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ORIGINAL ARTICLE

Bio-medicolegal guidelines and protocols: survey and future perspectives in Europe

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Abstract The preservation of uniqueness and the enhancement of the value of evidence in legal medicine is based on the implementation and development of a "quality management system," which includes a continuous education of specialists, the introduction and application of guidelines and protocols, as well as mechanisms of internal quality control. This ongoing process shows differences with regard to various fields of knowledge such as forensic genetics, toxicology, forensic pathology or forensic psychiatry, especially if different European countries are compared. To get an overview on the development of legal medicine in different European countries, a questionnaire was developed and sent to representatives of 42 European countries to verify the existence of bio-medicolegal guidelines and protocols. A National Society of Legal Medicine is established in 27 out of 32 countries (84%) which could be included in the final analyses. In 25 countries (78%), a specialisation is necessary as a prerequisite of inclusion in a national register, and 30 of the countries (94%) have guidelines in at least one field of legal medicine. The most common guidelines concern forensic pathology (in the fields of professional qualification and sudden death), forensic toxicology (driving under the influence of drugs and substance testing) and forensic genetics (paternity testing and personal identification). The findings of this study show that comparison is possible and can be a basis for further consensus in the European medicolegal community. The process of harmonisation of the medicolegal autopsy rules in Europe initiated in 1990 was a first step on this way. Further consensus is necessary and might be gained by developing European guidelines for each field within the subdisciplines, based on a standard European Guideline Format.

Keywords Legal medicine · Guidelines and protocols · Further harmonisation in Europe

Introduction

The preservation of unitariness and the enhancement of the value of evidence in bio-medicolegal knowledge depend upon the implementation of system quality, based on continuous education, shared guidelines and protocols, internal quality control. and proficiency testing systems, which, in turn, aim at the certification and the accreditation of institutions and individual professionals [1].

The realisation of this long-standing process finds a rational foundation in a context of a broad "critical mass," such as that existing in the international medicolegal community and, in particular, in the European one, characterised by a cultural affinity, yet differentiated in its structural, organisational, functional and operative features, where interdisciplinary and supranational innovations may lead to a wide methodological and criteriological European harmony.

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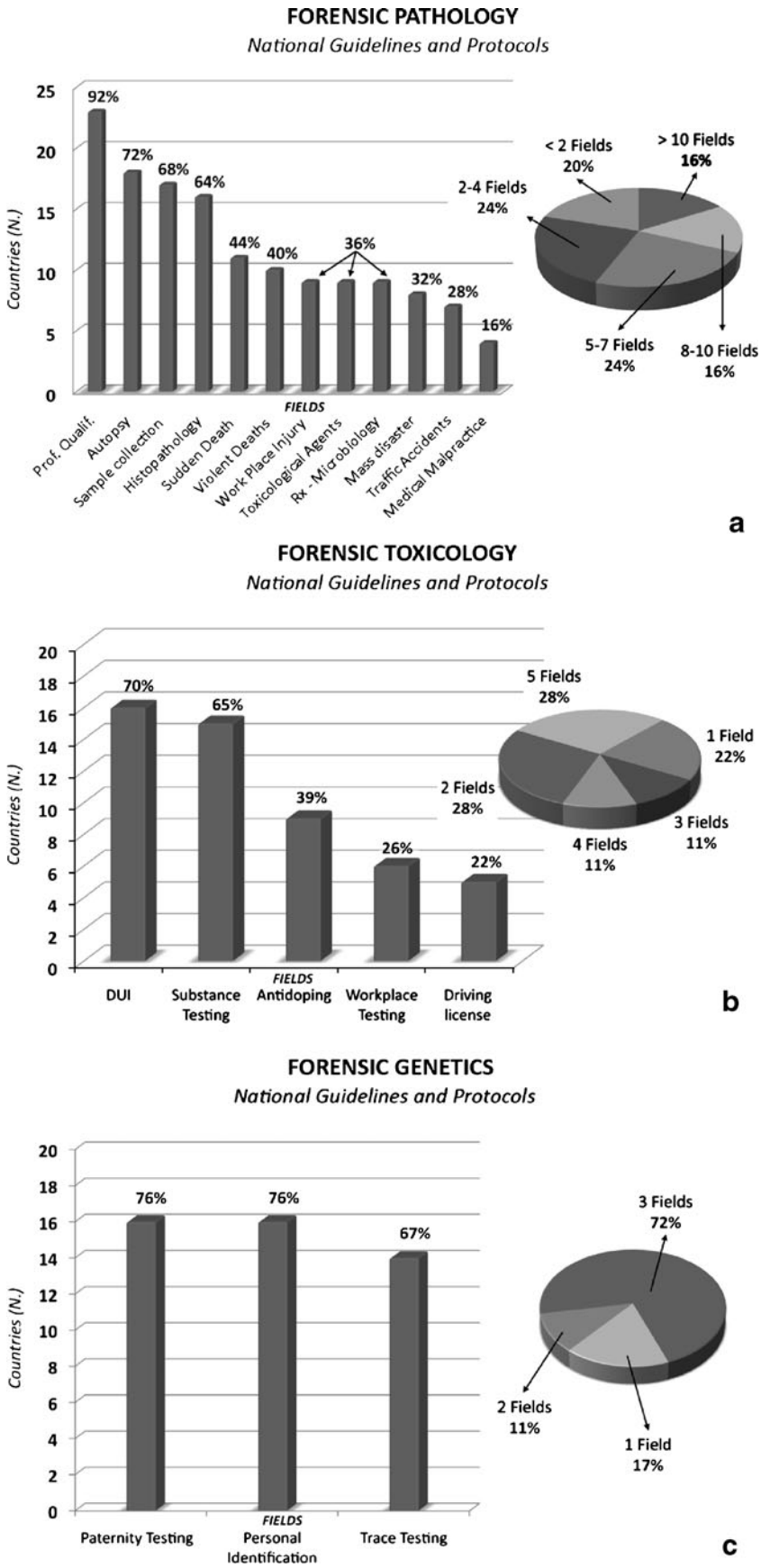
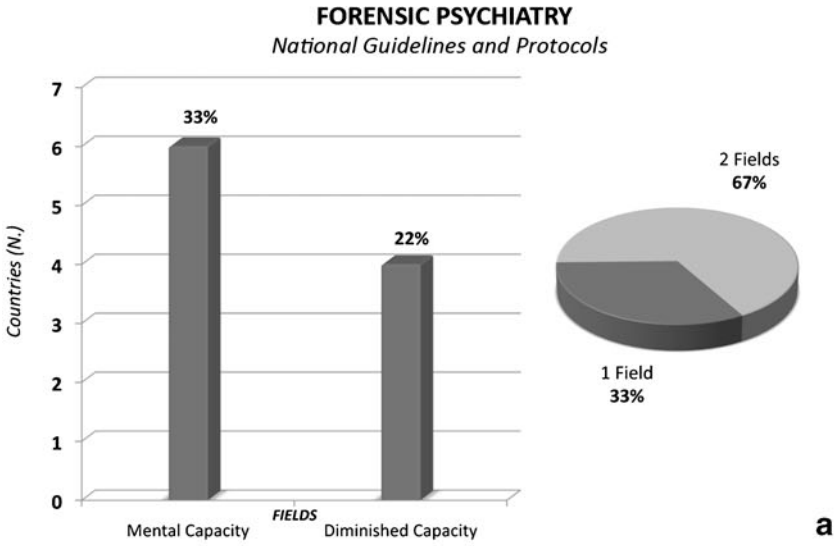
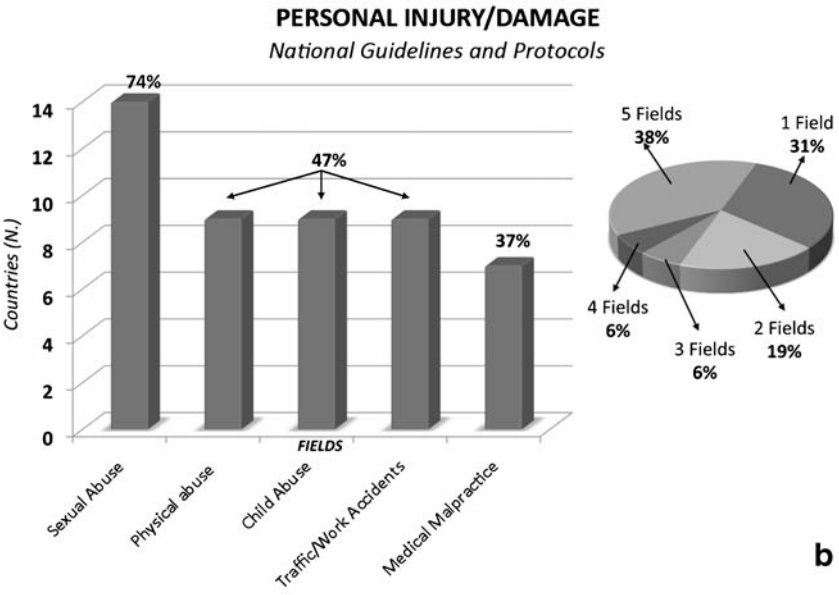


Fig. 1 Guidelines and protocols: state of the art in Europe for different fields of forensic pathology (**a** — 25 out of the total of 32 responders have guidelines), forensic toxicology (**b** — 23 countries have guidelines) and forensic genetics (**c** — 21 countries have guidelines). The *histograms* show the frequency of the countries with guidelines in the fields considered in the questionnaire. The *pie charts* show percentages for the countries with guidelines in more than one field





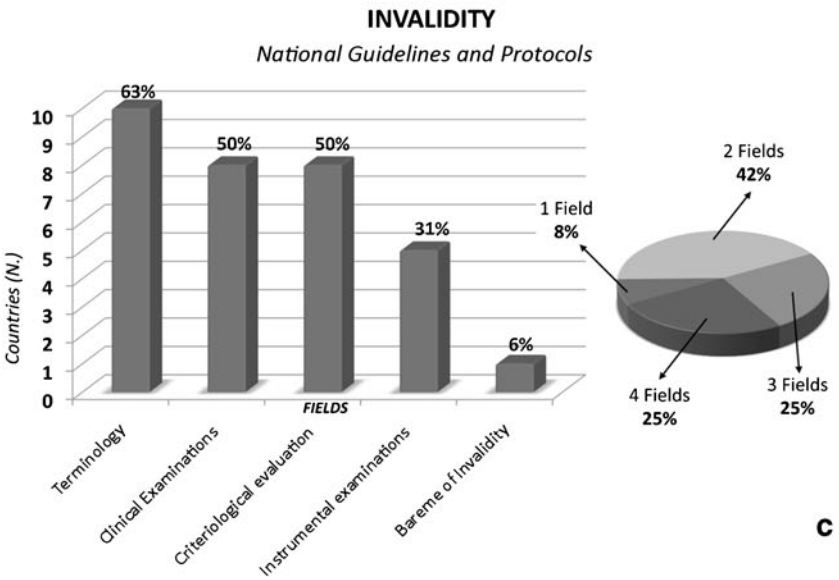


Fig. 2 Guidelines and protocols: state of the art in Europe for forensic psychiatry (**a** — 18 countries have guidelines), personal injury/damage (**b** — 19 countries have guidelines) and invalidity (**c** — 16 countries have guidelines). The *histograms* show the frequency of the countries with guidelines in the fields considered in the questionnaire. The *pie charts* show percentages for the countries with guidelines in more than one field

The knowledge of national medicolegal reality, precursory to this process, calls for the verification of the existence, or nonexistence, of "guidelines" and "protocols" upon the basis of which a sound comparison can be made. Regarding the European situation, the picture emerging in the few articles published in the international scientific literature is unclear. Some subdisciplines, such as forensic genetics, toxicology and anthropology, have long taken steps towards harmonisation, with the creation of European guidelines by means of consensus conferences [2-6], collaborative exercises and proficiency testing programmes [7-11]. Other subdisciplines or medicolegal branches, such as forensic pathology and forensic psychiatry, invalidity and biological damage, still lack a process of drafting and/or consensus, at both a national and a supranational level.

The methods used and the findings made in the present survey are a contribution to the knowledge gained in this field; although some of the findings were, to a certain extent, unexpected, they serve to demonstrate the relevant potential of European disciplinary culture and are therefore conducive to furthering development and innovation in the bio-medicolegal sciences.

Methods

The method used for conducting the study involved the:

1. creation of a questionnaire in the English language (see attached form as electronic supplementary material) consisting of five open and ten multiple-choice questions designed to verify the existence of bio-medicolegal guidelines and protocols, correlated with appropriate and characterising thematic approaches for each national area considered
2. identification of 42 countries with at least one institution of legal medicine among the 50 countries within the European network
3. telematic dispatch of 1,232 questionnaires to the members of the International Academy of Legal Medicine (IALM) and to members representing medicolegal institutions in the 42 countries selected

Inclusion criteria

The countries which mailed three or more questionnaires with complete responses (15/15) within a deadline of 30 days after their receipt were included in the study. In cases of discrepancy between the replies of a single country, recourse was made to the National Society of Legal Medicine in order to obtain an official version; in cases of a lack of response within 30 days of contact, the country in question was excluded from the study.

Results

On the basis of the criteria used, 32 of the 42 countries contacted were included in the study and classified as responders. The findings were as follows:

1. 84% have a national society (question 1)
2. 78% require a specialisation in legal medicine for inclusion in the professional register (question 4)
3. 70% have national laws governing the medicolegal profession (question 5);
4. 94% have guidelines and protocols for one, or more, bio-medicolegal subdisciplines or branches (forensic pathology, forensic genetics, forensic toxicology, forensic psychiatry, personal injury/damage, invalidity or others; question 6).

The most common guidelines and protocols are concerning forensic pathology and toxicology (83% and 73%, respectively, of the responder countries have at least one system of guidelines in the field), forensic genetics (70%), forensic psychiatry (60%), personal injury/damage (60%) and invalidity (53%).

The most frequent fields or methodologies of Forensic Pathology in which guidelines and protocols have been developed (professional qualification, autopsy, sample collection, histopathology, sudden death, violent death, workplace injury, toxicological agents, radiology, microbiology, mass disaster, traffic accidents and medical malpractice; questions 8 and 9) are shown in Fig. 1a.

Figure 1b reports the most frequent fields of forensic toxicology with guidelines and protocols (driving under the influence of drugs (DUI), substance testing, antidoping, workplace testing, driving license renewal; question 11).

Fig. 3 Distribution of the 32 responder countries according to their total number of guidelines and protocols. The 34 fields of the six subdisciplines/branches (forensic pathology, forensic toxicology, forensic genetics, forensic psychiatry, personal injury/damage and invalidity) specified in the questionnaire were considered

Figure 1c lists the most frequent fields with guidelines and protocols in forensic genetics (paternity testing, personal identification, trace testing; question 10).

The most frequent fields with guidelines and protocols of Forensic Psychiatry, Personal Injury, and Invalidity are reported in Fig. 2 (questions 12-14).

Figure 3 shows the distribution of the 32 responder countries according to their total number of guidelines and protocols.

Discussion

For several decades, the elaboration and implementation of guidelines and operative protocols have been a well established praxis and expression of evidence-based medicine in the biomedical sciences [12].

Albeit somewhat tardy, the bio-medicolegal sciences have taken these steps with the creation of working groups (within or external to national and international societies) representing the different subdisciplines and/or the various bio-medicolegal branches and fields [13].

The findings made in the present study show that 84% of the 32 investigated countries have a National Society of Legal Medicine and officially recognise the medicolegal profession both at an institutional and individual level. In 78% of the countries considered, the title of specialist is required for inclusion in the professional register and in 92% of cases there are existing guidelines and protocols for the medicolegal professional qualifications.

Contrary to that which might be expected from an analysis of the Pub Med indexed scientific literature, where the most numerous recommendations and guidelines published extol Forensic Genetics and Forensic Toxicology [3, 4, 10, 14], the findings made in the present survey show that the most common national guidelines and protocols are for Forensic Pathology (83% of the responder countries have at least one set of guidelines in this discipline), whereas Forensic Toxicology and Forensic Genetics fall into the second and third place (73% and 70%, respectively).

The capillary issuing of national guidelines in forensic pathology, in general, (above all sudden death and violent death, question 8, Fig. 1a) and for the specific methodologies (autopsy, sample collection, histopathology, radiology and microbiology, question 9, Fig. 1a) originates, albeit distantly, in the process of harmonisation of the medicolegal autopsy rules, initiated in 1990 [15]. From this assumption, the elaboration of a document adopted by the European Council of Legal Medicine (ECLM), dealing with the types of cases and the methods to be investigated and applied, in each respective case [15] was derived.

The above document may be considered a forerunner of the potential harmonisation goals that supranational scientific societies [i.e., IALM and the European Academy of Legal Medicine (EALM)] might actively pursue [1, 15, 16].

The findings made in this preliminary survey, in bringing up-to-date demonstrations of the role of societies, show that comparison is not only possible but is also probably facilitated by a patrimony of knowledge, the broadness of which is likely to bring about interesting developments, capable of contributing to a consensus among the European medicolegal community.

The above consensus might be gained through a series of initiatives including, for example, a preliminary meeting of the representatives of each country, nominated by the National Societies of Legal Medicine, as delegates or deputies to participate in disciplinary working groups, with a view to developing European guidelines for each field within the subdisciplines, based on a standard European Guideline Format.

The above task, complex, fraught with difficulty, long and arduous, would call for a series of successive and unavoidable initiatives.

Moreover, the quality of the bio-medicolegal system will, to a large extent, depends on the accomplishment of this task, since it is founded on the recognition of the cultural value of the role played by the bio-medicolegal discipline or rather the accreditation of the same discipline and subdisciplines in the scientific institutional, academic and extra-academic, legal, judicial and social contexts, in which the incidence of the patrimony and the plurimillennary tradition of European legal medicine are felt to be most relevant and prominent.

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