Patterns of Medical Errors:
A Challenge for Quality Assurance
in the Greek Health System

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1. Introduction

A widely accepted definition of quality, as given by the Institute of Medicine is: "The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Lohr, 1990). According to other definition, "quality is conceptually complex and represents a synthesis of lessons, methods and acquired knowledge from a range of disciplines" (Dalrymple & Drew, 2000). So, we can realize that the subject of quality in healthcare organisations has been the object of numerous attempts at quick fixes. Thus, quality management in various types of heath services organizations is an important issue to improve the quality and safe patient care, promote quality patient and organizational outcomes and in general to improve health (Kelly, 2006).

For delivering quality in a heath care system, we should deal with six areas – dimensions of quality (World Health Organization [WHO], 2006). These dimensions are:

- *effective*, delivering health care that is adherent to an evidence base and results in improved health outcomes for individuals and communities, based on need;
- *efficient*, delivering health care in a manner which maximizes resource use and avoids waste;
- *accessible*, delivering health care that is timely, geographically reasonable, and provided in a setting where skills and resources are appropriate to medical need;
- *acceptable/patient-centred*, delivering health care which takes into account the preferences and aspirations of individual service users and the cultures of their communities;
- *equitable*, delivering health care which does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location, or socioeconomic status;
- *safe*, delivering health care which minimizes risks and harm to service users.

Although error is inherent in all fields of human activity, it is however possible health professionals to learn from mistakes and prevent their reoccurrence and that health-care providers and organisations that have achieved a high level of safety have the capacity to acknowledge errors and learn from them.

Patients should participate in decisions about their health care, and recognising that those working in health-care systems should provide them with adequate and clear information about potential risks and their consequences, in order to obtain their informed consent to treatment.

Noting, also, the relevance of the World Health Organisation (WHO) "Health for All" targets for the European Region (target 2) and of its policy documents on improving health and quality of life and having regard to its Health Assembly Resolution 55.18 (2002) on "Quality of care: patient safety", which recognises the need to promote patient safety as a fundamental principle of all health systems.

Considering, thus, that patient safety is the underpinning philosophy of quality improvement and that all possible measures should therefore be taken to organise and promote patient-safety education and quality of health-care education (Council of Europe [C.E.], 2006).

For years, experts have recognized that medical errors exist and compromise health care quality, but the response to the November 30, 1999, release of the Institute of Medicine's (IOM) report, "*To Err is Human: Building a Safer Health System*", brought medical errors to the forefront of public attention (Institute of Medicine [IOM], 1999). In March 2001, the second IOM report, "*Crossing the Quality Chasm: A New Health System for the 21st Century*", was published (IOM, 2001). The 'chasm' report extends the findings of the 'error' report to other important dimensions of healthcare quality.

The reports concluded that the majority of these errors were the result of systemic problems rather than poor performance by individual providers, and outlined a four-pronged approach to prevent medical mistakes and improve patient safety. Much has been written worldwide about medical errors and improvements in their reporting and handling since then.

Recently, the Euro barometer survey, which was released by the European Commission (E.C., 2005) found that almost half of those surveyed said that hospital patients should be worried about being victims of medical errors.

In this research paper, we present various patterns of medical errors in Greece, after the analysis of 141 cases coming from administrative courts awards and Greek Ombudsman's reports for the years 2000 to 2007. We also present some of the current activities, as well as recommendations for additional activities to reduce errors through increased awareness of medical errors.

In the following sections 2 and 3, the definitions, classifications and epidemiology and root causes of *adverse events* and *medical errors* are given.

In sections 4 and 5, the measurement process and tools, as well as the underreporting factors of *medical errors* are presented.

In section 6, we present our research findings and finally, in section 7, we discuss our findings and we propose additional policies to reduce errors through increased awareness of medical errors.

2. Definitions, context and classifications

2.1 Definitions and context

The lack of standardized nomenclature and a universal taxonomy for adverse events and medical errors complicates the development of a response to the issues outlined in this paper. A number of definitions have been applied to medical errors and patient safety.

The World Health Organization (WHO) Collaborating Centres for International Drug Monitoring defines an adverse drug event as follows (WHO, 1984):

"Noxious and unintended and occurs at doses used in man for prophylaxis, diagnosis, therapy, or modification of physiologic functions."

In *To Err is Human*, the IOM (1999) adopted the following definitions:

"An error is defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim."

"An adverse event is defined as an injury caused by medical management rather than by the underlying disease or condition of the patient."

In an effort to thoroughly consider all of the relevant issues related to medical errors, the Quality Interagency Coordination Task Force (QuIC) expanded of the IOM definition, as follows (Quality Interagency Coordination Task Force, 2000):

"An error is defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Errors can include problems in practice, products, procedures, and systems."

2.2 Classifications

Most people believe that medical errors usually involve drugs, such as a patient getting the wrong prescription or dosage, or mishandled surgeries, such as amputation of the wrong limb. However, there are many types of medical errors. The following seven categories in Table 1 summarize types of medical errors that can occur (Lazarou et al., 1998) :

Medication Error	Such as a patient receiving the wrong drug.
Surgical Error	Such as amputating the wrong limb.
Diagnostic error	Such as misdiagnosis leading to an incorrect choice of therapy, failure to use an indicated diagnostic test, misinterpretation of test results, and failure to act on abnormal results.
Equipment failure	Such as defibrillators with dead batteries or intravenous pumps whose valves are easily dislodged or bumped, causing increased doses of medication over too short a period.
Infections	Such as nosocomial and post-surgical wound infections.
Blood transfusion-related injuries	Such as a patient receiving an incorrect blood type.
Misinterpretation of other medical orders	Such as failing to give a patient a salt-free meal, as ordered by a physician.

Table 1. Types of medical errors

There are many possible ways to categorize *medical errors*, but no universally accepted taxonomy. Classifications have included:

- Type of health care service provided (e.g., classification of medication errors by the National Coordinating Council for Medication Error Reporting and Prevention) (NCCMERP, 1998).
- Severity of the resulting injury (NQF, 2007) (e.g., sentinel events, defined as "any unexpected occurrence involving death or serious physical or psychological injury" by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO, 2011)).
- Legal definition (e.g., errors resulting from negligence (IOM, 1999)).
- Type of setting (e.g., outpatient clinic, intensive care unit), and
- Type of individual involved (e.g., physician, nurse, patient).

Also, Leap (1993) proposed a classification of *medical errors'* types as presented in the Table 2:

Diagnostic	Error or delay in diagnosis
	Failure to employ indicated tests
	Use of outmoded tests or therapy
	Failure to act on results of monitoring or testing
Treatment	Error in the performance of an operation, procedure or test
	Error in the administering the treatment
	Error in the dose or method of using a drug
	Avoidable delay in treatment or in responding to a abnormal test
	Inappropriate (not indicated) care
Preventive	Failure to provide prophylactic treatment
	Inadequate monitoring or follow-up of treatment
Other	Failure of communication
	Equipment failure
	Other system failure

Table 2. Types of medical errors

Finally, the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) Index for Categorizing Errors (National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP), 1998), proposes the following categories of *Adverse Events* severity in the NCC MERP Index:

Category A	Circumstances or events that have the capacity to cause error
Category B	An error that did not reach the patient
Category C	An error that reached the patient but did not cause harm
Category D	An error that reached the patient and required monitoring or intervention to confirm that it resulted in no harm to the patient.
Category E	Temporary harm to the patient and required intervention
Category F	Temporary harm to the patient and required initial or prolonged hospitalization
Category G	Permanent patient harm
Category H	Intervention required to sustain life
Category I	Patient death

Table 3. Index for categorizing adverse events severity

Categories A, B, C and D describe medication errors that do not cause harm, while categories E, F, G, H, and I of the NCC MERP Index describe errors that do cause harm.

3. The epidemiology and the root causes of medical errors

3.1 The epidemiology of medical errors

It is clear that, although the United States provides some of the best health care in the world, the numbers of errors in health care are at unacceptably high levels. The Institute of Medicine's report (IOM, 1999) estimates that more than half of the adverse medical events occurring each year are due to preventable medical errors, causing the death of tens of thousands. The consequences of medical mistakes are often more severe than the consequences of mistakes in other industries—leading to death or disability rather than inconvenience on the part of consumers—underscoring the need for aggressive action in this area.

As shown in the following table 4, the estimated total number of iatrogenic deaths -that is, deaths induced inadvertently by a physician or surgeon or by medical treatment or diagnostic procedures- in the US annually is $783,936 (Barczak et al., 1997; Burger et al., 2003; Healthcare Cost and Utilization Project [HCUPnet]; IOM, 1999; Lazarou et al., 1998; Morbidity and Mortality Weekly Report [MMW], 2000; Null et al., 2007; Starfield, 2000a; Tunis & Gelband, 1994; Weinstein, 1998; Xakellis et al., 1995). It is evident that the American medical system is itself the leading cause of death and injury in the US (U.S. National Center for Health Statistics [USNCHS], 2003). By comparison, approximately 699,697 Americans died of heart in 2001, while 553,251 died of cancer.

Condition	Deaths	Cost
Adverse Drug Reactions	106,000	$12 billion
Medical error	98,000	$2 billion
Bedsores	115,000	$55 billion
Infection	88,000	$5 billion
Malnutrition	108,800	
Outpatients	199,000	$77 billion
Unnecessary Procedures	37,136	$122 billion
Surgery-Related	32,000	$9 billion
Total	**783,936**	**$282 billion**

Table 4. Estimated annual mortality and economic cost of medical intervention

European *medical errors* statistics are difficult to acquire. Unlike in the US, there is no official authority collecting data relative to *medical errors* occurrences. Nevertheless, existing figures indicate an increase in reported medical malpractice incidents in recent years.

A United Kingdom estimate of clinical risks by University College London (GeneralCologneRe, 2002) suggests that nowadays 3 - 4% of patients in the developed world are harmed during a hospital stay. For 70% of them the resulting adverse effect is short-lived, 16% endure permanent disabilities, while 14% subsequently die. The Kellog Foundation (National Coalition on Health Care and the Institute for Healthcare Improvement, 2000) found that Britain's medical malpractice death rate is comparable to that of the United States. Medical error is the third most frequent cause of death in the United Kingdom after cancer and heart disease, killing up to 40,000 people a year. The number of medical errors deaths therefore is four times greater than the number of deaths due to all other types of accidents. In Germany, 1999 estimates put the number of medical errors incidents at 400,000 per year (GeneralCologneRe, 2002).

In Ireland, one in every 100 patients is estimated to experience some form of medical error (GeneralCologneRe, 2002). In Greece, there are not any official *medical errors* statistics. Nevertheless, calculations indicate that about 20 to 30 patients die every day and other 200 are harmed because of preventable medical errors (Vozikis, A. & Riga, M., 2008a).

Rates in the later adverse event studies from UK, Denmark and New Zealand are remarkably similar, all being around 10%; US rates are much lower, with Australia seemingly much higher. The lower rates in the US might reflect better quality care, but could also reflect the narrower focus on negligent injury rather than the broader quality improvement focus of most other studies (Thomas et al, 2000a).

Although differences in adverse event rates between countries attract a great deal of media attention, much debate and occasional recrimination, the whole issue needs to be set in a broader context. Other attempts to compare health systems have produced a completely different picture.

3.2 The root causes of medical errors

According to a variety of sources, the root cause of medical errors is due to the complexity of today healthcare systems. The IOM (1999) emphasized that most medical errors are

systems related and not attributable to individual negligence or misconduct. The key to reducing medical errors is to focus on improving the systems of delivering care and not to blame individuals. Health care professionals are simply human and, like everyone else, they make mistakes. The FDA reports that many patient deaths and injuries are associated with the use of FDA-regulated medical products within a complex and time-pressured health care system. Reducing the incidence of medical errors can save thousands of lives and billions of dollars. The Institute for Health Care Improvement has identified the leading cause of medical mistakes as the increasing complexity of health care (Griffin & Resar, 2009). His general recommendations were for more simplification and greater standardization, such as the use of bar codes to ensure that the right patient receives the right dose of the right medication.

Several issues have contributed the incidence of medical errors (Bates, 1998) including:

- Complexity of the health care system
- Reluctance of doctors to admit errors
- Lack of leadership
- Insurance reimbursement system that rewards errors since hospitals can still bill for additional services when patients are injured but often will not pay for practices that reduce those errors

This orientation of thought – that systems, not individuals, produce errors – has profound implications for caregivers and reporters. Medical leaders believe that focusing on systems is the best way to prevent errors. Assigning blame helps keep them hidden. A systems approach emboldens the health care policy officers to come forward with information needed to understand how mistakes occur.

Many doctors and nurses would like nothing better than for the media to stop skewering them individually and report on errors in the safer, neutral language of system failures. Indeed, if there is one overarching critique of quality stories from the medical profession, it is that the reporters look for victims and villains and blame caregivers too much. For journalists, however, reporting on system failures can be difficult; as such stories tend to be dry and antiseptic. But some journalists say the medical professionals may have a point. These reporters believe that the deepest stories include not only personal practices but also some sense of how these errors result from system failure. Reporters cannot let individuals off the hook, but the media should remember that no one acts alone. An error can usually be traced back to the system that sustains and directs the "perpetrator."

4. Identifying and measuring *medical errors* and *adverse events*

4.1 Framework for identifying medical errors

The overall goal of improved safety in health care is to reduce patient injury or harm, which underscores the importance of distinguishing between errors and harm. Although detection and analysis of errors is important in understanding failure-prone aspects of health care delivery systems and designing strategies to prevent and mitigate these failures, there is special value in quantifying actual harm.

Medical errors are failures in processes of care and, while they have the potential to be harmful, numerous reports have shown they are often not linked to the injury of the patient. Because events of harm are clear clinical outcomes, they are particularly likely to engage both clinicians and administrators in a thorough review of the system factors that led to the adverse event, with a clear focus on improving patient outcomes.

By concentrating on the events actually experienced by patients, a hospital can begin to foster a culture of safety that shifts from individual blame for errors to comprehensive system redesign that reduces patient suffering. To address the clear need to quantify adverse patient outcome, this paper focuses on the identification of harm or injury to the patient (Healthcare Cost and Utilization Project [HCUPnet], 2003-modified), as shown in Figure 1:
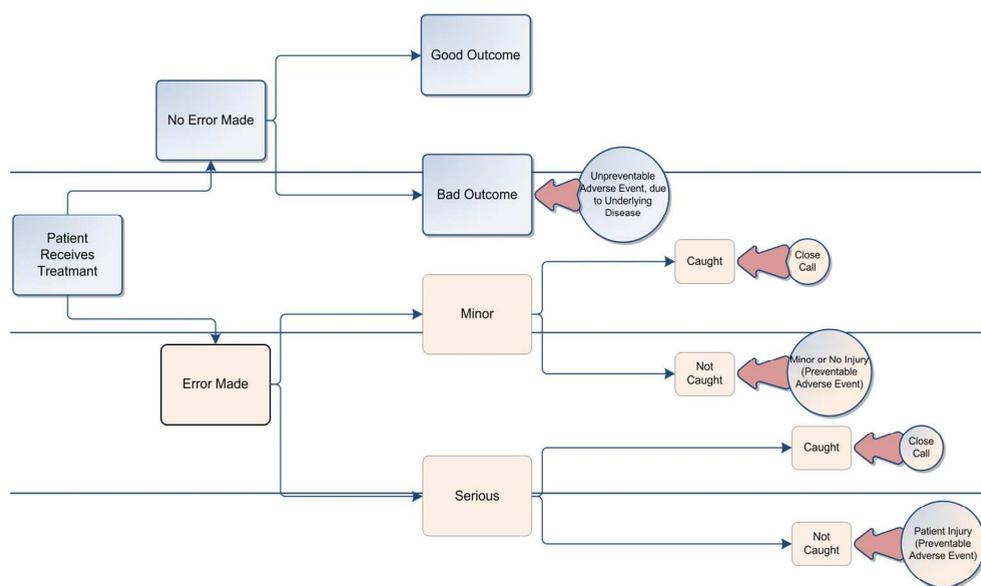
Fig. 1. Framework for identifying medical errors

4.2 Methods for studying and measuring medical errors

There are a number of methods of studying errors and adverse events, each of which has evolved over time and been adapted to different contexts. Each of the methods has particular strengths and advantages, and also weaknesses and limitations.

Table 5 illustrates a general framework to help select error and adverse event measurement methods (Thomas & Petersen, 2003) :

Study method	Advantages	Disadvantages
Morbidity and mortality conferences and autopsy	Can suggest contributory factors Familiar to healthcare providers	Hindsight bias Reporting bias Focused on diagnostic errors Infrequently used
Case analysis/root cause analysis	Can suggest contributory Factors Structured systems approach Includes recent data from interviews	Hindsight bias Tends to focus on severe events Insufficiently standardized in practice
Claims analysis	Provides multiple perspectives (patients, providers, lawyers)	Hindsight bias Reporting bias Non-standardized source of data
Error reporting systems	Provide multiple perspectives over time Can be a part of routine operations	Reporting bias Hindsight bias
Administrative data analysis	Uses readily available data Inexpensive	Might rely on incomplete and inaccurate data The data are divorced from clinical context
Record review/ chart review	Uses readily available data Commonly used	Judgments about adverse events not reliable Medical records are incomplete Hindsight bias
Review of electronic medical record	Inexpensive after initial investment Monitors in real time Integrates multiple data sources	Susceptible to programming and/or data entry errors Expensive to implement
Observation of patient care	Potentially accurate and precise Provides data otherwise unavailable Detects more active errors than other methods	Time consuming and expensive Difficult to train reliable observers Potential concerns about confidentiality Possible to be overwhelmed with information
Active clinical surveillance	Potentially accurate and precise for adverse events	Time consuming and expensive

Table 5. Advantages and disadvantages of methods used to study adverse events and medical errors

Although these methods can provide important and actionable information about systems, they also have weaknesses. They are incapable of providing error or adverse event rates because they are imprecise, primarily because of the various factors that influence whether an error or adverse event leads to a claim, incident report, or autopsy.

In the error reporting systems method, errors witnessed or committed by health care providers may be reported via structured data collection systems. Analysis of error reports may provide rich details about latent errors that lead to active errors and adverse events.

But error reporting systems alone cannot reliably measure incidence and prevalence rates of errors and adverse events because numerous factors may affect whether errors and adverse events are reported. Providers may not report errors because they are too busy, afraid of lawsuits, or worried about their reputation. High reporting rates may indicate an organizational culture committed to identifying and reducing errors and adverse events rather than a truly high rate. Despite these limitations, error reporting systems can identify errors and adverse events not found by other means, such as chart reviews, and can thereby be used in efforts to improve patient safety.

5. Underreporting of iatrogenic events

As few as 5% and no more than 20% of iatrogenic acts are ever reported (Barczak et al., 1997; Bates et al., 1995; Leape, 1994; Starfield, 2000a; Starfield, 2000b; Thomas et al., 2000b). A study conducted in two obstetrical units in the UK found that only about one-quarter of adverse incidents were ever reported, to protect staff, preserve reputations, or for fear of reprisals, including lawsuits (Bates et al., 1995).

An analysis by Wald and Shojania (2001) found that only 1.5% of all adverse events result in an incident report, and only 6% of adverse drug events are identified properly. The authors learned that the American College of Surgeons estimates that surgical incident reports routinely capture only 5-30% of adverse events. In one study, only 20% of surgical complications resulted in discussion at morbidity and mortality rounds (Vincent et al., 1999). From these studies, it appears that all the statistics gathered on medical errors may substantially underestimate the number of adverse drug and medical therapy incidents. They also suggest that our statistics concerning mortality resulting from medical errors may be in fact be conservative figures.

Standard medical pharmacology texts admit that relatively few doctors ever report adverse drug reactions to the FDA. The reasons range from not knowing such a reporting system exists to fear of being sued. Yet the public depends on this tremendously flawed system of voluntary reporting by doctors to know whether a drug or a medical intervention is harmful.

If hospitals admitted to the actual number of errors for which they are responsible, which is about 20 times what is reported, they would come under intense scrutiny (Vincent et al., 1999). Jerry Phillips, associate director of the FDA's Office of Post Marketing Drug Risk Assessment, confirms this number. "In the broader area of adverse drug reaction data, the 250,000 reports received annually probably represent only 5% of the actual reactions that occur."(Bates, 1998)

Dr. Jay Cohen, who has extensively researched adverse drug reactions, notes that because only 5% of adverse drug reactions are reported, there are in fact 5 million medication reactions each year (Dickinson, 2000).

6. Research findings

The aim of the present study is to present various patterns of medical errors in Greece. For the present research, an extensive search was carried out to find the relevant authorities and the organisations where the various stakeholders affected by the medical errors turn to. The material of our analysis consists from 141 cases coming from the administrative courts awards and Greek Obudsman's reports for the years 2000 to 2007.

For every case, we record the year of the recourse or the award publication, the legal status of the health care organization, the doctor's specialty, the type of medical error, the severity of the adverse event and the amount which the Administrative Court of First Instance imputed. The estimation of the financial cost is based on 31 lawsuits for which the Administrative Court of First Instance published awards during the period 2003-2007.

All the cases refer to Public or Not-for-Profit Health Care Organizations, because the administrative courts and the Greek Ombudsman have the authority to inquire cases only concerning Public and Not-for-Profit Organizations.

The assessment of patient safety should be carried out through both qualitative and quantitative methods. The qualitative methods (Institutionalization of Quality Assurance Project Report [QAP], 2001) map the various activities that exist in the routine delivery of services, for example using methods used in pathways analysis without, however, recommending one pathway as more appropriate than another. The purpose of the descriptive phase is to "map the genome of safety" in the delivery of care and services. The quantitative approach (C.E., 2006) uses indicators and epidemiological methods of analysis to systematically quantify distinct aspects of processes and their immediate outputs in relation to:

- adverse events;
- adverse events causing harm to patients;
- adverse events causing harm to providers; and
- for the risk of adverse events.

Surgeons and Obstetricians are the specialties most involved in medical errors as presented in the Table 6:

Specialty	Cases
General Surgeon	29
Obstetricians / Gynecologists	14
Orthopedic Surgeons	13
Ophthalmology Surgeon	11
Pathologists	10
Cardiac Surgeon	9

Clinical Microbiologist	8
Anaesthesiologist	7
Urologists	5
Gastroenterologist	3
Plastic Surgeon	3
Otolaryngologists (ENT surgeons)	2
All Other	18
n/a	9
Total	**141**

Table 6. Doctors' specialty

The most common medical errors are those referred to the category "*Error in performance of an operation, procedure or test*", following with the "*Error or delay in diagnosis*". The allocation of medical errors by error type (as defined in Table 2) is presented in the Figure 2:
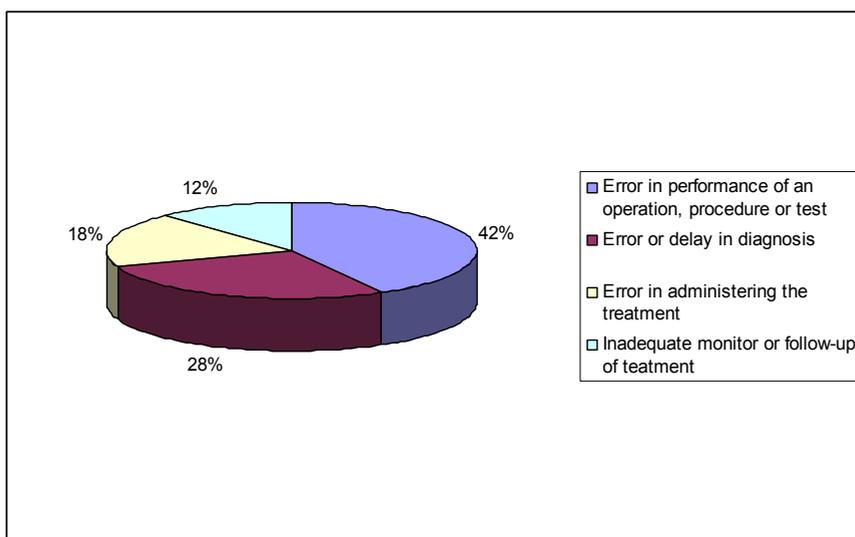
Fig. 2. Type of Medical error

The recorded medical errors caused various adverse events, with the most common the "**Category E**: *Temporary harm to the patient and required intervention & Category F: Temporary harm to the patient and required initial or prolonged hospitalization*" closely followed by the "**Category I**: *Patient death*".

Below, in the Figure 3, we present the allocation of medical errors by severity category, according to the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) Index for Categorizing Errors (as defined in Table 3):
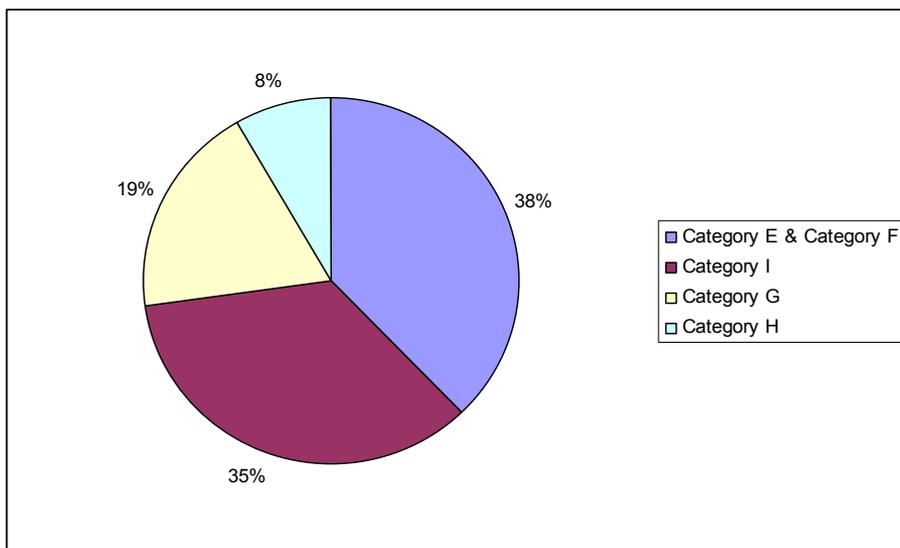
Fig. 3. Severity of medical error's adverse event

In Greece, contrary to other countries, the estimation of the total financial burden due to medical errors is very difficult due to the absence of an organized information system. Thus, the implementation of a system in order to identify, report and analyze medical errors and patient's adverse events following the international standards is crucial.

The estimation of the financial cost was based on 31 lawsuits for which the Administrative Court of First Instance published awards during the period 2003-2007. Our research pointed out that in Greece, the economic cost due to medical errors is worryingly high. In addition, the amount of mean and final compensation has been dramatically increased during the period 2003-2007 (Table 7 and Figure 4):

Year	Cases	Mean compensation	Total compensation
2003	3	136.972 €	410.916 €
2004	3	194.676 €	584.029 €
2005	5	50.972 €	254.860 €
2006	6	285.453 €	1.712.720 €
2007	2	375.000 €	750.000 €

Table 7. Mean and total compensation for years 2003-2007

The most injurious specialties are General Surgeons and Anaesthesiologists, while Anaesthesiologists have the higher mean compensation (Table 8 and Figures 5, 6 & 7):
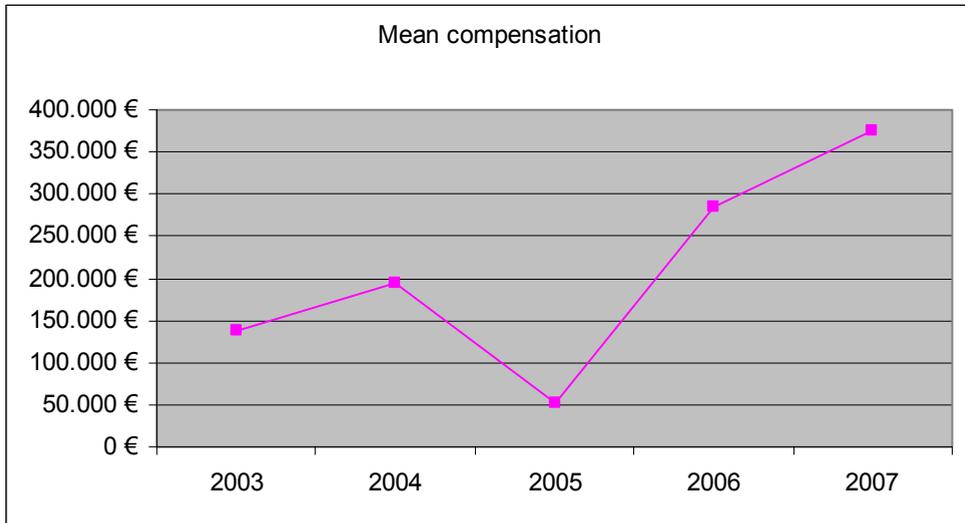
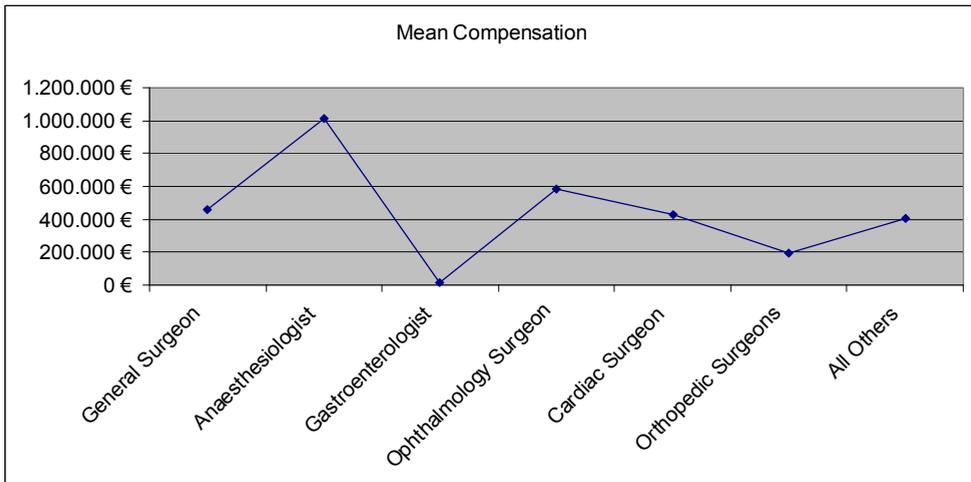Fig. 4. Mean compensation for years 2003-2007

Fig. 5. Mean compensation for various specialties

Specialty	Cases	Mean compensation	Total compensation
General Surgeon	10	457.428 €	4.574.283 €
Anaesthesiologist	4	1.012.570 €	4.050.279 €
Gastroenterologist	2	17.500 €	35.000 €
Ophthalmology Surgeon	1	586.940 €	586.940 €
Cardiac Surgeon	2	426.838 €	853.675 €
Orthopedic Surgeons	3	196.950 €	590.850 €
All Others	9	407.333 €	3.665.995 €
Total	31	463.130 €	14.357.022 €

Table 8. Mean and total compensation for various specialties

Fig. 6. Total compensation for various specialties

Total Compensation Allocation to Specialties

33%

29%

13%

10%

6%

3%

6%
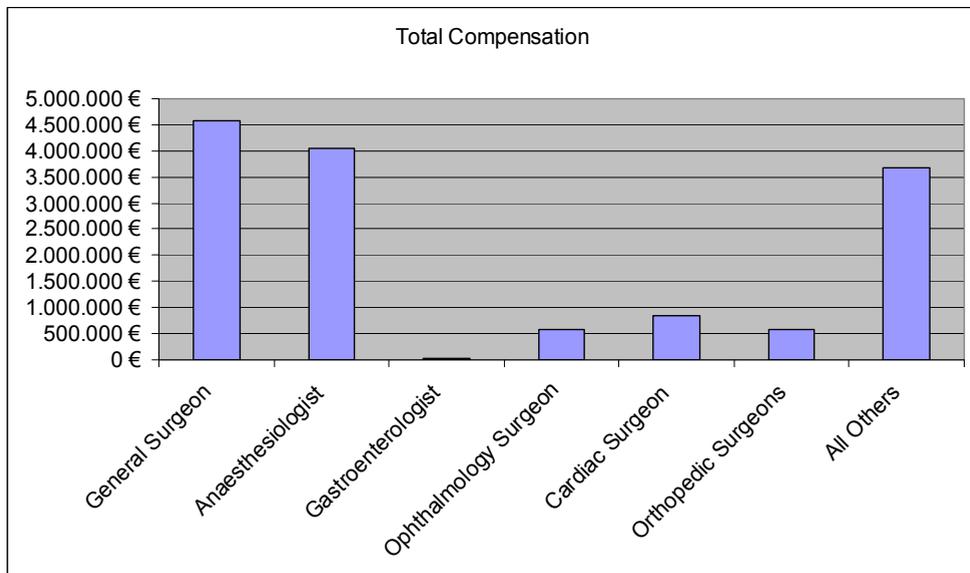
General Surgeon
Anaesthesiologist
Gastroenterologist
Ophthalmology Surgeon
Cardiac Surgeon
Orthopedic Surgeons
All Others
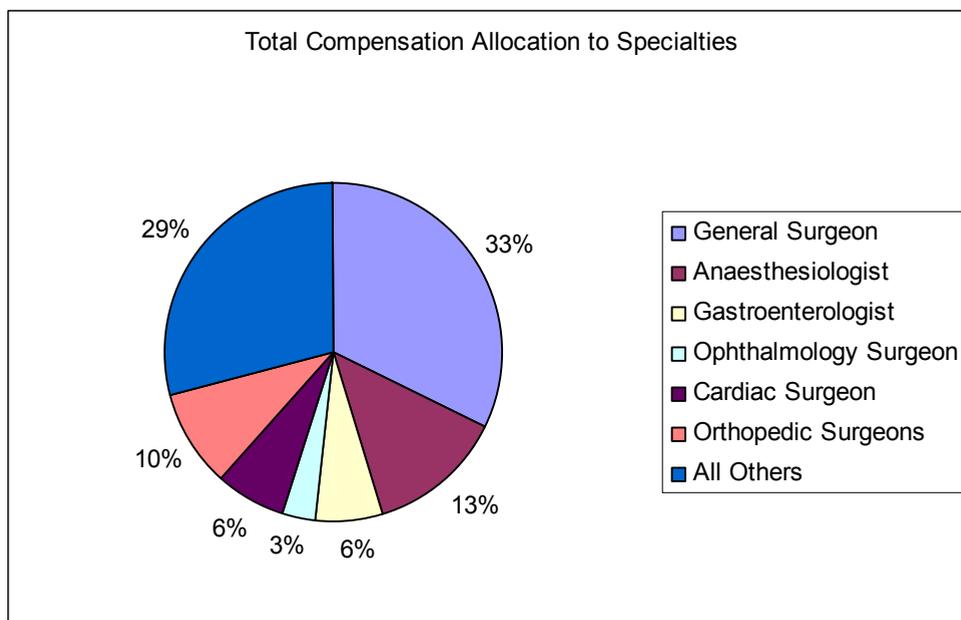
Fig. 7. Total compensation allocation to specialties

The highest mean compensation awarded to unknown severity adverse events and to the **Category H:** Intervention required to sustain life. It is remarkable that the awarded mean compensations for the **Category I:** Patient death is lower than those to adverse events categories with minor severity (Table 9 and Figure 8):

Severity	Cases	Mean Compensation	Total Compensation
Unknown	1	1.267.790 €	1.267.790 €
E	9	31.024 €	279.212 €
F	1	733.675 €	733.675 €
G	7	755.786 €	5.290.501 €
H	2	1.154.135 €	2.308.269 €
I	11	407.052 €	4.477.575 €
Total	31	463.130 €	14.357.022 €

Table 9. Mean and total compensation for adverse events severity categories.
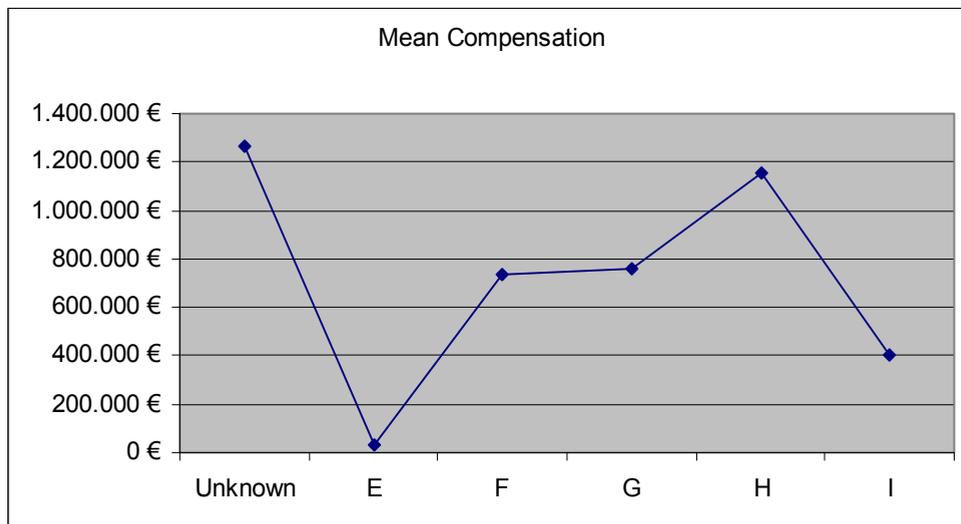
Fig. 8. Mean compensation for adverse events severity categories

7. Conclusions

Patient safety is extraordinarily important to the public, but the policy issues around adverse event detection and medical errors are questionable in practice. Within the Greek Health Care System today, most adverse events are being detected using spontaneous reporting, which identifies only a small number of adverse events. This is probably the major reason that problems with patient safety have been overlooked until recently.

Unfortunately, given the current structure of Greek Health Care System, there are strong incentives for Healthcare Organizations to turn a blind eye to medical errors and adverse events. In particular, serious, preventable adverse events typically should be reported to the Hospital Board and the Ministry of Health.

Unfortunately such events often lead to long lasting internal investigations from the hospital's management or end up in the press or in the courts, with adverse consequences for the doctor involved, the hospital or for the Health Care System as a whole.

Our research points out, that medical errors are a common phenomenon in Greek Health Care System (as in every Health Care System worldwide). Furthermore, they cause severe harm and substantial economic and psychological burden to the patients and to their relatives, professional medical liability to the doctors involved and a high economic burden to the Greek Health System and to the Greek Insurance Industry.

Though adverse events have negative connotations to many, our current system offers few incentives to healthcare organizations to look for them and possibly correct them aggressively.

It is clear that a systematic effort to understand and reduce medical errors will be the cornerstone of health care providers' professional responsibility in coming years, primarily due to the high costs associated with them.

Below, we present some of the current activities, as well as recommendations for additional activities and policy proposals to reduce medical errors:

- Building Public Awareness of Medical Errors
- Building Purchasers' Awareness of the Problem
- Working With Providers to Improve Patient Safety
- Using Decision-Support Systems and Information Technologies
- Using Standardized Procedures, Data Integration
- Checklists, and the Results of Human Factors Research

Specifically, Greek government should ensure that patient safety is the cornerstone of all relevant health policies, in particular policies to improve quality. For this reason, they due to develop a coherent and comprehensive patient-safety policy framework by promoting the development of a reporting system for patient-safety incidents in order to enhance patient safety, by reviewing the role of other existing data sources, such as patient complaints and compensation systems, clinical databases and monitoring systems as a complementary source of information on patient safety and also by producing regular reports on actions taken nationally to improve patient safety (C.E., 2006).

In developing patient-safety strategies, government should take a proactive, preventive and systematic attitude: to admit that errors happen, to identify and manage risk points in processes, to learn from errors and minimise their effects, to prevent further occurrences of patient-safety incidents and to encourage both patients and health-care personnel to report those patient-safety incidents they are confronted with. This could be achieved by proactive management and systematic design of safe structures and processes.

Patient safety should be recognised as the necessary foundation of quality health care, and should be based on a preventive attitude and systematic analysis and feedback from different reporting systems: patients' reports, complaints and claims as well as systematic reporting of incidents, including complications, by health-care personnel. The patient-safety strategy should become an integral component of the overall continuing quality-improvement programme. Investment in patient safety, as in quality improvement, should be considered as economically sound and good value for money (Institutionalization of Quality Assurance Project Report [QAP], 2001).

Support from the government to health professionals is crucial to make disclosure of the incident possible and to enable continuation of work in health care, where risks will always exist and adverse events happen (C.E., 2006).

Reducing the risk of error in health care will require a substantial and sustained effort at all levels of the health care system. It must become a priority goal wherever care is given—the doctor's office, the hospital, and the nursing home. That goal must be supported by the commitment of both human and financial resources. The Ministry of Health -and other regulators and accrediting bodies- must articulate the vision of safe care that they call upon

others to work toward (National Coalition on Health Care and the Institute for Healthcare Improvement, 2000).

Of course, the key task for the future effectiveness of any medical errors' reduction strategy and policy will be to identify quality assurance practices that could respond effectively to system data. We must not forget, that even countries with a long history of error reporting, have not yet implemented comprehensive programs to correct problems once they are identified.

The primary objective of an incident reporting system (Vozikis & Riga, 2008b; Vozikis, 2009) is the enhancement of patient safety, by learning from adverse events and mistakes made. Reporting and collection of incident data is meaningful only if the data is analysed and evaluated and if feedback is given to the professionals involved in the incident, and to all others who could learn from the incident. Although the medical literature has focused primarily on medication- and procedure-related errors, there is little information on the potential benefits and hazards associated with the use of new medical technologies.

To sum up, patient safety deals with safe practices in a safe health care system where the health providers analyze the quality and safety indicators to prevent future adverse events.

8. Acknowledgement

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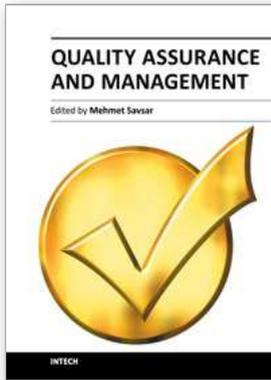
Quality Assurance and Management

Edited by Prof. Mehmet Savsar

The purpose of this book is to present new concepts, state-of-the-art techniques and advances in quality related research. Novel ideas and current developments in the field of quality assurance and related topics are presented in different chapters, which are organized according to application areas. Initial chapters present basic ideas and historical perspectives on quality, while subsequent chapters present quality assurance applications in education, healthcare, medicine, software development, service industry, and other technical areas. This book is a valuable contribution to the literature in the field of quality assurance and quality management. The primary target audience for the book includes students, researchers, quality engineers, production and process managers, and professionals who are interested in quality assurance and related areas.

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