

RESEARCH ARTICLE

Key Performance Indicators in Claims Management: Definition of a Set of Indicators for the Evaluation of the Medico-Legal Activity

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Abstract: Background: In recent decades, in the field of healthcare, awareness of the problems inherent to the quality has steadily increased. Currently, the evaluation of healthcare activities is one of the ways in which health systems regulate internal relationships and define strategic decisions.

Objective: The study aims to describe in detail the entire process of developing a group of Key Performance Indicators for monitoring and implementing the management of litigation due to medical liability. Particularly, the objective is to centralize and standardize the indicators to provide scientifically reliable data on claims management to hospital professionals responsible for strategic choices.

Methods: The study was conducted to analyze data relating to the claims management at Umberto I General Hospital in Rome from 2012 to 2018. All claims reported were classified according to a selection of the categories coded in the International Classification for Patient Safety system, the economic features, and the chronological references of the main management extrajudicial and judicial phases. The Process Analysis Method was followed to develop significant indicators for measuring the performance and the quality of claims management.

Results and Conclusion: The results obtained demonstrate how the assessment of performance in claims management can potentially lead to greater risk control with significant repercussions in terms of reduction of disputes, speed in settling claims, reduction of management times, planning of loss prevention measures, and implementation of quality of care.

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1. INTRODUCTION

The techniques and methodologies implemented for the analysis of clinical outcomes are subject to continuous evolution and, currently, are particularly complex and refined. Furthermore, the recognition of the different areas that make up the quality of care has determined the formal conceptual framework of the evaluation of care services in the more general context of the assessment of health services and systems [1].

In recent decades, in the field of healthcare, awareness of the problems inherent to the quality and safety of care, as

well as the need to bridge the so-called “quality gap” has steadily increased [2, 3].

Such a cultural revolution implied the involvement of different parties, including care providers (healthcare professionals, hospitals, nursing homes, residential facilities), insurance systems, government bodies, and quality improvement organizations [4, 5].

Currently, the evaluation of healthcare activities is not only a self-referential exercise that professionals carry out separately in their areas of expertise, but it is one of the ways in which health systems regulate internal relationships and define strategic decisions [6-8]. The evaluation action is now an integral part of the processes of elaboration, development and implementation of health policies and represents a fundamental point for the design and functioning of clinical governance precisely due to the role played in the accreditation processes [9, 10].

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However, understanding progress in quality improvement is hampered - especially in some scenarios - by a lack of systems for monitoring and comparing performance [11]. The standardization process hesitated in the approval of performance indicators and communication systems currently at the basis of the assessments regarding the accreditation of healthcare facilities. Performance indicators represent tools tailored to particular areas of healthcare or diagnostic and therapeutic pathways (management of surgical patients, rehabilitation paths, territorial care) [12].

Regarding hospital care, the various sets of performance indicators can be widely used across different institutions such as national regulatory bodies, insurance systems and patient organizations. In particular, in addition to encouraging the improvement of quality of care, the use of performance indicators can facilitate patient choices for care providers and company decisions regarding insurance policies.

Despite the indisputable organizational advantages, the use of performance indicators can have a series of implications on the management level. First, health facilities must collect a growing number of externally imposed data, addressing an increase in activities and management costs, with a substantially unknown impact on healthcare outcomes [13-16]. However, it has been observed that in many care settings, such as integration, although desirable, is only partially feasible [17].

From a strategic point of view, it is therefore essential for healthcare facilities to make choices aimed at balancing the resources necessary for homologation to the performance indicators defined externally and the potential benefits at the organizational level.

Historically, the constant demonstration of the need to improve the quality of healthcare worldwide has placed the question on the basis of national and international health policies. The National Academy of Medicine (NAM) in the United States has defined the quality of healthcare as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” [18].

The quality of care is defined by multiple dimensions - summarized below - which concern different aspects of the activity of professionals and health systems:

- Accessibility (ease of access to care based on patients' care needs).
- Continuity (degree of coordination and integration between different operators and services for patient management).
- Efficacy (ability of a health intervention to obtain the desired clinical results).
- Efficiency (ability of a health intervention to obtain the desired clinical results with the minimum use of resources).
- Clinical appropriateness (use of an effective health intervention in patients who can actually benefit from it).
- Organizational appropriateness (provision of the service adequate to the number of employed resources

with respect to the organizational context and the clinical characteristics of the patient).

- Safety (provision of care in organizational contexts that minimize risk conditions for patients and operators).
- Timeliness (provision of the service in appropriate times with the patient's care needs).
- Centrality of the patient (ability to take into account, in defining care pathways, the patient's needs while respecting their culture, decision-making autonomy, and dignity).
- Development of human resources (ability to develop the skills of professionals by offering opportunities for updating, in a context suitable for maintaining operator satisfaction).

Currently, several strategies are in place for the implementation of quality of healthcare with the involvement of health professionals, care processes, organizations, and health systems. In particular, systems for external monitoring and regulation of health services are currently active on a large scale. The development of a culture of healthcare quality is desirable for different reasons, including:

- The slow pace of improvement in the quality and safety of care [19].
- The need to ensure cost sustainability and care standards in a context in which the limitation of resources makes the appropriateness of healthcare spending central [20, 21].
- The growing technical and logistical complexity of healthcare provision [22].
- The need for reliable data on health services that allow adequate planning of economic and insurance policies [23-25].
- The growing social anxiety about changes in the quality of healthcare, including equity in access to high-quality care [26-28].
- The growing assertiveness and independence of consumers, with the need for access to standardized information that allows direct comparisons between healthcare professionals in order to facilitate decision-making processes [29].
- The interest of the media in reporting information relating to the quality of healthcare, in particular, through the publication of self-referential rankings with low levels of evidence [30-35].

Although the definition of a performance indicator is not unique [36, 37], the main feature of this tool is providing information that reflects the quality of a given parameter (process, diagnostic and/or therapeutic path, *etc.*) within the health system [38, 39]. As suggested by the term, a performance indicator provides a signal indicating a direction for research and actions to be taken at the organizational and political level; at the same time, the indicators provide users with important elements for choosing the services of reference. The criteria for evaluating care services represents the expression of the methods of assistance that should be put in

place in specific clinical situations and/or for certain categories of patients. These criteria should concern aspects of healthcare that can be measured and translated into representative indicators of the quantitative measure of the degree of adherence to a given criterion (Table 1).

Table 1. Assessment criteria requirements.

Scientificity	<ul style="list-style-type: none"> • Consistency with the evidence
Shareability	<ul style="list-style-type: none"> • Inclusion in guidelines and good care practices
Relevance	<ul style="list-style-type: none"> • Relevance to the care aspects under evaluation
Translatability into indicators	<ul style="list-style-type: none"> • Usability in a reproducible way • Accuracy (with a sensitivity and specificity such as to correctly discriminate between good and bad quality care minimizing false positives and false negatives) • Sensitivity to variations in the phenomenon • Understandability • Simplicity and cost-effectiveness of use

Consistent with the previous description of the fundamental aspects of the quality of healthcare and with the scientific evidence currently available, the performance indicators can relate to the structure, processes, and outcomes of care. In particular, the performance indicators may concern the management of a specific condition (breast cancer, venous thromboembolism, *etc.*), a specific professional category (radiologist, physiotherapist, *etc.*), a particular type of facility (hospital, rehabilitation center, nursing home, *etc.*) or a combination of the cases [40-48]. Nonetheless, indicators may reflect performance levels (strategic, tactical, and operational) as well as the dimensions of performance (safety, effectiveness, efficiency, timeliness, patient focus, and equity).

At present, there is a great consensus in the literature on the relevance of classification and quality control systems in the analysis of complex procedures such as those related to healthcare [49, 50].

The main objective of this study is to describe in detail the entire process of developing a group of Key Performance Indicators (KPIs) for monitoring and implementing the management of litigation in the field of medical liability. In particular, the study aims to centralize and standardize the Key Performance Indicators in order to provide scientifically reliable data on claims management to hospital professionals responsible for strategic choices.

The data obtainable through the outlined methodology can provide useful tools for clinical governance, for the planning and implementation of quality improvement strategies, as well as for the transparency and assurance of the safety of care [51-53].

In consideration of the lack of scientific recommendations and guidelines for litigation management, this study is oriented towards the identification and use of evaluation criteria and performance indicators that can contribute to increasing the evidence by triggering a virtuous circle for a continuous update of state of the art. The methodological approach put in place will also help to define reference

standards to be used for comparative purposes for the assessment of services provided in claims management activity that can be implemented through further studies following validation of the method.

2. MATERIALS AND METHOD

The study was conducted through the analysis of data relating to claims management carried out at Umberto I General Hospital in Rome from 2012 to 2018.

The preparation of the database involved the use of data collected at the hospital's Legal Affairs Office. All claims reported during the study period were included and classified according to:

- A selection of the categories coded in the International Classification for Patient Safety (ICPS) system [54], suitably modified in relation to the features of the reality under examination; in particular, a categorization based on parameters such as sex and age, operating unit involved, type of event, patient outcome, organizational outcome, and presence of guidelines or internal protocols was implemented.
- Economic features, such as requested amount, technical estimate, risk of loss, and amount paid.
- The chronological references of the main management extrajudicial and judicial phases.

In order to develop a significant index for measuring the quality of performance, the Process Analysis Method for the selection of indicators was followed [55]. This approach was designed to measure the sustainability of complex systems and allows the development of a complete set of indicators targeted for a predefined system. The implementation of PAM for the measurement of performance in claims management envisaged the five phases described below:

- Phase I - Overview of the claims. During the initial phase, a review of claims was carried out through the analysis of the files to deepen the management aspects, the risks, and the emerging issues in the context of clinical governance.
- Phase II - Definition of performance in claims management. The purposes of this definition are represented by the need to establish the criteria and reference parameters for evaluation of the system. For this purpose, performance in claims management has been defined as the contribution (result and methods of achieving the result) of a subject (health system, healthcare facility, operating unit, health professional) to the achievement of the aims and objectives, as well as to the satisfaction of the needs for which the system was set up. The subsequent evaluations were based on the derivation of perspectives representing the elements integrated into the concept of performance: qualitative and quantitative features of the claims; accessibility of documentation and interaction with the structures involved; peculiarities of clinical and economic risks; management skills in terms of timing, defensive strategies, and multidisciplinary involvement. The perspectives identified

were conceived to trace the direction of performance improvement and facilitate the implementation of the quality of healthcare. In particular, the creation of a high-performance system presupposes the reduction of claims, the increase in accessibility, the minimization of risks, and the improvement of management skills.

- Phase III - Setting system limits. The delimitation of the system was carried out using a spatial criterion and a temporal criterion. The spatial scale was set based on the size of the claims management system, including all claims for general civil liability and health liability. The time limit was instead determined to cover a period of 7 years - from 2012 to 2018 - to allow accurate detection of trends.
- Phase IV - Setting up the performance scoreboard. Consequently, based on the operational definition and setting of the system limits, the selection of a set of indicators and internal standards was made (Table 2). The KPIs have been standardized, in terms of indicator name, definitions, and calculation methods, as well as validated against internationally recognized benchmarks, such as the quality indicators of the Agency for Healthcare Research and Quality (AHRQ).
- Phase V - Verification. During the final phase, the data, measures, and indicators were verified through review and stakeholder consultation.

Such a methodology was found to be extremely compliant with the objectives of the study as it presents a systematic approach to structure the evaluation and provides transparent guidelines for the selection of indicators while ensuring flexibility for the customization of the measurement based on the peculiarities of the different care services. The evaluation of the structural peculiarities during the design of the performance indicators allowed to emphasize credibility, reliability, and salience.

3. RESULTS

The present study included a sample of 936 claims reported between 2012 and 2018. For the investigation, all claims for damages managed directly by the hospital or jointly with the insurance company were considered as requests. The population studied was composed mainly of claims resulting from medical liability, but there was also a small subset of claims due to general civil liability.

With regard to the volumes of activity, Umberto I General Hospital represents a highly specialized healthcare facility, with 1,235 beds, 41,000 annual hospitalizations, 24,000 admissions in day hospital, 140,000 accesses to the Emergency Department, and 1,000,000 annual services between instrumental diagnostics and specialist visits.

The data relating to monitoring of management activities during the study period are systematically reported according to the related indicators.

The preliminary assessment of the claims rate in terms of absolute frequency has shown over the years a trend towards a decrease in the number of claims for compensation. In particular, there was a 42% decrease in the number of claims from 2013 to 2018, while the average number of claims annually reported was 134. Concerning the indicator on the volume of claims, the calculation of the values for every single year produced the results shown in the graph below (Fig. 1). The application of the calculation formula to the average number of claims also made it possible to establish an internal standard of 20.61 and to demonstrate a deflationary trend with the satisfaction of the reference internal standard starting from 2015.

The analysis of the claims based on the areas of healthcare and operating units involved made it possible to highlight - as expected - the greater involvement of surgical disciplines with 49.46% of claims; in 21.47% of cases, the event from which the dispute originated took place in a medical area department, while in 5.03% of cases, the claim is attributable to the services area. In 24.04% of cases, it was

Table 2. Performance indicators and internal standards.

Indicator	Calculation Formula	Internal Standard
Claims volume	$\frac{\text{No. of reported claims}}{\text{No. of annual hospitalizations}}$	$\frac{\text{Mean of claims reported per year}}{\text{No. of annual hospitalizations}}$
Involvement of care areas	$\frac{\text{No. of reported claims}}{\text{No. of annual hospitalizations}}$	$\frac{\text{Mean of claims reported per year}}{\text{No. of annual hospitalizations}}$
Type of event	$\frac{\text{No. of reported claims}}{\text{No. of annual hospitalizations}}$	$\frac{\text{Mean of claims reported per year}}{\text{No. of annual hospitalizations}}$
Preliminary phase timing	No. of days	Standard set by regional guidelines
Completeness of documentation	$\frac{\text{No. of document integration requests per year}}{\text{No. of claims per decade}}$	$\frac{\text{Mean of integration requests per year}}{\text{No. of claims per decade}}$
Internal opinion	$\frac{\text{No. adequate reports per year}}{\text{No. of claims per decade}}$	$\frac{\text{Mean of adequate reports per year}}{\text{No. of claims per decade}}$
Internal recommendations and protocols	Annual percentage of claims covered	Goal set by the hospital management
Risk of loss	$\frac{\text{No. of claims at high risk}}{\text{No. of claims per decade}}$	$\frac{\text{Mean of claims at high risk per year}}{\text{No. of claims per decade}}$
Efficiency of the claims assessment committee	$\frac{\text{No. of claims discussed}}{\text{No. of claims per decade}}$	$\frac{\text{Mean of claims discussed per year}}{\text{No. of claims per decade}}$

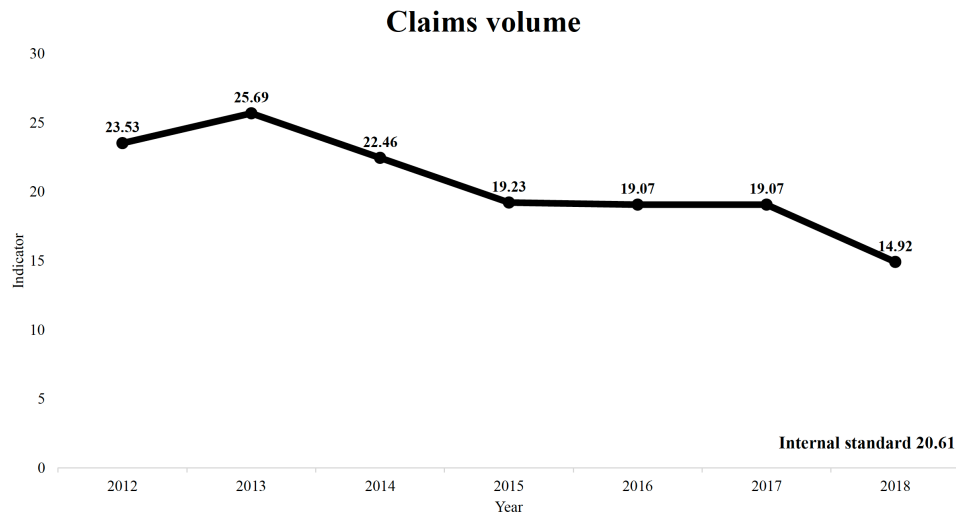


Fig. (1). Trend of the indicator relating to the volume of claims. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

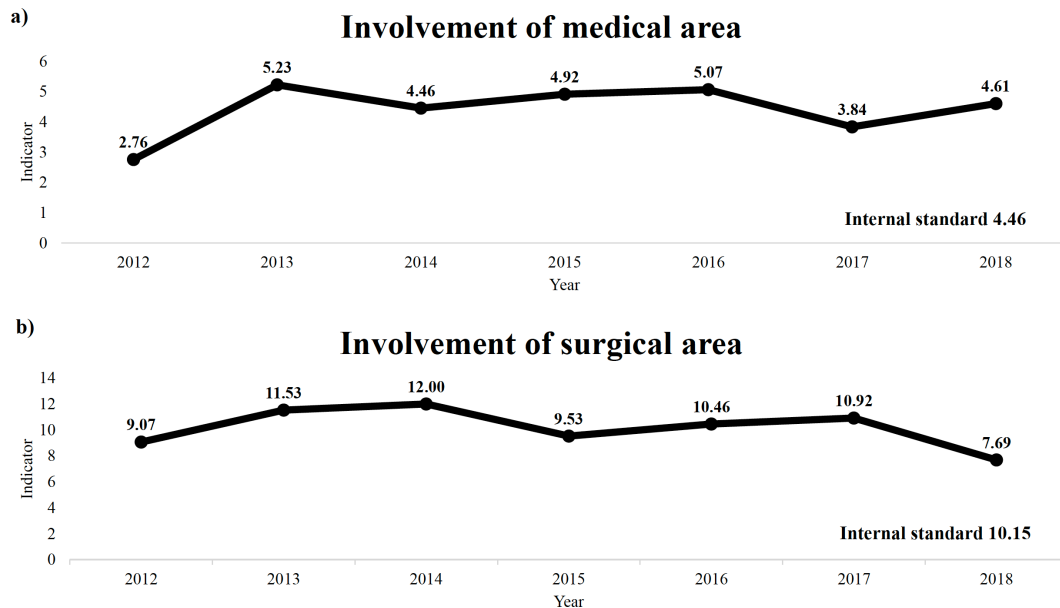


Fig. (2). Trend of the indicators relating to the involvement of care areas: a) medical area; b) surgical area. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

impossible to categorize the accident in a specific health area as it resulted from an accidental fall or theft and damage to objects. The stratification of this data according to the year in which the accident was reported highlighted an increase in the claims rate in all health areas except for the uncategorized cases, which, on the contrary, showed a significant decrease. With regard to the indicator of the involvement of health areas, the calculation of the values for each year produced the results shown below (Fig. 2). The application of the calculation formula to the average number of claims has also made it possible to establish internal standards of 4.46 for the medical area, 10.15 for the surgical area, and 1.07 for the services area.

The assessment of claims based on the type of event that occurred highlighted the prevalence of claims related to therapeutic errors (395; 42.20%), patient accidents (117;

12.50%), and healthcare-associated infections (102; 10.90%). Similarly, significant were the claims for which it was not possible to proceed with a categorization (108; 11.54%), as they arose from events that occurred outside the healthcare context. The stratification based on the year in which the claim was reported confirmed the general significance, in particular, objectifying a substantial stationary nature of claims from treatment errors and the constant increase in claims from healthcare-associated infections. To calculate the indicator relating to the type of event that occurred, the application of the formula to the different categories produced the results exemplified below (Fig. 3).

About the indicator relating to the timing of the preliminary phase, the latency period between the request for compensation and the transmission of the file produced - for the

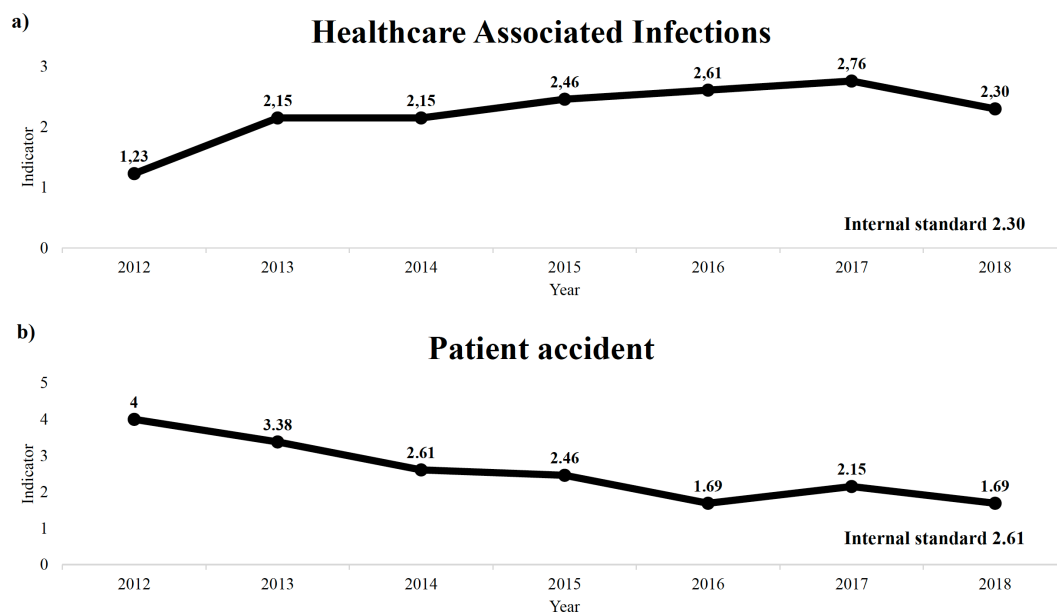


Fig. (3). Trend of indicators calculated according to the type of event: **a)** Healthcare Associated Infections; **b)** patient accident. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

year 2018 - the data exemplified in the graph below. The average time for completing the preliminary phase was quantified as 114.47 days. The internal standard was set at 75 days from receipt of the compensation request. The results obtained showed moderate satisfaction with the standard adopted with 46.39% of cases, in which the preliminary phase was concluded within the set period. At the same time, extreme situations were identified in which the time was more than one year, or the preliminary phase never came to an end.

With regard to the completeness of the documentation relating to the claims, the quantification of the requests for documentary integration forwarded to the competent office showed a deflationary trend with an average annual number of requests equal to 20. The application of the calculation formula to the average number of claims also made it possible to establish an internal standard of 1.47. The values obtained indicate the satisfaction of the internal reference standard starting from 2016, however, showing an incremental trend in the last year of the study period (Fig. 4a).

The analysis of the data relating to the adequacy of the internal report produced by the professionals of the Operating Unit involved has shown an increase in coverage over the years despite the presence of a substantial basic inadequacy. The average annual number of cases in which it is possible to rely on an internal relationship was 93; the average of the claims for which there is an internal report deemed adequate and useful for the management of the case was equal to 55. With regard to the indicator relating to the internal opinion, the calculation of the values for each year produced results shown in the graph below (Fig. 4b). To assess the medico-legal performance, the cases selected were those in which the internal relationship was deemed adequate. The application of the calculation formula to the average number of internal reports deemed adequate based on the completeness of the reconstruction, the support of evidence, and the

consistency of the considerations also made it possible to establish an internal standard of 4.05.

The assessment of claims based on the coverage of internal recommendations and protocols highlighted a large number of cases for which it is not possible to implement and apply specific procedures (250; 26.71%). In absolute terms, it was found the preponderance of cases for which diagnostic and therapeutic paths aimed at preventing errors were not implemented (441; 47.12%). The stratification of the data based on the year the claim was reported showed an incremental trend of claims whose management is supported by the presence of internal operating protocols. At the same time, the relatively stationary nature of the data concerning the lack of internal procedures was noted, above all due to the considerable presence of claims due to diagnostic or therapeutic errors for which the planning of care paths is very difficult. Finally, contrary to the general trend, a decrease in claims in which procedures cannot be theorized and applicable has been demonstrated. About the indicator on the coverage of internal recommendations and protocols, the calculation of the annual percentages of claims for which there is the support of internal procedures has produced the results shown below (Fig. 5a). To plan the objectives, the setting of an internal standard of 50% was deemed adequate.

Limited to the data concerning the risk of loss of the different claims, the results obtained documented the prevalence of high-risk claims (340; 36.33%); similarly, a significant proportion of claims was highlighted with low (275; 29.38%) and medium (227; 24.25%) risk of loss. The stratification of the data based on the year in which the claim was reported highlighted a significantly deflationary trend of claims at high risk of loss, with a decrease of 3.14% during the study period; such a result reflects in absolute terms the effectiveness of clinical risk management in reducing errors and improving the safety of care. At the same time, there was a significant increase in claims at low risk of loss, with a

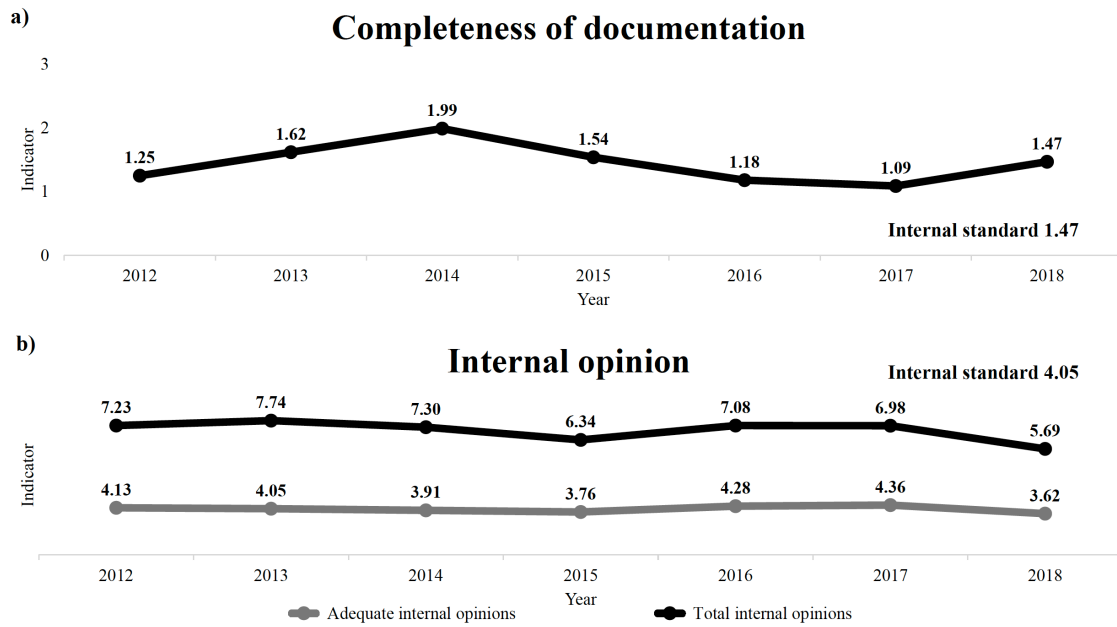


Fig. (4). Trend of indicators relating to: a) completeness of documentation; b) internal opinion. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

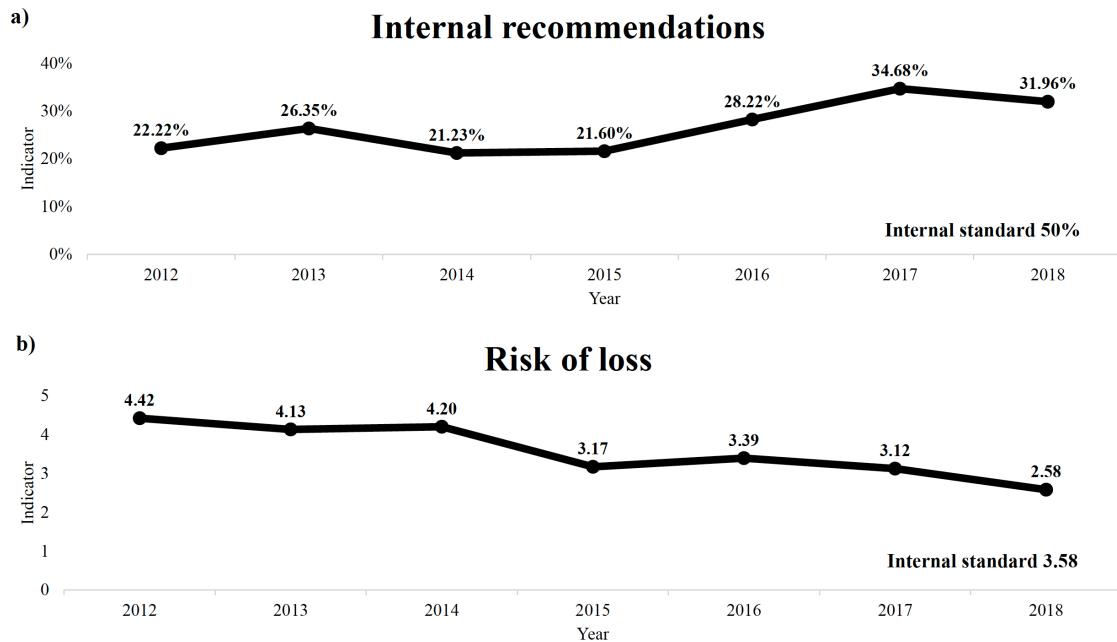


Fig. (5). Trend of indicators relating to: a) internal recommendations; b) risk of loss. (A higher resolution/colour version of this figure is available in the electronic copy of the article).

growth of 15.05% starting from 2012. During the investigation period, an increase of 12.45% in claims at medium risk of loss was also documented. Finally, the net decrease in cases in which the risk of loss has not been assessed constitutes an indirect indicator of the performance in litigation management, demonstrating a conspicuous strengthening of the coverage of the sample starting from 2014. With regard to the indicator on the risk of loss, the calculation applied to high-risk claims for every single year produced the results shown in the graph represented below (Fig. 5b). The application of the calculation formula to the average number of

high-risk claims also made it possible to establish an internal standard of 3.58.

The evaluation of the efficiency of the claims assessment committee (CAC) in terms of absolute frequency has shown over the years a trend towards an increase in the number of claims handled despite the presence of significant fluctuations in values. Specifically, the data obtained certifies an increase in claims management activities of approximately 116% from 2013 to 2017, with an average number of claims handled annually equal to 113. Concerning the indicator of

the efficiency of the claims assessment committee, the calculation of the values for each year produced the results summarized below. The application of the calculation formula to the average number of claims discussed annually within the Committee also made it possible to establish an internal standard of 8.22. The graphic representation demonstrates the inconsistent trend of the activities of the Claims Assessment Committee with the satisfaction of the internal reference standard only in the years 2015 and 2017.

4. DISCUSSION

In this exploratory study conducted on the medico-legal activity of litigation management, the usefulness of implementing a set of indicators for performance evaluation was demonstrated. Performance has been identified as an important factor that influences the safety of healthcare, also in the context of medico-legal services, and acquires the value of a useful tool for the growth of clinical skills, particularly in the field of maintenance and development of quality of care. However, starting from the preliminary stages of the study, the awareness of the absence of adequate data series for measuring sectoral performance was rooted. For this reason, indicators based on both qualitative and quantitative data suitable for assessing the multidimensionality of performance have been selected.

In general, a positive impact of the performance indicators on the internal quality control system in the management of company litigations has been noted [56, 57]. The obtained results provided extremely useful information on the role of the collection, analysis, and communication of performance data in the quality management system.

The statistical processing of the data collected reflects some elements of consistency with the evidence currently available and others, on the contrary, in clear contrast with the results obtained so far.

Concerning the volume of claims, the data obtained show a significant decrease in claims occurring over the last few years with a positioning below the internal standard and the national reference values starting from 2015. During the study period, Umberto I general hospital showed a decidedly reduced accident rate up to the minimum in the year 2018 with about 15 claims per 10,000 hospitalizations. Such a result represents an indirect indicator of the quality of litigation management, being mostly attributable to the decision to take deterrent measures against incongruous or even spurious requests, such as the immediate call for a visit to reject the claim.

As regards the involvement of the different care areas, the results obtained demonstrate full consistency with the literature data, demonstrating a prevalent distribution of claims in the operating units of the surgical area. The indicator on the involvement of care areas offers interesting insights into the phenomenology of litigation, highlighting a relative decrease in claims in the surgical area related to the implementation of certain corrective measures, especially in the context of the prevention of healthcare-associated infections.

With regard to the type of event, the substantial stationary nature of the claims from treatment errors and the substantial increase in claims from healthcare-related infections (from 5.23% in 2012 to 15.46% in 2018) were highlighted. The trend of the indicator relating to healthcare-associated infections finds its rationale in the greater sensitivity of public opinion to the issue; the experience gained also demonstrates the current refractoriness of the phenomenon to the implementation of internal protocols for containment. Similarly, the increase in claims for diagnostic errors was attributed to a greater sensitivity of patients to the accuracy of trauma and oncological diagnostics; the limitation of the phenomenon is subject to the planning of dedicated care paths. The constant reduction in claims resulting from accidental events that occurred to patients during hospitalization reflects the effective application of near-miss and incident reporting procedures, as well as the adherence of health professionals to internal protocols for the prevention of falls.

The undoubted qualitative improvement of the preliminary phase must be traced back to the introduction - from the year 2016 - of a checklist aimed at verifying the completeness of the file before transmission for the medico-legal evaluation.

As regards the presence and adequacy of the reports produced by professionals involved, the small extent of the improvement is probably due to a lack of training on the importance of internal opinion. Therefore, the implementation of training courses useful for raising the awareness of health professionals is being planned.

A particular effort in reducing management times must be made, although the preliminary results relating to the application of some measures are encouraging.

The study conducted provides topics for reflection on the process of elaboration of the indicators, starting from the issues relating to data collection [58]. The performance indicators have been conceived as an internal quality improvement tool aimed at identifying and characterizing potential areas that need intervention.

The implementation of quality control and performance measurement systems allows health facilities to initiate care improvement processes through case research, root cause analysis, and cluster identification; nevertheless, the adoption of similar systems allows the assessment of the impact of corrective interventions and the monitoring of performance over time [59, 60]. However, as with any quality measurement system, indicators need to be used carefully as a lot of the administrative data on which the surveys are based are not collected for research purposes or to assess the quality of care [61, 62]. Overall, the performance indicators constitute a low-impact tool that exploits readily available data to identify the problems inherent to the quality of care [63]. Consistent with numerous studies available in the literature, the performance indicators for internal use should be established by the health professionals themselves, but above all, they should be simple and quick to use with regard to collection and analysis [64, 65]. The use of such a system requires incessant planning activity that includes the systematic monitoring of results and the adaptation of indicators to the different care services [66]. The "personalization" of the

indicators presupposes a privileged point of view on healthcare services and, therefore, an active involvement of medical specialists and other appropriately trained health professionals [67-76]. The outlined sectoral approach allows identifying appropriate and relevant indicators for the specific characteristics of a given healthcare context, while preserving the necessary elements of consistency and comparability.

With reference to this study, during the initial selection of the indicators, the possibility of collecting reliable data has been widely considered by searching for satisfactory proxies in case of an incomplete dataset. The major challenges faced during the design phase have been identified in the collection of data relating to the timing of the preliminary and expert phases of the claim management. In any case, the in-depth study of the data relating to the litigation of Umberto I General Hospital allowed the selection of a balanced set of indicators despite the scarcity of evidence in the literature. The unavailability of adequate data to cover all indicators for the entire survey period has also demonstrated the usefulness of the performance assessment process in identifying the prioritization of data collection. For example, to complete the proposed set of indicators, the collection of data relating to the closing of claims could be implemented - regardless of rejection or settlement - with the aim of objectifying the predictive effectiveness of assessing the risk of loss and the technical estimate of the claim's value.

Ultimately, on the basis of the foregoing, the use of a performance measurement system indisputably presupposes the creation of new skills within the health facilities in terms of claims analysis, as well as the formation of a risk management network aimed at raising awareness of health risks and implementing good practices for the safety of care.

The proposed indicators clearly show the dynamic nature of health liability litigation. The significant changes found with some indicators during the investigation period underline the need to address the performance assessment in the management of hospital litigations through long-term analyzes, avoiding the exclusive use of precise estimates [77].

The results obtained from the declination of the methodological approach proposed in the claims management activities of Umberto I General Hospital are still undoubtedly preliminary, but definitely encouraging with regard to the extensive implementation and the assessments in terms of effectiveness and predictivity. The analysis carried out represents a fundamental alternative to the reports currently available as it is not limited to the merely actuarial aspect but considers the individual dimension of the care events underlying the claim [78, 79].

The evidence regarding the responses of hospitals to the application of performance indicators for litigation management is currently scarce. Given the variety of responses highlighted in the context of this study, the continuation of this research appears desirable. The extension of the study could provide professionals with information on how performance data is currently being managed and used. Nonetheless, the obtained results can contribute to the creation of a set of relevant performance indicators for internal monitoring, accreditation, training and research purposes.

The framework outlined in the present study demonstrates in particular how research and development are an integral part of clinical governance [80]. In fact, research is associated with the concept of knowledge progression, while development concerns the methods of implementing care services and outcomes through the application of the results obtained from the research. Therefore, in the context of clinical governance, not only the research but, above all, the translation into clinical practice and the dissemination of innovative practices are characterized with considerable importance. The introduction of new methodologies in the management of medical liability litigation requires the consolidation of knowledge, as well as of technical, organizational, and economic rules with the evaluation of costs and benefits understood as results in terms of equity and sustainability. In fact, despite the applicability of new knowledge to the healthcare sector based on the principles of evidence-based medicine, it is essential to contextualize the results to the organizational and managerial peculiarities of the individual situations.

The context of modern healthcare services is characterized by growing complexity and specialization and requires a cultural change - especially in the medical-legal field - which places ever greater attention on the outcomes of healthcare processes [81]. In other words, the progressive diffusion of a model oriented to the systematization of processes and the generation of scientific evidence in the theoretical and practical fields is desirable. With specific reference to the management of healthcare liability litigation, methodological standardization and inspiration from the principles of evidence-based medicine represent an essential prerequisite for maintaining risk monitoring, for short-term planning of initiatives aimed at improving provided services, and for the programming - by health services - of long-term organizational and economic strategies.

The assessment of the performance of health services currently represents an element of considerable importance in the context of health policies as it constitutes a substantial element of the governance models adopted by the healthcare structures [82].

The complexity of professional behaviors and the difficulties in spreading new operating methodologies explain the limited success of strategies based on the simple dissemination of aseptic recommendations and guidelines rather than sterile reports relating to the performance of care activities and outcomes [83]. Considering the fact that the behavior of health professionals is also determined by structural and organizational elements, the desired cultural change involves further subjects characterized in particular by health policy makers [84]. The quality-of-care assessment and implementation system, therefore, requires the creation of a favorable environment in which synergistic cooperation between professionals and health facilities aimed at enhancing skills according to the objectives of improving performance is possible [85].

In the face of the desired commitment of individual care services, the promotion of transparency through initiatives aimed at publicizing the results of performance measurements is still necessary for the purpose of change. In fact, the disclosure of data makes it possible to reduce the risks relat-

ed to care by directing the behavior of all involved parties in the care process. The literature has shown that the adoption of initiatives aimed at transparency has led to the development of greater sensitivity to the issue of quality in hospitals [86].

The promotion of transparency determines on the formal level the strengthening of external monitoring tools and on the substantial level the passage from the concept of "trust" to the concept of "reliability" [87-89]. The notion of reliability implies the increase of authority and credibility towards users through the use of indicators or other sophisticated statistical and epidemiological tools [90-92]. Therefore, the implementation of this step presupposes - by health organizations - the focus of attention on the ability to achieve and document specific objectives rather than on compliance with procedures.

Ultimately, the obtained results - although preliminary - make it possible to formulate recommendations regarding the implementation of performance indicators for the management of litigation. It is possible to briefly summarize the elaborated recommendations as follows:

- Optimize the use of performance indicators by including them among the guiding principles of hospital policies and strategies.
- Actively involve healthcare professionals in performance measurement. The effectiveness of this recommendation is subject to support and training on the planning and management of care pathways.
- Select priority measures for improving the quality of care, as well as for instruction and professional research. Regarding research, data collection must help to implement scientific evidence on optimizing the organization of healthcare.
- Extend at a multicenter level the use of the proposed indicators in order to refine the measurements, establish objective standards and give greater weight to the obtained results, ensuring their influence in the planning of health policies.
- Implement the technological infrastructure underlying the use of performance indicators by facilitating the collection, analysis, and presentation of measurement data. The fulfillment of this recommendation presupposes various hospitals' definition of priorities for performance measurement.

CONCLUSION

Based on the experience reported in the present study, the assessment of performance in the management of claims potentially allows greater risk control, in particular with regard to the so-called frequency claims, with significant repercussions in terms of reduction of litigation, speed in settling claims, reduction of management times, the possibility of preparing effective loss prevention interventions and implementation of the quality of care [93-96].

However, the usability of the benefits related to the use of performance indicators is necessarily bound to carrying out constant and multidisciplinary activities that make per-

formance assessment a fundamental action in clinical governance.

The analysis conducted starting from the mapping of the litigation management activity of Umberto I general hospital has clearly highlighted the increasingly determining role of legal medicine in the policies of health systems. In particular, the management of health liability litigation is characterized by interesting implications in terms of strategic planning and sustainability as it is involved in complex and sometimes predictive assessments such as estimates of the risk of loss and economic exposure.

The methodological rigor and the scientific perspective of the medico-legal activity allow - unlike the investigations carried out by non-governmental organizations and insurance companies - to obtain relevant results for the purposes of clinical governance precisely in relation to the knowledge and consideration of the different phases and of the various protagonists of the care pathways. In particular, the high qualification of the medico-legal evaluation activity allows obtaining indicators and standards which, despite the abstraction, tend towards the complete evaluation of the peculiar aspects of the claims. Performance evaluation through the medico-legal investigation acquires the value of a useful tool for the growth of clinical skills, especially in the field of maintaining and developing the quality of care.

The outlined perspective allows hypothesizing a fervent scientific growth in the management of health liability litigation. In particular, the path undertaken will result in the formation of evidence and the consolidation of evaluation tools - possibly converging and interconnected - which will confer objectivity and predictive value to the medico-legal evaluation.

Future research activities in this area will be aimed at the multicenter application of the methodological approach outlined with the aim of verifying its reliability and adaptability to different organizational contexts. In fact, the obtained results - especially as regards the reference standards - cannot be simplistically generalized and extended to different realities.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No animals/humans were used for studies that are base of this research.

CONSENT FOR PUBLICATION

Not applicable.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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