

# Public funding for research: a way into investigation in urgency and emergency medicine

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The knowledge available in the evaluation systems that funding agencies set up to review applications can be taken advantage of to increase the amount of well-designed research in emergency medicine, improving the current situation of low productivity. To further that end, we describe the 2 main review systems used by the Spanish national funding agency and the European Seventh Framework Programme for health research. The dimensions analyzed were as follows: procedures, processes and evaluation criteria; criterion weighting; and characteristics of reviewers. The 2 systems differ in terms of general organization, objectives, policies, allocation of resources, funding mechanisms, importance placed on research productivity, organization of research processes and management. Comparison is therefore difficult. Limitations detected include the lack of feedback for reviewers, of blinding, and of mechanisms to guarantee that evaluation criteria are applied consistently by reviewers over time. [Emergencias 2008;20:335-342]

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## Introduction

In Spain there has been a progressive growth in scientific activity in emergency medicine<sup>1</sup> in terms of both quantity and quality<sup>2</sup>. As demonstrated in recent bibliometric analysis of the publications in journals and congresses in this field, the main foci of investigation are located in the autonomous communities of Catalonia, Andalusia and Madrid, in this order and are especially produced at the level of hospital departments distantly followed by emergency departments<sup>3</sup>. Cardiological emergencies and the management of time are the preferred subjects<sup>3</sup>, although the designs of investigation are mostly observational and retrospective<sup>2</sup>.

Nonetheless, despite this progress, with the highest growth rate in 10 years (1995-2004), when the evolution of the investigative activity of the Spanish emergency physicians is com-

pared with that of other national medical areas and with emergency physicians from other European countries, the absolute production continues to be low at a hospital level<sup>6,7</sup> and study designs can and should be improved<sup>3</sup>. It can therefore be stated that medical investigation in emergency medicine still has a long way to go<sup>3</sup>.

In addition, it cannot be forgotten that investigation is an essential element for the success of any strategy proposed to improve health. The integration of this strategy in clinical practice not only guarantees a better and more rapid implementation of scientific advances but also provides more effective and ethical care to patients with urgent problems.

Although everyone may carry out an investigation, and the only requisite to begin is "curiosity", to guarantee the results in emergency medicine it is necessary for the investigation projects to be of quality<sup>8</sup>. This is highly complex

and costly task not only in terms of money but also at a personal level due to the requirements of time and effort. Thus, investigation goes beyond a personal option to being a necessity of the system<sup>9</sup>.

Investigators in emergency medicine can obtain public funding at basically three levels: a) Regional, depending on each autonomous community; b) National, with the Fondo de Investigaciones Sanitaria (FIS) integrated in the Instituto de Salud Carlos III through the Subdirección General de Evaluación y Fomento de la Investigación<sup>10</sup>, and c) the European community in which the Marco Programmes are known as the reference in European funding. With respect to the latter, the 7th Marco Programme (7MP) has prevailed from 2007 to 2013 with a budget of 50,400 million euros, distributed in several blocks (Ideas, Cooperation, People, Euroatom, Capacities) and within the specific block of Cooperation there are 10 subject areas in which those referring to health (Health) may be found<sup>11</sup>.

Cooperation in investigation within emergency medicine may be seen as a way to minimise efforts, reduce costs and find solutions to common problems. Obtaining financial aid at a European level is highly complex even for very productive national groups used to achieving funding. Thus, in addition to considering the importance of the knowledge of the subject priorities to direct our efforts in the appropriate direction and make our projects feasible, help is required<sup>8</sup>. Knowledge of the systems of project evaluation used by the funding organisms represents an unavoidable strategy to improve investigative productivity.

The HESCUAEP project was developed with this proposal (project within the 6th Marco Programme integrated in the ERA.NET). The objective of this project was, in addition to recognising the great heterogeneity and fragmentation of the different European emergency systems, to construct a platform to facilitate and promote quality investigation in emergency care and emergency medicine at a European level<sup>6,7</sup>. Based on the results of this project we herewith provide a description and simplified analysis of the main systems of evaluation used by both the national (Instituto de Salud Carlos III) and European (Cooperation programmes of the 7MP) funding organisms to which emergency department and emergency medicine professionals may approach. Five different dimensions were analysed: the method-

ology of the evaluation, the characteristics of the evaluators, the evaluation process, the criteria of evaluation and the weight of each criterion.

## Methodology of the evaluation

The methodology used by both the European and the FIS systems for the evaluation of investigation projects is peer review. This method is fundamentally based on the selection of a group of persons who combine relevant knowledge and experience to make independent judgments as to the merit of a project<sup>12</sup>.

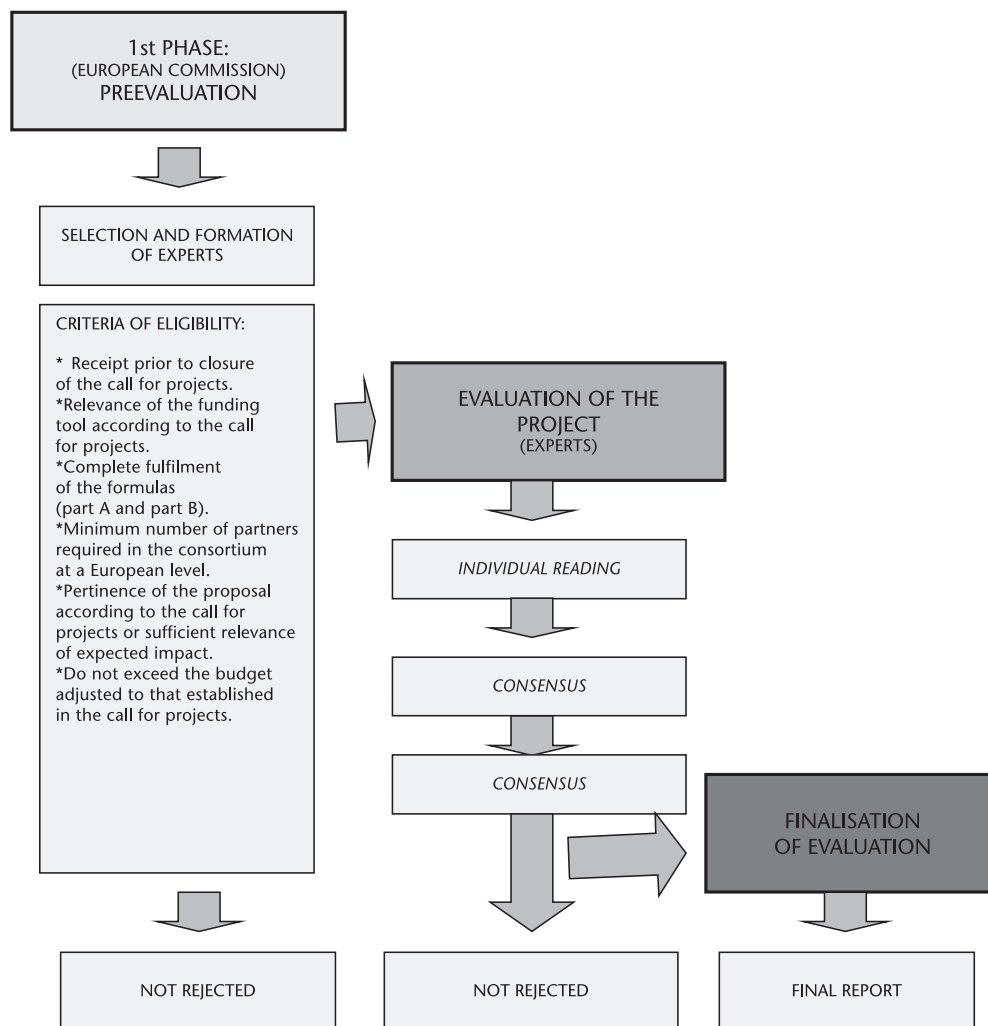
## Characteristics of the evaluators

The European evaluators are highly qualified and experienced independent investigative experts grouped in a variable number from 3 to 5 and make up what is denominated as the panel. These experts are selected following criteria which guarantee geographical distribution, sexes, rotation and range of competences through a commission or a database of experts<sup>13</sup>. Likewise, the Spanish system is composed of qualified independent expert evaluators with investigative experience in previous calls for projects and who are representatives of the different autonomous communities and selected from proposals on behalf of the FIS centres of investigation.

## Evaluation Process

The European evaluation process can be divided into three phases (Figure 1). In the first phase, the proposals electronically received are evaluated based on the fulfilment of minimum criteria of eligibility. On accomplishing these, the proposals are filed under conditions of anonymity and pass on to the second phase, the evaluation process per se.

The anonymous proposal is first evaluated by one of the experts on the panel. Later, the panel of experts, together with a representative of the European Commission (acting as a moderator), meet and elaborate a consensus report. The moderators from the same area join all the consensus reports and elaborate a ranking of the proposals with a score. The principal investigators of the proposals who have surpassed the threshold score may be called for a visit to Brus-



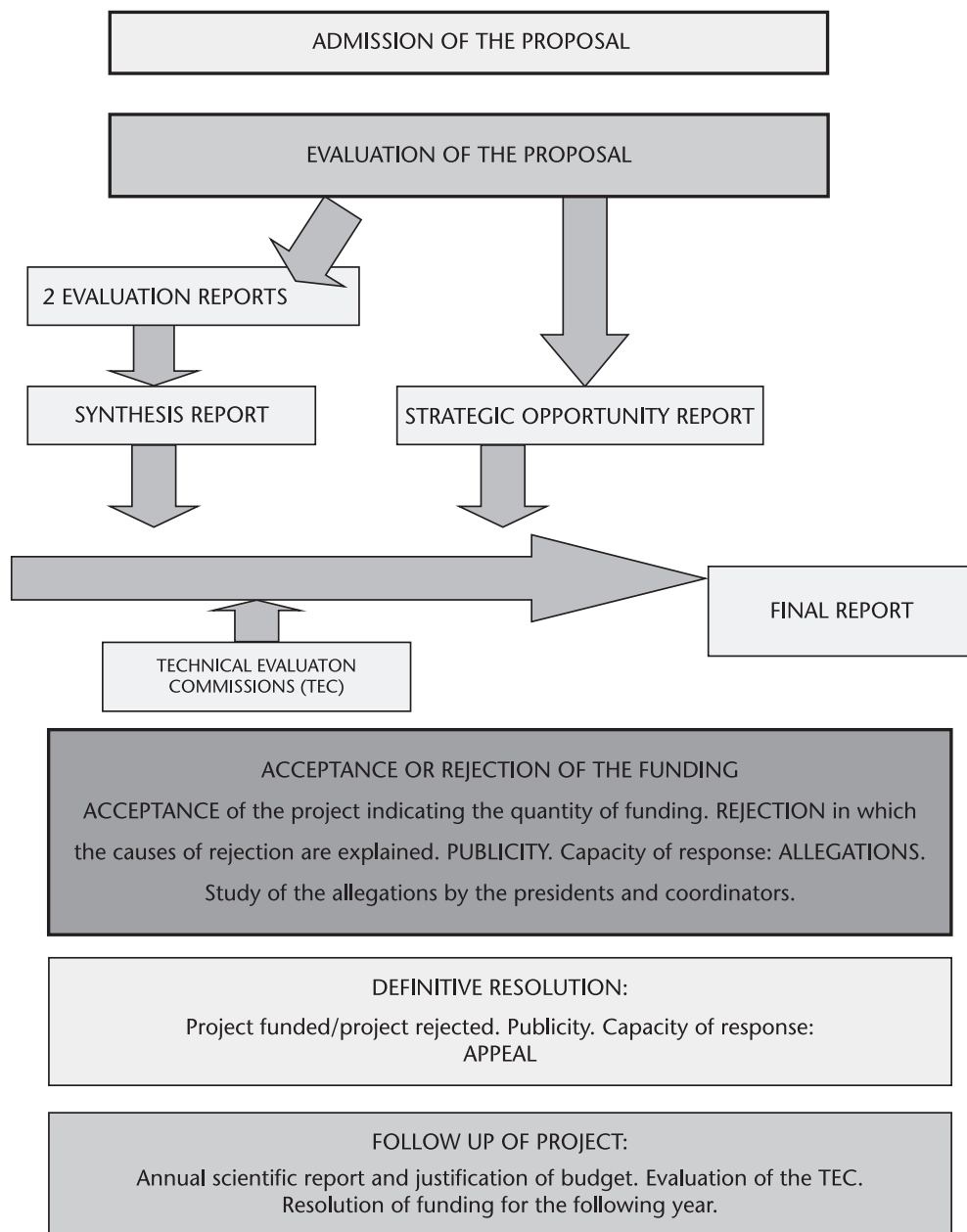
**Figure 1.** European evaluation process (7th Marco Programme) of projects of investigation.

sels to defend their project and the final score may be modified based on this. Lastly, at a higher level (Review Panel of the European Commission), the projects are prioritised by another series of more strategic and political criteria. An important step is the sending of the summary report of the evaluation to the coordinator of the proposal.

Since it is not an obligation of the commission, the ranking of the proposals evaluated/accepted/rejected and the statistical details of the procedure are not always published<sup>14</sup>.

In the Spanish evaluation process (Figure 2), after the admission of the project and confirmation of fulfilment of the bureaucratic requisites established by the call for project, the evaluation per se is initiated. An individual evaluation is initially made by two independent experts. Along an evaluation line, a third expert elaborates a report of synthesis of the scientific-technical quali-

ty, in which, in the case of discrepancies attempts to resolve these disagreements based on an established protocol. This report of synthesis is accompanied by another report of strategic opportunity which evaluates the added value of each project based on the priority lines established in each annual call for projects. In the third step, both reports (scientific-technical synthesis and strategic opportunity) are compared and ordered in technical commissions of evaluation. Finally, a commission of general coordinators analyses the proposals of evaluation based on another series of criteria such as geographical distribution. Likewise, the process finalises with the communication of the resolution to all the projects funded or rejected. It is possible for the investigators to respond to the evaluation obtained by a system of allegations. An annual follow up of the funded project is performed with a scientific report and justification of the budget.



**Figure 2.** Spanish evaluation process (FIS) of projects of investigation

### Evaluation criteria

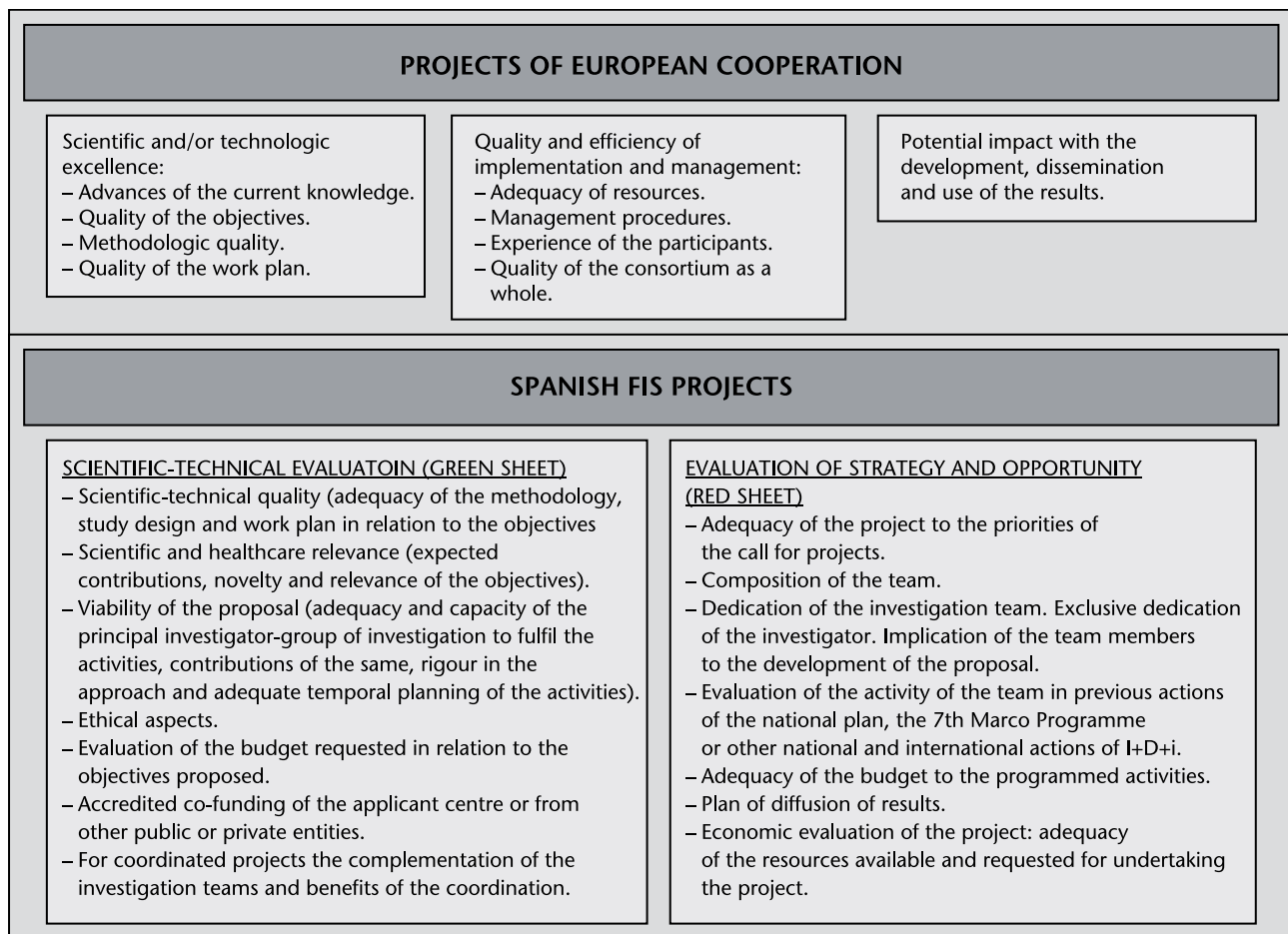
In the European Cooperation programmes the criteria are separated into three groups: a) the scientific and/or technological excellence, b) the quality and efficiency of the implementation and management and c) the potential impact (Figure 3).

The criteria of evaluation of the Spanish system are also shown in Figure 3 and refer both to scientific-technical evaluation as well as an evaluation of strategy and opportunity.

### Weight of each criterion

In the European Collaboration projects, each of the three criteria is scored from 0 to 5 (0 means it does not fulfil the criterion; 1, very poor; 2, poor; 3, sufficient; 4, good; 5, excellent) in which the maximum score possible of the proposal is of 15 and the minimum to not be rejected is 10 points. In addition, the proposal must pass the threshold of 3 points in each of the criteria.

In the Spanish system the score of a project under investigation in health sciences ranges



**Figure 3.** Criteria of evaluation of projects of investigation.

from 0 to 10 points and corresponds to a low priority between 0 to 4 points, a medium priority between 4 and 6 points, a high priority between 6 and 8.5 points and a maximum priority between 8.5 and 10 points.

### Comparison between systems

The resources destined to investigation are limited and thus the objective of every evaluation system is to select the projects of investigation which contribute the greatest added value in terms of innovation, applicability, and methodological quality. To do this, the same method of independent evaluation by highly qualified professionals is used. The phases of the evaluation process vary with respect to the criteria of evaluation and the methodological quality, the principal investigator and the team (composition, previous experience), the work scheme

and the adequacy of the means requested to the objectives proposed acquire great relevance.

Although the initial objectives of this study were to compare the different multinational systems of both regional and national evaluation in the European Union (EU) for simplification for investigators in emergency care and medicine (active or potential), a comparison of only Spain and the EU was made, undoubtedly implying a loss of information, especially since the time at which the competences of biomedical investigation were transferred to the different autonomous communities and a subanalysis of these systems was not carried out.

However, some data indicate that the temporal evolution of these evaluation systems is towards homogenisation not only in the method but also in the content and the process so that the regional and national organisms learn and incorporate elements of evaluation already used at a European level.

The main difference lies in the elaboration of the calls for projects since while the projects of the 7MP must adapt to proposals closely adhered to the different topics (Topics), in Spain the subject area is wider. However, there are objective translation problems for comparing the FIS and the 7MP systems. On the other hand, although in the beginning they seem to be different evaluation systems, in a first preliminary analysis there are points in common such as the evaluation method used. Peer review has the advantage of flexibility of adaptation for a wide range of projects but its main inconvenience is subjectivity. In this aspect there is the difficulty which arises from the establishment of objective parameters on which to make decisions on behalf of the experts with the aim of avoiding both the postures of subjectivity and conservatism which may have the most repercussion, particularly in innovative programmes which take on new focuses.

The expert selection process and the organisation of panels is very complex and, to a certain degree, these depend on the acceptability and reproducibility of the results. The evaluating group must have recognised prestige and come from different settings. The expert requires great effort in both time and personal dedication and not only at the time of developing the task but also in acquiring the formation to carry out adequate decision making. In both programmes, the evaluators undertake the evaluation individually (similar to peer review for articles sent to journals with a high impact factor). However, the evaluation of projects is not blind, and both the proposal and the evaluating team are simultaneously evaluated so that consolidated groups may benefit and represent a handicap for new teams with the same quality of project. Although a separate, double evaluation (the teams on one hand and the project on another) would be enormously beneficial for fairness, the workload and time consumed in the process would be greater. A novel phenomenon and not yet generally accepted is the attitude of some funding agencies for including specific section for "risk strategies", that is, direct a percentage of funding to innovative ideas even when the investigative teams have little previous production.

Despite the similarity in the evaluation method, some variations may be found in the procedure. Thus, while both systems have a similar first phase of individual evaluation, in the second phase (in which the consensus report is

made) in Europe the evaluators are "face to face" while in Spain this is carried out by a third independent evaluator from two individual reports. In this latter method, the possibility of discussion and feedback between evaluators is dispelled. This may sometimes represent a problem which is reflected in the final report received by the investigator.

The discrepancies of the evaluators and the effort of "synthesis" by a panel of a higher level do not seem to be the best solution. However, for practical purposes, the knowledge of these discrepancies should be avoided by our investigators as an important strategy to know which questions in their project should be solved or clarified to avoid different "readings" by the independent evaluators.

One of the differences described between the two evaluation systems is the publication of the date of the call for projects. In Europe this is predetermined, a fact which does not occur with the Spanish FIS system. This makes the elaboration of national projects difficult since from the time the call is made until the information is transmitted there may be less than one month and thus, some projects including good ideas do not have sufficient time to develop the presentation.

One of the advantages of the 7MP is that an assessment service is available prior to the presentation of the proposal to determine the possible eligibility of the same. Likewise, there are contacts of the different programmes at both a regional and national as well as European level who can direct the investigators in search of assessment. In the last years, the implementation of channels of communication with the EU has been developed. One example at an autonomic level is the Office for International Projects in Andalusia and at a national level there is the Office for European Projects of the ISCIII.

### **The importance of adapting a subject to the Topics in the European call for projects**

The priorities of investigation in the National Programmes are generally defined in the calls for projects and include many topics of investigation. The definition of the topics of investigation in the 7MP for each call is restricted and totally limits the possibilities of success for proposals which do not closely adhere to the focus and the content of the topics.

The principal objective of the 7MP Health programme for 2007 was the improvement in health of European citizens, with emphasis on the transnational and multicentric character of investigation with the aim of promoting the development of new therapies, diagnostic tools, medical technologies, efficient and sustainable systems and methods for the prevention and promotion of health (the latter being focused on healthy ageing). A budget of 6,000 million euros was available for all of this. Within the Topics proposed in the first call for September 2007, none of the topics explicitly referred to specific areas of emergency care and medicine, and thus, proposals in our setting which were interested in competing for funding had to be adapted to the content of one of the Topics proposed such as the adaptation of interventions to clinical guidelines or the variability in treatments in the different European countries.

The scientific community formally participates in the definition of the priority topics of the annual Work Programme of the European Commission and thereby influences the policy of investigation of this commission. This process involves the so-called briefing of the groups of investigation of greatest influence in Brussels. Inversely, Brussels also consults directly with certain European structures of investigation such as Technological Platforms, the ERA-NET platforms including the HESCUAEP programme as well as open consultations with citizens, associations and individual investigators.

## The application procedure

One of the great fears when presenting a project of investigation is the bureaucracy. Fortunately, the funding organisms are increasingly providing greater facilities through internet (online) to solve the process. The complexity of the presentation of the European compared with the national projects due to the extensive development of non scientific sections is of note. On the other hand, the European projects do not require additional administrative documents of the organisations and the signature of the legal representatives is not necessary until the funding agreement is signed. In addition, only a brief description of the curriculum of the investigators is necessary which is examined after having passed the first phase of the evaluation.

## Conclusion and recommendations

An optimistic vision may be made on comparing and analysing the evaluation systems of projects of investigation at both a national and European level in terms of the capacity to obtain funding. If we start with the assumption that investigation in Emergency Care and Medicine is largely based on the evaluation of results (little basic investigation here at present), the central idea which should be followed is the identification of variables of results (outcomes) which are useful to improve the morbimortality of the population, comparison of performance of work systems and the establishment of recommendations for improvement. The reasons why something does not work adequately should not be sought, but rather we must take advantage of the identification of problems to improve the quality of care.

The new groups (as part of the future) should be a formal priority in any funding system for investigation and should, therefore, receive greater facilities than those currently in place. One important point to consider is the necessity to join efforts to create multidisciplinary teams of investigation composed of professionals in Emergency Care and Medicine (prehospital, hospital, primary care) and specialists in the methodology of investigation (epidemiologists, statisticians, sociologists and psychologists, demographers, etc.).

One possible path to guarantee success in the search for funding in investigation of emergency medicine may be the constitution of adequate multidisciplinary teams to cover an attractive, innovative idea.

## Addendum

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## Las ayudas públicas para investigación: una puerta de entrada para investigar en urgencias y emergencias

Rebollo García NE, Kuli Muhedini G, Perea-Millá E, Molina Ruano R, Ordóñez Martí-Aguilar MV

Como medio de mejora de la baja productividad investigadora de calidad en medicina de urgencias, se puede recurrir a la cooperación y al conocimiento de los sistemas de evaluación de los organismos financiadores. Con dicho propósito se presenta una descripción de los dos principales sistemas de evaluación empleados por los organismos financiadores a nivel nacional (FIS) y a nivel europeo (Programas de Cooperación en Salud del Séptimo Programa Marco). Las dimensiones seleccionadas para el análisis fueron: la metodología, el proceso y los criterios de evaluación, el peso del criterio y las características de los evaluadores. Existen diferencias tanto a nivel organizativo, objetivos, política, asignación de recursos, mecanismo de financiación, importancia otorgada a la actividad investigadora, organización de los procesos de investigación y gestión de la investigación, que dificultan la comparación en materia de investigación. Las limitaciones detectadas afectan, entre otras, a la falta de retorno a los evaluadores, la ausencia de confidencialidad sobre los equipos y al déficit de mecanismos de homogeneización de criterios entre evaluadores a lo largo del tiempo. [*Emergencias* 2008;20:335-342]

**Palabras clave:** Investigación. Emergencias. Sistemas de evaluación.