Análisis de las medidas de seguridad obligatoria contra los riesgos antrópicos en los estadios de fútbol españoles

Analysis of obligatory measures against anthropic risks in spanish football stadiums

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Abstract: *Objectives:* a) To develop a tool to check the level of compliance of Spanish football stadiums for the obligatory security measures against anthropic risks; b) to analyse and describe the current security state of six football stadiums (two per division).
Methods: A dichotomic tool composed by 150 items divided in 10 categories was performed to analyse the situation of Spanish football stadiums.
Results: There is a big heterogeneity in the percentage of compliance of the obligatory security measures among the stadiums analysed,from 2nd Division B (52%) to those of 2nd Division (85%) and 1st Division (97%). The lower categories implemented are security plans (71%), high risk measures (69%), security documentation (67%) and technological means (61%).
Conclusion: None of the six studied cases performed the 100% of the obligatory security measures. The tool used in this study can be useful for them to perform all the obligatory security measures.
Key Words: Assessment, Prevention, Safety, Sporting Arenas, Sporting Events, Soccer.

Resumen: *Objetivos:* a) Desarrollar una herramienta para evaluar el nivel de cumplimiento de las medidas de seguridad obligatorias frente a los riesgos antrópicos en los estadios de fútbol españoles; b) analizar y describir el nivel de seguridad de seis estadios de fútbol (dos por división).
Métodos: Una herramienta de 150 ítems divididos en 10 categorías fue elaborada para analizar la situación de los estadios de fútbol españoles.
Resultados: El porcentage de cumplimiento de las medidas obligatorias entre los estadios analizados es muy heterogéneo: 2ª División B (52%) 2ª División (85%) y 1ª División (97%). Las categorías menos implementadas son: planes de seguridad (71%), medidas de alto riesgo (69%), documentación de seguridad (67%) y medios tecnológicos (61%).
Conclusión: Ninguno de los seis casos estudiados cumplieron con el 100% de las medidas de fútbol obligatorias. Esta herramienta puede ser útil para ayudar a alcanzar el cumplimiento de todas las medidas de seguridad obligatorias.
Palabras clave: Evaluación, Prevención, Seguridad, Instalaciones Deportivas, Eventos Deportivos.

Introduction

Security is a key element in the management and organisation of any event, regardless of its importance or nature. The main reason for this is that in case of accident, the service offered, the facilities used and the people involved could be seriously affected. Furthermore, according to Spanish regulations and authors such as Mason (2014) or Mwanuhehere (2009), the event organisers, the service managers and the owners of the facilities are in charge of guaranteeing a reasonable level of security to anyone who takes part in the activity.

Shamansouri and Hashemi-Minabad (2010) outline the principal incidents which throughout the sport's history have damaged and hurt their reputation, such as the Hillsborough tragedy of 1989 (Sheffield, UK). These examples demonstrate that if organisers do not manage security of facilities properly, the outcome of a security incident can be disastrous for all involved. It is important to emphasise that Spain also experiences such problems and that these incidents do not only belong to the past (Lowe, 2014; Robson, 2014).

Any type of security incident which happens nowadays usually gets broad media coverage and as a result there may be personal damage, economic repercussions and sporting penalties (such as points lose or, partial or total closure of a stadium), but also a negative touristic impact (Glaesser, 2004; Mwanuhehere, 2009; York, 2014). For these reasons, in the planning stages of any football event, football clubs and event organizers need to develop some security measures to protect the spectators and the facilities to ensure that the activity is conducted properly and safely(Carpenter, 2008; Hall, Marciani, Cooper, & Phillips, 2010; Spaaij, 2013; Tilaro, 2009). However, the security management has to be in concordance with event-customers perceptions since Hall, et al. (2009) found that most of attendees to NASCAR event who participated in their study, declared that the security measures if the event affect to the enjoyment of it.

When analysing security measures, one of the main problems is that the word 'security' can allude to both the preven-

tion or the provision of protection from any potential risk that could affect the sporting service (Hall, 2006). For that reason, and in order to facilitate the comprehension of this

topic, a risk classification, according to the nature of the possible anthropic threat, is given below (Table 1).

Table 1. Risk classification according to their nature (own elaboration).

Risk type	Description
Structural risk	Failure of the structure, poor distribution of spaces, poor or inadequate materials, etc.
Natural risk	Hurricanes, storms, floods, etc.
Occupational risk	Occupational illness and injury.
Anthropic risk	Actions from people (vandalism, violence, terrorism, etc.).
Biological or chemical risk	Biological or chemical accidents due to substance manipulation.
Others	Other kinds of risk, e.g. electrical malfunctions.

Authors such as Boyle and Haggerty (2009) and Giulianotti and Klauser (2010) claim that the most important risk factor for large sporting events nowadays is the possibility of terrorist attacks. This is because the attack alter the normal course of an international football event, not only it would be able to fatally hurt attendees, but also it would deeply damage the image of the host country. Despite the terrorism, most of Spaniards consider football stadiums to be one of the most dangerous public spaces (ADT, 2012). Several authors (ADT, 2012; Baker, Connaughton, Zhang, & Spengler, 2007; Ion, 2011; Leeson, Smith, & Snow, 2012; Pearson, 2006)explain that the main existing threats for such events are the outcomes from verbal and physical violence from certain fans, as well as from the dangerous vandalism which sometimes occurs in these spaces.

If we analyse the most serious incident occurred inside the football stadiums, it is clear that the main causes of these incidents were acts of violence and vandalism (anthropic risks). Also, they are indirectly enabled by inefficient crowd control measures and unsuitable preventive management by the organisers of these events (Shamansouri & Hashemi-Minabad, 2010). For these reasons, it is possible to conclude that the chief threat which affects Spanish football stadiums actually comes from an thropic risks. Despite this, managers should not fail to prioritise other possible threats.

In football, Spanish public authorities (local, regional and national) and Spanish football organisations (National Professional Football League and Royal Football Federation of Spain) have approved some standards and obligatory measures in order to guarantee that any football club will always have a minimum level of security in their stadium, since it happened in other countries as United Kingdom(Hall,

2010a). However, according to Hall (2010a), or Tourco, Riley and Swart (2002)these measures are not enough to prevent anthropic risks; clubs must therefore implement new measures besides the obligatory ones (best practices). Thus, Hall (2006)establish 11 critical security dimensions (Perimeter Control, Access Control, Credentialing, Physical Protection Systems, Risk Management, Emergency Management, Recovery Procedures, Communications, Security Personnel, Training, Modelling and Simulation and WMD – Toxic Materials Protection) divided in 134 standards in order to help the security responsible to identify the most important security aspect in the event management. Moreover, Hall, et al. (2009) highlighted the need that every stadium should perform their own auto-evaluation to guarantee a good level of security.

Hence, the aims of this project are: Firstly, elaborate a tool which will allow for an easy identification of the compliance grade of obligatory measures developed in the main leagues Spanish football stadiums (1st Division, 2nd Division and 2nd Division B); and finally, to check the extent to which these measures have already been enacted in various football stadiums.

Materials and Methods

Sample

Data were collected from six football stadiums; two per each national division (1st Division, 2nd Division and 2nd Division B). These stadiums were selected because they have different characteristics; the idea being to six distinct and different situations (see Table 2 for more information).

Table 2. Characteristic of the stadiums selected to this study.

Stadium	Competition	Characteristic
Stadium A:	2nd Division B	A practically debutant Stadium in this division (as is the case of most stadiums belonging to this division).
Stadium B:	2nd Division B	This stadium belongs to one of the clubs with the highest budget in 2nd Division B.
Stadium C:	2nd Division	This stadium has been a short time in 2nd Division.
Stadium D:	2nd Division	This stadium has been in 2nd Division many times, and it has also participated in the 1st Division.
Stadium E:	1st Division	It is a traditional stadium of 1st Division, but it has little experience in European football competitions.
Stadium F:	1st Division	This stadium usually participates in European competitions.

Data-gathering tools and variables

Data were collected by means of a tool that was designed and made specifically for this study. It permits the identification of every obligatory security measure that football stadiums of the 1st Division, 2nd Division and 2nd Division B must develop. This tool is a dichotomic answer checklist (Yes/No) and it was created in compliance with the main Spanish legislations and regulations.

Three PhD. researchers, experts in the field of Sport Management and its Facilities, collaborated in the elabo-ration of this checklist. In addition, a security expert in sporting events with the highest Spanish qualifications supervised in its creation. After several stages of preparation, this tool ended up having 150 items. These items had to be completed in two ways: 73 of them by observation and 77 of them through interview with the security directors of the clubs. Finally, these items were divided in 10 categories. Table 3 shows the total number of items per category and many of these items must be collected by observation and through interviews.

Table 3. Characteristics of the designed tool

Checklist categories	Nº items/ Category	Nº observable items	Nº Safety Officer items
Security Plans	15	0	15
Security Documentation	3	0	3
Access and Stay Criteria	28	28	0
Criteria Information	8	8	0
Measures and Protocols	36	12	24
Physical Means	17	12	5
Human Means	13	8	5
Technological Means	19	5	14
Services	3	0	3
High Risk Measures	8	0	8
TOTAL	150	73	77

Validation of the tool

Since the check list was newly created, it was essential to gauge its reliability and validity. This was carried out as follows: 1) Familiarization of the researchers with this tool, so that they can use it as efficiently as possible when they assess the relevant aspects of any stadium (The aforementioned expert helped the researchers familiarize themselves with this tool). 2) Expert revision in order to secure that the *checklist* is clear and it has no room for ambiguous answers. Three doctors from three different Spanish universities specializing in sport management and facilities helped to revise the checklist. 3) Pilot studies being conducted in three football stadiums from 1st Division, 2nd Division and 2nd Division B respectively.

Finally, each stadium was analysed by two researchers, who collected the results for analysis. Therefore a triangulation process was conducted in each case.

Procedure

The owners of the stadiums were contacted by e-mail, through the e-mail addresses available on their web sites. The characteristics of this study, as well as the requirements for

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conducting it and the potential benefits for clubs participating in it, were explained in the initial communication. Also, data confidentiality were guaranteed at all times.

Once the participant clubs agreed to the terms, we proceeded to contact their Safety Officer (S.O.). The S.O. is the person responsible for the security of the stadiums at any given moment except on the match day (when the responsibility passes to the General Coordinator of Security, who is attached to the public security services). The day for collecting the data was agreed with the S.O. in the following way. Initially the **r**esearcher went to the stadium 90 minutes before a match in order to assess the ticketing sales process and the entrance of fans into the stadium. Secondly**,** 30-40 minutes before the beginning of the match, researchers contacted the S.O., who showed stadiums and their surrounding areas. Then, with the permission of the S.O., researchers proceeded with an analysis of the entrance of the fans and their accommodation in the stadium. Thirdly, the researchers and the S.O. completed the items on the checklist which could not be completed by means of observation. Fourthly, during the second halves of the matches, the researchers assessed the physical, human and technological means *in situ*, as well as the crowd control measures in order to assess how they were being managed. Fifthly, at the end of the matches, researcher

analysed the fan exit procedure both inside and outside the stadium. Finally, once there were no fans in the stadiums, researchers completed the other items which have not been collected previously, concluding with the triangulation process conducted by the two researchers.

In the first five phases, researchers took photos to double-check on the information collected.

Data analysis

Data analysis focused on statistical and descriptive calculations so as to calculate the percentage of compliance for each category, with regard to the checklist for each stadium and competition. The statistical software SPSS v. 20 was used to produce the results. Results are presented as mean and standard deviation.

Results

The results illustrate a high difference among the studies. This difference can be appreciated in Table 4, which shows the results by means of elemental descriptive variables. It compares the minimum number of items and the maximum number of items answered by the stadiums per category.

**Table 4.** Descriptive Analysis of the results by category.

Categories	Nº item / Category	Nº minimum affirmative item	Nº maximum affirmative item
Security Plans	15	1	15
Security Documentation	3	0	3
Access and Stay Criteria	28	15	28
Criteria Information	8	0	7
Measures and Protocols	36	11	36
Physical Means	17	7	17
Human Means	13	4	13
Technological Means	19	1	19
Services	3	0	3
High Risk Measures	8	2	7
TOTAL	150	42	146

In general, there is a high difference among the six stadiums; however there are some categories which are being more performed than others by these six stadiums. Thus, the categories which have better percentage (mean ± standard deviation) of items fulfilled affirmatively were: access and permanence criteria (94 ± 15%),services (83 ± 24%), measures and protocols (82 ± 25%),human means (81 ± 26%) and physical means (80 ± 29%). In contrast, the categories with less percentage of items answered affirmatively belonged to security plans

(71 ± 37%),high risk measures (69 ± 24%), security documentation (67 ± 52%),technological means (62 ± 39%) and information of these criteria (44 ± 27%). The high value of the standard deviation in all cases shows that there are big differences among the six arenas and there is no homogeneity in the compliance of the obligatory measures.

Figure 1 shows the percentage of compliance of the stadiums overall and within each category. Also, the stadiums were analysed in terms of the competitions they were involved in.

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Figure 1. Average percentage of compliance for the checklist categories per division and the standard deviation.
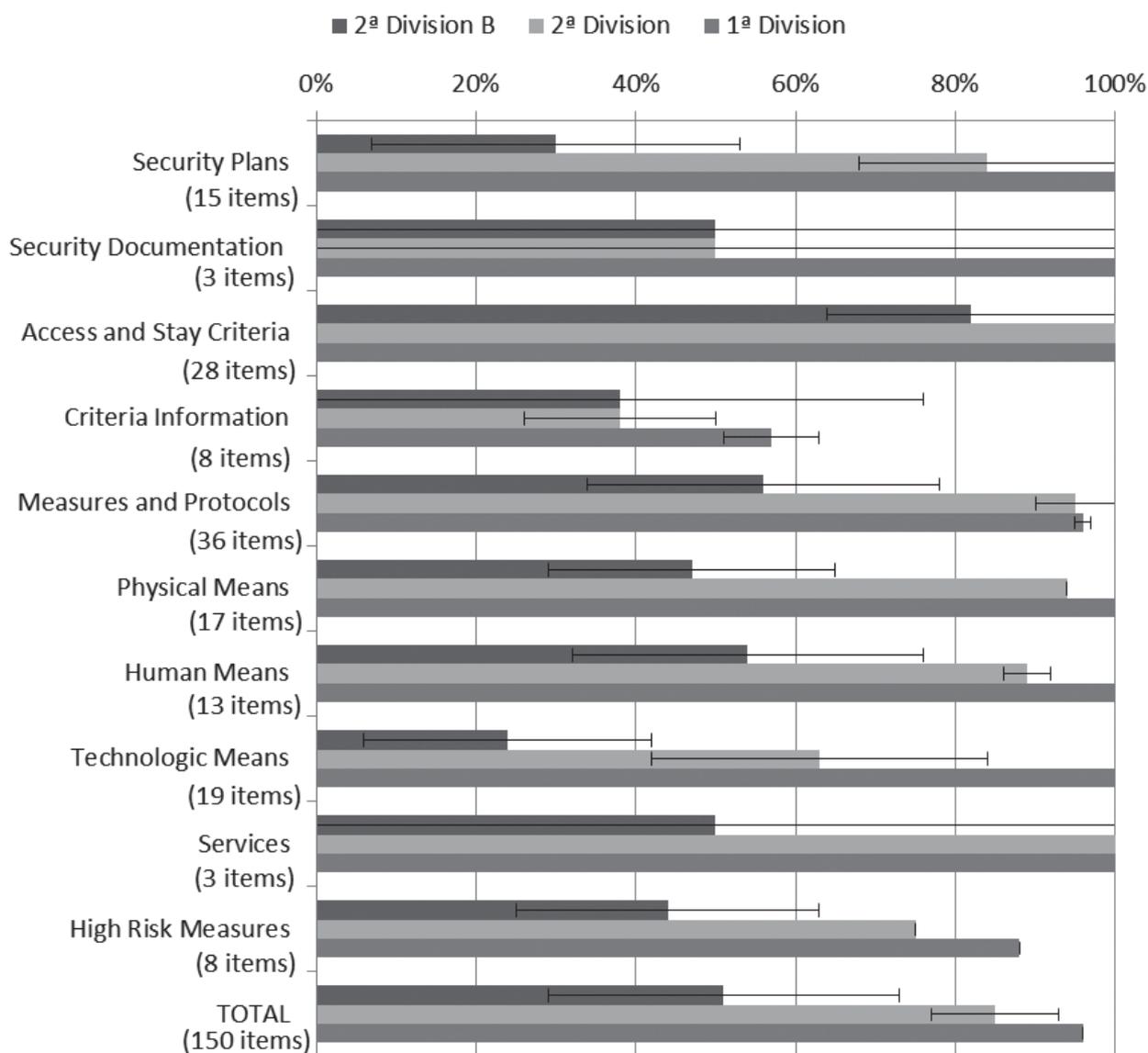
In this Figure, the standard deviation shows how the grade of compliance from the stadiums was used for clubs in each division, with two football arenas per division being examined. Thus stadiums used for teams in 2nd Division B (stadium A and stadium B) performed fewer obligatory security measures than the stadiums of teams in the other two divisions (52 ± 22% of accomplishment). Also, despite the fact that stadiums from the 1st Division (stadium E and stadium F) and the 2nd Division (stadium C and stadium D) are in professional competition, none of them fulfilled all the obligatory security measures set out in the Spanish legislation (85 ± 7%) for 2nd Division and (97 ± 0%) for 1st Division arenas.

Discussion

This checklist has been developed in order to comply with obligatory measures. Therefore the expected result should be 100% of compliance in every stadium. However, none of the six arenas achieved this. Furthermore, stadiums of teams in lower divisions had worse results than those in higher divisions.

According to Bole and Haggerty (2009), Houlihan and Giulianotti (2012) and Yu, Klauser and Chan (2009), one of the key elements in the security of football matches is the future planning. Security plans are essential for these events

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because they present information related to all participants in the security procedures, as well as guidelines of action if any accident occurs. After the incident which occurred in England, now a days the stadiums from the four main league must have a 'Safety Certificate' (Hall, 2010a); in Spain, all football clubs must develop at least six security plans or protocols to protect their stadiums (Short Protocol Security, Basic Protocol Security, Reinforced Security Protocols, Internal Codes [endorsed by the National Professional League of Football], Individual Risk Plans and Plan / Device / Operative Security). These plans are often complementary to the Self-Protection Plan, which is only obligatory if the stadium can hold more than 20,000 people or if the public authorities consider it necessary, as specified by Spanish government regulations and legislations. Despite the importance of the planning stages in security management, only three stadiums had implemented all of the security plans: two stadiums belonging to the first division and one belonging to the second division (stadiums D, E, and F). Of the other three, stadium A had the worst result (7%) because it had only developed the Plan / Device / Operative Security, while stadiums B and D did not achieve 70% of compliance. Finally, according to Spanish legislation stadiums A, B and C did not have to develop a Self-Protection Plan, they were supposed to do this as an advisory measure (Gómez-Calvo, 2012).

Category of Security information checked whether the stadium had information about its fan groups, clubs or and radical factions, because this knowledge can be useful in selecting the best security measures for the risk management of match-day (Mojet, 2005; Spaaij, 2013).Despite the importance of this element, the study showed that Stadiums A and C did not carry out any item of this category, whereas the other four stadiums fulfilled all of them.

As a side note, in order to avoid unacceptable behaviour within the stadiums (Category of access and stay criteria), football clubs have the legal right and obligation to develop measures against such possible situations, measures which must be followed by any fan who wants to enter the stadium or be present at a match. If they do not follow these criteria they can be expelled from the facilities (Warren & Zurawski, 2014). All stadiums had complied with 100% of these, except for stadium A, at only 64%.However, Spanish clubs do not generally inform their fans about security as effectively as they should do. In this category, the club with the best performance belonged to 2nd Division B (stadium A 0%, stadium B 75%, stadium C 25%, stadium D 50%, stadium E 63% and stadium F 50%). Information is the first means of security since it is the base for the rest of the security measures (Category of Criteria information). Placing informative posters at the entrances, access points and interior of the stadium might avoid possible risks and improper behaviour by fans, especially more moderate ones, since then fans would

know what is allowed and what is not(Hall, 2006; Hall et al., 2009).

In the security management of football matches, five key measures and protocols are required to ensure a successful security management. All of them belong to Category of Measures and Protocols of the checklist and they are useful for crowd control throughout the match (Abbott & Geddie, 2000; Hall et al., 2010; Madensen & Eck, 2008). With the exception of stadium A, every arena scored higher than 80% in this category. However due to the importance of this category and the diversity of the items, this was divided into five steps in order to facilitate understanding:

Revisions and checks before the match: These are necessary so that every stadium is in a suitable condition for holding an event (Madensen & Eck, 2008). Every arena had complied with and enforced all the measures defined by current laws and regulations, except stadium A (which had only complied with one of the six items).

Access management: The importance of this resides in football clubs preventing access of inappropriate people into their arenas. It is therefore the first line of security on a match day (Madensen & Eck, 2008; Mason, 2014). Only stadium A did not present good access management as it did not compile personal records, capacity control was not performed and its tickets could be easily counterfeited.

Permanency management: Crowd control is important in order to avoid the presence of anthropic risks. The main functions of permanence management are to allot and locate fan groups in different areas of the stadium and monitor them once they enter the stadium. Only in this way there is a chance to reduce the permanence measures of fans break in. If they break in, the possible culprits can be identified(Madensen & Eck, 2008; Mason, 2014). All the arenas analysed had complied with these measures except Stadium A.

Stadium evacuation: The evacuation of arenas has not been historically common in Spain (last time was in 2004), but the Spanish legislation states that football clubs must be ready for the total or partial evacuation of a stadium. This is a paramount task since the number of attendees at football matches usually ranks in the thousands and of the procedure for emergency crowd control is extremely complicated (Mason, 2014; Mwanuhehere, 2009). Stadium A did not comply with any of the obligatory measures. In addition, the emergency drills being used to evacuate an arena need to be very efficient. Each participant in the security process needs to understand their roles in this process clearly. Stadiums B, D and E had not really ensured that this was possible (Mwanuhehere, 2009).

Post-match report: According to the Royal Decree 203/2010, this report should include details of all incidents that occur during a football match. Therefore, this report is useful in analysing the security measures used in this match

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and to improve them for the future. All six arenas were given this report once their matches finished.

Even if some stadiums carry out these five measures, security accidents can happen if security is not managed optimally. For that reason, physical, human and technological means are essential in this situation (Mason, 2014). These means (assessed in categories Physical means, human means and technological means) present important differences between divisions, because higher divisions have better means than lower divisions.

The main goal of physical security means is the crowd control through the separation of different fan groups. Physical means are also useful to ensure a smooth movement of fans and segment the stadium into areas for different fans. Moreover, they are important because the distribution of human and technological means is based on them. Therefore, if there are better physical means in a stadium, the chance of an anthropic risk occurring will be lower (Hall, 2006; Madensen & Eck, 2008). stadiums A (29%) and B (65%) had low compliance results because they did not have an Organisational Control Unit (where the main security managers must be during the match) and according to Madensen and Eck (2008)this is one of the most important security areas in a football arena. Also, stadiums A and B had no turnstiles, no physical fan separation and the seats were not numbered.

Human means are important because they positively control physical and technological means and they have more impact on crowd control than other means, as they are insufficient on their own without humans to control them. Moreover, human means are in direct contact with the attendees at a football match and therefore they can help persuade them not to take part in inappropriate behaviour. The problem is the cost at which they function. However, to reduce investment without this being detrimental to the quality of security, clubs can hire volunteers to help security members in their workplaces (Giulianotti & Klauser, 2010; Hall, 2010b, 2011; Madensen & Eck, 2008). Stadium A (31%) did not have the main human means such as a General Security Coordinator, security watchers or seat attendants, whereas stadium B (77%)only lacked a General Security Coordinator and seat attendants. The remaining stadiums had every human means, but the numbers of security workers were fewer in stadiums C (85%) and D (92%) than in stadiums E and F (100%), since their budgets allowed for the hiring of more personnel.

Technological means can provide the highest quality security service, because nowadays they can give important information in real time. However, they need human means to be successful. Technological means can control football fans more accurately, without them feeling observed. In addition, these means have a good dissuasive power and their proper management can help identify inappropriate behaviour more easily. The main technological resources are Close Circuit Television (CCTV), electronic turnstiles, communication networks and acoustic system (Giulianotti & Klauser, 2010; Klauser, 2011; Madensen & Eck, 2008). Furthermore, all these elements must be integrated into an encompassing system which needs to be managed at the Organisational Control Unit. The arenas in the 1st Division usually have higher investment in this means than stadiums from lower divisions, since their bigger budgets may explain why stadiums E and F had complied with 100% of the security regulations, whereas stadium D only reached 80% and Stadiums A, B and C less than 50%. Stadium A (5%) lacks CCTV, turnstiles and even communication networks. Stadium B (42%) lacked turnstiles and an integrated system with all the technological means of security (if it did, its CCTV and acoustic system would not be so deficient). Stadium C (42%) has neither CCTV system nor an integrated technological system. Finally, stadium D (85%), despite having all the technological means, does not implement a regulation-compliant CCTV system.

The main problem that concern football matches is that not all of them are affected by the same risks; therefore, not all of their problems can be assessed in the same way. In that sense, those matches that are perceived as being more important by the fans (such as the league, the European competitions, the promotion and relegation, etc.) usually have an increased risk of accidents. For those reasons, some football matches are categorised as Highest Risk Matches (category of High risk measures) and new security measures need to be implemented that complement the standard procedures in order to guarantee crowd control and the general safety of all parties present at the stadium(Hall, 2010a; Madensen & Eck, 2008; Spaaij, 2013). None of the six stadiums had put all of these obligatory security measures in place (stadium A 25%, stadium B 63 %, stadium C and D 75% and stadium E and F 88%), but all of them had implemented some additional security for such matches. In such a situation, all the stadiums could strengthen their ticket systems and control access to the stadium more thoroughly, yet the least used measure of security was the monitoring of attendants. Finally, there were many differences between the six stadiums, all of them had developed other measures in order to ensure a high security outcome for any kind of football match, regardless of its importance. In addition, according to the security directors, these measures of well-being are more important than the optimal obligatory measures.

To conclude, despite the fact that obligatory measures were identical for the three divisions (1st Division, 2nd Division and 2nd Division B); every stadium have different characteristics (in terms of arena capacity, number of supporters, budget, etc.). Thus we agree with Hall (Hall, 2010a; Hall et al., 2009)that every single stadium should performs their own auto-evaluation per each risk factor. Therefore, this tool can be useful for them in order to guarantee they accomplish

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with all obligatory measures, but they should adapt it to their own reality. Finally, the level of compliance of the obligatory measures in Spanish football stadiums is not homogeneous; since the stadiums belonging to 1st Division clubs are close to comply effectively with all the security measures. That is why if football authorities (public and private) ensure that all football arenas must apply all of the obligatory security measures, they should do so in proportion to their budgetary restrictions and specific security threats.

This study has developed a dichotomic tool with 150 items in order to identify the extent of compliance with obligatory security measures by Spanish football stadiums. This tool has been used in six stadiums. The use of this tool can help football stadiums to fulfil all the obligatory measures,no matter what division their clubs are in. On the other hand, none of the stadiums of the 2nd Division B achieved 75% compliance, showing that there is a great difference between this competition and the other two. Also, the 2nd Division had only 85% of compliance because there are great differences between the analyses of stadiums. Finally, even though the 1st Divisionis one of the most important competitions in the world and achieved 97% compliance, its stadiums still need to improve their security measures.

The main aspects that Spanish football stadiums need to improve (especially those in the 2nd Division B and 2nd Division) are security planning, developing more security plans, security documentation and collecting information about fans and attendees. Also, more investment in technological means, physical means and other measures to control behaviour at matches will be needed in the future to deal with potentially high risk situations. Finally, despite the fact that the best result obtained has been in the category of access and stay criteria, the stadiums should inform fans and attendees more clearly about how they must behave at any particular moment, as well as they should improve the ways to guarantee the compliances of these access and stay criteria.

List of Abbreviations: Safety Officer (S.O.).

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