,237
		(Request≠Payout)	(49.0)	(55.0)	(-202,013)	(-239,143)
	All Levels	**All Claims**	**52.3**	**41.6**	**-296,785**	**-221,464**
		(Request≠Payout)	**(38.7)**	**(33.3)**	**(-381,581)**	**(-275,345)**
	Temp. Emot.	All Claims	55.2	53.7	-31,221	-32,648
		(Request≠Payout)	(44.0)	(46.9)	(-39,026)	(-37,418)
Civil	Perm. Minor	All Claims	61.9	68.6	-61,999	-31,847
		(Request≠Payout)	(46.6)	(39.8)	(-86,799)	(-60,542)
	Perm. Major	All Claims	62.8	67.3	-333,005	-142,997
		(Request≠Payout)	(50.3)	(50.3)	(-444,007)	(-159,237)
	Death	All Claims	64.8	57.3	-78,93	-67,267
		(Request≠Payout)	(47.2)	(50.8)	(-118,394)	(-77,072)
	All Levels	**All Claims**	**61.9**	**60.5**	**-122,181**	**-50,148**
		(Request≠Payout)	**(47.2)**	**(47.2)**	**(-169,173)**	**(-77,603)**

NOTE: Request/Payout is the percentage of damages that the plaintiff recovered with respect to the damages requested. Request-Payout is the amount of damages requested by the plaintiff minus the amount of payout. We present results for all claims excluding loss of a chance and for claims in which the requested damages were equal to the payout.

amounts. However, the tort system should provide vertical inequity: patients suffering higher levels of injury should receive higher damages than patients suffering lower injury levels.

3.4.1 Methodology

The "Zeroes Problem" is commonly found in award data, which is typically composed by a substantial fraction of zero observations and a skewed positive outcome.[41] Our aim is to detect predictors of a positive award and to investigate, within those cases that received a payout, how compensation levels are set. We will use two methodologies (Two-Part model and Heckman model) and compare the results they provide.

We start by estimating a Two-Part model, as reported in equations (1.a) and (1.b). The fist part (*selection equation* (1.a)) models the probability of receiving compensation as a binary outcome. The second part (*outcome equation* (1.b)) models the amount of

[41] See Eisenberg et al. (2009).

compensation for those cases in which a payout has been awarded.[42] Let CPSC[43] denote compensation amount, our dependent variable. Define the binary indicator CP such that CP=1 if CPSC>0 (positive payout) and CP=0 if CPSC=0 (no payout). When CPSC=0, we can only observe Pr(CP=0). For those cases with CPSC>0, let f(CPSC|CP=1) be the conditional density of CPSC. The *outcome equation* is a linear regression of the logarithm of CPSC on the set of explanatory variables, for those observations with CP equal to one. The explanatory variables are: *plaintiff's characteristics* (level of harm suffered, age at the time of the accident, gender); *defendant's characteristics* (individual practitioner or institution, type of hospital (public or private), doctor's specialty); *case characteristics* (administrative or civil, time of the accident, lower court decision's date, before or after 1998 reform, loss of a chance doctrine, use of scheduled damages); *economic variables* (logarithm of regional GDP per capita).[44] The Two-Part model for compensation can be written in the following way:

$$f(CPSC|X) = \begin{cases} Pr(\text{CP} = 0|X) & \text{if } CPSC = 0 \quad (1.a) \\ Pr(\text{CP} = 1|X) f(CPSC|\text{CP} = 1, X) & \text{if } CPSC > 0 \quad (1.b) \end{cases}$$

A critical assumption of the Two-Part model is the independence of the two equations ((1.a) and (1.b)) which implies that, after controlling for covariates, those cases with an award are randomly selected from the population of cases. If this assumption does not hold, the results from the second-stage regression (provided by equation (1.b)) suffer from selection bias. Therefore, the second methodology consists in using the Heckman selection model[45] that allows for possible dependence in the two stages. According to this model, which is close in spirit to the Two-Part model, a selection regression is performed first (for the probability of receiving an award) followed by the outcome equation (for the amount of compensation). For more robust identification we should impose a valid exclusion restriction. In other words, we should have a valid instrument in the sense that it is relevant in the selection equation but it should not influence the outcome variable. In our problem, the variable DEFENDANT APPEAL can

[42] As widely recognized in the literature, this departure from the classical Tobit approach has the strength of allowing two different precesses: determining the decision of awarding compensation and determining its magnitude. Moreover, the Two-Part model is preferable to the Tobit since the homoskedasticity and normality hypotheses are not necessary conditions for consistency of the estimator (see for example Cameron and Trivedi 2005).

[43] Which stands for "*Compensation Supreme Court*".

[44] All financial variables are in 2009 prices.

[45] See Heckman (1979).

have an impact on the probability of compensation but it does not affect payout levels directly. The reasoning underlying is that when the defendant appeals to the Supreme Court, it means that the lower court decided that the defendant was negligent and the patient should be compensated. Although there are decisions reversed by the Supreme Court, the majority of these decisions were not reversed.[46] Thus, having the defendant appealing to the Supreme Court increases the probability of receiving compensation (because in general the Supreme Court agrees with the previous court decision which was, in this case, to attribute compensation) but this variable does not have any impact on the amount of compensation that plaintiffs receive. We obtain the same results in case we use the variable PLAINTIFF APPEAL instead, although the coefficient is negative.[47]

3.4.2 Results

Table 3.5 reports the estimated coefficients for 2 different specifications for the Two-Part and for the Heckman models.[48] Under both specifications, having a defendant appealing the case or suffering a permanent major level of harm increases in a statistically significant way the probability of receiving compensation. When the defendant appeals (DEFENDANT APPEAL =1), the probability of receiving compensation is between 78% and 83% higher than when the plaintiff appeals. Notice that this makes our exclusion restriction in the Heckman model robust since DEFENDANT APPEAL is a strong predictor of receiving an award (but it does not influence the amount of compensation).[49] Patients suffering a PERMANENT MAJOR level of harm have a higher probability of receiving compensation with respect to patients suffering TEMPORARY/EMOTIONAL injury (36% to 38% higher). DEATH cases seem to increase the probability of compensation in 28% but only under specification 2 and at a low significance level.

The value of λ for specifications 1 and 2 is statistically significant, even though at a low level of significance (*p-values* are respectively 0.094 and 0.072). This means we cannot reject the possibility that selection bias might be present. Therefore, we should rely more on the results given by the Heckman model although, as we can see

[46] We found in the previous chapter that the agreement rate was 72% for administrative decisions and 88% for civil decisions.

[47] The coefficients are not symmetric because in 10 cases both the defendant and plaintiff appealed. In case we use as instrument PLAINTIFF APPEAL, ONLY PLAINTIFF APPEAL or ONLY DEFENDANT APPEAL, the regression results are similar.

[48] The results for Heckman´s *selection equation* are omitted because they are essentially the same as those obtained with the Two-Part model.

[49] In the Appendix we present other regressions that show that DEFENDANT APPEAL does not have an impact on the amount of compensation.

Table 3.5: Regression Results

	Specification 1			*Specification 2*		
	Two-Part		Heckman	Two-Part		Heckman
Dependent Variable	CP	LN(CPSC)	LN(CPSC)	CP	LN(CPSC)	LN(CPSC)
Administrative	0.184*	0.511**	0.588**	-0.026	-0.111	0.123
	(0.099)	(0.242)	(0.236)	(0.212)	(0.558)	(0.530)
Def. Appeal	0.782***			0.833***		
	(0.111)			(0.120)		
Male	0.051	-0.071	-0.108	0.070	-0.059	-0.087
	(0.072)	(0.176)	(0.170)	(0.077)	(0.182)	(0.169)
Permanent Minor	0.220	0.690	0.633	0.252	0.518	0.448
	(0.155)	(0.443)	(0.425)	(0.161)	(0.463)	(0.428)
Permanent Major	0.360**	2.101***	1.925***	0.382**	1.962***	1.794***
	(0.159)	(0.442)	(0.435)	(0.165)	(0.455)	(0.430)
Death	0.225	1.408***	1.387***	0.281*	1.201**	1.171***
	(0.162)	(0.469)	(0.448)	(0.170)	(0.494)	(0.455)
y2007				0.049	0.345	0.321
				(0.100)	(0.240)	(0.223)
y2008				-0.003	0.064	0.019
				(0.129)	(0.302)	(0.281)
y2009				-0.049	0.698**	0.740**
				(0.139)	(0.331)	(0.308)
Pre-98 Reform				0.215*	0.314	0.145
				(0.127)	(0.357)	(0.341)
Duration LowerCourt-SC				-0.104*	-0.156	-0.088
				(0.057)	(0.147)	(0.141)
Duration Injury-SC				-0.006	0.010	0.004
				(0.014)	(0.026)	(0.025)
Loss Of Chance		-0.782***	-0.732***		-0.762**	-0.694**
		(0.294)	(0.277)		(0.308)	(0.279)
Other Controls						
Hospital Type	Yes	Yes	Yes	Yes	Yes	Yes
Defendant Type	No	No	No	Yes	Yes	Yes
Scheduled Damages	No	Yes	Yes	No	Yes	Yes
Ln(GDPpc)	Yes	Yes	Yes	Yes	Yes	Yes
Mills λ			-0.365*			-0.390*
			(0.218)			(0.217)
Observations	254	123	249	251	122	247
R-squared		0.420			0.468	

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions included a constant. Regressions (1) and (4) present coefficients in marginal effects.

from Table 3.5, there are no strong differences between the Two-Part model and Heckman. Cases arriving at the Administrative Chamber of the Spanish Supreme Court seem to have a higher level of compensation according to Specification 1, but this result is not robust. Cases involving permanent major injury and death receive much higher amounts of compensation with respect to temporary/emotional injuries. Suffering a permanent major injury increases the compensation award between 180% and 193% if we consider the Heckman results. If we consider the Two-Part Model instead, suffering a permanent major injury increases the compensation award between 196% and 210%. For cases involving death, the awards are also higher than those for patients suffering temporary/emotional injuries, but lower than those for patients suffering permanent major injuries. The increase can range from 117% to 141%, depending on the specification we consider and the methodology we use.

When courts consider that patients should be compensated under the loss of chance doctrine, the levels of awards are considerably lower with respect to cases being fully compensated. The reductions of payouts due to loss of a chance range from 69% to 78%. Using scheduled damages to quantify awards does not have a statistically significant impact on payouts (the coefficient is positive).

3.4.3 Discussion of the Results

Predictors of Compensation

The regression results show that suffering a permanent major level of harm is a strong predictor of receiving compensation. Critics of the medical malpractice liability system argue that courts are awarding compensation to patients when there is no evidence of negligence and that this happens mainly in those cases involving a permanent disability. Recent empirical literature has shown that, even if the tort system is not perfect in matching merit of claims and outcomes, negligence matters to predict outcomes and the system is able to eliminate frivolous claims.[50] Although we found that higher levels of harm are strong predictors of receiving payouts, we cannot claim anything with respect to the correctness of the Spanish Supreme Court in judging medical malpractice cases. In fact, we do not have any variable that allows checking for negligence. However, we can add that from those cases involving a permanent major level of harm, the Spanish Supreme Court refused compensation in approximately one third of cases: from the 62

[50] Rosenblatt and Hurst (1989), Cheney *et al.* (1989), Farber and White (1991), Sloan and Hsieh (1990), Taragin *et al.* (1992), Sloan *et al.* (1993), Farber and White (1994), Baker (2005b) and Studdert and Mello (2007).

(19) cases arriving at the Administrative (Civil) Chamber, compensation was refused to 22 (6) cases. As for cases involving death, from the 27 (26) Administrative (Civil) cases, compensation was denied in 16 (15) of them. Therefore, suffering a high severity injury is not a sufficient condition to receive compensation. As we can see from the above, not all cases involving permanent major harm or death are compensated.

Cases in which the defendant appeals seem to have a higher probability of receiving compensation. The reason why this is happening is because the Supreme Court tends to agree with previous courts decisions. In fact, as we saw in Chapter 2, the overall agreement rate at the Supreme Court was 78%. Having the defendant appealing the case means that the previous court decided that the defendant acted wrongfully and should pay damages. Since the agreement rate is high, DEFENDANT APPEAL is a strong positive predictor of receiving compensation. Notice that the same happens when we include PLAINTIFF APPEAL instead, although this is a strong negative predictor of receiving compensation. The reasoning is that when the plaintiff appeals, it means that the previous court refused compensation. And again, since overall the Supreme Court tends to agree with previous decisions, having the plaintiff appealing to the Supreme Court decreases the probability of receiving a payout.

After controlling for several covariates we found that having cases being judged at the Administrative Chamber of the Supreme Court does not influence the probability of receiving compensation. The same holds for the type of hospital (private or public) and type of defendant (individual or institution).

Amount of Compensation

When studying levels of awards we did not find evidence of significant differences between the Administrative and Civil Chambers (the only statistically significant results were not robust to different specifications). Therefore, generally speaking, we cannot claim that administrative and civil courts tend to award different compensation levels to victims of medical negligence, controlling for case characteristics.

We find that, consistent with previous literature, patients suffering a permanent major level of harm are those receiving higher payouts, even comparing to cases involving death. Suffering a permanent major harm implies that, on average, the level of damages can be up to 62% higher than those cases involving death.[51] Therefore, a vertical inequity in payments according to the level of harm is present in our data, but this is

[51]These results are from regression analysis in which the baseline group was DEATH instead of TEMP/EMOTIONAL.

reasonable: patients suffering more serious injuries should be those receiving higher awards.

Loss of a chance decreases the amount of compensation, as expected. On average, patients might receive less than 70% of the correspondent full level of compensation. If this assessment is correct, patients involved in loss of a chance cases had a recovery chance of 30%, on average.

One interesting question is if the use of scheduled damages has any effect on the level of payouts. Moreover, in case any impact is found, in which direction does it go: does it increase or reduce compensation levels, in comparison with those cases in which courts do not use scheduled damages. Although we did not have any prior guess for the coefficient on scheduled damages, we do find that this variable is not important. Therefore, from our data we cannot claim that the use of scheduled damages can decrease or increase the amount of compensation received by plaintiffs. Generally speaking, the use of scheduled damages has the advantage of setting compensation levels in a more consistent and predictable way, leaving less discretion for courts when they must come up with a calculation. When courts award compensation to patients, one natural concern is in terms of fairness and prediction of awards. The essential idea is that patients suffering the same level of harm should receive similar amounts of compensation, *i.e.*, we should find an horizontal equity in payments according to the level of harm. When looking at Supreme Court decisions (which generally include references to the lower court's decision on the same case) we did not find a consistent and systematic way of setting awards by courts. This can be problematic in the sense that patients cannot predict how much they can recover in terms of compensation, not even by looking at similar cases. This unpredictability might also result in a loss of deterrence[52] if defendants believe that they might have to pay less for the harm they caused. Nevertheless, it is hard to make judgments in terms of horizontal equity of awards. Although Figure 3.1 seems to point to a high dispersion of payouts by harm level, regression results do not support it. Several other variables might play a role. Besides, we have an injury severity scale with 4 levels, which means that we could eventually obtain a lower dispersion with a more detailed scale.

According to the Spanish legal system, the amount of compensation is generally set by lower courts. The Supreme Court might change the amount of compensation only if there are reasons to believe that the amount was clearly unreasonable.[53] Therefore,

[52]It would be interesting to assess the effect on deterrence, although we cannot study it with the data we have.

[53]This happened in a total of 7 cases: 3 corresponding to a permanent minor injury, 2 to a permanent

when we study Supreme Court's decisions in terms of compensation, there is a strong component which is related to the way lower courts set the amount of compensation. For instance, if the lower court decided that the patient was entitled to receive compensation, then the lower court must set the amount of damages. Therefore, if this case is appealed to the Supreme Court and there is an agreement with the previous decision, the Supreme Court tends to agree as well with the award that was previously set. In case the lower court denied compensation to the patient and this decision is reversed by the Supreme Court, then the amount of damages will have to be calculated. This happened in a total of 44 cases: 35 by the Administrative Chamber and 9 by the Civil Chamber. When setting the level of awards for these cases, the Supreme Court did not refer to scheduled damages in any decision. Therefore, at least with respect to the use/no use of scheduled damages, consistency can be found at the Supreme Court level. However, there is a reduced number of decisions in which this happened, which means that we cannot draw strong conclusions from here.

3.5 Conclusion

In this chapter we studied predictors of compensation for medical malpractice cases arriving at the Spanish Supreme Court. The level of harm is an important predictor, but no confrontation can be made with the evidence of negligence. Additionally, we investigate levels of compensation for the subset of cases in which a positive payout was awarded. Patients suffering a permanent major injury are those receiving higher awards, even when comparing to those cases involving death. Therefore, we found vertical inequality of awards by level of harm, as it should be. However, it is harder to draw conclusions with respect to horizontal equity of payments, which should be found if courts attribute fair compensation to patients. From our regression analysis, we find some consistent results, namely the following: there is no statistically significant difference between Administrative and Civil decisions; coming from poorer or richer regions of Spain is not relevant; patient's gender is not relevant neither.

The quantification of damages for physical injury and death is a difficult task. When a patient has been negligently injured and the tort system delivers a correct outcome by forcing the defendant to compensate for the harm caused, a calculation must necessarily be made. Having a consistent way of quantifying damages is important, but compensating patients properly is important as well. We find that, generally speaking,

major injury, and 2 to cases involving death. All of them were appealed to the Administrative Chamber and all payouts were increased.

Spanish lower courts do not seem to be consistent in setting awards. At the Supreme Court, the consistency we find is that scheduled damages are not used to calculate pay-outs. Overall, when patients suffer a medical accident, courts use different forms to quantify damages.

Chapter 4

Monitoring Medical Malpractice Claims[1]

4.1 Introduction

Patient safety is currently in the agenda of several national governments.[2] In the last years, some initiatives have been taken at the international level[3] as well, with the aim of preventing harm to patients during treatment and care. A negligently injured patient might present a claim against the health care provider with the aim of being compensated for the economic loss, pain and suffering,[4] and hoping eventually that the claim will have some deterrent effect. In several European countries, health care is mainly provided by a public national health system[5] which means that if a patient harmed in a public hospital succeeds in a claim against the hospital, national health expenditures increase because the State takes part in the litigation process.[6] This poses a problem in a context of increasing national health expenditures and public debt, which is the case

[1] Significant parts of this chapter are from Amaral-Garcia and Grembi (2011b).

[2] The report "*To Err is Human*" by the Institute of Medicine (Kohn et al. (2000)) might have helped governments to become aware of the problem. According to the estimates, there are more people dying in the U.S. due to medical errors than from breast cancer, motor vehicle accidents or AIDS.

[3] Namely by the World Health Organization or the European Commission. On May 24, 2006 a Recommendation Rec (2006) 7 of the Committee of Ministers to member states on "*management of patient safety and prevention of adverse events in health care*" has been done. It provides general guidelines for state members on those matters.

[4] Punitive damages are also an important variable especially in the American context. They are not allowed in Italy. See Scarso (2009) for a description of the type of damages that can be awarded in Italy.

[5] For instance, Italy, Spain, France and Portugal, to name only a few. In these countries, private health care providers can co-exist with the public health care providers, but public providers supply the majority of health care. We will present a more detailed explanation about the Italian case.

[6] We can think of several costs: extra medical care due to the harm suffered; costs of compensation; legal costs in case the patient decides to file a lawsuit.

in Italy.[7] The Italian government must deal with rising health expectancy,[8] higher costs of medical care given new technologies,[9] but also the costs of medical negligence.[10] Insurance plays a crucial role in this setting, although the impact on behavior is not straightforward: on the one hand, insured physicians might have distorted incentives[11] to provide standard care which can be translated in higher costs for the hospital if patients present a claim and prevail; on the other hand, insured physicians might not feel so compelled to engage in defensive medicine behaviors, avoiding costs with unnecessary tests and treatments. This might be relevant in the Italian context, where physicians face the highest number of criminal proceedings for medical malpractice among European countries.[12]

Medical liability insurance involves several risks[13] and its consequences are hard to predict. Over time, medical technology and practice evolve, and the medical legal system can change as well. In Italy, insuring for medical liability has been seen as a problem: the government, health care units and medical practitioners refer to an increase in the number of claims; to rising premiums especially for obstetricians/gynecologists, surgeons, orthopedics and anesthetists; to difficulties in finding insurance; and to many withdrawals of insurance companies.[14] This list of difficulties resembles very much the American case, widely studied in the law and economics literature.[15] Still, since no rigorous quantification for the Italian problem has been provided,[16] it is hard to know

[7] In Italy, the national health expenditure as a percentage of gross domestic product rose from 7.3% in 1988 to 9.5% in 2009 (OECD Health Data 2010, June 2010 - Frequently Requested Data, available at www.oecd.org/health/healthdata). For a detailed analysis of public health expenditure in Italy, and a description of eventual differences in OECD data with those from Istat (Italian National Institute of Statistics), see Armeni (2010), in Italian.

[8] In 2007, life expectancy at birth was 78.4 years for men and 83.8 years for women (Istat). In 1999, Italy had one of the highest percentage level of population aged more than 60 years in the world, which was equal to 23.9% (WHO (2000), p. 158).

[9] For the U.S., Black et al. (2005) find that medical inflation is higher than general inflation. It was not possible to recover such information for the Italian case.

[10] Although we refer especially to the Italian case, these problems are present in many other developed countries.

[11] Zeiler et al. (2007).

[12] Traina (2009), pp. 437-438.

[13] Baker (2004b) groups liability insurance risk in four categories: baseline liability risk, liability developments risk, contract risk, and financing risk. Liability developments risk (*i.e.*, "*developments that change the rate or cost of loss during the insured period*") involve a high degree of uncertainty and are an important component in medical liability insurance.

[14] OECD (2006).

[15] Recent empirical studies on the American case do not provide support of many of these claims. See, for instance, Black et al. (2005) and Vidmar et al. (2005).

[16] Lack of data and information do not allow a quantitative analysis of the problem in Italy. See, for

how serious it is in reality.

Recent decades are rich in reforms' initiatives trying to solve the malpractice insurance problem. With the aim of lowering premiums and preventing an eventual unavailability of some medical services, several American states adopted legal reforms. Sloan (1985) classified legal reforms in three categories: i) tort modifications; ii) alternatives to trial; and iii) insurance provisions. In a more recent paper, Kilgore et al. (2006) describe some of the main reforms. Avraham (2010) provides the most detailed dataset of tort reforms in the United States from 1980 to 2008. Most of the studies on the impact of these reforms on insurance premiums have focused on some of the main specialties or at the aggregated state level.

Another line of policies focuses on monitoring medical accidents. In the U.S., initiatives for monitoring and supervising medical errors were taken at the national level, with the U.S. Patient Safety and Quality Improvement Act of 2005 (Public Law 109-41) providing a good example. With the objective of improving patient safety, this Act creates Patient Safety Organizations (PSOs) that "*create a secure environment where clinicians and health care organizations can collect, aggregate, and analyze data, thus identifying and reducing the risks and hazards associated with patient care and improving quality*".[17] This scheme resembles somehow the American Society of Anesthesiologists (ASA) Closed Claims Project,[18] which started in 1985 by collecting information on closed insurance claims due to anesthesia mishaps.[19] After analyzing several claims and understanding common causes of anesthesia injury, patient safety has improved and insurance premiums have decreased.

Patients safety is also on the Italian's government agenda. Two national policies that aim to improve patients' safety should come into force very soon.[20] Both policies will try to achieve their goal through monitoring: SIMES monitors medical errors, and SIMPAS monitors insurance policies of health care providers. However, given the autonomy that regional governments[21] enjoy, some regions started to implement a monitoring system

instance, Taroni et al. (2008) - in Italian.

[17]Agency for Healthcare Research and Quality. See http://www.pso.ahrq.gov/psos/overview.htm last access on September 16, 2011.

[18]See www.asaclosedclaims.org, last access on September 16, 2011.

[19]Anesthesiologists were finding difficulties in obtaining insurance in some states and were paying high premiums because they were considered a high-risk specialty, representing "*only 3% of insured physicians but 11% of total dollars paid for patient injury*" (Cheney (1999), p. 552).

[20]We provide a more detailed description of these policies in the next section. Both of them should be active by the beginning of 2011, but they were not.

[21]In Italy, the health care system went through a decentralization process and can be currently defined as regionalized (although heavily centrally funded) (European Observatory on Health Care Systems,

on medical malpractice claims.[22] We use a unique dataset with financial data from public hospitals from 2001 to 2008, in order to evaluate the effects of this monitoring system. Although it might be too soon to judge the effectiveness of this policy, we present data at the health care providers' level and some preliminary evaluations.

Our study differs from previous literature in several ways: to start with, our variable of interest is the insurance premium paid by public Italian hospitals. This is a significant difference as most of the studies focus on insurers' losses, which means that in those studies the unit of analysis is the insurance company.[23] Another relevant difference is on the side that started pressuring for reforms. In the U.S., several insurance companies pressured for liability reform laws that could limit their costs.[24] In Italy, it seems that the main concern was with patients' safety, more than with insurers' losses. An additional note is worth mentioning in terms of specificities of the Italian case: although we are assessing the impact of the changes that were implemented in an heterogeneous way by Italian regions, tort legislation is the same for all of them. This is quite different than what we can see in the U.S. case, for instance, where states can have different statutes of limitations and caps for damages.

The effects of any reform can be hard to disentangle given the potential effect on a complex set of variables which means that the interpretation of the estimation values must be done with caution. One crucial point of our study is that the focus is to compare regions that implemented a monitoring system on medical claims with those that did not. Therefore, the aim is not to assess the global effect of this reform.

4.2 Impact of Reforms: Past Research

The problems found in the medical liability system have lead to several governmental interventions in the past few decades.[25] The American example is rich in examples of tort reforms since the 1970s. In the 1980s, the most popular tort reforms held in the U.S. limited the amount of damages awarded in cases of medical malpractice: a cap

2001). Having the provision of health care services shifted to sub-national entities took place in other NHS countries as well, such as Spain and the UK (Fiorentini et al. (2008)).

[22]Until 2008, 8 regions opted for implementing a monitoring system; the remaining 13 regions did not have such type of system.

[23]Other works studied the total of losses per state (as in Viscusi and Born (1995)) or premiums paid by individual physicians (namely in specific specialties, such as those seen as the most risky and an eventual comparison with those less risky, Sloan (1985)).

[24]For instance, Viscusi et al. (1993). Currently there are also several patient safety movements. See for instance Sage (2003).

[25]For an overview of the insurance crisis in the U.S. see Priest (1987).

could be set for noneconomic damages,[26] punitive damages or for the overall amount of damages.[27] Several works tried to estimate the impact of legal reforms, which is important especially if a new wave of reform is expected. Additional tort reforms have been enacted also during the 2000s, building on the experience from previous years.[28] A common and general characteristic of these reforms was the aim of reducing losses of insurance companies, so that insurance for medical liability could be affordable and available. As Sloan (1985) describes, "*[l]egislators assumed that, if laws could reduce the number and dollar amounts of malpractice awards, insurers would be in a better position to predict recoveries, and therefore would maintain coverage at reasonable rates and assure availability of malpractice insurance*".[29]

The current literature on the impact of medical malpractice reforms is vast and focuses on the American case. The idea is that the legislator should focus on those reforms that are more efficient in attaining the desired outcome.[30] Empirical studies try to asses the impact of tort reforms by looking at different variables: insurers losses, medical malpractice insurance prices, medical malpractice claims, award payments, payouts, defensive medicine, physicians' location and supply of health care, quality of health care, health insurance coverage, to name a few. Recently, this literature has been revised by a few studies.[31]

We focus here on the most recent or influential studies on the impact of reforms on insurance premiums, which typically use U.S. data. The reason for doing so is because we are not aware of studies assessing the impact of reforms of the medical monitoring system on insurance premiums. Therefore, given that our main variable of interest is how much hospitals are paying for insurance premiums, it seems natural to opt for reviewing these studies. Additionally, another feature of the American case makes it interesting for us: the heterogeneity of states in terms of policy options for medical malpractice. As we will see in detail, there is also heterogeneity among Italian regions with respect to the implementation of the monitoring system for medical claims.

Last, we review some studies on the impact of risk-management policies taken by

[26] For a discussion of the potential problems in setting a fixed upper limit on awards for pain and suffering, see Viscusi (2004).

[27] Viscusi and Born (1995).

[28] Williams and Mello (2006).

[29] Sloan (1985), p. 633.

[30] As noticed by several studies, it is hard to come up with an overall assessment of the global impact of those reforms: the reforms might have been able to lower costs but might have resulted in lower quality of health care, for instance. See Klick and Stratmann (2007).

[31] For example, Nelson III et al. (2007), US-CBO (2004). See also Mello (2006b), Figure 4, for a summary of the main results of some studies of the impact of tort reforms.

public national health systems. Some studies on the British NHS system are particularly relevant for our case. The fact that the Italian NHS system was modeled on the British NHS[32] makes this analysis more significant.

4.2.1 Effect on Premiums

There have been several studies on the effect of tort reforms on insurance premiums. Sloan (1985) estimates the effect of tort reforms in medical malpractice insurance premiums during 1974-78 for three specialties: general practitioners, ophthalmologists and orthopedic surgeons. The author finds that the reforms did not have the expected result of lowering insurance premiums, and he presents some possible explanations, such as the awareness of juries and potential plaintiffs of the cost consequences of malpractice suits and the lack of use of past experience to set future expectations on the insurer. In 1990 the work of Sloan (1985) was extended until 1986 by Zuckerman et al. (1990), where they find that caps on physician liability reduced short-run premiums for general surgeons, obstetricians and general practitioners by 13%, 17% and 14% respectively. The authors attribute the lack of results in Sloan (1985) to the short period of study.

Thorpe (2004) reaches the result that states that cap noneconomic damages or both noneconomic and economic damages have premiums 17% lower than states without such caps. When the earned premiums per physician is used as dependent variable instead, a 12% reduction in premiums is found in states with those caps. Other tort reforms showed no impact on premiums. Danzon, Epstein and Johnson (2004) study data on premium levels and increases by state for internists, surgeons and obstetricians/gynecologists. They find that states with caps at or below $500,000 on noneconomic damages had on average a 6% smaller increase in premiums than in states where this type of cap was not imposed. Limits on total damage caps had no effect on premiums, and the same holds for caps higher than $500,000 on noneconomic damages.

Extending a previous work from 1998, Viscusi and Born (2005) use the biggest dataset until that date to study the effect of some medical malpractice reforms, especially caps on damage awards, limits on punitive damages and insurability of punitive damages. The variables of punitive damage reform and non-insurable punitive damages[33] do not have a statistically significant impact on premiums earned. On the other hand, states not allowing punitive damages have premiums approximately 8% lower than those states allowing punitive damages. This result is not statistically significant

[32] See France and Taroni (2005).

[33] *I.e.*, when "*punitive damages are not expressly insurable*", Viscusi and Born (2005), p. 29.

and presents a positive coefficient if the variable that accounts for the premiums in the previous year is not included in the regression. Viscusi and Born (2005) stress the fact that assessing the impact of these reforms on insurance premiums is hard because it reflects the influence of both price and quantity. Moreover, insurance purchasers can opt for different purchases, namely by changing the coverage or self-insure.[34]

Kilgore et al. (2006) assess the impact of the introduction of some tort law changes on insurance premiums for three specialties, from 1991 to 2004.[35] They find that noneconomic damage caps reduced premiums for internal medicine by 17%, for obstetricians/gynecology by 26%, and for general surgery by 21%. They reach the result that an increase of $100,000 in the statutory cap on noneconomic damages increased medical malpractice premiums by the same exact percentage for the three specialties under study: 3.9% increase for internal medicine, general surgery and obstetrics/gynecology.

To sum up, the majority of these studies points to a reduction in medical malpractice premiums due to the introduction of damage caps, with caps on noneconomic damages having generally a strong impact. The unit of analysis tends to be the state level or individual physicians.

4.2.2 Risk Management Policies in a Public National Health System

The UK provides an interesting case-study according to which reforms were made but the focus was not so much on legal reforms. In the UK, there was a transfer of risk from individual physicians to NHS hospitals[36] (regarding responsibility for injured patients by NHS directly employed staff), resulting in an enterprise fault liability system. An additional transfer of risk[37] was done later in time, from NHS hospitals to a central agency, the National Health Service Litigation Authority (NHSLA), which pools litigation risks through the Clinical Negligence Scheme for Trusts (CNST). If the CNST is able to handle in a cost-effective way claims against hospitals and to provide risk management guidance, the costs of medical malpractice will be reduced: the number of claims

[34] Viscusi and Born (2005), p. 38.

[35] The authors also simulate the impact of a $250,000 damage cap on noneconomic damages at the national level.

[36] Fenn et al. (2004) mention that this risk transfer was motivated, among other reasons, by hospitals' better position (in comparison with individual physicians) to institute risk management policies - at p. F277. The authors refer to potential costs, namely because if the aim is to provide correct incentives to deliver a standard quality of care, those causing injury should support at least some of the injury costs - p. F278.

[37] Fenn et al. (2004) present two important motivations for this change: the burden for hospital management of having a decentralized system for small value claims; and because the NHSLA would be in a better position to identify activities and procedures with a higher risk of litigation. At F278.

will be lower and the contributions made by members are lower than the equivalent commercial insurance premiums.[38]

In this 'pay-as-you-go' scheme with unlimited cover for medical accidents suffered by NHS patients,[39] the hospitals' level of contribution is calculated every year: a forecast of the aggregate expenditures according to the expected number and value of claims is made; subsequently, individual contributions are calculated as well, taking into account trusts' characteristics.[40] Two additional important variables play a role in determining member's contribution to the scheme: claims experience and risk management standards applied by hospitals.[41] If recent claims experience is considerably different than it was expected considering the trust's casemix, contributions can change in a 10% range. If trusts implement certain risk management standards, discounts are applied.[42]

The application of financial discounts for hospitals should provide incentives to comply with higher levels of risk management standards, which can result in an improvement in patient's safety. Fenn and colleagues (Feb 2007) assess the impact of these financial incentives on MRSA infections,[43] taking into consideration a potential endogeneity of the risk management standards. As stated by the authors, while trying to achieve a certain level of risk management standards, hospitals might have taken into consideration the liability risk from this type of infection. Hospitals presenting the highest levels of risk management standards (levels 2 and 3) showed a reduction in hospitals' infections, with both coefficients having negative signs. Hospitals attaining level 3 showed the highest reduction in the infection rate (statistically significant). The results show evidence that the financial incentives provided to hospitals to reach higher risk management levels (especially the highest levels) can improve patients' safety.

In 2010, the same group of scholars studied the impact of a policy shift implemented by the NHSLA, which was the passage to a zero deductible level for all hospitals from 2002 onwards.[44] This change eliminated one form of risk sharing but other forms of

[38] See http://www.nhsla.com/Publications/, last access on September 2011.

[39] See http://www.nhsla.com/Claims/, last access on September 2011.

[40] Several works by Fenn, Rickman, Gray and colleagues have focused on the NHSLA and CNST. For a description of the calculation of each hospital's contribution to the risk pool, see Fenn et. al (2007).

[41] See Fenn, Rickman and Gray (2007).

[42] There are three levels of compliance that result in three levels of discounts on CNST contributions: level 1 (10% discount); level 2 (20% discount); and level 3 (30% discount).

[43] Methicillin resistant staphylococcus aureus infections.

[44] Before 1997 a deductible of £100,000 was compulsory; after 1997 and until 2002, hospitals would choose their deductibles level; the deductible level was set to zero after 2002. See Fenn et al. (2010) for further details.

risk management were applied by the NHSLA (*i.e.*, the financial discounts described above). Fenn et al. (2010) study the effect of this change in hospitals' incentives to use diagnostic tests. The authors find that, during the period of study, the deductible level and the higher risk management standards (levels 2 or 3) had no impact on diagnostic imaging tests. Some of the possible explanations for this result might be that the incentives provided by the NSHLA are suboptimal or that the design of the risk management standards was not properly done (additionally, if this last possibility is true, it might show some evidence of the negative implications of having a monopoly insurer). One important conclusion from Fenn et al. is that "*certain types of patient care activity, including the use of diagnostic tests, may be less responsive to incentives placed at the level of the hospital by comparisons with incentives placed at the level of the clinician*".[45]

In a 2007 study, Fenn, Rickman and Gray study the connection between deductible levels and the use of diagnostic procedures[46] in NHS hospitals before the switch to the zero deductible level took place. Hospitals with a higher level of deductibles might face higher expected costs from litigation which induces them to supply more diagnostic tests. The authors reached the interesting result that hospitals with higher levels of deductibles do not seem to react in terms of ultrasound scans and X-rays, which are the most frequent and routine diagnostic tests. But hospitals with higher deductibles provide more MRI scans, radio-isotopes, CT scans and fluoroscopies, which are the less frequent diagnostic imaging tests. After controlling for activity levels and casemix, the results suggest that hospitals with a £100,000 excess level used almost 74% more MRI scans and more 43% CT scans than hospitals with £50,000 deductible level. The results seem to point to the fact that hospitals do react when they expect higher litigation costs, but additional policy implication conclusions must be drawn with caution: as the authors state, whether additional diagnostic care leads to a better health care is beyond the scope of their work. Still, an important message is that tort rules can be important for improving patient's safety, even if liability insurance exists.

[45] Fenn et al. (2010), p. i240.

[46] The authors look at frequent and routine procedures (x-rays and obstetric ultrasound scans) and to less frequent procedures (CT scans (computerised tomography), MRI scans (magnetic resonance imaging), radio-isotopes and fluoroscopy).

4.3 Italian Medical Framework

4.3.1 Health Care System

The Italian National Health System[47] provides universal coverage to citizens.[48] Health care is mainly provided by public entities and citizens are not allowed to opt out of the system and search private health care only.[49] The current organization and management[50] of the NHS is done at three levels: at the central level, by the national state; at the regional level, by each region; at the local level, by population-based local health units (LHUs)[51] and public and private accredited hospitals.[52]

The national state defines the essential levels of services (LEAs)[53] that regions are expected to deliver to their residents and funds regional governments. The regions are responsible, among other things, for ensuring the delivery of the health care, for the allocation of resources to the LHUs and *independent hospitals*' (IHs),[54] and for the accreditation of public and private health care. Regions are also free to deliver additional services, which might happen in the most efficient regions as they are financially responsible for those services.[55]

[47] SSN, which stands for *Servizio Sanitario Nazionale* in Italian.

[48] Art. 32, Italian Constitution. The National Health System was enacted by Law 833/1978, providing universal coverage free of charge at the point of service. This public system is financed by general taxation but, in addition, Local Health Units can collect funds from prescription charges. See http://www.salute.gov.it/ministero/sezMinistero.jsp?label=principi&id=573, last access on October 2011. Scarso and Foglia (2011) describe these prescription charges as "*the money which the majority of patients are under a duty to pay for basic health services*", p. 331.

[49] Lo Scalzo et al. (2009). Due to the existence of this universal coverage, voluntary complementary/supplementary health insurance covered 15.6% of the Italian population in 1999 (Mossialos and Thomson (2004), p. 34). Complementary insurance covers dental care (which is included in the national health system for specific groups only, namely children, vulnerable people or people in need for emergency care), co-payments, non-reimbursed services, hospital *per diem* charge. Supplementary health insurance allows an increased choice of providers and access to private hospitals. Health insurance purchase practices present regional differences with respect to the age of the head of the family, education, income level and living in the north, central or eastern Italy (Lippi Bruni (2001)).

[50] See, for instance, France and Taroni (2005), Fiorentini et al. (2008) and Lo Scalzo et al. (2009) for a description of the Italian health system and its evolution.

[51] ASL in Italian, which stand for *Azienda Sanitaria Locale*.

[52] Lo Scalzo et al. (2009), p. 17. Private health care structures might work either for the public sector or independently. See Lo Scalzo et al. (2009), Section 4.1.2, for a detailed description. When private health care providers meet specific requirements they can apply for accreditation in their region, which makes them eligible for NHS reimbursements, as mentioned by Anessi Pessina et al. (2004), p. 309.

[53] Title V, Art. 117.m, Italian Constitution 2001's amendment.

[54] AO in Italian, which stands for *Azienda Ospedaliera*.

[55] Fiorentini et al. (2008), p. 206.

There are essentially three broad categories of public health care providers: LHUs (Local Health Units), IHs (Independent Hospitals) and RHs (Research Hospitals). However, if a further distinction is made among IHs (between those that are teaching hospitals and those that are not) we can consider four categories instead: LHUs, RHs, IHs and THs (Teaching Hospitals).[56] LHUs, IHs and THs deliver health care and enjoy financial and decision-making autonomy. Each LHU must provide health services related to the "*prevention, care, rehabilitation and forensic medicine, ensuring health care service levels for the entire population*"[57] in accordance to the levels defined by the national state.[58] LHUs "*provide care directly through their own facilities or through services supplied by AOs [IHs and THs], research hospitals [RHs] and accredited private providers (acute and long-term hospitals, diagnostic laboratories, nursing homes, outpatient specialists and GPs)*".[59] They operate in their geographical area and patients enroll into the health plans provided by LHUs according to their place of residence. IHs were established in 1992,[60] and hospitals must comply with some requirements[61] in order to acquire the statue of IHs: they must be highly specialized and nationally relevant hospitals that deliver highly specialized health care, hospital care and rehabilitation; moreover, and contrarily to what happens with LHUs, there are no geographic constraints for patients when they search for health care provided by an IH.[62] Therefore, and contrarily to what happens with LHUs, patients can choose to receive hospital care from a hospital that belongs neither to their LHU area nor to their region of residence.[63] IHs can also be teaching hospitals (THs)[64] if they have some link with a university. IHs and THs are essentially structured like the British National Health System's trusts.[65] Another type of health care providers that is also present in the Italian health system are the research

[56] In our work, one possibility we want to test is if there are differences between THs and other types of hospitals, as we will explain in detail. We should have in mind that when some authors describe the Italian national health system they might make a distinction between THs and IHs or not.

[57] Art. 19, Law 833/1978, December 23.

[58] As defined by Art. 3, Law 833/1978, December 23.

[59] Lo Scalzo et al. (2009), p. 75. GPs stands for general practitioners.

[60] Legislative Decree 502/1992, December 30.

[61] For instance, they must have a complete emergency department with an intensive care unit, at least three high specialty units according to the list provided by the Ministry of Health. See http://www.salute.gov.it/ministero/sezMinistero.jsp?label=principi&id=575, last access on September 2011.

[62] As described in http://www.salute.gov.it/ministero/sezMinistero.jsp?label=principi&id=575, last access on September 2011.

[63] See Fabbri and Robone (2010).

[64] Legislative Decree 517/1999, December 21.

[65] Anessi Pessina et al. (2004), at p. 309.

hospitals (RHs)[66] which are essential to perform research and provide assistance with specific pathologies.[67]

The current decentralized structure of the Italian Health System is the product of several reforms that were done especially in the 1990s and beginning of the 2000s that aimed at the introduction of internal market competition by giving more autonomy to the regions (both in terms of political power and fiscal policy).[68] Overall, the reforms introduced managerialism,[69] decentralization,[70] and quasi-market mechanisms.[71] As a result of these reforms, the existing system is fragmentized with respect to the organization of the regional services and funding of providers.[72] One of the concerns about the effects of these reforms is that they might increase regional inequalities, given that northern regions have been very assertive in exploiting their autonomy, while most of the southern regions have been slower in changing their systems.[73] Regional differ-

[66]IRCCS in Italian, which stands for *Istituti di Ricovero e Cura a Carattere Scientifico*. Legislative Decree 288/2003, October 16. Research hospitals are monitored both by the Ministry of Health and regions.

[67]See, for instance, CERGAS-Bocconi (2008).

[68]Namely Legislative Decree 502/1992 and 517/1993 on LHUs and IHs; Legislative Decree 446/1997 that introduces sources of autonomous financing and initiates the process of fiscal federalism; Law 59/1997 that regulates the transfer of powers to regions; Decree Law 229/1999, June 19, that establishes that regions and local entities should choose health care providers (both public and private) taking into account the quality and costs; and Legislative Decree 56/2000, according to which the regions are the main responsible for funding the health care (the National Solidarity Fund replaced the National Health Fund. Nowadays, regions' tax revenue comes essentially from IRAP (*imposta regionale sulle attività produttive*), the regional tax on production, and the IRPEF (*imposta sull reddito delle persone fisiche*), the regional tax on the national progressive income tax).

[69]IHs and LHUs are now required to meet higher performance standards, being managed by a general manager appointed by the regional government. They share similar management structures (Art. 4, Legislative Decree 502/1992).

[70]Regional governments have more autonomy, appoint the general manager, but are also expected to cover the deficits of IHs and LHUs.

[71]Anessi Pessina et al. (2004) describe it in the following way: "*Quasi-markets require money to 'follow patients'. Each region sets the total amount to be spent on health care and allocates it to LHUs on a (possibly adjusted) capitation basis. This is supposed to cover all services provided to LHU residents by the LHU itself and by other providers, i.e. other LHUs, IHs, and accredited private providers (APPs). LHUs then reimburse other providers for care given to their residents. Reimbursements are DRG-based for hospital discharges and fee-for-service for out-patient services. When patients receive care outside their area of residence, the LHU of residence will have to reimburse the entity that provided the health care. The reimbursements are made according to Diagnosis Related Group (DRG) basis for hospitals discharges and according to a fee-for-service for outpatient services*", p. 310. See also Fattore (1999).

[72]Jommi et al. (2001).

[73]France et al. (2005), p. S188. The authors list some of the main problems, which are the shortage of own-source resources for the regions to match their new responsibilities, large interregional differentials in fiscal capacity and conflictual intergovernmental relations, especially over the adequacy of central

ences are known to exist in Italy, with regions in the north being richer than regions in the south. The north-south differences are present in health care services as well (both in terms of quality and services provided) which results in significant cross-regional patient flows from the south to the north to receive health care, particularly in terms of high-level care in tertiary hospitals.[74] In 2001 the proportion of patients searching for hospital care outside their LHU of residence (exit rate) was higher for southern regions, with variation according to the type of care (higher for complex surgery).[75] Inflow rates did not show regional variation.

After the reforms described above, the number of IHs increased[76] while the number of LHUs decreased,[77] as regions were trying to reshape their own health care governance.[78] For example, the "*increased fiscal responsibilities and deteriorating finances*"[79] led many regions to merge some LHUs, IHs or THs. Possible motivations for mergers between health care providers are a cost reduction, economies of scale or spreading the deficits over a large population.[80] Regional health care systems present substantial differences in terms of governance, *i.e.*, in terms of the independence and regional administration of LHUs and their relationship with IHs and THs.

4.3.2 Medical Liability System and Insurance

Italy does not possess a specific law to regulate the physician-patient relationship.[81] Therefore, medical liability is judge-made law, similarly to what happens in the United States. As argued by Zeno-Zencovich (2007), recent developments in the Italian medical law are due to the Supreme Court.[82] Although recent decades provide several examples of a discussion on whether medical liability should be regulated by tort or

government funding for the National Health System.

[74] Lo Scalzo et al. (2009), p. 120.

[75] Fabbri and Robone (2010).

[76] In 1995 there were 81 IHs. The total number of IHs increased in the following years, but it suffered a decrease to 82 in 2010. See Carbone et al. (2010) for more details - in Italian.

[77] In 1992, before the reforms took place, there were 659 LHUs (by that time the equivalent were USLs), they were reduced to 228 in 1995 and further reduced to 146 in 2010. See Carbone et al. (2010) for more details - in Italian.

[78] Anessi Pessina and Cantù (2004).

[79] Anessi Pessina et al. (2004), p. 314.

[80] See, for example, Anessi Pessina et al. (2004) and Carbone et al. (2010).

[81] Notice that the same happens in Spain.

[82] *Corte Suprema di Cassazione* in Italian. This is the highest court in the judicial system. While analyzing decisions from the Italian Supreme Court from 1979 until 2009 Grembi and Garoupa (2010) find that, from 397 analyzed decisions, 63% were in favor of the patient. Suffering a medical injury is not a suficient condition to receive compensation.

contract law, the current state of the law applies contract law[83] to regulate the relationship between health care providers and patients.[84] As Scarso and Foglia (2011) describe, "*two scenarios can be outlined. The patient admitted to a hospital or a clinic:* (i) *enters into a contract with the medical institution, and is treated by an internal physician who is affiliated with the medical institution;* (ii) *concludes a contract with a physician practicing their professional activity within a medical institution*".[85] Moreover, "*both the medical institution and the physician are contractually liable towards the patient*".[86]

We can sum up some of the main relevant characteristics of this liability system.[87] In case of a medical malpractice claim, the patient (*creditor*) must allege that there has been a breach of contract, but the burden of proof is on the defendant (*debtor*).[88] The standard level of care is the one of a "*buon padre di famiglia*" and, in case of non-fulfillment, specificities of the professional activity shall be considered to evaluate the performance.[89] This means that "*for routine medical treatments Italian jurisprudence considers* slight *negligence as being sufficient for the liability of the medical staff; for treatments involving skills which go beyond ordinary qualifications,* gross *negligence is required, unless the physician is a specialist*".[90] Additionally, the medical employee is not responsible for harm if the performance implies solving technical problems of special difficulty, unless there was criminal intent or gross negligence involved.[91] Injured patients can find compensation not only through the civil justice system but also through the criminal law system. Traina (2009) argues that several characteristics of the Italian

[83] Arts. 1176, 1218 and 2236 of the Civil Code. Previously, there have been several discussions by Italian legal scholars on whether to apply contract or tort law. In fact, it was not always straightforward which one to apply in medical malpractice cases. Moreover, there were five fundamental types of relationships to be considered, depending on the type of physician providing the medical care: independent physician, physician employed by the public health care institution, university physician, physician working in a private clinic or physician with agreements with the public health care institution (Miriello (2011), p. 48). See Miriello (2011) and references herein - in Italian. As referred by the author, there has been an harmonization in medical malpractice claims: contract law is applied instead of tort law and, moreover, the same rules apply whether the health care institution is private or public.

[84] This situation presents a significant difference with respect to the Spanish case.

[85] Scarso and Foglia (2011), p. 341.

[86] Scarso and Foglia (2011), p. 342. As the authors describe, according to Italian jurisprudence, the admission of a patient in a medical institution *de facto* generates a contract.

[87] The literature on the Italian liability system is quite vast (and tends to be written in Italian). For more details, see for instance Franzoni (2011), Comandé and Turchetti (2004)- both in Italian, Scarso and Foglia (2011). For a more economic view, see Grembi and Garoupa (2010).

[88] Art. 1218, Civil Code.

[89] Art. 1176, Civil Code.

[90] Scarso and Foglia (2011), p. 341.

[91] Art. 2236, Civil Code.

legal system incentivize criminal proceedings:[92] it is faster, the expenses of gathering and prosecution are supported by the State, and in case the plaintiff prevails it is possible to receive monetary compensation and have the physician suffering a criminal penalty at the same time. Moreover, criminal judges can decide over compensation,[93] making this jurisdiction appealing to patients.[94] The statute of limitations for compensation due to breach of contract is ten years.[95]

Injured patients shall be compensated for their losses.[96] In case of breach of contract, Art. 1223 of the Italian Civil Code specifies that compensation shall be attributed for the actual damage and forgone profits. Art. 1225 of the Civil Code limits compensation for losses that could have been predicted when the obligation arose, which seems to be a restrictive condition. However, in aggregated terms, Italian courts seem to award a high amount of damages to plaintiffs.[97] Italian jurisprudence allows damages for loss of a chance, similar to what happens in Spain. In case of permanent harm, the plaintiff is entitled to receive damages as a life annuity.[98] Nevertheless, as mentioned by Scarso and Foglia (2011), case law constantly ignores this norm and attributes a lump-sum award.[99] Patients are entitled to receive pecuniary and non-pecuniary losses.[100] Given that setting payouts brings several difficulties to Italian courts, standard disability tables (similar to motor vehicle accidents)[101] are considered by courts to set economic damages in a more harmonized way.[102]

[92] Traina (2009), p. 438.

[93] *I.e.*, the plaintiff will not have to wait for the civil decision on the compensation.

[94] See more details on Grembi and Garoupa (2010).

[95] Art. 2946 of the Civil Code. This is a longer period than in case of extra-contractual harm, which is five years (Art. 2947, Civil Code). Moreover, it is a longer statute of limitations when compared to medical malpractice cases in Spain. However, and similar to the Spanish case, the starting date is the date in which the harm was suffered. The exception is when the patient needs more time for the consequences of the medical treatment to be known (Art. 2935, Civil Code).

[96] See Scarso (2009) for a description of the different types of compensation in medical malpractice cases in Italy.

[97] With respect to awards for medical malpractice by courts, OECD (2006) says that "*total damages awarded by courts and paid by insurers for medical malpractice accounted for €29 million in Austria and €350 million in France in 2003, €250 million in Germany in 2002 and £500 million (around €730 million) in the UK and up to €2.4 billion in Italy*", p. 27. However, no reference is made to the number of awards nor to the injury severity level involved.

[98] Art. 2057, Civil Code.

[99] Scarso and Foglia (2011), p. 250.

[100] On this issue, the Supreme Court has decided 'twin judgments' nos. 26972, 26973, 26974 and 26975: Supreme Court, Joint Chambers, n. 26972, November 11, 2008.

[101] Insurance Code - *(Codice delle assicurazione private)*, Legislative Decree, September 7, 2005.

[102] OECD (2006), p. 38. This situation shows some similarities with the Spanish case, where courts face the same problem. However, there is still room for discretion by courts when setting compensation levels.

Liability insurance is not mandatory for physicians and medical institutions, but there have been recently some legal proposals in that sense.[103] However, although public health care providers (LHUs, IHs, RHs, THs, and hospitals directly managed by LHUs) are not legally obliged to insure against medical malpractice themselves, they are contractually bound to provide third-party liability insurance for their medical personnel.[104] Having hospitals providing insurance for their own employees might bring some advantages as hospitals have a higher bargaining power than individual physicians and collective policies allow financing diverse levels of risk.[105] In fact, the American experience shows that when hospitals buy insurance for doctors, "*some physicians have been able to find a stable, relative low-cost source of insurance*", which can be particularly relevant for physicians practicing in high risk specialties.[106] However, moral hazard problems[107] can arise if doctors do not take appropriate levels of care because they know that the hospital will cover their potential losses.[108]

According to the data released by the Italian Association of Insurance Companies (ANIA), from 2000 until 2008 there were approximately 14 compensation requests for each 100 physicians, with an average payout of €39,779 (2005 data). These data shows an increasing trend in the number of claims between 1995 and 2004.[109] The ratio between lawsuits and compensation requests seems to be quite low (significantly lower than 20%), although this index is only available for a very limited number of regions.[110] Moreover, it is not possible to infer why only a small proportion of claims ended up in courts. In other words, it is not possible to disentangle, for instance, how many claims were dropped and how many were settled.

Public heath care providers cannot buy liability insurance from the insurer they

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See Scarso and Foglia (2011) for some examples.

[103] *Disegno di Legge* 108, senator Tomassini, June 6, 2001, on professional liability of medical employees. For potential problems that might arise by making insurance compulsory, see Faure (2006).

[104] See Art. 28, Presidential Decree 761/1979, December 20. According to Art. 41.2 of the national collective agreement for physicians of February 2005 *(Accordo Collettivo Nazionale per la disciplina dei rapporti con i medici specialisti ambulatori interni ed altre professionalita - ai sensi del D.L.Vo 502/92 e successive modificazione)*, in cases of liability against third-parties, the insurance policies can provide coverage up to: €1,549,370.68 *per* medical accident; €1,032,913.80 *per* person.

[105] Taroni et al. (2008), p. 87.

[106] Mello (2006), p. 3.

[107] Taroni et al. (2008), at p. 87.

[108] See also Fenn et al. (2004) and Faure and Verhulsdonck (2004).

[109] There are no national data available on the number of paid requests. Just to have a reference - although caution is needed when trying to make comparisons, given the significant differences in samples and health care systems- in Texas, in 2002, the number of compensation requests was approximately 20 per 100 physicians (Black et al. (2005)).

[110] Amaral-Garcia and Grembi (2011a).

want. Precisely because they are public entities, they are legally obliged to open a call for tenders for the acquisition of professional liability coverage (public procurement auctions).[111] Insurance companies operating in the Italian market for medical malpractice are private companies, covering health care providers on the basis of a yearly premium.[112] Medical practitioners claim that insurance premiums have increased substantially. However, data on the cost of insurance for medical liability *per* policy sold are not available. ANIA made a survey, asking insurance companies how much they were charging for this type of insurance.[113] The survey presents an estimation for the total cost of insurance premiums for medical liability, but there are no data on the number of policies being sold.[114] This means that total costs might have risen just because the total number of insurance policies being sold has increased over time. Besides, important variables do not seem to be taken into account when setting insurance premiums. For instance, no references to the number of beds, average recovery length or average number of surgeries were found. Moreover, experience rating is not considered when setting medical liability insurance premiums.[115] What seems to be more important when setting insurance premiums is the amount of total payout that the hospital is paying to employees. This means that hospitals with more employees or with a higher proportion of senior physicians can be charged higher prices.[116] If this is the only variable that matters when insurance companies set their prices, at least two things can be noticed: (i) physicians might not have the correct incentives when delivering health care; (ii) hospitals with more senior and experienced physicians will pay more than hospitals with interns and unexperienced physicians. This is quite surprising: as physicians progress in their careers and acquire more expertise, we would expect a reduction in the probability of incurring in a medical error. In case insurance companies use this variable to set prices, we should expect a reduction in premiums, not an increase as it seems to be the case.[117]

[111] See Legislative Decree 163/2006, April 12, for more details on the call for tenders and awarding process.

[112] MdS (2006).

[113] Although this brief survey came out in 2004, it was not possible to find similar data for more recent years. Moreover, we are not able to know how representative the sample of respondents is. In other words, the ANIA made the survey and insurance companies replied to the survey. Typically, insurance companies offering medical liability insurance are companies that operate in general insurance market. However, the precise number of how many insurance companies offer medical liability insurance is unknown.

[114] The same holds for all reports that we found from ANIA.

[115] For a discussion of experience rating in medical malpractice insurance see Sloan (1990).

[116] See Taroni et al. (2008), p. 87.

[117] It could also be argued that interns do not practice risky procedures and this is the reason why hospitals with senior physicians pay higher premiums. However, this does not seem to be a strong argument to

Also in Italy, there has been a shift from *occurrence-based* policies - "*which cover all incidents in the policy year regardless of when the claim is filed*",[118] to *claims-made* policies[119] - "*which cover only claims filed in the policy year*".[120] Given that the consequences of medical malpractice injuries can become apparent even after several years, there might be a "*relatively long period between the time that the premiums for a medical malpractice policy are paid and the time that losses under that policy can be known with certainty*".[121] According to ANIA (2010), in 1994, a total of 95.8% of medical claims were paid in the same year of the insurance contract. In 2008, only 9.8% of medical accidents have been paid in the same year of the insurance contract. The statute of limitations is an important variable in medical malpractice cases: the longer the statute of limitations, the longer the period during which the plaintiff can bring the claim, and the higher uncertainty it creates with respect to losses.

Buzzacchi and Gracis (2008) argue that having public health care providers buying insurance from private insurers brings several costs, namely a sub-optimal risk diversification, high organizational costs and submission to the market power of those firms.[122] However, there are also advantages, such as solving the problem of *soft budget constraint*.[123] What the situation in Italy seems to show is a lack of competition among insurance companies offering professional liability for medical malpractice. This situation can be a result of two serious problems: barriers to entry to new insurers for professional liability; and asymmetric information in the call for tenders,[124] in the sense that past statistical information on the risk should be available to bidders but it is generally lacking. This gives an advantageous position to the incumbent, which is often the only firm possessing that information. Additionally, Comandé and Turchetti (2004) refer that a culture of risk management in a multidisciplinary and systemic way between the

support a higher premium paid by hospitals with more senior physicians. As physicians progress in their careers, and even if they are not senior physicians, they acquire more expertise, not less.

[118] Mello (2006), p. 3.

[119] This change is currently present in a large number of countries. When describing the claims made medical malpractice insurance in the U.S., Baker (2005c) mentions that it is "*the only kind of medical malpractice insurance available in the individual market in most states*", at p. 423.

[120] Mello (2006), p. 3.

[121] Baker (2005c), p. 395.

[122] Buzzacchi and Gracis (2008), p. 106.

[123] Buzzacchi and Turati (2008), p. 10. The idea is that Italian regions, funded by the state, do not take the limit they have to spending in a serious way: they believe that the state will cover their losses, as happened in the past. Therefore, the limit on spending is not considered as being credible. See also Bordignon and Turati (2009) and references herein.

[124] See AGCM (1997).

health care operators is missing in Italy.[125]

In this setting, two national initiatives can be relevant. One is the institution of the SIMES,[126] a system that monitors medical errors. This system shall increase patients' safety and manage medical risk. Moreover, it is an uniform system for each and every Italian region. The second is the creation of the SIMPAS,[127] a system that monitors insurance policies of health care providers. Given that the costs with insurance policies for medical liability are high,[128] the purpose of this system is to allow health care providers to have a profound understanding of their own clinical risks and its evolution. By using this system, health care providers can exchange information on insurance policies with other health care providers. Moreover, it shall allow a comparison between insurance companies operating in Italy with those operating in other countries. A good design of this system shall allow a reduction in the problem of asymmetric information that health care providers face.[129] The implementation of these systems might bring a positive advantage in case public hospitals do not have appropriate incentives to collect these types of information.[130] Moreover, health care providers will have more information on their side when they need to contract out insurance for medical liability.[131]

Although none of these systems is currently into force in Italy, from 2001 until 2008 it is possible to find regions that implemented a monitoring system on medical malpractice claims. For the same time period, other regions did not implement any sort of monitoring system for medical claims. Therefore, from a total of 21 regions, 8 have a monitoring system. According to the AGENAS (2009) report, 5 regions have the system working fully (Lombardia, Friuli Venezia Giulia, Lazio, Toscana, and Trento) and 3 regions have a monitoring system "in progress" (Piemonte, Emilia Romagna and Puglia). The first region to adapt such a system was Trento, in 1997. The remaining 13

[125] Comandé and Turchetti (2004), p. 9.

[126] Software that monitors medical errors (*Sistema informativo per il monitoraggio degli errori in sanita*), (10A00120), *Gazzetta Ufficiale della Repubblica Italiana, Serie Generale* n. 8, January 12, 2010.

[127] Informatics system to monitor health insurance policies (*Sistema Informatizzato di monitoraggio delle Polizze Assicurative in Sanita*).

[128] See http://www.salute.gov.it/qualita/paginaDettaglioQualita.jsp?menu=programmi&lingua=italiano&id=1329, last access on September 2011.

[129] Notice that, according to several reports already presented, namely the Ministry of Health, the problem of asymmetric information is on the health care provider. It is counterintuitive, as generally the part with less information is the insurance company. In this setting, insurance companies (and especially the incumbent) tend to have more information than health care providers.

[130] For instance, health care providers might think that collecting this information is too time costly and that the State will cover for their expenses.

[131] In the sense that they are better informed about the number and type of medical accidents taking place in their hospitals and on how much other insurance companies are charging.

regions never adopted this type of monitoring system until 2008 (see Table 4.1).

Table 4.1: Institutional Details

Regions	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Abruzzo								
Basilicata								
Bolzano								
Calabria								
Campania								
Emilia Romagna			Mon	Mon	Mon	Mon	Mon	Mon
Friuli Venezia Giulia						Mon	Mon	Mon
Lazio							Mon	Mon
Liguria								
Lombardia				Mon	Mon	Mon	Mon	Mon
Marche								
Molise								
Piemonte								Mon
Puglia							Mon	Mon
Sardegna								
Sicilia								
Toscana					Mon	Mon	Mon	Mon
Trento	Mon	Mon	Mon	Mon	Mon	Mon	Mon	Mon
Umbria								
Valle d'Aosta								
Veneto								

Note: Mon=Monitoring claims. Source: AGENAS (2009).

4.4 Hypothesis

The policy differentiation among Italian regions allows us to test the impact of monitoring medical claims on insurance premiums paid by health care providers. Before discussing possible implications of this policy, we should notice that this is not a pure risk management system. In a sense, it deviates from typical management risk strategies: as previously described, the most common risk management policy used in hospitals is a monitoring system for medical errors or near misses. However, in our case, the

system monitors medical claims, which is not necessarily the same as a medical error. For instance, patients can make a claim because they believe that there was a medical error in their treatment when in fact there was not.[132] The information provided by this system might be relevant in order to analyze which case characteristics make it more likely to present a claim.[133] Moreover, this system can also provide useful information on the different stages of litigation. We have in mind, for instance, the possibility to assess which types of cases tend to be settled, dropped or end up in courts.[134] Precisely because of its novelty, it is interesting to assess the effects of this system.

Effect on Premiums

If properly designed, monitoring medical malpractice claims can bring advantages for regions adopting them: health care providers operating in these regions are able to collect more information and to use it when they need to contract out insurance for medical liability. This is particularly relevant in the Italian medical liability insurance market, given that insurance companies tend to make an overvaluation of medical accidents[135] which might lead them to set aside higher amounts of reserves than they need.[136] Therefore, the implementation of a monitoring system on medical claims might take insurance companies to set a more accurate level of reserves.

However, other hypotheses might be available as well. For instance, let us suppose that the asymmetric information problem that health care providers suffer from is not, after all, that serious. Then, by implementing this system, insurance companies can actually realize that they could charge higher premiums (for example, by comparing the number of medical accidents occurring in other health care facilities). Therefore, assessing the impact of this monitoring system can bring useful insights, especially if similar programs should start operating at the national level.

Effect on Legal Expenditures

It is not clear whether a monitoring system can affect legal expenditures or how they can be affected. Before discussing possible implications of this monitoring system on legal expenses, we should describe what is the item "legal expenditures" appearing

[132] See Chapter 1.

[133] As described in Chapter 1, Studdert, Brennan and Thomas (2000) find that the poor and the elderly are less likely to present a claim.

[134] It should be noted, however, that the possibility to analyze these issues is left for future research, as the current data does not allow to have information on the number or type of claims.

[135] Taroni et al. (2008), p. 88.

[136] For Texas, Black et al. (2008) find that medical malpractice insurers made an undervaluation of their initial expense reserves, even though costs were rising during the period they analyzed.

in health care providers' balance sheets. Legal expenditures include essentially costs due to litigation. Wages paid to lawyers working at health care facilities,[137] as well as expenses with legal counseling, are not part of legal expenditures. Therefore, this variable can be considered as a proxy for costs with medical malpractice claims.

The monitoring system on medical claims could have an indirect impact on legal expenses if, for example, the quality of health care provided to patients improves and, because of that, health care providers receive less claims. This hypothesis will be tested in the regression analysis. There are reasons to believe that a monitoring system on medical claims should not have a direct impact on legal expenditures (*i.e.*, the item legal expenditures as it appears in the balance sheet). In case health care providers discover through the monitoring system that they have a high number of claims against them, that should not affect legal expenditures . Legal expenditures are essentially costs that health care providers must pay because patients decided to make a claim against them. Although we can think about situations in which the health care provider can directly influence legal expenditures (for example, if it is the health care provider that decides to appeal a court decision, which implies paying legal court's fees), these tend to be more influenced by patients or indirectly.[138] Notice that, in case legal counseling was included in legal expenditures, there could be a direct effect of the monitoring system on legal expenses. For instance, after implementing the monitoring system, health care providers could realize that they had a high number of claims against them, and they could decide to spend more on legal counseling.

Health Care Providers Type

One important hypothesis we want to test is whether insurance premiums present any difference according to the various types of health care providers. In other words, does the type of the health care provider matter when setting insurance premiums? On the one hand, we might think that the type of health care provider is relevant. For example, Teaching Hospitals can present higher risk exposure[139] because they have interns. However, Teaching Hospitals also have experienced and senior doctors that teach in-

[137] It is not possible to know the wage that health care providers pay to their lawyers because the financial data provides one aggregated item on which other professionals are also included (namely engineers and architects).

[138] These conclusions follow precisely because the item "legal expenditures" does not include wages paid to lawyers or legal counseling.

[139] We discuss the possibility of different risk exposure and not the possibility of different moral hazard problems among different types of health care providers. Health care practitioners face the same liability and insurance coverage independently of the type of health care provider where they are working at.

terns and that make a continuous investment in research. Therefore, if the type of health care provider matters, it is not clear how it might affect insurance premiums. On the other hand, there are also reasons to believe that the type of health care provider is totally irrelevant when setting insurance premiums. In the end, health care is highly regulated in Italy and, as previously described, the relevant variable when setting insurance premiums seems to be payout paid to health care employees.

Merged Health Care Providers

As described in Section 4.3.1, some health care providers have merged. In case merged hospitals are able to find more advantageous conditions when contracting out their insurance policies, a reduction in insurance premiums could be expected. This hypothesis will be considered because we must make sure that, in case we find a reduction in insurance premiums, that reduction is not due to the merger. However, one might also suspect that only the less efficient health care providers went through a merging process. There were only 19 mergers from 2001 until 2008 which means that, even if being involved in a merger might be relevant, we should not expect a strong impact.

4.5 Data and Empirical Strategy

In order to create the Italian Public Health Care Providers Dataset (IPHCPD) we collected data from the Ministry of Health (MdS), the Italian National Institute of Statistics (Istat), and the Ministry of Justice (MoJ),[140] from 2001 until 2008.[141] The Ministry of Health releases the annual balance sheets of each LHU, IH, RH, and TH. From this source we obtain, among others, two crucial variables for our analysis: paid insurance premiums and legal expenditures.

Paid insurance premiums are a proxy for medical malpractice liability premiums, since until 2007 health care providers did not specify how much of insurance premiums corresponds to medical liability or to something else (for instance, insurance against burglary). However, since 2008, health care providers present not only the overall expenses with insurance premiums, but they also make a distinction between medical liability and other types of insurance. This change offered us the possibility to check what is the proportion of medical liability insurance on total insurance premiums. We find that, on average, it accounts for 84%, making us confident that it is a good proxy

[140] For a list of the variables collected, please see Section 4.4.1.

[141] In September 2011, the MdS had released financial data until 2008. This is the reason why we are not including more recent years.

for our dependent variable.

Legal expenditures are an aggregate measure as well, and they are available until 2007 only. We collect information on this variable because we cannot control for the total number of medical claims against each health care provider or region. However, if health care providers are spending considerable amounts on legal expenditures, it might be a signal that they are involved in litigation. Including this variable allows to control for that possibility. Naturally that this is not a perfect measure, given that legal expenditures might include costs that are not related to medical malpractice claims. However, it seems to be a good proxy.

We have an unbalanced panel: a few health care providers started operating later than 2001, others stopped their activity, and others merged. For this reason, health care providers are not exactly the same every year, as we can see from the table bellow. The minimum number of health care providers is 263 (in 2001), and the maximum is 323 (in 2005). The majority of health care providers are LHUs, followed by IHs.

Table 4.2: Types of Health Care Providers per Year

Type	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
LHUs	183	197	197	196	196	180	171	157
IHs	52	68	65	61	63	63	63	63
THs	28	32	32	34	43	43	45	43
RHs	0	0	20	22	21	20	21	21
Total	**263**	**297**	**314**	**313**	**323**	**306**	**300**	**284**

Note: LHUs: *Local Health Units*; IHs: *Independent Hospitals*; THs: *Teaching Hospitals*; and RHs: *Research Hospitals*. There is no data for RHs for 2001 and 2002 because they started operating, as we know them today, in 2003 (Legislative Decree 88/2003).

The fact that some health care providers merged with other units should be considered in our analysis. To start with, when health care providers merge, is as if some units stopped existing. In other words, let us suppose that hospital number 110 merged with hospital 111 and they are now hospital 112. When we analyze the data, we have that hospitals 110 and 111 are no longer in activity, although they actually are. In order to take this situation into consideration, we coded the number of the hospital in such a way that we can check if the hospital has been part of a merger or not. In case we exclude health care units that were merged with other hospitals, we can see that we have a lower number of health care providers, but the number is more stable from 2001 until 2008 (Table 4.3). Moreover, we can see the following from the table: RHs were not involved in mergers; the number of mergers involving THs and IHs was very low;

and LHUs are the units that typically merge with other units.[142] We can also add that mergers were performed on the majority of cases within untreated health care units.

Table 4.3: Types of Health Care Providers per Year (Excluding Mergers)

Type	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
LHUs	131	141	141	141	141	141	141	141
IHs	49	65	62	61	63	63	63	63
THs	28	32	32	33	40	40	40	40
RHs	0	0	20	22	21	20	21	21
Total	**208**	**238**	**255**	**257**	**265**	**264**	**265**	**265**

Note: LHUs: *Local Health Units*; IHs: *Independent Hospitals*; THs: *Teaching Hospitals*; and RHs: *Research Hospitals*.There is no data for RHs for 2001 and 2002 because they started operating, as we know them today, in 2003 (Legislative Decree 88/2003).

Table 4.4. describes the average paid premium per type of health care provider, and its evolution over years. On average, THs are paying higher insurance premiums, compared to LHUs, IHs and RHs. This might reflect a higher risk exposure of these units, due to the presence of interns, for instance. However, the available data do not allow to check for other alternative possibilities. For example, if all THs in our sample have a higher number of medical professionals, that could be enough to explain the difference. Moreover, if total payout is the variable that matters when setting insurance premiums, then health care providers with a higher proportion of senior physicians are also expected to pay higher premiums. Therefore, if THs have a higher proportion of senior physicians, that could also explain the difference.

From 2001 until 2008, LHUs have registered a higher increase in insurance premiums: in 2001, LHUs were paying, on average €853,000 while in 2008 this amount was equal to €2,248,000 (both in 2009 euros) (Table 4.4). A similar trend is detectable for legal expenditures (Table 4.5).

Some descriptive statistics are calculated, comparing now treated regions with untreated regions. As already described on Table 4.1, treated regions are those that implemented a monitoring system on medical malpractice claims. In 2001, the only treated region was Trento. In this region, there was one LHU, that is the reason why we can see only one treated health care provider in Table 4.6. However, in 2008 the number of treated units surpassed the number of untreated units.

[142]One additional note: in this section, we will typically present descriptive statistics considering the entire sample, unless stated differently. The number of mergers is not significant and the results do not change when we exclude health care units that were merged with other units.

Table 4.4: Average Premium

Type	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
LHUs	853	950	1,234	1,531	1,681	1,833	1,968	2,248
IHs	1,023	1,022	1,220	1,518	1,602	1,734	1,857	1,844
THs	1,591	1,642	1,885	2,326	2,376	2,320	2,052	2,238
RHs	.	.	564	692	903	881	989	922
Total	**967**	**1,041**	**1,255**	**1,561**	**1,708**	**1,819**	**1,889**	**2,059**

Note: Values are in €1,000 deflated at 2009. LHUs: *Local Health Units*; IHs: *Independent Hospitals*; THs: *Teaching Hospitals*; and RHs: *Research Hospitals*. There is no data for RHs for 2001 and 2002 because they started operating, as we know them today, in 2003 (Legislative Decree 88/2003).

Table 4.5: Average Legal Expenditures

Type	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
LHUs	143	164	255	304	440	423	428
IHs	83	122	146	284	222	185	193
THs	96	101	105	160	258	170	200
RHs	.	.	61	142	174	95	190
Total	**126**	**148**	**205**	**273**	**358**	**319**	**334**

Note: Values are in €1,000 deflated at 2009. LHU: *Local Health Units*; IH: *Independent Hospitals*; TH: *Teaching Hospitals*; and RH: *Research Hospitals*. There is no data for RHs for 2001 and 2002 because they started operating, as we know them today, in 2003 (Legislative Decree 88/2003). Legal expenditures are only available until 2007.

Table 4.6: Health Care Providers (*Treated vs. Non-Treated*) per Year

		2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
All sample	*Non-Treated*	262	296	294	246	240	212	174	137
	Treated	1	1	20	67	83	94	126	147
	Total	**263**	**297**	**314**	**313**	**323**	**306**	**300**	**284**
Excluding Mergers	*Non-Treated*	207	237	238	191	183	171	143	128
	Treated	1	1	17	66	82	93	122	137
	Total	**208**	**238**	**255**	**257**	**265**	**264**	**265**	**265**

Average premiums have increased over time, and this holds for both treated and untreated units. Nevertheless, from 2001 until 2008, the increase in treated units was smaller (97%) than in untreated units (142%), as shown in Table 4.7. Legal expenditures increased as well from 2001 until 2007, at a faster rate for untreated units.

Table 4.7: Average Premiums and Legal Expenditures (by Groups)

	Premium		***Legal Expenditures***	
Year	*Non-Treated*	*Treated*	*Non-Treated*	*Treated*
2001	810	1,090	140	115
2002	844	1,235	164	131
2003	1,011	1,493	252	159
2004	1,288	1,828	310	238
2005	1,505	1,908	481	232
2006	1,713	1,913	396	248
2007	1,765	2,003	482	195
2008	1,962	2,149	.	.
Total	**1,370**	**1,708**	**325**	**190**

Note: Values are in €1,000 and 2009's prices. Legal Expenditures are only available until 2007.

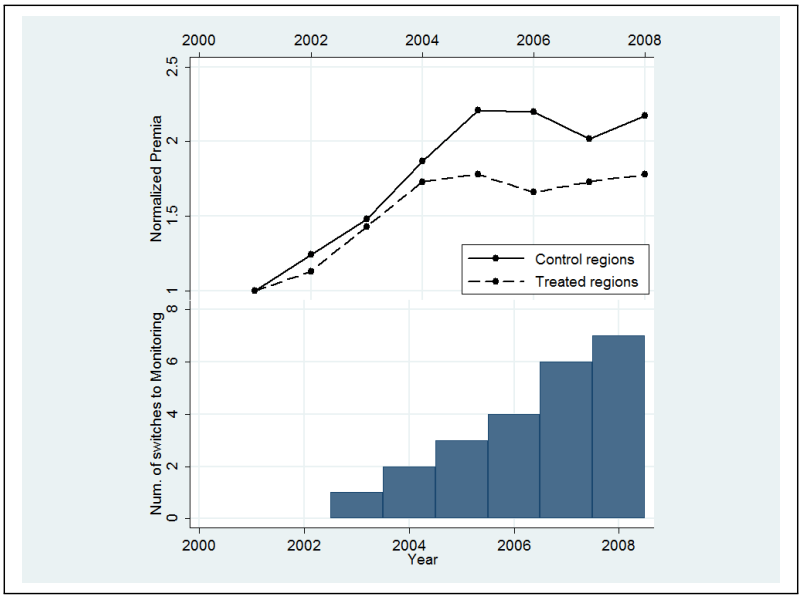
Figure 4.1. shows the evolution of paid premiums and legal expenditures in treated and control regions. From the graphs, it seems that treated regions had lower increase in premiums comparing to control regions. With respect to legal expenditures, both treated and control regions had the same evolution until 2003 (Figure 4.2). From 2003 until 2007, treated regions show a smoother pattern. Controlled regions suffered a lower increase in legal expenses in 2006 but a higher increase in 2007. From the graph, we cannot say that implementing a monitoring system had an impact on legal expenditures. We can see in both graphs the total number of regions that decided to switch to a monitoring system.

4.5.1 Data Limitations

We face some data limitations that we try to explain in a detailed way. We also provide arguments which suggest that these data limitations are not problematic.

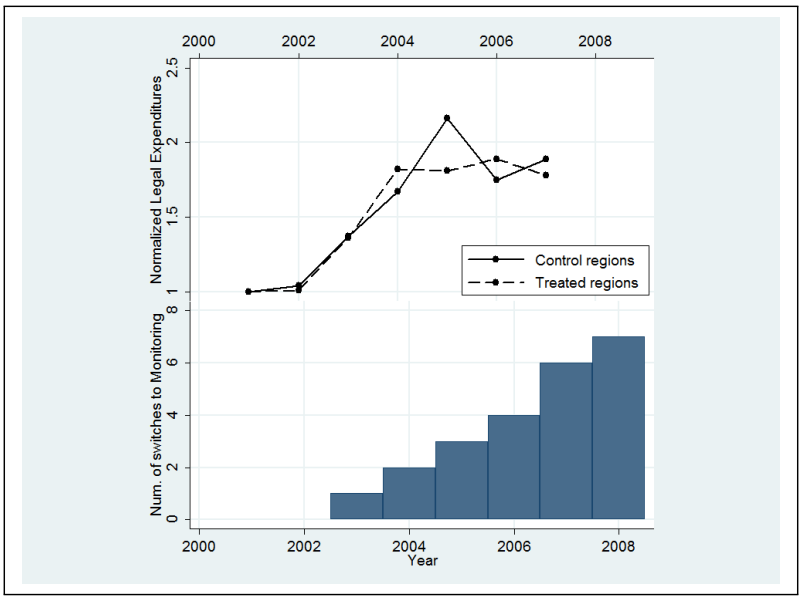
Time Period: We are using data from 2001 until 2008. Although the number of health care providers is significant, which makes our sample numerous, it would be interesting to have more years of data. Given that the financial balance sheets have changed in 2001, it is not possible to recover that information for previous years. And

Figure 4.1: Premiums: Treated *vs.* Control



NOTE: "Num. of switches to Monitoring" represents the total number of regions adopting a monitoring system. One region, Trento, is not included as it implemented the monitoring system in 1997.

Figure 4.2: Legal Expenditures: Treated *vs.* Control



NOTE: "Num. of switches to Monitoring" represents the total number of regions adopting a monitoring system. One region, Trento, is not included as it implemented the monitoring system in 1997. Legal expenditures are only available until 2007.

although we are almost ending 2011, the Ministry of Health released data until 2008 only.

Type of Insurance: We cannot control for the type of insurance that health care units are buying. Although this limitation might be relevant, it should not be of concern given the Italian setting. The idea is that there were reforms being implemented in Italy with respect to monitoring but there were no reforms being implemented that could have had an impact on physicians or health care providers' liability. For instance, in case a tort reform had been implemented during the period of study establishing that hospitals were not liable for the health care professionals, we could expect a decrease in premiums paid by hospitals. This decrease would not be due to the impact of monitoring but due to the fact that health care units would stop buying coverage for their health care professionals. Reforms of this type did not took place in Italy, which makes us feel more confident with the results we get even without detailed information on each hospital insurance contract.

Physicians' specialties: It would be interesting to account, for instance, for the type of specialties working in each health care facility. However, taking into account the Italian setting, this does not pose a limitation because we are assessing changes overtime in malpractice premiums *per* health care unit, and these health care units did not change the mix of specialties and services provided.

Level of Harm: We have no information on the severity level of claims being filed against health care providers. If one health care provider is generally involved in litigation in cases with high levels of harm (death or permanent grave injuries), that could explain why the hospital is paying higher insurance premiums. However, we believe that, on average, there should not be huge differences with respect to harm levels among hospitals. In other words, hospitals that have obstetricians and neurosurgeons are expected to pay higher premiums than health care providers in which these "risky" specialties do not work. However, that should be accounted for in the hospital fixed effect: over time, there were no significant changes in the structure of hospitals in terms of specialties (as explained above).

Physicians' behavior: One important effect of this reform on the monitoring system is on physicians' behavior. Can we expect doctors to change their behavior after this reform has been implemented? We are looking at the impact of these reforms on insurance premiums paid by hospitals on behalf of their employees. On the one hand, we can expect nothing to change because physicians are not paying directly for the medical liability insurance anyway. On the other hand, physicians can think that they must report errors and might adopt more defensive medicine procedures.

Insurance Market: We have no information on the Italian insurance market for med-

ical liability. Currently it is not possible to obtain information on how many insurance companies are offering insurance for medical liability (which is a part of general liability insurance). However, the insurance market can be considered national (it would be problematic in case it was a regional market). Nowadays, even foreign companies are among the list of main providers of medical liability at least for some regions.[143]

4.5.2 Econometric Strategy

In order to assess the impact of the monitoring system (*Monitoring*) implemented by some Italian regions, we use a Differences-in-Differences (DD) estimation. As Bertrand et al. (2004) describe, "*DD estimation consists of identifying a specific intervention or* treatment *(often the passage of a law). One then compares the difference in outcomes after and before the intervention for groups affected by the intervention to the same difference for unaffected groups*".[144] In this setting, the *treatment* is the introduction of a monitoring system by the region. Hospitals must comply with their region's decision of implementing this system, which means that from the health care providers' perspective this is an exogenous policy. To assess the impact of this policy *treatment* on insurance premiums, we shall compare changes in health care providers' premiums in regions adopting the monitoring system (*treated*) with changes in health care providers' premiums in regions that did not adopt this treatment (*untreated/control group*). We must take into consideration the fact that, within *treated regions*, this policy was implemented in different years.[145]

Let $ln(Y_{irt})$ be the log of insurance premiums paid by health care provider i, operating in region r, at time t (our dependent variable).[146] We estimate the following equation:

$$ln(Y_{irt}) = A_i + B_r + C_t + \alpha X_{irt} + \beta Z_{rt} + \delta Monitoring_{rt} + \varepsilon_{irt}$$

where A_i, B_r and C_t are fixed effects for health care providers, regions and years, respectively. X_{irt} are individual controls (*i.e.*, variables for the health care providers) which include:

- *Health care provider type:* as described before, public health care providers can be LHU (Local Health Units), TH (Teaching Hospitals), IH (Independent Hospitals) or RH (Research Hospitals). We have created a dummy variable for each type of

[143] See, for instance, DGS (2010).
[144] At p. 249.
[145] As in Autor et al. (2006) and Acemoglu et al. (2011).
[146] In our dataset, insurance premiums are in €1,000, in 2009 prices.

health care provider. One hypothesis is that some health care providers might pay higher premiums than others. For instance, we should not be surprised if we find that THs pay higher insurance premiums than other types of hospitals because of their interns. Or even that they pay less because these units might have better technologies or more experienced doctors.

- *Wage of health care professionals:* for each health care provider, we include the amount of health care professionals wages (essentially physicians and nurses). According to MdS (2006), insurance companies tend to set insurance premiums as a proportion of that amount.

- *Entry Rate:* this index tries to control for qualitative differences, which might affect the number of errors or the probability of patients filing claims. Hence, we use the ratio of revenues due to medical care provided to residents from other public health care providers within the same region (*entry rate*). This index is generally associated with good quality: patients tend to perceive the quality of the health care providers in their region, which might take them to search medical care in those facilities they believe the quality is better.

- *Legal expenditures:* how much are health care units spending each year for legal expenditures, excluding lawyers' wages and legal counseling. As we discussed before, we cannot control for the number of claims that hospitals receive. A good proxy is the costs with legal issues. Naturally, this is not a perfect proxy because we cannot assure that all legal expenditures are with medical malpractice claims. However, it is a good proxy for these cases. In robustness checks we also include the lag of legal expenditures as a regressor.

Z_{rt} are relevant regional controls (*i.e.*, variables at the regional level). The list of these variables comprises:

- *Resident population per LHU:* it is calculated as the number of total residents in one region divided by the total number of LHUs operating in that same region. This variable should be seen as a proxy for the dimension and activity levels of regional LHUs.

- *Litigation rate:* equal to regional ordinary civil proceedings filed in first-instance courts weighted per 1,000 residents. It is important to include this variable because it can be a driver of legal expenditures and claims requests.

- *Average duration of first instance cases:* how long regional ordinary civil proceedings filed in first-instance courts take to be decided, on average.

- *Regional GDP:* the inclusion of this regressor allows to control for regional differences at the economic level. This difference can be important at the patients' level but also at the health care providers' level, as these institutions are funded by regional taxes.

One potential problem that we might have in this analysis is the one of endogeneity with respect to the choice of the treatment. In our case, we do not have a true experiment in which treatment and control groups are randomly chosen. Therefore, one can be worried with the fact that, for example, regions with more medical malpractice problems might self select into the treatment of monitoring medical malpractice claims because they have higher costs. Or that only regions with modest medical malpractice problems self select into the treatment in order to obtain better conditions when contracting out liability insurance policies. Indeed, we cannot claim that Italian regions are randomly affected by the treatment. However, there are reasons to believe that the type of regions implementing the treatment are not of the same type. For example, from our data there is no clear path for regions adopting this system (for instance, there is no North/South division, nor richer/poorer division, nor more populated/less populated division: both types are represented in treated and control groups). Due to these concerns on the endogeneity of the intervention variable (as raised by Bertrand et al. (2004)), we include regions fixed effects. Notice, moreover, that we use as unit of analysis the premium that each health care provider is paying. Additionally, health care providers practicing in treated regions must implement the monitoring system, whether they would like to implement it or not. In a way, it is an external decision and they must comply with it.

ε_{irt} is an error term. The estimated impact of the intervention (the DD estimator) is δ. $Monitoring_{rt}$ is always equal to zero for those regions that did not adopt the monitoring system. However, for regions adopting the monitoring system, we have the following: $Monitoring_{rt}$ is equal to zero for those years in which the monitoring system was not in effect; $Monitoring_{rt}$ is equal to one for those years in which the monitoring system was in effect. This means that if region A adopted the monitoring system in 2002, the variable $Monitoring_{rt}$ is zero until 2001, but it is one from 2002 onwards (*i.e.*, assumes value one already in 2002, the year in which the policy was in effect).

Another possible problem that might arise is serial correlation. Therefore, we always present clustered standard errors so that we can mitigate those concerns, as pointed out by Bertrand et al. (2004).

4.5.3 Robustness Checks

We try different specifications in order to test the robustness of our results. Given that the introduction of a monitoring system might have an effect that is not immediate, all regressions are run using $Monitoring1$ instead of $Monitoring$. Similarly to $Monitoring$, this variable is always equal to zero for untreated regions. For regions adopting the monitoring system, the variable $Monitoring1$ is zero for those years in which the treatment was not in effect; and it assumes the value 1 starting one year after the introduction of this policy.[147] The rationale for performing this analysis is that in case the implementation of a monitoring system has an impact on insurance premiums, the effect might not be immediate.

The lack of information on the number of medical malpractice claims is a natural concern in this analysis. Therefore, we also try alternative specifications: in some we include $Ln(LegalExp)_{irt}$ and in other we add $Ln(LegalExp)_{irt-1}$.[148]

In order to assess if taking part on a merger might distort the results we obtain, we perform the regressions for a subsample of observations: excluding health care units that took part on a merger.

Finally, we run the regressions having as dependent variable $Ln(LegalExp)$. If implementing a monitoring system had an impact on the legal expenditures, then insurance premiums can decrease afterwards. This means that the results we are obtaining from the regressions above might be distorted because what is driving them is a reduction on medical malpractice claims. Having $Ln(LegalExp)$ as a dependent variable is the best way to check for this possibility, given the available data.

4.6 Results

The results from the Differences-in-Differences model are presented in Table 4.8. The main results are the following:

- Monitoring medical malpractice claims has a negative impact on insurance premiums: hospitals operating in regions that implemented such a system paid 35% to 36% less than hospitals in the control group. In case we opt for including $Monitoring1$ instead, the results are nearly the same and range from 31% to

[147] Therefore, if region A adopts a monitoring system in 2003, $Monitoring1$ assumes value one from 2004 onwards. Remember that, in this example, $Monitoring$ assumes the value one already in 2003. This means that the only difference between $Monitoring$ and $Monitoring1$ is on the year in which the policy was implemented.

[148] See Appendix for these results.

33%. Therefore, the introduction of this policy has the desirable effect on insurance premiums, *ceteris paribus*. This is a robust result, that holds when standard errors are clustered at the health care unit level.

- Hospitals involved in mergers pay higher insurance premiums compared to hospitals that were never involved in mergers. Merged hospitals can pay from 72% to 126% more than health care units that did not go through this type of change.

- The type of health care provider does not influence the level of insurance premiums. In some specifications we can find a statistically significant negative coefficient on RH, for example, but it is not robust to other specifications.

- Regional GDP does not affect how much health care providers are paying for insurance premiums. The coefficient is always negative but it is never statistically significant.

- The more crowded LHUs are (*i.e.*, the higher the average resident population *per* LHU), the higher the insurance premium. However, this impact is no longer statistically significant when variables on the legal system are introduced. In case we consider the specification with $Monitoring1$, the coefficient is only statistically significant in one regression, and at a low level of significance.

- There is a positive and statistically significant relationship between wages of health care professionals and how much hospitals are being charged from insurance companies. A 1% increase in the total payout of health care professionals is correlated with an increase in premiums from 0.59% to 1.1%. This result seems to support the hypothesis that insurance companies tend to consider payouts when setting premiums: the higher the payout, the higher the premium paid.

- Litigation rate has no effect on insurance premiums.

- An increase in the duration of first-instance civil proceedings is associated with an increase in insurance premiums, on average.

When including *Ln(LegalExpenditures)* as a regressor, the results are quite similar (Table 4.9). The impact of monitoring seems to have a slightly higher effect on insurance premiums: health care providers practising in regions where a monitoring system has been implemented pay from 32% to 41% less than health care units in control regions.

In Table 4.10 we present the results for the regression analysis using *Ln(Legal Exp)* as dependent variable. The main results that we obtain are the following:

Table 4.8: Impact on Paid Premiums

	Dependent Variable: Ln(Premiums)							
	Monitoring				Monitoring1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Monitoring	-0.36***	-0.35***	-0.35***	-0.35***				
	(-4.94)	(-4.80)	(-4.76)	(-4.58)				
Monitoring1					-0.33***	-0.31***	-0.31***	-0.31***
					(-5.59)	(-5.51)	(-5.54)	(-5.24)
Merged Hosp.	1.26***	0.99***	1.11***	0.81**	1.14***	0.96***	1.08***	0.72*
	(34.58)	(4.90)	(3.46)	(2.05)	(33.06)	(4.70)	(3.35)	(1.89)
IH	-0.63***	0.23	0.67	2.21***	-0.47***	0.33	0.77	2.47***
	(-11.61)	(0.51)	(1.25)	(3.68)	(-9.76)	(0.73)	(1.45)	(4.37)
TH	-2.25***	-1.37***	-0.93*	0.71	-2.15***	-1.33***	-0.89*	0.89
	(-56.85)	(-3.04)	(-1.74)	(1.16)	(-57.18)	(-2.96)	(-1.66)	(1.55)
RH	-4.25***	-3.25***	-1.22	0.28	-4.14***	-3.17***	-1.33	0.15
	(-116.72)	(-2.80)	(-0.57)	(0.49)	(-119.16)	(-2.73)	(-0.63)	(0.28)
Ln(GDP)	-1.94	-2.11	-1.50	-0.82	-1.92	-2.10	-1.45	-1.20
	(-1.00)	(-1.15)	(-0.82)	(-0.38)	(-1.01)	(-1.16)	(-0.81)	(-0.55)
Ln(LHUPop)	0.21**	0.21**	0.23**	0.08	0.14	0.15	0.16*	0.05
	(2.05)	(2.08)	(2.11)	(0.67)	(1.52)	(1.61)	(1.70)	(0.43)
Ln(Wage)		0.59**	0.62**	1.05***		0.60**	0.63**	1.09***
		(2.23)	(2.24)	(3.23)		(2.25)	(2.26)	(3.51)
Entry Rate			-0.14	-0.13			-0.17	-0.15
			(-1.03)	(-0.93)			(-1.26)	(-1.10)
Litigation Rate				0.07				0.05
				(1.61)				(1.18)
Ln(DurationY)				0.91***				0.71***
				(3.42)				(2.76)
Observations	2,347	2,347	2,240	1,832	2,347	2,347	2,240	1,832
R-squared	0.83	0.83	0.84	0.84	0.83	0.83	0.84	0.84
Adj Rsq	0.796	0.803	0.808	0.810	0.794	0.801	0.805	0.807

Note: Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include region, health care provider and year fixed effects. The number of observations drops from 2,347 to 2,240 in regressions (3) and (7) because *Entry Rate* is not available for some health care units. It further drops to 1,832 because data for duration and litigation rate is available until 2007 only. Robust standard errors clustered at the health care provider level in brackets.

Table 4.9: Impact on Paid Premiums (Legal Expenditures as Regressor)

	Dependent Variable: Ln(Premiums)							
	Monitoring				Monitoring1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Monitoring	-0.41***	-0.37***	-0.37***	-0.37***				
	(-5.07)	(-4.71)	(-4.60)	(-4.61)				
Monitoring1					-0.37***	-0.34***	-0.34***	-0.32***
					(-5.72)	(-5.40)	(-5.35)	(-5.09)
Ln(LegExp)	-0.03	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01
	(-1.31)	(-1.24)	(-1.00)	(-0.72)	(-1.02)	(-0.98)	(-0.73)	(-0.46)
Merged Hosp.	4.00***	0.26***	0.26***	0.14	4.02***	0.11	0.11	0.01
	(23.28)	(3.62)	(3.25)	(1.63)	(25.43)	(1.52)	(1.33)	(0.16)
IH	-3.47***	1.19***	1.23***	1.25***	-3.41***	1.46***	1.50***	1.52***
	(-19.92)	(6.38)	(6.42)	(6.62)	(-21.38)	(8.15)	(8.09)	(8.31)
TH	-5.02***	-0.34*	-0.30	-0.25	-5.05***	-0.14	-0.11	-0.06
	(-28.24)	(-1.89)	(-1.63)	(-1.36)	(-30.82)	(-0.81)	(-0.59)	(-0.34)
RH	-2.80***	-2.02*	0.88***	-2.09*	-2.86***	-1.95*	0.86***	-1.85
	(-14.76)	(-1.80)	(4.14)	(-1.78)	(-16.22)	(-1.73)	(4.12)	(-1.58)
Ln(GDP)	-3.98*	-3.38*	-2.34	-2.21	-4.13**	-3.48*	-2.43	-2.47
	(-1.91)	(-1.65)	(-1.17)	(-1.00)	(-2.06)	(-1.76)	(-1.26)	(-1.11)
Ln(LHUPop)	0.14	0.12	0.11	0.07	0.10	0.07	0.07	0.04
	(1.10)	(0.94)	(0.87)	(0.63)	(0.82)	(0.64)	(0.59)	(0.32)
Ln(Wage)		0.70***	0.76***	0.70***		0.75***	0.80***	0.76***
		(4.35)	(4.59)	(4.19)		(4.64)	(4.85)	(4.59)
Entry Rate			-0.13	-0.14			-0.15	-0.16
			(-0.89)	(-0.92)			(-1.06)	(-1.10)
Litigation Rate				0.08				0.06
				(1.65)				(1.25)
Ln(DurationY)				0.91***				0.71***
				(3.34)				(2.72)
Observations	1,881	1,881	1,785	1,656	1,881	1,881	1,785	1,656
R-squared	0.83	0.83	0.84	0.84	0.83	0.83	0.84	0.84
Adj Rsq	0.793	0.797	0.804	0.804	0.790	0.794	0.802	0.800

Note: Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include region, health care provider and year fixed effects. The number of observations drops from 1,881 to 1,785 in regressions (3) and (7) because *Entry Rate* is not available for some health care units. It further drops to 1,656 because data for duration and litigation rate is available until 2007 only. Also for this reason the number of observations is lower than the number we obtain excluding legal expenses. Robust standard errors clustered at the health care provider level in brackets.

- Monitoring medical malpractice claims does not seem to have any impact on legal expenditures: this variable is statistically significant in only one of the specifications. According to Reg. (2), introducing a monitoring system on medical claims decreases legal expenditures by 19%. This result is not robust when we include variables on the legal system, which should be relevant to the amount that health care providers are paying.

- Teaching hospitals and independent hospitals face lower legal expenditures, on average, than the base group (LHUs). This result holds in different specifications. With respect to research hospitals, the results are somehow striking: initially, it seems that being a research hospital is associated with paying lower legal expenditures. However, when we include variables on the legal system and the index *Entry Rate*, the coefficient changes signal. One potential explanation relies on the fact that RHs started operating later when compared to the other types of health care units. As Table 4.3. shows, RHs starting operating in 2003. Therefore, we should not be surprised with the results we obtain: these health care units might take some time to stabilize the amount they are paying for legal expenses.

- A longer duration of first-instance civil proceedings is associated with lower legal expenditures. One possible explanation is that patients are aware of the delays, which might refrain them from presenting a claim.

4.6.1 Discussion of the Results

The preceding results suggest that monitoring medical malpractice claims can allow health care providers to pay less insurance premiums comparing to health care units that did not implement such a system. Notice that we are not arguing that monitoring medical malpractice claims are effective in reducing insurance premiums, given that insurance premiums have risen from 2001 until 2008 in all regions. Nevertheless, the increase for health care units adopting the monitoring system was lower than the increase for health care units that did not adopt such a system. This result is robust in several specifications. The following robust results were obtained as well: an increase in wage leads to an increase in insurance premiums; the longer the duration of first instance civil proceedings, the higher insurance premiums; and legal expenditures have no effect on insurance premiums (not even when we consider legal expenditures paid in *(t-1)*, *i.e.*, in the previous year.). Monitoring medical claims does not have an impact on how much hospitals are paying for legal expenditures.

Table 4.10: Impact on Legal Expenses

	Dependent Variable: Ln(Legal Expenditures)							
	Monitoring				Monitoring1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Monitoring	-0.18 (-1.58)	-0.19* (-1.65)	-0.17 (-1.47)	-0.15 (-1.35)				
Monitoring1					-0.04 (-0.35)	-0.04 (-0.39)	-0.01 (-0.10)	-0.01 (-0.06)
Merged Hosp.	0.45*** (4.08)	-0.07 (-0.40)	-1.25*** (-4.38)	-1.04*** (-3.47)	0.40*** (4.05)	-0.07 (-0.39)	-1.21*** (-4.21)	-1.01*** (-3.34)
IH	-1.91*** (-17.58)	-2.54*** (-7.22)	-3.82*** (-8.44)	-3.74*** (-8.15)	-1.86*** (-17.81)	-2.36*** (-6.88)	-3.64*** (-8.20)	-3.57*** (-7.91)
TH	-1.47*** (-20.98)	-2.11*** (-6.21)	-3.40*** (-7.70)	-3.34*** (-7.45)	-1.47*** (-19.12)	-1.97*** (-5.85)	-3.25*** (-7.44)	-3.20*** (-7.16)
RH	-1.82*** (-24.80)	0.78*** (9.83)	-8.17*** (-4.64)	0.28* (1.78)	-1.86*** (-24.10)	0.75*** (9.97)	-7.86*** (-4.45)	0.27* (1.72)
Ln(GDP)	-5.01 (-1.60)	-5.15 (-1.64)	-4.54 (-1.38)	-3.63 (-1.10)	-4.96 (-1.58)	-5.05 (-1.61)	-4.39 (-1.33)	-3.65 (-1.10)
Ln(LHUPop)	-0.09 (-0.58)	-0.09 (-0.54)	-0.07 (-0.44)	-0.02 (-0.13)	-0.12 (-0.80)	-0.12 (-0.77)	-0.10 (-0.65)	-0.05 (-0.30)
Ln(Wage)		-0.17 (-0.72)	-0.23 (-1.01)	-0.15 (-0.62)		-0.11 (-0.48)	-0.17 (-0.76)	-0.09 (-0.40)
Entry Rate			0.17 (0.94)	0.23 (1.20)			0.16 (0.85)	0.21 (1.12)
Litigation Rate				-0.01 (-0.10)				0.00 (0.04)
Ln(DurationY)				-0.90* (-1.78)				-0.86* (-1.70)
Observations	1,885	1,885	1,789	1,660	1,885	1,885	1,789	1,660
R-squared	0.75	0.75	0.75	0.76	0.75	0.75	0.75	0.75
Adj Rsq	0.694	0.694	0.692	0.697	0.693	0.693	0.692	0.696

Note: Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include region, health care provider and year fixed effects. The number of observations drops from 1,885 to 1,789 in regressions (3) and (7) because *Entry Rate* is not available for some health care units. It further drops to 1,660 because data for duration and litigation rate is available until 2007 only. Robust standard errors clustered at the health care provider level in brackets.

It is not clear if the implementation of a monitoring system will generate social improvements. In order to make such an analysis, we would need to have information on other important variables that are not available. Overall, the implementation of a monitoring system on claims should have a desirable impact in terms of costs of insurance premiums for health care units, but should not distort the incentives of providing a good quality of health care. For instance, if implementing a monitoring system on claims allows for a reduction on insurance premiums but this reduction is more than outweighed by the costs of the monitoring system itself or by the costs of adopting defensive medicine procedures, this reform might not be desirable. Both positive and negative medicine behaviors could be adopted by physicians. For instance, physicians can react by lowering the supply of health care services. In other words, in terms of liability, introducing a monitoring system brings no change. However, given that medical claims are being monitored, physicians can fear the repercussions of this system. We have in mind the possibility of having experience rated insurance premiums, which would force health care providers to pay higher insurance premiums given that their doctors are facing claims. Physicians can also fear the repercussion of this system in terms of promotion or reputation, for instance.[149] The hypothesis of adopting negative defensive medical practices is quite unlikely because, as we explained previously, the national state defines the minimum level of health care that must be provided to citizens. Unless this minimum level is set to be too low, it is hard for medical professionals not to provide those levels of care. We find the possibility of practicing positive defensive medicine more likely, though. Doctors might feel that they are being "monitored", which induces them to perform additional tests so that, in case some medical accident happens, those tests can be used as a way to prove that they were not negligent. To sum up, this system should not have a negative impact on the quantity nor on the quality of medical services being provided to patients.

Another important point after the introduction of this monitoring system is how will insurance companies and hospitals use this information. For instance, we could expect more competition in the call for bids because more insurance companies obtain information on medical accidents: the incumbent is no longer the only party that has access to it. Hospitals might use this information as well when they need to contract out their liability insurance. Although it seems unreasonable, health care providers were not aware of how many medical accidents were taking place inside their facilities for a long time. Moreover, they were not able to compare how much they were paying for

[149] We find this possibility quite unlikely, given the rigid structure for public employees. However, the purpose of this discussion is to think about possible reactions, namely by physicians.

liability insurance with how much other hospitals in other regions were paying. Therefore, from this point of view, the implementation of this system seems to be beneficial. However, we see one potential problem when using this information. Essentially, the concern is with what will be considered in the end: is it the number of claims or the number of claims in which negligence was involved? These are two totally different situations, and only the latter should be used for insurance companies when setting the prices of insurance premiums. The reason is simply that, as we saw in Chapter 1, making a claim is not a sign of negligent care. Sometimes patients might need to file a claim in order to get more information on the medical treatment they received. Patients might actually drop the claim during the process, namely after finding that it is not clear that a negligent treatment has been provided. If insurance companies use the information on the total number of claims instead of using the total number of claims involving negligence, they might set a higher insurance premium than they should.

Additionally, we are not saying anything about an eventual change in patients' incentives to file a claim. For example, if patients react to this policy by making more claims even when there is no evidence of negligence, then this result is not desirable.

We believe that with respect to patient's safety this policy can only bring advantages. After the implementation of this monitoring system, it is possible to assess which types of procedures are likely to result in a higher number of medical accidents and claims. This information should be properly used in order to improve patient's safety: it should be investigated by the physicians why these errors are taking place, and what can be changed in order to reduce them. Sometimes, small changes can make substantial differences. For example, if it is found that physicians working with sleep deprivation are more likely to incur in mistakes, rules that set how much physicians are working on-call should be modified. Another situation is the one involving infections. Suffering an infection after a surgery due to the lack of hygienic conditions seems to be an outrageous situation. We can currently see in health care units posters reminding doctors and nurses that they must wash their hands. However, sometimes the failure is not because the physician forgot to wash her hands: it is because the hospital did not have soap for her to wash her hands. Of course these are only simple examples, that have already been studied in the literature.[150] For sure physicians working everyday in hospitals have many examples to provide. Precisely because they know the situation better than anyone else, they should take part in the process of finding solutions.

[150] Please see Chapter 1 on this matter.

4.7 Conclusions

The fear of skyrocketing insurance premiums might induce governments to implement reforms. In the U.S., many legal reforms have taken place in the past few decades, and the main motivation claimed by reformers was precisely the need of controlling insurance premiums. In Europe, the main motivation claimed by reformers has been more on the patient's safety side. The Italian case is a good example: some regions started implementing a monitoring system on medical claims. If implemented properly, this system may allow an improvement in patient's safety and to control the increase of insurance premiums. In this chapter, we only assess the impact of the implementation of this policy on insurance premiums, given that there is currently no way to assess the impact on patient's safety.

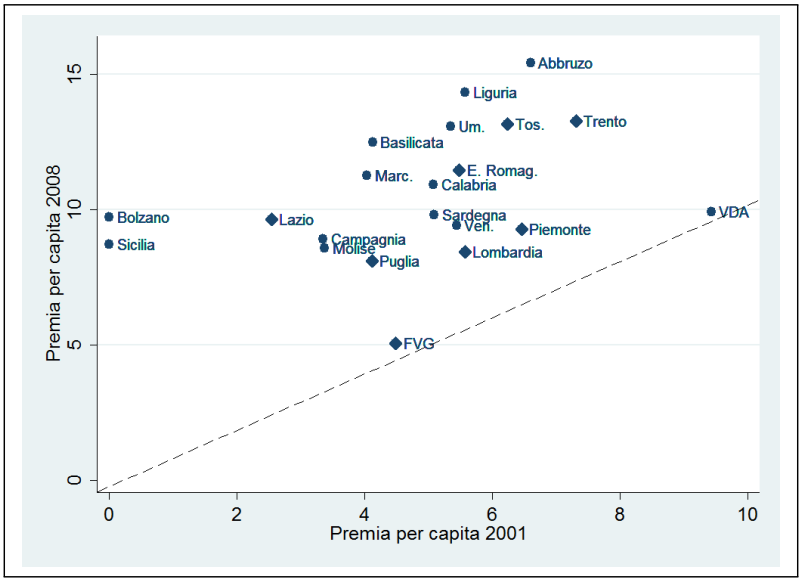
The results show that implementing a monitoring system is related to lower increases in insurance premiums. However, it is not clear the net effect of this policy on public health. For example, physicians might react by adopting defensive medical practices. Additionally, it is not clear how insurance companies will use this information when setting liability premiums: considering the total number of claims can be disadvantageous for health care providers, given that this is not the same as claims involving negligence.

If the information is properly used, patients and the state might benefit from this monitoring system. Patients might benefit if this information is translated into changes that lead to an improvement in patient's safety, and to a reduction in medical accidents. The state might benefit as well: if there are less medical accidents, given that there is a public national health system in Italy, the state will have lower expenses in treating injured patients. Moreover, if there are less medical negligent accidents, a reduction in legal costs due to litigation can be expected: the state will be involved in less medical malpractice cases.

To sum up, in this chapter the impact of monitoring medical malpractice claims on insurance premiums has been analyzed. However, in order to assess if this policy is socially desirable, several other impacts should be taken into account. We lack information on the impact of this reform in other variables. Moreover, some years are needed until an evaluation can be properly done. Assessing the overall effect of this reform is beyond the scope of this study, but monitoring medical claims should not harm patient's safety.

4.8 Appendix

Figure 4.3: Paid Premium per capita (variation 2001-2008)



NOTE: Per capita paid premium variation from 2001 to 2008. Treated regions with diamond symbol; control regions with circle symbol. Dotted-line is the 45 degree line.

Table 4.11: Variables description

Variable	Type	Definition	Source
Monitoring	Dummy	1 for those regions and in those years in which a monitoring policy on claims was active (first year of the policy implementation is included), 0 otherwise	AGENAS
Premium	Continuous (1.000€)	Paid insurance premium per health care provider	MdS
Legal_Exp	Continuous (1.000€)	Legal expenditures per health care provider	MdS
GDP	Continuous (€)	Regional GDP	Istat
Wage	Continuous (1.000€)	Total wages of health care personnel *per* health care provider	MdS
LHU_Pop	Continuous	Regional resident population *per* regional LHU	Health for All-Italia
Litigation Rate	Continuous	Ordinary civil proceedings filed in first-instance courts per 1,000 inhab. in the region (excludes cases assigned to special divisions: labor, social security, family law and bankruptcy)	Istat (with data from the MoJ)
DurationY	Continuous	Mean duration of ordinary civil proceedings filed in first instance courts in years (estimated)	Istat (with data from the MoJ)
LHU	Dummy	1 if the health care unit is a Local Health Unit, 0 otherwise	MdS
IH	Dummy	1 if the health care unit is an Independent Hospital, 0 otherwise	MdS
TH	Dummy	1 if the health care unit is a Teaching IH, 0 otherwise	MdS
RH	Dummy	1 if the health care unit is a Research Hospital, 0 otherwise	MdS
Entry Rate	Continuous [0,1]	(Revenues from public entities intra-region)/(Total revenues from health care)	MdS

Table 4.12: Impact on Premiums (Excluding Hospitals that Merged)

	Dependent Variable: Ln(Premia)							
	Monitoring				Monitoring1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Monitoring	-0.46***	-0.43***	-0.42***	-0.44***				
	(-5.48)	(-5.12)	(-5.00)	(-5.05)				
Monitoring1					-0.41***	-0.38***	-0.37***	-0.37***
					(-6.03)	(-5.71)	(-5.61)	(-5.50)
Ln(LegExp)	-0.03	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01
	(-1.11)	(-0.99)	(-0.98)	(-0.74)	(-0.75)	(-0.65)	(-0.64)	(-0.40)
IH	14.42*	12.52*	10.56	-1.94***	15.15**	13.06*	-1.85***	-1.82***
	(1.96)	(1.72)	(1.45)	(-13.08)	(2.13)	(1.86)	(-13.61)	(-12.94)
TH	12.84*	10.96	9.01	-3.47***	13.49*	11.42	-3.48***	-3.44***
	(1.74)	(1.51)	(1.24)	(-21.60)	(1.90)	(1.63)	(-23.15)	(-21.62)
RH	9.17	13.58*	-1.72**	-5.41***	10.02	13.96**	0.84***	-5.00***
	(1.25)	(1.87)	(-2.17)	(-10.19)	(1.41)	(1.99)	(3.84)	(-9.92)
Ln(GDP)	-4.34**	-3.78*	-3.20	-3.01	-4.54**	-3.92*	-3.32	-3.40
	(-1.99)	(-1.76)	(-1.49)	(-1.25)	(-2.17)	(-1.89)	(-1.60)	(-1.40)
Ln(LHUPop)	0.27**	0.24**	0.24**	0.17**	0.21***	0.17**	0.18**	0.13*
	(2.30)	(2.32)	(2.27)	(2.21)	(2.62)	(2.47)	(2.48)	(1.92)
Ln(Wage)		0.73***	0.75***	0.69***		0.79***	0.81***	0.77***
		(4.28)	(4.45)	(4.00)		(4.58)	(4.72)	(4.45)
Entry Rate			-0.19	-0.21			-0.22	-0.24
			(-1.16)	(-1.15)			(-1.37)	(-1.38)
Litigation Rate				0.08				0.05
				(1.45)				(0.95)
Ln(DurationY)				0.92***				0.66**
				(2.92)				(2.19)
Observations	1,559	1,559	1,491	1,362	1,559	1,559	1,491	1,362
R-squared	0.83	0.83	0.83	0.83	0.82	0.83	0.83	0.83
Adj Rsq	0.789	0.793	0.796	0.795	0.784	0.789	0.792	0.789

Note: Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include region, health care provider and year fixed effects. The number of observations drops from 1,559 to 1,491 in regressions (3) and (7) because *Entry Rate* is not available for some health care units. It further drops to 1,362 because data for duration and litigation rate is available until 2007 only. Also for this reason the number of observations is lower than the number we obtain excluding legal expenses. Robust standard errors clustered at the health care provider level in brackets.

Table 4.13: Impact on Premiums (Includes Legal Expenditures of Previous Year)

	Dependent Variable: Ln(Premiums)							
	Monitoring				Monitoring1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Monitoring	-0.42***	-0.39***	-0.38***	-0.37***				
	(-4.62)	(-4.41)	(-4.20)	(-4.12)				
Monitoring1					-0.36***	-0.34***	-0.33***	-0.30***
					(-5.39)	(-5.13)	(-4.91)	(-4.59)
Ln(LegalExp$_{t-1}$)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
	(0.05)	(0.17)	(0.18)	(0.26)	(0.07)	(0.20)	(0.21)	(0.26)
Ln(LegalExp$_{t}$)	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01
	(-0.79)	(-0.80)	(-0.74)	(-0.58)	(-0.56)	(-0.58)	(-0.52)	(-0.37)
Merged Hosp.	0.05	0.03	0.20**	0.06	-0.11*	-0.08	0.07	-0.02
	(0.77)	(0.29)	(2.19)	(0.57)	(-1.68)	(-0.69)	(0.75)	(-0.16)
IH	-0.40***	0.78***	0.97***	0.98***	-0.13	1.12***	1.28***	1.29***
	(-3.06)	(3.21)	(4.08)	(4.02)	(-1.07)	(4.54)	(5.25)	(5.21)
TH	-1.82***	-0.63***	-0.44**	-0.38*	-1.64***	-0.37	-0.20	-0.16
	(-16.39)	(-2.70)	(-1.97)	(-1.68)	(-15.67)	(-1.54)	(-0.87)	(-0.65)
RH	1.96***	1.29***	-2.61**	-3.17***	1.60***	0.89***	-2.39**	-2.72**
	(20.44)	(6.34)	(-2.51)	(-2.86)	(24.67)	(4.53)	(-2.13)	(-2.31)
Ln(GDP)	-6.60**	-6.31**	-5.62**	-6.31**	-6.60***	-6.28**	-5.59**	-6.57**
	(-2.52)	(-2.42)	(-2.17)	(-2.06)	(-2.60)	(-2.49)	(-2.22)	(-2.12)
Ln(LHUPop)	0.09	0.07	0.07	0.04	0.04	0.02	0.03	0.01
	(0.68)	(0.56)	(0.56)	(0.40)	(0.37)	(0.22)	(0.25)	(0.09)
Ln(Wage)		0.57***	0.62***	0.56***		0.64***	0.68***	0.65***
		(4.09)	(4.32)	(3.66)		(4.12)	(4.28)	(3.92)
Entry Rate			-0.09	-0.12			-0.12	-0.14
			(-0.63)	(-0.76)			(-0.78)	(-0.90)
Litigation Rate				0.07				0.05
				(1.42)				(0.92)
Ln(DurationY)				0.84**				0.61*
				(2.58)				(1.93)
Observations	1,539	1,539	1,459	1,357	1,539	1,539	1,459	1,357
R-squared	0.85	0.85	0.86	0.86	0.84	0.85	0.85	0.85
Adj Rsq	0.805	0.807	0.814	0.813	0.801	0.803	0.811	0.809

Note: Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include region, health care provider and year fixed effects. The number of observations drops from 1,539 to 1,459 in regressions (3) and (7) because *Entry Rate* is not available for some health care units. It further drops to 1,357 because data for duration and litigation rate is available until 2007 only. Also for this reason the number of observations is lower than the number we obtain excluding legal expenses. Robust standard errors clustered at the health care provider level in brackets.

Table 4.14: Impact on Legal Expenditures (Excludes Mergers)

	Dependent Variable: Ln(LegalExp)							
	Monitoring				Monitoring1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Monitoring	-0.19*	-0.21*	-0.19	-0.17				
	(-1.69)	(-1.80)	(-1.62)	(-1.47)				
Monitoring1					-0.04	-0.05	-0.01	0.01
					(-0.33)	(-0.40)	(-0.11)	(0.08)
IH	16.96	17.69	16.11	-2.71***	16.58	17.17	15.40	-2.66***
	(1.53)	(1.60)	(1.41)	(-14.50)	(1.50)	(1.55)	(1.35)	(-14.15)
TH	17.35	18.07	16.49	-2.34***	16.94	17.52	15.75	-2.31***
	(1.57)	(1.63)	(1.44)	(-12.00)	(1.53)	(1.59)	(1.38)	(-11.73)
RH	17.15	17.17	3.52***	-3.21***	16.87	16.92	3.44***	-2.90***
	(1.55)	(1.55)	(14.36)	(-4.58)	(1.53)	(1.53)	(13.93)	(-4.16)
Ln(GDP)	-5.27	-5.48*	-5.01	-4.06	-5.14	-5.31	-4.79	-4.05
	(-1.61)	(-1.68)	(-1.49)	(-1.20)	(-1.57)	(-1.63)	(-1.42)	(-1.20)
Ln(LHUPop)	-0.23***	-0.22**	-0.20**	-0.14	-0.27***	-0.26***	-0.24***	-0.18**
	(-2.60)	(-2.35)	(-2.11)	(-1.18)	(-3.48)	(-3.37)	(-3.09)	(-1.98)
Ln(Wage)		-0.29	-0.32	-0.24		-0.22	-0.25	-0.18
		(-1.39)	(-1.53)	(-1.13)		(-1.07)	(-1.23)	(-0.84)
Entry Rate			0.18	0.24			0.16	0.21
			(0.90)	(1.15)			(0.80)	(1.06)
Litigation Rate				0.00				0.02
				(0.02)				(0.19)
Ln(DurationY)				-0.65				-0.60
				(-1.17)				(-1.08)
Observations	1,563	1,563	1,495	1,366	1,563	1,563	1,495	1,366
R-squared	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Adj Rsq	0.669	0.669	0.669	0.672	0.667	0.667	0.668	0.671

Note: Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include region, health care provider and year fixed effects. The number of observations drops from 1,563 to 1,495 in regressions (3) and (7) because *Entry Rate* is not available for some health care units. It further drops to 1,366 because data for duration and litigation rate is available until 2007 only. Also for this reason the number of observations is lower than the number we obtain excluding legal expenses. Robust standard errors clustered at the health care provider level in brackets.

Chapter 5

Conclusions

Medical mishaps bring significant costs to the society. Victims of a medical accident may suffer injuries with devastating consequences for them and their families. Moreover, a loss of enjoyment of life might follow, or even death. Naturally, doctors are affected by these cases: they might have to pay for the harm they caused but damage to their reputation and emotional costs are also part of the story. Medical malpractice can be very hard to assess due to problems of causation. We cannot go back in time, provide a different medical treatment to the patient and see the final outcome. When patients search for medical care, they are already sick in the first place. Therefore, the result of the treatment could be due to the poor medical condition and not because of negligence.

Different legal systems have diverse rules regarding medical practice, which means that they can provide different incentives to physicians. What Law and Economics tell us in general is that legal rules should provide incentives to invest in optimal levels of care in order to prevent damage. Moreover, legal rules should take into consideration that medical care provides positive externalities to the society[1] and that no matter how much doctors invest in expertise, they will never be able to eliminate the probability of incurring in a medical error.[2] Arlen (forthcoming) argues that, "*in order to determine the proper scope of liability, we need a model of malpractice that recognizes that medical providers can err accidentally because they misdiagnose patients, accidentally select the wrong treatment, or err in providing the treatment*". The optimal level of care will determine if the doctor was negligent or not.

When a doctor acts negligently, the tort system should be able to compensate patients in a consistent way. A difficult task is to compute the fair level of compensation

[1] Cooter and Porat (2006).

[2] Arlen and MacLeod (2005).

that patients should receive, or the full level of compensation, an argument we did not cover in the current work. However, for the sake of equity and fairness, patients suffering similar levels of harm should receive equivalent amounts of compensation. This is something that society should expect and request from the legal system. As we saw in the Spanish case, medical liability rules are based on fault. If a patient receives substandard level of care and harm materializes, he is entitled to receive compensation. Moreover, the burden of proof is, in the vast majority of cases, on the patient side (exceptions are essentially related to uninformed consent). The organization of the Spanish National Health Care system allows patients to search for medical treatment in public hospitals. Moreover, the Social Security is important if a loss of income resulted from the medical accident. As we tried to explain previously, this is a much different setting than the American one. Moreover, and precisely because of that, we should see less dispersion in awards that courts attribute to patients, after controlling for the level of harm.

Empirical Law and Economics has been developing quickly during the last years, although "*the field of empirical health law (EHL) is still in its adolescence*".[3] Especially in Europe, some of the topics have been much less empirically developed than in the U.S., and this is particularly true for the literature on medical malpractice. In this work we have tried to fill an existing gap in this literature using as a case study two European countries: Spain and Italy. This analysis is interesting given the heterogeneity of systems that we can find and that have not been exhaustively studied yet. In order to do so, we built two different datasets. The Spanish Supreme Court Medical Malpractice Dataset (SSCMMD) is a valuable one, in the sense that it provides a detailed description on several variables of interest, generally hard to combine in one dataset. In order to build this database, reading Supreme Court decisions (sometimes together with lower court decisions) was needed. As unit of analysis we have the entire set of cases that arrived to the Spanish Supreme Court from 2006 until 2009. This allows including cases in which the medical accident took place all over the country. As explained previously, the important feature of the Spanish Supreme Court is the obligation to come out with a decision for each and every appealed case. The Italian Public Health Care Providers Dataset (IPHCPD) includes data for public health care units in Italy, from 2001 until 2008 (the last available year in September 2011). We can assess how much hospitals are spending over time for insurance and legal expenditures, together with other important financial and economic variables. This dataset is also valuable as it puts together Italian public health care providers from the entire country, instead of

[3] Mello and Zeiler (2008), p. 651.

focusing in a few regions only. As mentioned, the dataset and methodologies that we use have some important limitations and challenges, which we explain in more detail in the different chapters. However, these limitations are not specific to our work, and can be a reflection of the adolescence period of Empirical Health Law and Economics.[4]

Given the nature of medical malpractice, the government might be called to act due to pressures from citizens that require better health care and safety or physicians and insurance companies that claim that the legal system is too harsh on them. In addition, and particularly in Europe, taxpayers might exercise some pressure since they have to pay not only for health services but also for compensation to victims of medical malpractice in public hospitals. In order to understand the severity of this problem, we must remember that the vast majority of patients search for medical treatment in public hospitals (again, very different than the American case). Recent decades are rich in tort reforms that have been implemented in several American states, with caps on non-economic damages being the most popular one. The European Commission recently adopted some measures concerning patient safety. Policy makers should take into consideration possible unexpected effects of proposed or enacted laws. Empirical works can be a powerful tool to investigate impacts of laws before enacting them. We believe several lessons can be taken from this work, which we now try to sum up.

- We do not find strong reasons to have different courts and jurisdictions judging similar medical mishaps when the only difference between them is the place of the medical accident, *i.e.*, a public or private hospital. This situation creates unpredictability in a final outcome which is already unpredictable *per se*. Moreover, if the argument that supports the existence of administrative courts is the specificity of administrative law, this argument does not hold in medical accidents. Additionally, this separation between regular and administrative courts makes capture by the State or special interests easier, which brings costs to the system, as mentioned by Dari-Mattiacci et al. (2010).

- Courts should be consistent when setting damages. Medical malpractice is a very complex problem. As we saw in Chapter 3, vertical inequity in terms of payouts according to the level of harm should be expected, and it is reasonable to be so. What is not reasonable is to find horizontal inequity with respect to payouts, *i.e.*, similar patients that suffer identical severity injuries being compensated differently. Adding the fact that courts opt for different ways when setting awards, brings more unpredictability.

[4] Mello and Zeiler (2008) refer to this problem as well while characterizing the U.S.

- The legal system should make clear what the aim of the tort system is. Is it to compensate everyone who suffered harm (independently of fault), or to compensate victims of negligence? Is it to punish negligent doctors? This is inter-related with the way the health system and social security function (if the health system provides medical treatment to patients even after being injured and social security pays to the victim the corresponding loss of income, then the tort system should only compensate negligently injured patients). For instance, one recurrent debate has to do with a change to a no-fault system. According to this system, injured patients are allowed to receive compensation, independently of the evidence of negligence.[5] We are skeptical of this regime, especially if we consider, for instance, the Spanish or the Italian case. In the end, this is not a substitute for the tort system: this is essentially an administrative system with no involvement from courts. A strong drawback of this system is that negligent doctors will not bear any of the consequences of the harm they caused. Moreover, under this system more patients are expected to be compensated but they will not be necessarily better compensated: the amounts of compensation tend to be lower. Supporters of this system frequently claim that it allows for savings because it is not necessary to assess negligence and courts are not involved. However, evidence has shown (as reported in Chapter 1) that the increase in the number of accidents and the extra number of people searching for compensation might outweigh the savings with litigation. Additionally, it is not true that all harmed patients are compensated, *i.e.*, that suffering medical harm is a necessary and sufficient condition to receive compensation. In fact, when we look at the Supreme Court's decisions, a significant part of cases involving death or permanent major injury did not receive compensation. Precisely because of this, it is necessary to know the objective of the system. One argument that can be brought to the debate is that injured patients need money for their medical expenses and income losses. True, they do. But if there is a national health care system and social security, the main objective of the tort system is precisely to punish the wrongdoers and try to compensate patients negligently injured.

  To sum up, we believe that the current liability system based on fault is far from being perfect in performing its aims of deterrence and compensation. Nevertheless, some improvements can be made before jumping to other types of regimes that also present evidence to be expensive, that do not provide clear evidence of

[5] See Shavell 1978.

giving incentives for physicians[6] to provide a high quality of care and that will probably not be able to compensate efficiently some of the patients. Physicians should obviously be involved in the debate, given that they are the agents with more information and in a better position to suggest improvements. Empirical studies, even with some limitations, can be a powerful tool to enrich the debate and can contribute to a better health care service.

- Governments should make an effort to collect more information before starting enacting legal reforms. As literature has shown, the results are complex and might have unintended consequences.[7] Scholars do not have the ability of requiring data to be collected. Moreover, given the delicate nature of the information involved, even if the data exist already it is natural to find some resistance in making them available, even if scholars are willing to make a compromise of not disclosing it.

- Interdisciplinary works are particularly important to study medical malpractice. Health practitioners with a medical background have a practical understanding of negligent medical treatment; legal scholars are proficient in understanding the legal system and legal rules; economists have the expertise of assessing the impact of rules on agents' incentives and behavior; methodologists[8] master techniques to estimate the effects of laws. All of them are important if we want to fully understand legal medicine problems.

- Empirical health studies can benefit future patients by improving their safety. "*To err is human*",[9] but doctors should take into account that when they err, the consequences can be devastating, as they have effects on human life. Precisely because of that, it should not be surprising that "*to sue is human*"[10] as well. As

[6] For example, Klick and Stratmann (2005) estimate that although some reforms increase the access to health care, collateral source reform (that allowed "*offsetting the damages owed by the tortfeasor by any amount for which the victim has already been compensated or will be compensated for by an alternate insurer*") lead to a statistically significant increase in infant mortality rates in the black community they studied.

[7] Klick and Stratmann (2007) provide a good example.

[8] This expression is used to refer to experts on methods used in empirical studies. Mello and Zeiler (2008) list some of the most common methodologies (some more rigorous than others) in EHL, namely: case studies, qualitative analysis of judicial opinions, collection of survey and interview data, univariate analysis, bivariate analysis, and controlled observational or quasi-experimental studies using multivariate regression techniques. See pp. 657-660.

[9] Kohn et al. (2000).

[10] Zeiler et al. (forthcoming).

empirical evidence suggests, it seems that the main problem is not that patients are suing too much: it seems that there are too many patients being injured, with high severity levels of harm. Fortunately, medicine evolves and there are positive experiences. For instance, the American Society of Anesthesiologists' initiative[11] is a good example of how to improve patient safety (moreover, with a reduction in premiums paid by anesthesiologists).

- Eventually, having a specific law to regulate the physician-patient relationship could bring some benefits, at least when we have in mind the case of Spain and Italy. The current state of the art might bring several uncertainties to patients. To start with, there is a distinction between public and private medical providers which implies that patients should follow different procedures in case they want to fill a claim. Moreover, the distinction between contract and tort law is not always clear.[12] For instance, in Spain, regulations point to contract law in case of a medical accident for voluntary medicine. However, case law shows that courts follow tort law when judging medical cases. In Italy, pursuing a criminal claim against the doctor is free to the claimant, and "*the state bears all the expense of evidence gathering and prosecution*".[13] The easiness of suing doctors under criminal law makes this the European country with the highest number of physicians subject to criminal proceedings.[14]

- For sure several other policies could be easily implemented. For that to be possible, expertise from those who work every day in hospitals is crucial. Therefore, they should be involved in the process, together with legal scholars and methodologists.

Future Research

In this work, we add to the literature on Empirical Law and Economics, especially to the field of medical malpractice. A lot of work is still to be done, though. Having more data available would make the task easier. For instance, even if we focus on Supreme Court decisions, a first obstacle is to find all the decisions available and not a subsample of them, as it would imply a biased sample. Spanish Supreme Court's

[11] The American Society of Anesthesiologists (ASA) Closed Claims Project started in 1985 by collecting information on closed insurance claims due to anesthesia mishaps. The causes of anesthesia injury were subsequently analyzed and changes in procedures were made in order to improve patients' safety.

[12] Cristas and Garoupa (2009).

[13] Jourdan et al. (2000), p. 1268.

[14] Traina (2009), pp. 437-438.

decisions are available to the general public, although they are not categorized by type of case. Other countries do not make courts' decisions public , which means that any sort of analysis is biased, unless the decisions available are a random sample of all court decisions (generally, they are not). Making a comparative analysis of Supreme Court decisions in other civil law countries would be interesting.

Spain enacted a reform in 1998 / 1999 which makes it clear that plaintiffs can no longer opt for the civil jurisdiction in case of medical accidents in public hospitals. One main motivation for this reform had to do with delays in the legal system. It would be important to assess if this reform brought the desired outcomes, but for that we would need to extent the Spanish Supreme Court Dataset.

Civil law tradition countries, especially those with a national health system, show some similarities: generally there is no law regulating the physician-patient relationship; there is a distinction between administrative and civil jurisdictions that plaintiffs should follow in case of medical harm; public hospitals tend to be vicariously liable for their employees. Still, they present important differences. One future line of research could be to assess the implications of the easiness of pursuing criminal claims against doctors in Italy.

Empirical studies in the medical malpractice field are underdeveloped in Europe. This implies that there is room for many studies. We still lack studies on:

- Costs of medical accidents: for each euro amount spent in litigation, how much goes to patients, and how much is for administrative costs? What is the cost of medical injuries for the public health system that must provide additional care, for patients and their families (loss of income, pain and suffering, loss of enjoyment of life), for doctors (reputation, emotional costs)? Are doctors adopting defensive medicine procedures?
- Role of medical experts when they must testify in court
- Law and Medicine: Medical Malpractice in mandatory intervention (births), semi-mandatory or high value (saving lives or curing cancer) and totally voluntary (plastic surgery)
- Role of insurance

It seems a sick joke that so many people die or become physically impaired due to medical mishaps nowadays. It is imperative that efforts are done in order to improve patients' safety. This is naturally a joint effort between medical practitioners, legal scholars, economists, methodologists and policy makers. Empirical analysis can be a powerful tool.

Bibliography

Abel, R. (2006). General Damages Are Incoherent, Incalculable, Incommensurable, and Inegalitarian (But Otherwise a Great Idea), *DePaul Law Review* **55 (2)**: 253–330.

Acemoglu, D., Cantoni, D., Johnson, S. and Robinson, J. (2011). The Consequences of Radical Reform: The French Revolution, *The American Economic Review* .

AGCM (1997). Affidamento dei servizi assicurativi da parte degli enti pubblic, *Technical report*, Autorità Garante per la Concorrenza e il Mercato, AS107, Rome.

AGCM (2009). Affidamento del servizio di brokeraggio assicurativo da parte delle pubbliche amministrazioni, *AS623 Bollettino 40*, Autorità Garante per la Concorrenza e il Mercato.

AGENAS (2009). Rapporto sull'indagine relativa ai sistemi regionali di gestioni sinistri, *Agenzia Nazionale per i Servizi Sanitari Regionali* .

AMA (2011). Medical Liability Reform-NOW!, *Technical report*, American Medical Association.

Amaral-Garcia, S. and Grembi, V. (2011a). *Le responsabilità nei servizi sanitari - Profili Giuridici, Economici, Clinici e Comparatistici*, Zanichelli Editore, chapter Economia della Malpractice Medica: Elementi Teorici ed Evidenze Empiriche.

Amaral-Garcia, S. and Grembi, V. (2011b). Curb Your Premium! Evaluating State Intervention in Medical Malpractice Insurance, *Working Paper* .

Anderson, R. (1999). An "Epidemic" of Medical Malpractice? A Commentary on the Harvard Medical Practice Study, *Civil Justice Memo* .

Anessi Pessina, E. (2011). Mobilità e contabilità economica, *Convegno di primavera AIES* .

Anessi Pessina, E. and Cantù, E. (eds) (2004). *L'aziendalizzazione della sanità in Italia: Rapporto OASI 2004*, CERGAS.

Anessi Pessina, E., Cantù, E. and Jommi, C. (2004). Phasing Out Market Mechanisms in the Italian National Health Service, *Public Money and Management* **24**: 309–316.

Angrist, J. D. and Pischke, J.-S. (2009). *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press.

ANIA (2008). Tutti i numeri del contenzioso medico-legale, *Technical report*, Associazione Nazionale fra le Imprese Assicuratrici.

ANIA (2010). L' assicurazione italiana 2009/2010, *Technical report*, Assicurazione Nazionale fra le Imprese Assicuratrici.

Aranaz-Andres, J. M., Aibar-Remón, C., Vitaller-Murillo, J., Ruiz-López, P., Limón-Ramirez, R. and Terol-Garcia, E. (2008). Incidence of adverse events related to health care in Spain: results of the Spanish National Study of Adverse Events, *Journal of Epidemiology and Community Health* **62**: 1022–1029.

Arlen, J. (1985). An Economic Analysis of Tort Damages for Wrongful Death, *New York University Law Review* **60 (6)**: 1113–1136.

Arlen, J. (2000). *Encyclopedia of Law and Economics*, Edward Elgar, chapter Tort Damages, pp. 682–734.

Arlen, J. (forthcoming). *Reality Check: How Medical Facts Changed Malpractice Liability Theory*.

Arlen, J. and MacLeod, W. B. (2003). Malpractice Liability for Physicians and Managed Care Organizations, *New York University Law Review* **78(6)**: 1929–2006.

Arlen, J. and MacLeod, W. B. (2005). Beyond Master-Servant: A Critique of Vicarious Liability, *New York University Law and Economics Working Papers* **Paper 1**.

Armeni, P. (2010). *L'aziendalizzazione della Sanita in Italia: Raporto OASI 2010*, CERGAS, chapter La spesa sanitaria: composizione ed evoluzione.

Arrow, K. J. and Lind, R. C. (1970). Uncertainty and the Evaluation of Public Investment Decisions, *The American Economic Review* **60**(3): 364–378.

ASSR (2007). La promozione dell'Innovazione e la gestione del rischio, *Technical report*, Agenzia per i Servizi Sanitari Regionali.

Autor, D. H., Donohue III, J. and Schwab, S. (2006). The Costs of Wrongful-Discharge Laws, *The Review of Economics and Statistics* **88(2)**: 211–231.

Avraham, R. (2010). Database of State Tort Law Reforms (DSTLR 3rd), *Northwestern Law & Econ Research Paper No. 06-08; U. of Texas Law, Law and Econ Research Paper No. 184* .

Azagra-Malo, A. and Gili Saldaña, M. (2006). Ruleta Indemnizatoria y Tutela Judicial Efectiva, *InDret* .

Baicker, K. and Chandra, A. (2005). Defensive Medicine and Disappearing Doctors?, *Regulation* **28(3)**: 24–31.

Baicker, K., Fisher, E. S. and Chandra, A. (2007). Malpractice liability costs and the practice of medicine in the Medicare program, *Health Affairs* **26(3)**: 841–852.

Baker, G. R. (2004a). Commentary - Harvard Medical Practice Study, *Quality & Safety in Health Care* **13(2)**: 151–152.

Baker, G. R., Norton, P. G., Flintoft, V., Blais, R., Brown, A., Cox, J., Etchells, E., Ghali, W. A., Hébert, P., Majumdar, S. R., O´Beirne, M., Palacios-Derflingher, L., Reid, R. J., Sheps, S. and Tamblyn, R. (2004). The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada, *Canadian Medical Association Journal* **170(11)**: 1678–1686.

Baker, T. (2004b). Insuring Liability Risks, *Geneva Papers on Risk and Insurance* **29 (1)**: 127–149.

Baker, T. (2005a). The Medical Malpractice Myth, *Chicago: University of Chicago Press* .

Baker, T. (2005b). Reconsidering the Harvard Medical Practice Study Conclusions About the Validity of Medical Malpractice Claims, *Journal of Law, Medicine & Ethics* **33**: 501–514.

Baker, T. (2005c). Medical Malpractice and the Insurance Underwriting Cycle, *University of Connecticut School of Law Articles and Working Papers* **26**.

Baldwin, L.-M., Hart, G., Lloyd, M., Fordyce, M. and Rosenblatt, R. A. (1995). Defensive Medicine and Obstetrics, *Journal of the American Medical Association* **274(20)**: 1606–1610.

Ben-Shahar, O. (2009). *Tort Law and Economics, Encyclopedia of Law and Economics*, Vol. 1, second edn, Edward Elgar, chapter Causation and Foreseeability, pp. 83–108.

Bertrand, M., Duflo, E. and Mullainathan, S. (2004). How Much Should We Trust Differences-in-Differences Estimates?, *Quarterly Journal of Economics* **119**: 249–275.

Black, B., Hyman, D., Silver, C. and Sage, W. (2005). Stability, Not Crisis: Medical Malpractice Claim Outcomes in Texas, 1988-2002, *Journal of Empirical Legal Studies* **2(2)**: 207–259.

Black, B., Hyman, D., Silver, C. and Sage, W. (2008). Defense Costs and Insurer Reserves in Medical Malpractice and Other Personal Injury Cases: Evidence from Texas, 1988-2004, *American Law and Economics Review* pp. 185–245.

Bordignon, M. and Turati, G. (2009). Bailing out expectations and public health expenditure, *Journal of Health Economics* **28(2)**: 305–321.

Bovbjerg, R. R., Sloan, F. A. and Blumstein, J. F. (1989). Valuing Life and Limb in Tort: Scheduling Pain and Suffering, *Northwestern University Law Review* **83 (4)**: 908.

Bovbjerg, R. R., Sloan, F. A. and Rankin, P. J. (1997). Administrative performance of 'no-fault' compensation for medical injury, *Law and Contemporary Problems* **60**: 71–115.

Brahams, D. (1988). No Fault Compensation Finnish Style, *The Lancet* **332**: 733–736.

Brennan, T. A., Leape, L. L., Laird, N., Lawthers, A. G., Localio, A. R., Barnes, B. A., Hebert, L., Newhouse, J. P., Weiler, P. C. and Hiatt, H. (1991b). The nature of adverse events in hospitalized patients: results of the Harvard Medical Practice Study II, *New England Journal of Medicine* **324(6)**: 377–384.

Brennan, T. A., Leape, L. L., Laird, N. M., Hebert, L., Localio, A. R., Lawthers, A. G., Newhouse, J. P., Weiler, P. C. and Hiatt, H. H. (1991a). Incidence of Adverse Events and Negligence in Hospitalized Patients: Results of the Harvard Medical Practice Study I, *New England Journal of Medicine* **324(6)**: 370–376.

Brennan, T., Sox, C. and Burstin, H. (1996). Relation between negligent adverse events and the outcomes of medical malpractice litigation, *New England Journal of Medicine* **335(26)**: 1963–1967.

Browne, M. J. and Puelz, R. (1999). The Effect of Legal Rules on the Value of Economic and Non-Economic Damages and the Decision to File, *Journal of Risk and Uncertainty* **18 (2)**: 189–213.

Buchanan, J. M. and Faith, R. L. (1979). Trying again to value a life, *Journal of Public Economics* **12(2)**: 245–248.

Buzzacchi, L. and Gracis, C. (2008). Meccanismi allocativi per il rischio sanitario nelle Aziende Sanitarie pubbliche italiane, *Mecosan* **66**: 105–125.

Buzzacchi, L. and Turati, G. (2008). Precautionary Investments and Vertical Externalities: the Role of Private Insurers in the Intergovernamental Relations, *Carefin Working Paper* **4**.

Calciolari, S., Cantù, E. and Fattore, G. (2011). Performance management and goal ambiguity: Managerial implications in a single payer system, *Health Care Management Review* **36(2)**: 164–174.

Cameron, A. C. and Trivedi, P. K. (2010). *Microeconometrics Using Stata (Revised Edition)*, Stata Press.

Cameron, C, A. and Trivedi, P. K. (2005). *Microeconometrics - Methods and Applications*, Cambridge, University Press.

Carbone, C., Ferré, F. and Liotta, A. (2010). *L'aziendalizzazione della sanità in Italia: Rapporto OASI 2010* , CERGAS, chapter La Struttura del SSN in Rapporto.

CERGAS-Bocconi (2008). Osservatorio sulla Funzionalità delle Aziende Sanitarie Italiane, *Rapporto* .

Cheney, F. (1999). The American Society of Anesthesiologists Closed Claims Project: What Have We Learned, How Has It Affected Practice, and How Will It Affect Practice in the Future?, *Anesthesiology* **91**: 552–556.

Cheney, F. W., Posner, K., Caplan, R. A. and Ward, R. J. (1989). Standard of care and anesthesia liability, *Journal of the American Medical Association* **261(11)**: 1599–1603.

Clermont, K. M. and Eisenberg, T. (1992). Trial by Jury or Judge: Transcending Empiricism, *Cornell Law Review* **77**: 1124–1151.

Clermont, K. M. and Eisenberg, T. (1998). Do Case Outcomes Really Reveal Anything About the Legal System? Win Rates and Removal Jurisdiction, *Cornel Law Review* **83**: 581–607.

Clermont, K. M. and Eisenberg, T. (1999). Appeal from Jury or Judge Trial: Defendants' Advantage, *SSRN* .

Coderch, P. S., Gonzalez, S. R., Yerga, A. L., Garcia, J. A. R., Alvarez, V. S., Saldana, A. G. and Crende, A. F. (2006). El Derecho Español de Daños en 2005, *Global Jurist Topics* **6(1)**: 1.

Cohen, D., Chan, S. B. and Dorfman, M. (2009). Malpractice Claims on Emergency Physicians: Time and Money, *Journal of Emergency Medicine XXX* .

Comandé, G. and Turchetti, G. (2004). La responsabilità sanitaria tra valutazione del rischio e assicurazzione.

Conferenza permanente per i rapporti tra lo stato, le regioni e le province autonome di Trento e Bolzano (2008). *Technical report*, Atto n 116 del 20 marzo 2008.

Cook, P. J. and Graham, D. A. (1977). The Demand for Insurance and Protection: The Case of Irreplaceable Commodities, *The Quarterly Journal of Economics* **91(1)**: 143–156.

Cooter, R. D. (1991). Economic Theories of Legal Liability, *The Journal of Economic Perspectives* **5**(3): 11–30.

Cooter, R. and Porat, A. (2006). Liability Externalities and Mandatory Choices: Should Doctors Pay Less?, *Journal of Tort Law* **1 (1)**.

Coviello, D. and Gagliarducci, S. (2010). Tenure in Office and Public Procurement, *CEIS Working Paper* **179**.

Cristas, A. and Garoupa, N. (2009). *Economic Analysis of the DCFR*, Sellier: European Law Publishers, chapter On the Boundary between Torts and Contracts: An Economic View.

Currie, J. and MacLeod, W. B. (2008). First Do No Harm? Tort Reform and Birth Outcomes, *Quarterly Journal of Economics* **123(2)**: 795–830.

Danzon, P. (1982). The Frequency and Severity of Medical Malpractice Claims: New Evidence, *RAND, The Institute for Civil Justice* .

Danzon, P. (1986). The Frequency And Severity Of Medical Malpractice Claims, *Law and Contemporary Problems* **49 (2)**: 57–84.

Danzon, P. (1994a). Tort reform: the case of medical malpractice, *Oxford Review of Economic Policy* **10**: 84(15).

Danzon, P. (1994b). The Swedish Patient Compensation Regime: Lessons for the United States, *Journal of Legal Medicine* **15**: 199–247.

Danzon, P., Epstein, A. J. and Johnson, S. J. (2004). *Brookings-Wharton Papers on Financial Services*, Washington, DC: Brookings Institution Press, chapter The Crisis in Medical Malpractice Insurance, pp. 55–96.

Danzon, P. and Lillard, L. (1983). Settlement out of Court: The Disposition of Medical Malpractice Claims, *Journal of Legal Studies* **12**: 345–378.

Danzon, P. M. (1985). *Medical Malpractice: Theory, Evidence and Public Policy*, Harvard University Press.

Danzon, P. M. (1991). Liability for Medical Malpractice, *The Journal of Economic Perspectives* **5**(3): 51–69.

Danzon, P. M. (2000). Liability for Medical Malpractice, *Chapter 26 of J. Newhouse and A. Culyer (eds.), Handbook of Health Economics, Elsevier* **1**: 1339–1404.

Danzon, P. and Towse, A. (1999). Medical negligence and the NHS: an economic analysis, *Health Economics* **8**: 93–101.

Dari-Mattiacci, G., Garoupa, N. M. and Gómez-Pomar, F. (2010). State Liability, *European Review of Private Law* **18 (4)**. Amsterdam Center for Law & Economics Working Paper No. 2010-01; U. Illinois Law & Economics Research Paper No. LE10-005.

Davies, J., Posner, K. L., Lee, L., Cheney, F. W. and Domino, K. B. (2009). Liability Associated with Obstetric Anesthesia - A Closed Claims Analysis, *Anesthesiology* **110(1)**: 131–139.

Davis, P., Lay-Yee, R., Schug, S., Briant, R., Scott, A., Johnson, S. and Bingley, W. (2001). Adverse events regional feasibility study: indicative findings, *New Zealand Medical Journal* **114(1131)**: 203–205.

Davis, P., Lay-Yee, R., Schug, S., Briant, R., Scott, A., Johnson, S. and Bingley, W. (2001b). Adverse events regional feasibility study: methodological results, *New Zealand Medical Journal* **114(1131)**: 200–202.

Delibera n 116 del 20 marzo 2008 (2008). Conferenza Stato - Regioni.

DGS (2010). Mappatura del rischio del Sistema Sanitario Regionale, *Technical report*, Direzione Generale Sanita Regione Lombardia.

Domino, K. B., Posner, K., Caplan, R. and Cheney, F. (1999). Awareness during Anesthesia: a closed claim analysis, *Anesthesiology* **90(4)**: 1053–1061.

Dranove, D. and Gron, A. (2005). Effects of the Malpractice Crisis on Access to and Incidence of High-Risk Procedures: Evidence from Florida, *Health Affairs* **24(3)**: 802–810.

Dranove, D. and Wanabe, Y. (2010). Influence and Deterrence: How Obstetricians Respond to Litigation against Themselves and Their Colleagues, *American Law and Economics Review* **12(1)**: 69:94.

Dubay, L., Kaestner, R. and Waidmann, T. (2001). Medical malpractice liability and its effect on access to obstetrical care and infant health, *Journal of Health Economics* **20(4)**: 591–611.

Dulleck, U. and Kerschbamer, R. (2006). On Doctors, Mechanics, and Computer Specialists: The Economics of Credence Goods, *Journal of Economic Literature* **44(1)**: 5–42.

Durrance, C. P. (2010). Noneconomic Damage Caps and Medical Malpractice Claim Frequency: A Policy Endogeneity Approach, *Journal of Law, Economics and Organization* **26 (3)**: 569–591.

Dute, J., Faure, M. and Koziol, H. (eds) (2004). *No-Fault Compensation in the Health Care Sector,* Tort and Insurance Law 8, ECTIL, SpringerWienNewYork.

EC (2007a). Study on the Transparency of Costs of Civil Judicial Proceedings in the European Union - Country Report Spain (Annex 48), European Commission.

EC (2007b). Study on the Transparency of Costs of Civil Judicial Proceedings in the European Union - Final Report, European Commission.

Eisenberg, T. and Heise, M. (2009). Plaintiphobia in State Courts? An Empirical Study of State Court Trials on Appeal, *Journal of Legal Studies* **38 (1)**: 121–155.

Eisenberg, T., Wells, M. T. and Zhang, M. (2009). Regression Models for Trial Outcome Data with a Large Proportion of Zeroes, *Presented at CELS* .

Encinosa, W. E. and Hellinger, F. J. (2005). Have State Caps On Malpractice Awards Increased The Supply Of Physicians?, *Health Affairs* pp. W5 (250–258).

EOHCS (2001). *Health Care Systems in Transition: Italy*, European Observatory on Health Care Systems.

Essinger, K. (2009). The Swedish Medical Injury Insurance, LOF.

Fabbri, D. and Robone, S. (2010). The Geography of Hospital Admission in a National Health Service with Patient Choice, *Health Economics* **19**: 1029–1047.

Farber, H. S. and White, M. J. (1991). Medical Malpractice: An Empirical Examination of the Litigation Process, *The RAND Journal of Economics* **22**(2): 199–217.

Farber, H. S. and White, M. J. (1994). A Comparison of Formal and Informal Dispute Resolution in Medical Malpractice, *Journal of Legal Studies* **23(2)**: 777–806.

Fattore, G. (1999). *Health Care and Cost Containment in the European Union*, Aldershot: Ashgate, chapter Cost-containment and reforms in the Italian National Health Service, pp. 513–546.

Faure, M. G. (2006). Economic Criteria for Compulsory Insurance, *The Geneva Papers* **31**: 149–168.

Faure, M. and Verhulsdonck, A. (2004). *No-Fault Compensation in the Health Care Sector*, Vol. Tort and Insurance Law, ECTIL, SpringerWienNewYork, chapter Economic Observations Concerning Optimal Prevention and Compensation of Damage Caused by Medical Malpractice.

Fenn, P. (2002). Counting the cost of medical negligence, *British Medical Journal* **325**: 233–234.

Fenn, P., Diacon, S., Gray, A., Hodges, R. and Rickman, N. (2000). Current costs of medical negligence in NHS hospitals: analysis of claims database, *BMJ* **320**: 1567–1571.

Fenn, P., Gray, A. and Rickman, N. (2004). The Econonomics of Clinical Negligence Reform in England, *The Economic Journal* **114**: F272–F292.

Fenn, P., Gray, A., Rickman, N., Vencappa, D., Rivero, O. and Lotti, E. (19th February 2007). The impact of risk management standards on the frequency of MRSA infections in NHS hospitals.

Fenn, P., Gray, A., Rickman, N., Vencappa, D., Rivero, O. and Lotti, E. (2010). Enterprise Liability, Risk Pooling, and Diagnostic Care, *Journal of Public Administration Research and Theory* **20**: i225–i242.

Fenn, P., Hermans, D. and Dingwall, R. (1994). Estimating the Cost of Compensating Victims of Medical Negligence, *British Medical Journal* **309**: 389–391.

Fenn, P. and Rickman, N. (2001). Clinical Negligence in the UK - Throwing the Baby Out With The Bath Water?, *Economic Affairs* **21(4)**: 19–23.

Fenn, P. and Rickman, N. (2005). Legal Liability and the Timing of Settlement in Medical Malpractice, *American Law and Economics Association Annual Meetings* **44**.

Fenn, P., Rickman, N. and Gray, A. (2007). Liability, insurance and medical malpractice, *Journal of Health Economics* **26**: 1057–1070.

Fiorentini, G., Lippi Bruni, M. and Ugolini, C. (2008). Health Systems and Health Reforms in Europe: the Case of Italy, *Intereconomics* pp. 205–212.

Forti, G., Catino, M., D'Alessandro, F., Mazzucato, C. and Varraso, G. (2010). Il problema della medicina difensiva - Una proposta di riforma in materia di responsabilità penale nell'ambito dell'activita sanitaria e gestione del contenzioso legato al rischio clinico, *Centro Studio Federico Stella* .

France, G. and Taroni, F. (2005). The Evolution of Health-Policy Making in Italy, *Journal of Health Politics, Policy and Law* **30 (1-2)**: 169–187.

France, G., Taroni, F. and Donatini, A. (2005). The Italian health-care system, *Health Economics* **14**: S187–S202.

Franzoni, M. (ed.) (2011). *Le responsabilità nei servizi sanitari*, Zanichelli Editore.

Freeman, A. D. and Freeman, J. M. (1989). No-Fault Cerebral Palsy Insurance: An Alternative to the Obstetrical Malpractice Lottery, *Journal of Health Politics, Policy and Law* **14(4)**: 707–718.

Friedman, D. (1982). What is 'Fair Compensation» for Death or Injury?', *International Review of Law and Economics* **2**: 81–93.

GAO (2003a). Medical Malpractice. Multiple Factors Have Contributed to Increased Premium Rates, *Technical report*, GAO-03-702, Washington, DC, US Government Printing Office.

GAO (2003b). Medical Malpractice. Implications of Rising Premiums on Access to Health Care, *Technical report*, GAO-03-836 Washington, DC, US Government Printing Office.

GAO (2003c). Medical Malpractice Insurance. Multiple Factors Have Contributed to Premium Rate Increases Testimony before the Subcommittee on Wellness and Human Rights, *Technical report*, GAO, Washington DC, US Government Printing Office.

Garoupa, N. M. (2004). Regulation of Professions in the US and Europe: A Comparative Analysis.

Garoupa, N. M. (2010). *Handbook of Regulation*, Edward Elgar, chapter Regulation of Professions.

Garoupa, N. M., Gili Saldana, M. and Gómez-Pomar, F. (2011). Political Influence and Career Judges: An Empirical Analysis of Administrative Review by the Spanish Supreme Court, *SSRN* **(July 2)**.

Gertner, R. (1993). Asymmetric Information, Uncertainty, and Selection Bias in Litigation, *University of Chicago Law School Roundtable* **1**: 75–94.

Giunta, P. and Stiari, A. (2008). Le strategie per il 2009/2010 della regione Piemonte per la gestione del programma assicurativo, **dicembre**.

Gómez-Pomar, F. (2001). Carga de la prueba y responsabilidad objetiva, *InDret* **01**.

Gómez-Pomar, F. and Sánchez Álvarez, V. (2006). El Problema de la Responsabilidad de las Administraciones Públicas en Derecho Español: la visión del análisis económico de derecho, *Sub Judice* **34**: 27–47.

Grembi, V. and Garoupa, N. M. (2010). Medical Malpractice in Civil Law: Some Evidence from the Italian Court of Cassation, *WP* .

Hagihara, A., Nishi, M. and Nobutomo, K. (2003). Standard of care and liability in medical malpractice litigation in Japan, *Health Policy* **65(2)**: 119–127.

Harrington, S. E., Danzon, P. and Epstein, A. (2008). Crises' in medical malpractice insurance: evidence of excessive price-cutting in the preceding soft market, *Journal of Banking and Finance* **32**: 157–169.

Heckman, J. J. (1979). Sample Selection Bias as a Specification Error, *Econometrica* **47**(1): 153–161.

Helland, E. and Showalter, M. (2006). The Impact of Liability on the Physician Labor Market, *Working Paper WR-384-ICJ, RAND Institute for Civil Justice* .

Herzog, P. and Karlen, D. (1982). *Civil Procedure* , International Encyclopedia of Comparative Law, chapter Attacks on Judicial Decisions.

HMPS (1990). Harvard Medical Practice Study - Patients, Doctors and Lawyers: Medical Injury and Patient Compensation in New York - The Report of the Harvard Medical Practice Study on the State of New York.

HOPE (2004). *Hospitals of the European Union. Insurance and Malpractice*.

Hughes, J. W. and Snyder, E. A. (1989). Policy Analysis of Medical Malpractice Reforms: What Can We Learn from Claims Data?, *Journal of Business & Economic Statistics* **7 (4)**: 423–431.

Hylton, K. and Lin, H. (2009). *Encyclopedia of Law and Economics*, Vol. X: Procedural Law and Economics, Edward Elgar Publishing, chapter Trial Selection Theory and Evidence: a Review.

Hylton, K. and Lin, H. (2010). Trial Selection Theory: A Unified Model, *Boston University School of Law Working Paper* **10-12**.

Hyman, D. (2002). Medical Malpractice and the Tort System: What Do We Know and What (If Anything) Should We Do About It?, *Texas Law Review* **80**: 1639–165, republished in 1 ICFAI J. Healthcare L. 33.

Hyman, D., Black, B., Zeiler, K., Silver, C. and Sage, W. (2007). Do Defendants Pay What Juries Award? Post-Verdict Haircuts in Texas Medical Malpractice Cases, 1988-2003, *Journal of Empirical Legal Studies* **4(1)**: 3–68.

Hyman, D. and Silver, C. (2006). Medical Malpractice Litigation and Tort Reform: Its the Incentives, Stupid, *Vanderbilt Law Review* **59(4)**: 1085–1136.

IRER (2008). Risk management in sanità: strategie, modelli di attuazione, analisi comparata fra alcune regioni italiane e stati europei. L'integrazione con i sistemi di valutazione della qualità, *Technical report*, Istituto Regionale di Ricerca della Lombardia, Milano.

ISTAT (2009). Conti Economici Regionali. Statistiche 1995-2008, *Italian National Institute of Statistics* .

Izzo, U. (2003). La responsabilità medica, verso un modello alternativo di risoluzione delle controversie.

Jommi, C., Cantù, E. and Anessi-Pessina, E. (2001). New funding arrangements in the Italian National Health Service, *International Journal of Health Planning and Management* **16(4)**: 347–368.

Jourdan, S., Rossi, M. L. and Goulding, J. (2000). Italy: medical negligence as a crime, *The Lancet* **356 (9237)**: 1267–1268.

Karapanou, V. and Visscher, L. (2010). Towards a Better Assessment of Pain and Suffering Damages, *Journal of European Tort Law* **1(1)**: 48–74.

Kessler, D. (2007). The Effects of the U.S. Malpractice System: A Review of the Empirical Literature, *Working Paper* .

Kessler, D. and McClellan, M. (1996). Do Doctors Practice Defensive Medicine?, *Quarterly Journal of Economics* **111**: 353–390.

Kessler, D. P. (2011). Evaluating the Med Malpractice System and Options for Reform, *Journal of Economic Perspectives* **25(2)**: 93–110.

Kessler, D. P. and McClellan, M. (2002). Malpractice law and health care reform: optimal liability policy in an era of managed care, *Journal of Public Economics* **84**: 175–197.

Kessler, D., Sage, W. and Becker, D. (2005). Impact of Malpractice Reforms on the Supply of Physicians Services, *Journal of the American Medical Association* **293**: 2618–2625.

Khoury, L. (2006). *Uncertain Causation in Medical Liability*, Hart Publishing.

Kilgore, M., Morrisey, M. and Nelson, L. (2006). Tort Law and Medical Malpractice Insurance Premiums, *Inquiry* **43**.

Kim, B. (2007). The Impact of Malpractice Risk on the Use of Obstetrics Procedures, *Journal of Legal Studies* **36(S2)**: S79–S119.

Klick, J. and Stratmann, T. (2005). Does Medical Malpractice Reform Help States Retain Physicians and Does It Matter?, *SSRN* .

Klick, J. and Stratmann, T. (2007). Medical Malpractice Reform and Physicians in High-Risk Specialties, *Journal of Legal Studies* **36(S2)**: S121–142.

Klingman, D., Localio, R., Sugarman, J., Wagner, J., Polishuk, P., Wolfe, L. and Corrigan, J. (1996). Measuring Defensive Medicine Using Clinical Scenario Surveys, *Journal of Health Politics, Policy and Law* **21(2)**: 185–220.

Kohn, L. T., Corrigan, J. M. and Donaldson, M. S. (2000). *To Err Is Human: Building a Safer Health System*, National Academy Press, Washington, D.C.

Kornhauser, L. A. (2000). *Encyclopedia of Law & Economics 5*, chapter Appeal and Supreme Courts, pp. 45–62.

Landis, J. R. and Koch, G. G. (1977). The Measurement of Observer Agreement for Categorical Data, *Biometrics* **33(1)**: 159–174.

Leiter, A., Thoeni, M. and Winner, H. (2011). Duo Cum Faciunt Idem, Non Est Idem - Evidence from Austrian Pain and Suffering Verdicts, *University of Salzburg Working Papers in Economics and Finance* **2**.

Liang, B. A. (1999). Error in Medicine: Legal Impediments to U.S. Reform, *Journal of Health Politics, Policy and Law* **24(1)**: 27–58.

Linnerooth, J. (1979). The Value of Human Life: A Review of the Models, *Economic Inquiry* **17**(1): 52–74.

Lippi Bruni, M. (2001). Il ruolo dei fondi integrativi nel nuovo assetto del SSN, *in Fiorentini (eds) I Serviz Sanitari in Italia, Bologna, Mulino Bianco* .

Lo Scalzo, A., Donatini, A., Orzella, L., Cicchetti, A., Profili, S. and Maresso, A. (2009). Italy Health system review, *Health Systems in Transition - European Observatory on Health Systems and Policies* **11 (6)**: 1 – 216.

Localio, A. R., Lawthers, A. G., Brennan, T. A., Laird, N. M., Hebert, L. E., P. L. M., Newhouse, J. P., Weiler, P. C. and Hiatt, H. H. (1991). Relation Between Malpractice Claims and Adverse Events Due to Negligence. Results of the Harvard Medical Practice Study III, *New England Journal of Medicine* **325**: 245.

Luna Yerga, l. (2003). Regulación de la carga de la prueba en la LEC - En particular, la prueba de la culpa en los procesos de responsabilidad civil médico-sanitaria, *InDret* **04**.

Luna Yerga, l. (2004). *La Prueba de la Responsabilidad Civil Médico-Sanitária: Culpa y Causalidad*, Thomson Civitas.

Luna Yerga, l. (2005). Oportunidades Perdidas - La doctrina de la pérdida de oportunidad en la responsabilidad civil médico-sanitária, *InDret* **02**.

Madrid, Observatorio del Sistema Nacional de Salud, M. o. H. and Affairs., C. (2004). Ministry of Health and Consumer Affairs - La atención sociosanitaria en españa: experiencias actuales y retos para el futuro. (Working draft 1).

Martín-Casals, M., Feliu, J. S. and Torreblanca, J. C. S. (2004). *No-Fault Compensation in the Health Care Sector*, Wien/New York, Springer, chapter Compensation in the Spanish Health Care Sector, pp. 334–366.

Matsa, D. A. (2007). Does Malpractice Liability Keep the Doctor Away? Evidence From Tort Reform Damage Caps, *Journal of Legal Studies* **36(S2)**: S143–S182.

McDonald, C. J., Weiner, M. and Hui, S. L. (2000). Deaths Due to Medical Errors Are Exaggerated in Institute of Medicine Report, *Journal of the American Medical Association* **284(1)**: 93–95.

McGinn, T., Wyer, P. C., Newman, T. B., Keitz, S., Leipzig, R. and Guyatt, G. (2004). Tips for learners of evidence-based medicine: 3. Measures of observer variability (kappa statistic), *Canadian Medical Association Journal* **171(11)**: 1369–1373.

MdS (2004). Risk Management in sanità. Il problema degli errori, *Ministero della Salute, Commissione Tecnica sul Rischio Clinico, Roma, marzo* .

MdS (2006). Rapporto sulla prima rilevazione nazionale relativa agli 'aspetti assicurativi in ambito di gestione aziendale del rischio clinico, *Ministero della Salute* .

MdS (2009a). Protocollo di Monitoraggio degli eventi sentinella 2° Rapporto (settembre 2005 - agosto 2009), *Technical report*, Ministero della Salute.

MdS (2009b). Decreto 11 dicembre 2009 (Istituzione del sistema informativo per il monitoraggio degli errori in sanità), *Technical report*, Ministero della Salute.

Mello, M. (2006). Understanding medical malpractice insurance: A primer, *Research Synthesis Report N. 8, Princeton, NJ, The Robert Wood Johnson Foundation* .

Mello, M. (2006b). Medical malpractice: Impact of the crisis and effect of state tort reforms, *Research Synthesis Report N. 10, Princeton, NJ, The Robert Wood Johnson Foundation* .

Mello, M. and Kachalia, A. (2010). Evaluation of Options for Medical Malpractice System Reform, *MedPAC* **10-2**: 1–75.

Mello, M. M., Studdert, D. M., Schumi, J., Brennan, T. A. and Sage, W. M. (2007). Changes in Physician Supply and Scope of Practice During a Malpractice Crisis: Evidence from Pennsylvania, *Health Affairs* **26(3)**: w425–w435.

Mello, M., Studdert, D. M., Thomas, E. J. and Yoon, C. (2007). Who pays for medical errors? An Analysis of Adverse Event Costs, the Medical Liability System, and Incentives for Patient Safety Improvement, *Journal of Empirical Legal Studies* **4 (4)**: 835–860.

Mello, M. and Troyen, A. B. (2002). Deterrence of Medical Errors: Theory and Evidence for Malpractice Reform, *Texas Law Review* **80**: 1595–1637.

Mello, M. and Zeiler, K. (2008). Empirical Health Law Scholarship: The State of the Field, *The Georgetown Law Journal* **96**: 649–702.

Mello, Michele, S. D. M. and Brennan, T. A. (2003). The New Medical Malpractice Crisis, *New England Journal of Medicine* **348**: 2281–84.

Merryman, J. H. and Pérez-Perdomo, R. (2007). *The Civil Law Tradition - An Introduction to the Legal Systems of Europe and Latin America*, third edition edn, Stanford University Press.

MHCA (2004). Spanish National Hospitals Catalogue, Ministry of Health and Consumer Affairs.

Michel, P., Quenon, J. L., de Sarasqueta, A. M. and Scemama, O. (2004). Comparison of three methods for estimating rates of adverse events and rates of preventable adverse events in acute care hospitals, *British Medical Journal* **328(7433)**: 199.

Michel, P., Quenon, J. L., Djihoud, A., TricaudVialle, S., de Sarasqueta, A. M. and Domecq, S. (2005). Les événements indésirables graves liés aux soins observés dans les établissements de santé: premiers résultats d'une étude nationale, *Etudes et Resultats* **398**: 1–16.

Miller, R. S. (1992). An Analysis and Critique of the 1992 Changes to New Zealand's Accident Compensation Scheme, *Canterbury Law Review* **5 (1)**: 1–16.

Mir Puigpelat, O. (1999). La reforma del sistema de responsabilidad patrimonial de las Administraciones públicas operada por la Ley 4/1999, de 13 de enero, de modificación de la LRJPAC, *Revista Jurídica de Catalunya* **4**: 49–90.

Mir Puigpelat, O. (2008). Responsabilidad objectiva vs. Funcionamento anormal en la responsabilidad patrimonial de la Administración sanitaria (y non sanitaria), *Revista Española de Derecho Administrativo* **140**: 629–652.

Miriello, C. (2011). *Le responsabilità nei servizi sanitari - Profili Giuridici, Economici, Clinici e Comparatistici*, Zanichelli Editore, chapter La Responsabilita Medica Nello Specchio Della Responsabilità Civile.

Mossialos, E. and Thomson, S. (2004). *Voluntary health insurance in the European Union*, World Health Organization on behalf of the European Observatory on Health Systems and Policies.

Neale, F. R., Eastman, K. L. and Drake, P. P. (2009). Dynamics of the Market for Medical Malpractice Insurance, *The Journal of Risk and Insurance* **76 (1)**: 221–247.

Nelson III, L., Morrisey, M. and Kilgore, M. (2007). Damage Caps in Medical Malpractice Cases, *The Milbank Quaterly* **85**: 259–286.

OECD (2006). Medical Malpractice. Prevention, Insurance, and Coverage Options, *Policy Issues In Insurance* **11**.

Olsen, R. N. (2000). *The Encyclopedia of Law and Economics*, London, Edward Elgar Press, chapter The Regulation of Medical Professions, pp. 1018–1054.

Peeples, R., Harris, C. T. and Metzloff, T. B. (2002). The Process of Making Medical Malpractice Cases: The Role of Standard of Care, *Wake Forest Law Review* **37**: 877–902.

Phillips, R. L. J., Bartholomew, L., Dovey, S., Fryer, G., Miyoshi, T. and Green, L. (2004). Learning from malpractice claims about negligent, adverse events in primary care in the United States, *Quality & Safety in Health Care* **13(2)**: 121–126.

PIIA (2003). Statement of the Physician Insurers Association of America Before a hearing of the United States House of Representatives Committee on the Judiciary Regarding H.R.5 - The Help Efficient, Accessible, Low-cost, Timely Healthcare (HEALTH) Act of 2003.

Pintos Áger, J. (2000). Scheduling Damage Awards, *InDret* **1**.

Posner, R. A. (1993). What Do Judges and Justices Maximize? (The Same Thing Everybody Else Does), *Supreme Court Economic Review* **3**: 1–41.

Posner, R. A. (2008). *How Judges Think*, Harvard University Press.

Priest, G. and Klein, B. (1984). The Selection of Disputes for Litigation, *Journal of Legal Studies* **13(1)**: 1–55.

Priest, G. L. (1987). The Current Insurance Crisis and Modern Tort Law, *The Yale Law Journal* **96 (7)**: 1521–1590.

Ramos González, S. (2004). *Responsabilidad Civil por Medicamento - Defectos de fabricación, de diseño y en las advertencias o instrucciones*, Thomson Civitas.

Ramos González, S. and Luna Yerga, l. (2004). Los baremos como paradigma de valoración de daños personales - Comentario a la STS, 1ª, 20.6.2003, *InDret* **01**.

Rickman, N. and Fenn, P. (2001). Clinical negligence in the UK: Throwing the baby out with the bath water?, *Economic Affairs* **21**: 19–23(5).

Rosenblatt, R. A. and Hurst, A. (1989). An Analysis of Closed Obstetric Malpractice Claims, *Obstetrics and Gynecology* **748(5)**: 710–714.

Runciman, W., Webb, R. K., Helps, S. C., Thomas, E. J., Sexton, E. J., Studdert, D. M. and Brennan, T. A. (2000). A comparison of iatrogenic injury studies in Australia and the USA II: Reviewer behaviour and quality of care, *International Journal for Quality in Health Care* **12**: 379–388.

Sage, W. M. (2003). Medical Liability and Patient Safety, *Health Affairs* **22 (4)**: 26–36.

Sage, W. M. (2004). The Forgotten Third: Liability Insurance and the Medical Malpractice Crisis, *Health Affairs* **23 (4)**: 10–21.

Saks, M. J. (1992). Do we really know anything about the behavior of the Tort Litigation System - and why not?, *University of Pennsylvania Law Review* **140**: 1147–1292.

Sari, A. B.-A., Sheldon, T. A., Cracknell, A., Turnbull, A., Dobson, Y., Grant, C., Gray, W. and Richardson, A. (2007). Extent, nature and consequences of adverse events: results of a retrospective casenote review in a large NHS hospital, *Quality and Safety in Health Care* **16**: 434–439.

Scarso, A. P. (2009). *Punitive Damages: Common Law and Civil Law Perspectives*, Vol. 25 of *Tort and Insurance Law*, SpringerWienNewYork, chapter Punitive Damages in Italy, pp. 103–113.

Scarso, A. P. and Foglia, M. (2011). *Medical Liability in Europe: A Comparison of Selected Jurisdictions*, Vol. Tort and Insurance Law, Berlin/New York: De Gruyter, chapter Medical Liability in Italy, pp. 329–359.

Schioler, T., Lipczak, H., Pedersen, B. L., Mogensen, T. S., Bech, K. B., Stockmarr, A., Svenning, A. R. and Frølich, A. (2001). Danish Adverse Events Study. Incidence of adverse events in hospitals: a retrospective study of medical records, *Ugeskr Laeger* **163(39)**: 5370–5378.

Schwartz, G. T. (1992). *The Liability Maze: The Impact of Liability Law on Safety and Innovation*, Washington DC, The Brookings Institution, chapter Product Liability and Medical Malpractice in Comparative Context.

Segal, J. A. and Spaeth, H. J. (2003). *The Supreme Court and the Attitudinal Model Revisited*, Cambridge University Press.

Shavell, S. (1978). *The Economics of Medical Malpractice*, American Enterprise Institute, Washington, D.C., chapter Theoretical Issues in Medical Malpractice, pp. 35–64.

Shavell, S. (1987). *Economic Analysis of Accident Law*, Harvard University Press.

Shavell, S. (1995). The Appeals Process as a Means of Error Correction, *Journal of Legal Studies* **XXIV**: 379–426.

Shavell, S. (1996). Any Frequency of Plaintiff Victory at Trial is Possible, *Journal of Legal Studies* **25(2)**: 493–501.

Shavell, S. (2010). On the Design of the Appeals Process: The Optimal Use of Discretionary Review versus Direct Appeal, *Journal of Legal Studies* **39**(1): 63–108.

Sloan, F. A. (1985). State Responses to the Malpractice Insurance 'Crisis' of the 1970s: An Empirical Assessment, *Journal of Health Politics, Policy and Law* **9 (4) Winter**: 629–646.

Sloan, F. A. (1990). Experience Rating: Does It Make Sense for Medical Malpractice Insurance?, *The American Economic Review* **80**(2): 128–133.

Sloan, F. A., Entman, S. S., Reilly, B. A., Glass, C. A., Hickson, G. B. and Zhang, H. H. (1997). Tort Liability and Obstetricians' Care Levels, *International Review of Law and Economics* **17(2)**: 245–260.

Sloan, F. A., Githens, P. B., Clayton, E. W. and Hickson, G. B. (1993). *Suing for medical malpractice*, The University of Chicago Press.

Sloan, F. A. and Hsieh, C. (1990). Variability In Medical Malpractice Payments: Is The Compensation Fair?, *Law & Society Review* **24**: 997–1039.

Sloan, F. A. and Shadle, J. H. (2009). Is there empirical evidence for 'Defensive Medicine'? A reassessment, *Journal of Health Economics* **28(2)**: 481–491.

Sloan, F., Mergenhagen, P. and Bovbjerg, R. (1989). Effects of Tort Reforms on the Value of Closed Medical Malpractice Claims: A Microanalysis, *Journal of Health Politics, Policy and Law* **663**.

Spurr, S. J. and Howze, S. (2001). The effect of care quality on medical malpractice Litigation, *The Quarterly Review of Economics and Finance* **41**: 491–513.

Studdert, D. M. and Brennan, T. A. (2001). No-fault compensation for medical injuries: the prospect for error prevention, *Journal of the American Medical Association* **286(2)**: 217–223.

Studdert, D. M., Brennan, T. A. and Thomas, E. J. (2000). Beyond dead reckoning: measures of medical injury burden, malpractice litigation, and alternative compensation models from Utah and Colorado, *Indiana Law Review* **33(4)**: 1643–1686.

Studdert, D. M. and Mello, M. M. (2007). When Tort Resolutions are "Wrong": Predictors of Discordant Outcomes in Medical Malpractice Litigation, *Journal of Legal Studies* **36(S2)**: S47–S78.

Studdert, D. M., Mello, M. M. and Brennan, T. A. (2004). Medical Malpractice, *The New England Journal of Medicine* **350(3)**: 283–292.

Studdert, D. M., Mello, M. M., Gawande, A. A., Gandhi, T. K., Kachalia, A., Yoon, C., Puopolo, A. L. and Brennan, T. A. (2006). Claims, Errors, and Compensation Payments in Medical Malpractice Litigation, *New England Journal of Medicine* **354 (19)**: 2024–2033.

Studdert, D. M., Mello, M., Sage, W. M., DesRoches, C., Peugh, J., Zapert, K. and Brennan, T. A. (2005). Defensive Medicine Among High-Risk Specialist Physicians in a Volatile Malpractice Environment, *Journal of the American Medical Association* **293(21)**: 2609–2617.

Studdert, D. M., Thomas, E. J., Burstin, H. R., Zbar, B. I., Orav, E. J. and Brennan, T. A. (2000). Negligent Care and Malpractice Claiming Behavior in Utah and Colorado, *Medical Care* **38**: 250.

Studdert, D. M., Thomas, E. J., Zbar, B. I. W., Newhouse, J. P., Weiler, P. C., Bayuk, J. and Brennan, T. A. (1997). Can the United States afford a 'no-fault' system of compensation for medical injury?, *Law and Contemporary Problems* **60(2)**: 1–34.

Sykes, A. O. (1984). The Economics of Vicarious Liability, *Yale Law Journal* **93**: 1231.

Taragin, M. I., Willett, L. R., Wilczek, A. P., Trout, R. and Carson, J. L. (1992). The influence of standard of care and severity of injury on the resolution of medical malpractice claims, *Annals of Internal Medicine* **117(9)**: 780–784.

Taroni, F., De Palma, A. and Cicognani, A. (2008). Principi e pragmatismo nella gestione del rischio: evidenze empiriche e priorità per la riforma, *Medicina e Diritto* **3**: 74–89.

Thomas, E. J., Studdert, D. M., Burstin, H. R., Orav, E. J., Zeena, T., Williams, E. J., Howard, K. M., Weiler, P. C. and Brennan, T. A. (2000). Incidence and types of adverse events and negligent care in Utah and Colorado, *Medical Care* **38(3)**: 261–271.

Thomas, E. J., Studdert, D. M., Newhouse, J. P., Zbar, B. I., Howard, K. M., Williams, E. J. and A., B. T. (1999). Costs of medical injuries in Utah and Colorado, *Inquiry* **36(3)**: 255–264.

Thomas, E. J., Studdert, D. M., Runciman, W. B., Webb, R. K., Sexton, E. J., Wilson, R. M., Gibberd, R. W., Harrison, B. and Brennan, T. A. (2000). A comparison of iatrogenic injury studies in Australia and the USA I: Context, methods, casemix, population, patient and hospital characteristics, *International Journal for Quality in Health Care* **12(5)**: 371–378.

Thorpe, K. (2004). The Medical Malpractice 'Crisis': Recent Trends and the Impact of State Reforms, *Health Affairs* pp. W4–W20.

Tigar, M. E. (1993). *Federal Appeals: Jurisdiction and Practice*, 2 edn, Colorado Springs: Shephards/McGraw-Hill, Inc.

Traina, F. (2009). Medical Malpractice - The Experience in Italy, *Clinical Orthopaedics and Related Research* **467(2)**: 434–442.

Trebilcock, M. J. and Dewees, D. N. (1992). The Efficacy of the Tort System and its Alternatives: A Review of Empirical Evidence, *Osgoode Hall Law Journal* **30(1)**: 57–138.

Tussing, A. D. and Wojtowycz, M. A. (1992). The Cesarean Decision in New York State, 1986: Economic and Noneconomic Aspects, *Medical Care* **30(6)**: 529–540.

Ubel, P. A. and Loewenstein, G. (2008). Pain and Suffering Awards: They Shouldn't Be (Just) about Pain and Suffering, *Journal of Legal Studies* **37**: S195–S216.

US-CBO (2004). The Effects of Tort Reforms: Evidence from the States, Congress of the United States - Congressional Budget Office.

U.S. Department of Health and Human Services (2002). Confronting the New Health Care Crisis: Improving Health Care Quality and Lowering Costs By Fixing Our Medical Liability System.

Vidmar, N. (1992). The unfair criticism of medical malpractice juries, *Judicature* **76**: 118–125.

Vidmar, N. (1995). *Medical malpractice and the American jury: confronting the myths about jury incompetence, deep pockets, and outrageous damage awards*, Ann Arbor: University of Michigan Press.

Vidmar, N., Lee, P., MacKillop, K., McCarthy, K. and McGwin, G. (2005). Uncovering the "Invisible" Profile of Medical Malpractice Litigation: Insights from Florida, *DePaul Law Review* **54**: 315–356.

Vincent, C., Neale, G. and Woloshynowych, M. (2001). Adverse events in British hospitals: preliminary retrospective record review, *British Medical Journal* **322(7285)**: 517–519.

Viscusi, K. (1998). *The New Palgrave Dictionary of Economics and the Law*, Vol. 3, London, U.K.: Macmillan Publishers, chapter Valuing Life and Risks to Life, pp. 660–669.

Viscusi, K. (2004). Tort Reform and Insurance Markets, *Risk Management and Insurance Review* **7 (1)**: 9–24.

Viscusi, K. and Born, P. (1995). Medical Malpractice Liability in the Wake of Liability Reform, *The Journal of Legal Studies* **24**: 463–490.

Viscusi, K. and Born, P. (2005). Damages Caps, Insurability, and the Performance of Medical Malpractice Insurance, *The Journal of Risk and Insurance* **72 (1)**: 23–43.

Viscusi, W. K., Zeckhauser, R., Born, P. and Blackmon, G. (1993). The Effect of 1980s Tort Reform Legislation on General Liability and Medical Malpractice Insurance, *Journal of Risk and Uncertainty* **6(2)**: 165–186.

Visscher, L. (2009). *Tort Law and Economics, Encyclopedia of Law and Economics*, Vol. 1, second edn, Edward Elgar, chapter Tort Damages, pp. 153–200.

Weiler, P. C., Hiatt, H., Newhouse, J. P., Johnson, W. G., Brennan, T. and Leape, L. (1993). *A measure of malpractice: medical injury, malpractice litigation, and patient compensation*, Cambridge, M. A.: Harvard University Press.

WHO (2000). The World Health Report 2000 - Health Systems: Improving Performance, *World Health Organization* .

Williams, C. and Mello, M. (2006). Medical Malpractice: Impact of the Crisis and Effect of state tort reforms, *The Synthesis Project, Policy Brief* **10**: 1–4.

Wilson, R., Runciman, W., Gibberd, R. W., Harrison, B. T., Newby, L. and Hamilton, J. D. (1995). The Quality in Australian Health Care Study, *Medical Journal of Australia* **163(9)**: 458–471.

Young, R., Faure, M. and Fenn, P. (2004). Causality and causation in tort law, *International Review of Law and Economics* **24**: 507–523.

Zegers, M., de Bruijne, M. C., Wagner, C., Groenewegen, P. P., Waaijman, R. and van der Wal, G. (2005). Pilot Studie Petientveiligheid in Nederland (Pilot Study on patient safety in Netherland), *VUmc / NIVEL* .

Zeiler, K. (2003). Medical Malpractice and Contract Disclosure: A Study of the Effects of Legal Rules on Behavior in Heath Care Markets, *California Institute of Technology* .

Zeiler, K., Black, B., Hyman, D., Sage, W. and Silver, C. (forthcoming). *To Sue is Human: A Profile of Medical Malpractice Litigation*, Yale University Press.

Zeiler, K., Silver, C., Black, B. S., Hyman, D. A. and Sage, W. M. (2007). Physicians' Insurance Limits and Malpractice Payments: Evidence from Texas Closed Claims, 1990-2003, *Journal of Legal Studies* **36 S2(06)**: S9–S45.

Zeno-Zencovich, V. (2007). A Comedy of Errors: Tort, Contract and Compensation Schemes as Remedies for Medical Malpractice, *6th HCTM Conference, Scuola Superiore Sant Anna, Pisa* .

Zhou, J. (2010). Access to Justice: An Economic Approach, *Dissertation Series, Center for Economic Research (Tilburg)* **249**.

Zuckerman, S., Bovbjerg, R. R. and Sloan, F. (1990). Effects of Tort Reforms and Other Factors on Medical Malpractice Insurance Premiums, *Inquiry* **27 (2)**: 167–182.

English Summary

Medical malpractice brings several costs to society. Medical mishaps can have devastating consequences for patients and their families. Nevertheless, physicians might suffer from the consequences of their own mistakes, *e.g.*, psychologically or by the effects on their reputation. Medical errors can never be fully eliminated: even the most brilliant and studious doctors make mistakes. The victims of medical malpractice might also react: patients and their families can make a claim, hoping to be compensated for their losses. Therefore, "*to err is human*"[15] but to "*sue is human*"[16] as well. The most recent empirical literature on medical malpractice is revised in Chapter 1.

The goal of this thesis is to investigate, in the first place, some of the consequences of having two separate sub-systems (civil and administrative) coexisting within the same legal system, which is common in civil law tradition countries with a public national health system. When this holds, and taking the Spanish case as an example, civil courts decide claims involving private hospitals and administrative courts decide claims involving public hospitals. This means that different procedures might apply depending on the type of hospital where the injury took place. Moreover, one question that might arise is why (or why not) both civil and administrative courts should decide medical malpractice cases? In medical malpractice decisions, the level of compensation attributed to patients is a crucial variable. Identical patients suffering similar medical accidents should receive analogous compensation amounts. In order to study these issues, the Spanish Supreme Court Medical Malpractice Dataset (SSCMMD) was created. It consists of medical malpractice decisions made by the Spanish Supreme Court from 2006 until 2009. With this dataset, a comparison between administrative and civil decisions is made in Chapter 2. Chapter 3 uses the SSCMMD to assess predictors of compensation in medical malpractice cases and to investigate how much are patients receiving for damages.

In the last few years, there was a general concern with patient safety, which is currently on the agenda of numerous national governments. Some initiatives have been taken at the international level, with the aim of preventing harm to patients during treatment and care. In several European countries, health care is mainly provided by a public national health system, which means that if a patient harmed in a public hospital succeeds in a claim against the hospital, national expenditures increase because the State takes part in the litigation process. This poses a problem in a context of increasing

[15] As part of the title from Kohn et al. (2000).

[16] As part of the title from Zeiler et. al. (forthcoming).

national health expenditures and public debt, which is the case in several European countries. In Italy, some regions implemented a monitoring system for medical claims. If properly implemented, monitoring medical claims might increase patients' safety and allow a reduction in medical liability insurance premiums. The impact of this policy is assessed in Chapter 4. Finally, Chapter 5 discusses our main findings, describes possible future research and concludes.

It seems a sick joke that so many people die or become physically impaired due to medical mishaps nowadays. It is imperative that efforts are done in order to improve patients' safety. This is naturally a joint effort between medical practitioners, legal scholars, economists, empiricists and policy makers. Empirical analysis can be a powerful tool.

Een kwantitatieve analyse van medische aansprakelijkheid

Samenvatting

Medische fouten kunnen leiden tot een aantal maatschappelijke kosten. Medische missers kunnen rampzalige gevolgen hebben voor zowel patiënten als hun familieleden. Bovendien kunnen artsen lijden onder de gevolgen van hun eigen fouten, bijvoorbeeld psychologisch of door de negatieve gevolgen voor hun reputatie. Medische fouten zullen nooit helemaal voorkomen kunnen worden: zelfs de beste en meest voorzichtige doctoren maken wel eens fouten. Slachtoffers van medische fouten kunnen ook reageren: patiënten en hun familieleden kunnen een schadeclaim indienen in de hoop op compensatie voor het geleden verlies. Daarom kunnen we het volgende stellen: "*fouten maken is menselijk*"[17] maar ook "*een schadeclaim indienen is menselijk*".[18] In hoofdstuk 1 volgt een overzicht van de meest recente wetenschappelijke literatuur op het gebied van medische fouten.

Het doel van dit proefschrift is in de eerste plaats om enkele gevolgen te onderzoeken van het hebben van twee aparte, naast elkaar bestaande systemen binnen hetzelfde rechtssysteem, wat heel gebruikelijk is in landen met een civielrechtelijke traditie en een nationaal publiek gezondheidszorgstelsel. In landen waar dit zo is, bijvoorbeeld in Spanje, beslissen de civiele rechters over de schadeclaims waarbij private ziekenhuizen betrokken zijn en bestuursrechters over schadeclaims waarbij staatsziekenhuizen betrokken zijn. Dit betekent dat verschillende regels van toepassing zouden kunnen zijn, afhankelijk van het soort ziekenhuis waar de medisch fou gemaakt wordt. Dit leidt tot de vraag waarom (of waarom niet zowe civiele rechtbanken als bestuurlijke rechtbanken uitspraken doen in rechtszaken die het gevolg zijn van medische fouten. Bij uitspraken over medische fouten is de hoogte van de toegekende schadevergoeding een uiterst belangrijke variabele. Vergelijkbare patiënten die hebben geleden onder vergelijkbare medische fouten zouden even hoge schadevergoedingen ter compensatie dienen te ontvangen. Om deze aspecten te kunnen bestuderen, is er in Spanje nu de Spanish Supreme Court Medical Malpractice Dataset (SSCMMD). Deze databank bestaat uit alle uitspraken van het Spaanse Hooggerechtshof over zaken die betrekking hebben op medische fouten tussen 2006 en 2009. Dankzij deze databank kan een vergelijking worden gemaakt tussen de bestuursrechtelijke en de civielrechtelijke uitspraken in hoofdstuk 2. In hoofdstuk 3 wordt de SSCMMD gebruikt om te beoordelen of het te voorspellen is of er compensatie word toegewezen in rechtszaken als gevolg van

[17] Fragment uit de titel van Kohn et. al. (2000).

[18] Fragment uit de titel van Zeiler et. al. (nog te verschijnen).

medische fouten. En bovendien om te onderzoeken welk bedrag aan schadevergoeding patiënten ontvangen.

De laatste jaren staat patiëntveiligheid hoog op de agenda van een groot aantal regeringen. Op internationaal niveau is een aantal initiatieven genomen met als doel om schade tijdens medische ingrepen of patiëntenzorg te voorkomen. In een aantal Europese landen wordt gezondheidszorg vooral aangeboden door een nationaal openbaar gezondheidszorgstelsel. Dit betekent dat een medische fout die in een staatsziekenhuis gemaakt is en op basis waarvan een schadeclaim wordt toegewezen, leidt tot een toename van de overheidsuitgaven omdat de overheid onderdeel is van het aansprakelijkheidsproces. Dit is een probleem gezien de steeds stijgende kosten van de gezondheidszorg en de stijgende staatsschulden, wat het geval is in een aantal Europese landen. In Italië hebben een aantal regio's een system ingevoerd om medische claims te kunnen monitoren. Als dit goed wordt ingevoerd, kan het monitoren van medische schadeclaims leiden tot een verbetering van de patiëntveiligheid en zorgen voor een daling van de premies voor medische aansprakelijkheidsverzekeringen. Het effect van dit beleid wordt behandeld in hoofdstuk 4.

Ten slotte worden in hoofdstuk 5 de belangrijkste resultaten besproken, conclusies getrokken en suggesties gedaan voor toekomstig onderzoek.

Het lijkt een zieke grap dat zoveel mensen tegenwoordig sterven of blijvend lichamelijk letsel ondervinden door een medische fout. Het is van groot belang dat er maatregelen worden getroffen om de patiëntveiligheid te verbeteren. Uiteraard dient dit een gezamenlijke inspanning te zijn van zowel medici, juridische wetenschappers, economen, empirische onderzoekers als beleidsmakers. Empirisch onderzoek kan daarbij een krachtig hulpmiddel zijn.