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Information on nosocomial infections in the mainstream media: an opinion document

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ABSTRACT

This paper seeks to explore the reasons for the low impact of nosocomial infection in the mainstream media and the responsibilities of physicians and journalists in terms of this situation. To this end, a small group of 13 experts met for round-table discussions, including physicians with expertise in nosocomial infection, medical lawsuits and ethics, as well as journalists from major mainstream Spanish media outlets. The various participants were asked a series of questions prior to the meeting, which were answered in writing by one of the speakers and discussed during the meeting by the whole group, the aim being to obtain consensual conclusions for each of them. The document was subsequently reviewed, edited and forwarded to all co-authors for their agreement. The opinions expressed are the personal opinions of the participants and not necessarily those of the institutions in which they work or with which they collaborate.

Key-words: Nosocomial infections, Healthcare associated infections, Healthcare burden, journalists, mass media, journals

Información sobre las infecciones nosocomiales en los principales medios: un documento de opinión

RESUMEN

Este documento busca explorar las razones del bajo impacto de la infección nosocomial en los medios de comunicación tradicionales y las responsabilidades de los médicos y periodistas en esta situación. Con este fin se realizó una mesa redonda con un pequeño grupo de 13 expertos, incluidos médicos con experiencia en infecciones nosocomiales, legislación médica y ética, así como periodistas de los principales medios de comunicación españoles. Antes de la reunión, se les hicieron una serie de preguntas a los participantes, las cuales fueron respondidas por escrito por cada uno y discutidas durante la reunión por todo el grupo, con el objetivo de obtener conclusiones consensuadas para cada una de ellas. El documento fue posteriormente revisado, editado y enviado a todos los coautores para su acuerdo. Las opiniones expresadas por cada participante son propias y no necesariamente de las instituciones en las que trabajan o con las que colaboran.

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INTRODUCTION

Nosocomial infection is one of the greatest challenges to health systems in the developed world. This term refers to infections acquired after admission to a healthcare institution, which were not present or in incubation at the time of admission. They may involve up to 10% of those hospitalised and be responsible for up to 1% of the deaths of all patients admitted, which, when translated into absolute figures, provides unacceptable data, even more so if we bear in mind that a substantial proportion of such infections and deaths are potentially preventable by adopting simple routine measures.

The reasons why this issue does not appear frequently in the media as a reflection of the media's critical work on the government and health institutions was part of the analysis that both the Fundación de Ciencias de la Salud and the Future Day Foundation carried out on the subject at a recent meeting. Questions were raised about whether there is ignorance, lack of interest or other reasons for this and a decision was made to hold a joint meeting between doctors involved in infection control and media professionals, particularly those who report on health issues. All participants were asked a series of questions to review the state of the art of each topic, with particular emphasis on the situation in Spain and opportunities for improvement. The opinions expressed by the speakers are their own and do not necessarily represent those of the institution or institutions to which they belong. This document is not intended to provide recommendations or guidance, but simply to convey opinions.

The meeting was held in Madrid on the 27th June 2018 and this document reflects the main questions, answers and conclusions of the meeting. It has been updated and edited in accordance the literature available up to July 2018.

MATERIAL AND METHODS

Prior to the meeting, questions were sent to the various speakers regarding the situation of nosocomial infections and how they are dealt with by journalists. Each of these questions was formulated by one of the members of the panel and discussed by all the attendees in an attempt for them all to reach a consensus conclusion on the subject.

The questions were essentially divided into two blocks. In the first one, data was presented on the situation of nosocomial infections on a global scale, and specifically in Europe and Spain, in an attempt to find out if the journalists knew all or most of the main data regarding the burden of the problem and how they dealt with such data. In the second block, the position of journalists, their priorities and mechanisms for selecting information and their opinions on how professionals should present information to make it interesting for readers were explored. We also heard opinions regarding the views of readers and the impact that problems related to nosocomial infection have on lawsuits filed against health authorities and covered by insurance companies. Finally, topics relating to ethics pertinent to the issue were addressed.

The document containing the data collected during the conference, which was appropriately edited, was sent back to all the speakers for their corrections and final approval.

We now turn to the different questions that were asked, the data and arguments put forward by the different speakers and a final summary of the responses that was thought to best reflect the overall opinion of the discussion group.

QUESTION 1.

What is nosocomial infection and what is the extent of the problem in terms of figures?

Exposure:

Hospital-acquired infections or nosocomial infections (NIs) are those that are acquired during a hospital stay and as a consequence of healthcare provided. For convenience, we will take them to refer to infections which appear at least 72 hours after admission. NIs will also be considered to be those that, despite being diagnosed within the first 48 hours following admission, meet one of the following criteria: a) involve patients who have been admitted to another hospital within the previous 48 hours; b) relate to deep or space-based surgical infections in patients who have undergone surgery within the previous 30 days or within the previous 90 days in the case of surgery involving implants; c) involve *Clostridium difficile* infections in patients who have been admitted within the previous month; and d) involve infections caused by a device implanted on the first or second day of admission.

It is important to stress that today, healthcare extends beyond acute-care hospitals and there are mixed-care facilities such as dialysis centres, day-care hospitals, home hospitalisation, outpatient chemotherapy, hospitals for the care of chronic diseases, nursing homes, old people's homes, etc. The infections that patients contract when receiving any of these healthcare services or during their stay in a healthcare facility (to receive day care, hospital care, long-term care, etc.) are called healthcare-associated infections (HAIs).

NIs have a significant impact on healthcare and society in general. They cause significant morbidity and mortality, prolong hospital admissions, increase expenditure and promote antimicrobial resistance. They are considered a quality index of healthcare facilities [1-7].

It is estimated that NIs affect some 4.1 million people in the European Union each year. In Spain, the numerical data can be extracted from the EPINE study, which consists of a prevalence study carried out over the past 25 years in a large proportion of Spanish hospitals [8]. This study has included 313 hospitals and 61,673 patients, of whom 4,772 suffered from NIs. In other words, the prevalence of NIs in our country is 7.74% (7.53-7.95) and this figure has remained practically stable for the past 25 years, fluctuating between 7.7% and 8.5%. Of course, there are differences according to the type of patients analysed, and thus in intensive care the figures for NIs are clearly higher and are close to 20% of patients (17.92% in the 2017 EPINE study and 21.37% in the 2016 study).

When we analyse the results from the Community of Madrid, focusing on hospitals of high complexity, the rate is somewhat lower than the national average, namely 6.45% in 2016. Even so, if we imagine a hospital with 50,000 admissions per year, this nosocomial infection rate means that some 3,500 patients will be affected in a single hospital alone.

Conclusion:

Nosocomial infections are those that are acquired after admission to a healthcare facility which were not in incubation at the time of admission. They affect between 7% and 8% of patients receiving healthcare in Spain.

QUESTION 2.

What are the most prevalent nosocomial infections in Spain?

Exposure:

The main NIs are *Clostridium difficile* infections (CDIs), surgical site infections (SSIs), urinary tract infections (UTIs), respiratory tract infections (RTIs), and catheter-related bloodstream infections (CR-BSIs). The EPINE study shows that the rate of nosocomial UTIs has decreased in recent years, with SSIs becoming the most frequent (prevalence of 2.24%), followed by RTIs (1.74%), UTIs (1.59%) and CR-BSIs (1.18%) [8].

C. difficile (CDI) infection is considered by the Centres for Disease Control (CDC) to be the most common nosocomial infection at present and probably the one associated with the highest economic burden. CDI produces diarrhoea with varying degrees of severity and can be fatal, particularly when caused by hypervirulent strains. Unfortunately, in addition to serious episodes, one of the major problems with CDI is that approximately 20-30% of patients will have recurrent episodes, which often require hospital readmissions and will have a very significant impact on their quality of life. The route of transmission is oral-faecal, person-to-person, or through contaminated fomites or surfaces. We know that the hospital rooms of patients who have had a CDI remain contaminated with spores produced by this microorganism for up to 5 months and proper cleaning is far from easy. In addition to strict cleaning, special emphasis should be placed on the importance of washing hands, as spores are resistant to commonly used alcohol solutions.

In the USA, the CDC reports figures of 250,000 episodes of CDI per year, with 14,000 deaths and a cost of approximately \$1 billion. The problem is that the diagnosis of CDI is not simple and not performed uniformly in all hospitals, meaning the rates published do not correctly reflect reality. Only 110 cases of CDI are described in the EPINE study in Spain, representing 2.09% of all NIs and involving 0.17% of the 61,673 patients included. However, we know that the estimated incidence in Spain of CDI is 1-5 cases per 1,000 admissions and 44 episodes per 100,000 inhabitants/year, which would give figures higher than 20,000 episodes per year in Spain alone. In a study carried out in our country we were able to verify that 50% of the ep-

isodes are not suspected, so the infra diagnosis in this entity is well demonstrated [9]. Unfortunately, centres with diagnostic excellence are those that logically report the highest incidences, giving the impression they do not have the situation under adequate control.

Surgical site infections (SSIs) affect 4.5% of patients according to the EPINE study and account for 26.5% of all NIs. The rate of NIs clearly varies with the type of surgery, being around 2% in clean surgery (e.g. cardiac surgery), 5.7% in clean-contaminated surgery (e.g. biliary tract surgery), 10.97% in contaminated surgery (e.g. recent traumatic injury) and 6.99% in dirty surgery (e.g. surgery for perforation of the gastrointestinal tract) [8]. More than 25% of patients admitted to a tertiary hospital have a surgical wound, so this NI also represents a significant numerical burden. Surgical wound infections, especially when they are deep or organ/space infections, can lead to readmission, further surgery and even death when accompanied by bacteraemia, or require drainage from spaces such as the mediastinum or abdomen. Also, particularly serious are those associated with infection of prosthetic material, such as heart valves or joint replacements. In any case, they always lead to significant morbidity for the patients involved, as well as a significant increase in health expenditure.

Nosocomial UTIs affect 1.46% of patients admitted and account for 20% of NIs. The incidence is higher in patients with urinary catheterisation (5-25%) and the risk increases with the duration of catheterisation (accumulated 10% per day). Since it is estimated that approximately 15% of all patients admitted to our hospitals have a urinary catheter fitted, the quantitative dimension of the problem is enormous. Of patients with nosocomial UTIs, 2-4% will have secondary bacteraemia, and it is in these patients that mortality is highest.

Catheter-related bloodstream infections (CR-BSIs) occur in 1.17% of patients admitted and account for almost 16% of all NIs. It is estimated that 10% of all hospitalised patients have a central intravenous catheter fitted and 73% a peripheral one. Infection rates increase the longer catheters are in place and are expressed in number of infections per 1,000 catheter-days in order to have comparable figures. Rates range from 0.7-2.3 episodes of CR-BSIs per 1,000 days of catheter use (ICUs 0.4-1.7 and non ICUs 0.9-2.7) [10]. CR-BSIs can be especially severe in patients with prosthetic heart valves or in patients with previous valve injury. Different studies have shown that 31-57% of all nosocomial endocarditis is caused by an IV catheter, many of which were peripheral catheters, not always strictly necessary at the time of infection. Catheters represent a particularly prevalent cause of infectious endocarditis in cancer patients [11]. Mortality from these episodes of nosocomial endocarditis ranges from 25% to 45%. It is important to remember that peripheral venous catheters should not be taken lightly, since, as we have seen, they are much more prevalent than central catheters and also tend to produce *S. aureus* bacteraemias, with the consequent morbidity and mortality caused by this aggressive pathogen.

Finally, regarding RTIs, particularly nosocomial pneumo-

nia, this is the most frequent infection in intensive care units, affecting 10% of intubated patients and resulting in an attributable mortality rate of 15%, an increase in stay of around 8 days and an increase in cost of more than 20,000 euros per case. In the EPINE study, the rate of respiratory infections was 1.43% and accounted for almost 20% of NIs. Pneumonia associated with mechanical ventilation accounted for 23% of nosocomial pneumonia in the study, showing the importance of extending pneumonia prevention campaigns beyond ICUs [10].

Conclusion:

The most frequent nosocomial infections in Spain are, in decreasing order of incidence, *Clostridium difficile* infections, surgical site infections, urinary tract infections, respiratory tract infections and catheter-related bloodstream infections.

QUESTION 3.

What do we know about morbidity and mortality caused by nosocomial infection? What is the economic burden?

Exposure:

NIs are the most common adverse effect of healthcare. Although their effects on patient health and associated costs have been extensively studied, there is a lack of precise knowledge on the global burden due to the absence of comprehensive measurement (monitoring) systems and the heterogeneity of these complications [12, 13].

Direct costs include longer hospital stays, the need for diagnostic tests, treatment by means of antibiotics and other medications, surgery, and ICU admission. Indirect costs include disability, increased avoidable mortality, costs associated with litigation, damage to the image of (reputable) centres, increased resistance of microorganisms to antimicrobials and opportunity costs [14-16]. In addition, NIs have other effects on both the patient and their families and on the general public as a whole, arising from loss of productivity, potential years of life lost, and adjusted years of life lost due to premature death and disability (DALYs) [17]. Multidrug-resistant microorganism (MDRMs) infections represent a significant proportion of nosocomial infections. Recently, they have been given great attention because of their current and future health implications. The most important MDRMs due to their frequency are *Enterobacteriaceae* resistant to third-generation cephalosporins and/or carbapenems, methicillin-resistant *Staphylococcus aureus* (MRSA), and non-fermented Gram-negative bacilli resistant to carbapenems [18]. Another microorganism of epidemiological importance is *C. difficile*, which is associated with both NIs and the use of antibiotics to treat them.

In Europe, according to ECDC data, it is estimated that NIs are responsible for 16 million extra days of hospitalisation, 37,000 attributable deaths and 110,000 contributory deaths at a cost of 7 billion euros, in direct costs alone [19]. The most important social impact (DALYs/100,000 inhabitants) is caused

by pneumonia, followed by bacteraemia, urinary tract infections, surgical infections and *C. difficile* infections.

In Spain, the three main MDRMs which cause death are *E. coli* resistant to third-generation cephalosporins, MRSA and *Pseudomonas aeruginosa* resistant to carbapenems. However, in terms of impact on both potential years of life lost and DALYs, the order of importance is carbapenem-resistant *Pseudomonas*, third-generation cephalosporin-resistant *E. coli* and MRSA. According to ECDC calculations, it is estimated that 41,345 cases of MDRM infections occur each year in Spain, causing 1,900 attributable deaths, 40,611 potential years of life lost and another 8,200 years of life with disability [18, 19].

Compared to the top 10 causes of death in Spain, in terms of potential years of life lost, NIs rank 4th only behind ischemic heart disease, lung cancer and Alzheimer's disease. In terms of DALYs, NIs represent the 9th most common cause. According to ECDC estimates, NIs cause 1.5 million extra days of hospitalisation annually in Spain, 3,367 attributable deaths, another 10,011 deaths (as a contributory cause) and direct costs of 637 million euros [18, 19].

Conclusion:

Although we do not know precisely the cost and impact of nosocomial infections on society, both are very significant. In Spain, in terms of the leading causes of death, nosocomial infections are ranked 4th in potential years of life lost, cause more than 13,000 deaths and cost more than 600 million euros per year.

QUESTION 4.

To what extent are nosocomial infections preventable and at what cost?

Exposure:

A high proportion of NIs are preventable and it is our duty and responsibility to consider each of them as a failure of the system, to analyse them as a team, and to determine where we have failed, in order to prevent similar episodes in the future. But preventing NIs is not an easy task because virtually all microorganisms can cause them (viruses, bacteria, fungi and even parasites) and because there are multiple transmission routes (airborne, contact, patient-to-patient, etc.) that require very different measures to be taken.

NI reduction plans are usually coordinated by a hospital's Infection Commission, which establishes targets, looks at the current situation, puts measures into place and then measures their impact. It is essential that the vast majority of their work be focused on action rather than measurement, which is why point prevalence studies are often used.

At practically all facilities, there are training plans in place for patient safety and the prevention of nosocomial infection by staff, and in some of them patients themselves are also being involved, with notable success. Hand hygiene plans, isolation measures, active policies to remove unnecessary catheters and urinary catheters, prevention of surgical wound infection

and ventilator-associated pneumonia and plans to promote the conservative use of antimicrobials are also essential. Of course, swift action is always taken when outbreaks are detected.

To carry out this enormous task, it is necessary to have a multidisciplinary team made up of expert members, such as microbiologists, preventive medicine experts, pharmacists, infectious disease specialists and experts in occupational medicine, as well as representatives from the units/departments with the highest rates of infection, such as intensive care units, surgical departments, paediatrics, internal medicine, nursing and other areas. Management and central departments such as maintenance, engineering, etc. must also be represented. Such a multidisciplinary team is necessary for problems to be dealt with by personnel who have the relevant expertise, this being especially important when faced with issues concerning particularly virulent microorganisms, specific patients, health-care personnel, or the hospital environment. For this reason, legislation, such as that introduced by the Community of Madrid in 2006, which centralises this task in a single specialty, has been very badly received by scientific societies and by the professionals involved in this task and must therefore be reconsidered.

In addition, we are faced with other added difficulties, such as the lack of visibility of the specialty of clinical microbiology, which, despite its very high level of assistance and scientific recognition internationally, is seriously threatened in our country by voices advocating its integration in core laboratories on economic grounds. It should not be forgotten that microbiologists are the first to diagnose infection and represent the only specialty that has the more precise information on it. They are also experts in infections and resistance and must be essential and well-recognised players in the control of NIs if we are to succeed. On the other hand, Spain continues to be one of the countries in the world without an officially recognised infectious disease specialty. We need to change the laws if we are to move forward.

We have good examples of effective measures that have been endorsed by legislators in other countries. An example of this is the USA, where scientific evidence has shown that the use of a simple checklist with 5 mandatory points followed when inserting a central catheter has practically eliminated catheter-related bacteraemias. Laws were passed to make its implementation mandatory. In addition, this legislation was accompanied by the allocation of funds to each state for its implementation, the aim being to reduce nosocomial infections by 50% over a period of 5 years [20-23].

These measures were followed by a system of incentives and monetary penalties for hospitals based on nosocomial infection rates, which in all cases were considered preventable. It is in this system that the differences in the healthcare model are most significant between Europe and the USA. However, in France, since 2002, hospitals have been responsible for all NIs and patients can seek financial compensation from the ONIAM (Office National d'Indemnisation des Accidents Médicaux, des

Affections Iatrogenes et des Infections Nosocomiales), which reports to the Ministry of Health.

This 'carrot and stick' system is a double-edged sword as it punishes the hospitals with the best diagnostic record, these usually being those with the highest degree of excellence as evidenced by recent scientific data. This can lead to an intentional microbiological under-diagnosis, which is not accompanied by a reduction in the actual use of antimicrobials [24].

The change must go deeper and our main goal must be to implement a culture of patient and staff safety. It is not a question of looking for culprits, but of not tolerating deliberate non-compliance with measures proven to be effective (hand hygiene, vaccination of health personnel, etc.). However, this cannot be based on will and sufficient resources must be devoted to carrying out ongoing and sustained campaigns over time, as well as technological innovation being encouraged to help prevent mistakes. Finally, it is essential to stress that the mistaken idea of the situation of zero-risk and zero-infection being immediately feasible must not be conveyed to the public and that the media must work together with health professionals within a framework of meaningful, but serious and well-founded campaigns.

Conclusions:

It is possible to significantly reduce nosocomial infections. To this end, we must implement useful and effective campaigns inside and outside ICUs, which are carried out by multidisciplinary teams with the necessary collaboration from microbiology, infectious diseases and preventive medicine departments, among others. A gross estimate from all the experts present is that the current figures for nosocomial infection in Spain could be reduced by at least 50%.

QUESTION 5.

Are nosocomial infections, in the opinion of journalists, an indicator with which to assess and gauge the quality of a health system?

Exposure:

In 1847, Ignaz Semmelweis found that there was a link between the procedures carried out in the necropsy rooms of the University Hospital of Vienna and the high mortality rate in its delivery room, the reason being that the same staff were used, who did not follow proper hygiene measures. He also found that hand hygiene prevented transmission. It is therefore evident that the reduction of nosocomial infection is a parameter of quality of care [25-28].

Since then, numerous studies have shown that nosocomial infections are a preventable cause of serious adverse events in healthcare and a patient safety mechanism [10, 21, 29-31]. Infection prevention has been included as one of the parameters for quality control in different clinical situations [10, 21, 32-38]. In addition to the human factor, there is also the aspect of sustainability of health systems, since NIs extend

hospital stays and increase healthcare costs (greater use of medication, more laboratory studies, etc.). According to data from the NNIS in the USA, in 2012 there were 1.7 million nosocomial infections in the country, which resulted in tens of thousands of human lives and a cost of between 28,000 and 45,000 million dollars.

Although already mentioned, a study published in *Infection Control and Hospital Epidemiology* in 2011 estimated that the implementation of prevention programmes for NIs can prevent around 65% of bacteraemias and urinary tract infections and 55% of pneumonia and surgical infections, which not only saves thousands of lives, but also millions of dollars [39]. Most significantly, the measures to achieve this are relatively simple and include proper hand hygiene and following a series of steps by means of checklists for various medical procedures.

Therefore, from a journalistic point of view, there is no doubt that nosocomial infections and the indicators used to evaluate their incidence are a factor that can be used to assess the quality of care provided. However, when drawing comparisons between facilities, it is necessary to properly weigh up the differences in the basic situations of the populations each one serves and to look at the progress made by each centre, rather than comparing different ones. Hospitals and departments with a higher number of patients with a high-risk profile are therefore more likely to have higher rates of nosocomial infection than other facilities.

Given the size of the problem, it is surprising that nosocomial infection is not extensively reported on by the media, at least by the mainstream media, particularly in comparison to other factors relating to the quality of our health system. For example, despite the fact that the EPINE study has been ongoing since 1990, allowing us to see the trends in terms of prevalence and foci of nosocomial infection, the reality is that its data has received much less media coverage than that provided by other health reports periodically made public, such as those reporting on waiting lists for surgery [8].

Conclusion:

From a journalistic point of view, nosocomial infection figures can be used as an indicator to assess the quality of care in a given sector. However, traditionally they have not received much coverage in the mainstream media.

QUESTION 6.

How does the information on nosocomial infection that reaches the media in the USA, Europe and Spain compare with objective parameters?

Exposure:

One of the advantages of NIs is that their recording and monitoring is both routine and uniform in many countries. The first epidemiological monitoring programme for nosocomial infections was launched in the United States in 1970 and most developed countries now have their own systems, the majority

based on the US model. These seek both to monitor and identify the microorganisms responsible for NIs and to compare different hospitals, with the aim of improving the control and prevention of these infections. In Europe, the European Centre for Disease Control (ECDC), based in Stockholm, has been conducting a comprehensive study on the prevalence of NIs and antimicrobial resistance in acute-care hospitals in all Member States since 2011, under the auspices of the European Commission [19].

In the case of Spain, there are several regional models, such as the Catalan and Andalusian models, but the main reference for the monitoring of healthcare related infection is the Study on the Prevalence of Nosocomial Infection in Spain, Epine, launched in 1990 by the Spanish Society of Preventive Medicine, Public Health and Hygiene [8]. There is also a specific study for the monitoring of nosocomial infections in ICUs, Envin-Helics, developed in 1994 by the Spanish Society of Intensive, Critical and Coronary Medicine [40]. There is therefore no shortage of available data.

Having said this, the specific question regarding how the information on this subject is published by the media can only be answered by stating that it is clearly limited. The subject should enjoy more and better coverage in the non-specialised media, this being partly the responsibility of the media and partly that of the institutions, which should improve how and what they communicate. To these, we must add social demand. Since the U.S. Institute of Medicine published the book 'To Err is Human' in 2000, which revealed that adverse medical events were the third leading cause of death in the United States, awareness has increased among the general public, and one of them, nosocomial infections, has emerged as a real public health problem [41]. Sometimes, causing alarm amongst the general public is profitable.

It is clear that there is a growing interplay between the mass media and scientific journals, and that almost every week, the media gather and publish some of the most relevant scientific data that has appeared in leading scientific journals [42]. The relations between the two forms of communication are not always easy and must take into account such things as the need to be newsworthy, the lack of time, the need for prudence and the enormous impact that the mainstream media can have. On the other hand, although some clinical trials have been able to demonstrate the influence of media campaigns in reducing problems such as those surrounding breastfeeding [43], the stigmatisation surrounding HIV amongst young African Americans [44], increasing the use of mosquito nets in Cameroon [45], reducing smoking [46] [47] and encouraging physical exercise [48], in many cases meta-analyses are not conclusive in revealing such an impact. An example of this is the effectiveness of smoking cessation campaigns, where it is not possible to prove a lasting impact as a result of intervention by the media [49], campaigns to discourage risky behaviour in order to prevent the spread of communicable diseases [50] or drug use [51-53]. In places where the consumption of mass media by the general public is scarce, due to their low socio-economic level, the impact will most likely be lower [54].

On the other hand, often the media simply report the facts but only convey a small proportion of the health measures people need to take to protect themselves in outbreaks of communicable diseases [55].

There are general differences in terms of the focus of content published by the media in the United States of America and Europe. In Hallin's opinion, and in terms of political orientation, the European media has a more ideologically oriented position, while the Americans seek greater objectivity in their news [56]. We have not found any data that objectively and quantitatively compares the incidence of nosocomial infection news between the United States and Europe. Daniela Paolotti reviews the major developments in the world of infection between 2008 and 2013 and compares the information, needs of professionals and the public. There was great interest in various outbreaks, particularly *C. difficile* and MRSA infections, although they were more static for the general public than for professionals. The author emphasises the need for collaboration between health authorities, professionals and the media in ensuring the quality of information and its evidence-based rationale [57].

Conclusion:

We are not aware of any studies that specifically compare the quantity and quality of information on nosocomial infections in the mainstream media in the United States, Europe and Spain. In general, information on the subject is well received and followed with interest by readers.

QUESTION 7.

Is the low amount of information in the mainstream media due to ignorance or the fact that it is simply not a priority?

Exposure:

It has been stated that between 7 and 8% of all those hospitalised in Spain acquire an infection that they did not have at the time of admission. The WHO estimates that these figures are still higher and closer to 9% for all those hospitalised in Europe. In addition, a significant proportion of these infections are caused by multidrug-resistant microorganisms (MDRs). We believe that this data, although without much more detail, is known by most media outlets. Having said that, it is not easy to establish the reasons why such information has little or no presence in terms of news published on a daily basis, especially on television. We rely on the news for providing us with new facts and information on topics of general interest. If the outlet in question is specialised, space is made for all types of health-related information, this being part of their philosophy. On the contrary, in the mainstream media, news deals with a wide range of sections: politics, society (with its detachment from events, social facts, scientists, health, education, etc.), culture, sports, economy, etc., and airtime or printed/online space is very limited.

Competition to 'sell' the news of the day, which fills the printed and online pages of newspapers and takes up airtime on TV, is tough and the winner is usually the outlet that provides the stories (whether positive or negative) which are most interesting and most capture the public's attention.

According to the VIII Science Perception Survey 2017 [50], carried out by the Spanish Foundation for Science and Technology (FECYT), public awareness of science has improved substantially. More than half of the general public now answers this question correctly: do antibiotics cure infections caused by bacteria or viruses? It sounds like an anecdote, but it is not. Scientific literacy has increased. A decade ago, less than half of those asked the question on antibiotics knew the answer. Six out of every ten Spaniards who were asked by the FECYT said they are interested in health and science issues, the medium through which the majority of these receive information being television.

Journalists know we cannot give up on health information, but nosocomial infection is often simply not considered to be news. In 2009, a campaign was launched in New York to link sugar-sweetened drinks to obesity. The initiative, published as a scientific study in *Jama Internal Medicine*, had the effect of significantly reducing the consumption of sugar-sweetened drinks among adults and teenagers [51]. The media can and should be allies of professionals. Many patients turn to the media to complete or check the information they receive from professionals. Nevertheless, the responsibility for promoting good health, health-related campaigns, prevention and health education lies with the public authorities.

Sources are essential when it comes to provide the media with adequate information. These sources should be such that they may be considered to be news, examples being new research, partial or definitive results from a study, new evidence, a warning, a complaint, etc. Of course, those responsible for such news must be willing to collaborate with the media and criticism must be defended and communicated.

For the first time this year, Health Infonometer 2018 was carried out by 'Infoperiodistas y Acceso', with the support of the Federation of Spanish Press Associations (FAPE) and the National Association of Health Informers (ANIS), including more than a hundred journalists from 2,361 media outlets, namely national and local press, radio, television, digital outlets and blogs. The goal was to assess the relationship between the sources of information and health information professionals.

The health sector accounts for 2.8 per cent of all mainstream media coverage. Social networks such as Twitter, or the information on the Internet from specific health websites and Wikipedia itself, account for 44% of information searches. Among the topics of interest are research studies and developments. 70% of the sector's information is published by digital media outlets, despite the fact that they only represent 15% of the media outlets consulted. As a result, 86% of the target audience will be reached.

Conclusions:

Overall, 2.8% of material published comes from the

health sector. The scarcity of information on nosocomial infection is not so much a problem of ignorance as a problem of competition with other 'more newsworthy' topics.

The specialisation of journalists may be the solution to this, something which would allow them to differentiate important information from unimportant information and thus avoid alarm and sensationalism.

QUESTION 8.

What proportion of medical lawsuits are related to infections?

Exposure:

Medical mistakes are frequent and affect 6.2% of patients admitted to Spanish hospitals from our emergency department. According to this study, errors are most common among patients who are admitted with fever and have infectious diseases, where diagnostic or treatment errors are made in 12.8% of all cases [58].

The OCDE has drawn up a list of 21 indicators that it recommends for monitoring in hospitals as a guarantee of patient safety. These are classified into six sections, the first of which is nosocomial infections. In particular, it recommends preventing pneumonia associated with mechanical ventilation, surgical site infection, other infections attributable to medical intervention and pressure ulcers.

Infection is a common cause of medical lawsuits, but hospitals are often only held legally liable if they did not have the usual rules of infection prevention in place and properly implemented, or indirectly if the staff involved did not properly follow such rules, resulting in complications for patients [59].

The British National Health System paid a total of £911 million (0.88% of the total budget) in compensation for malpractice in 2010/2011, figures that have not fallen significantly in recent years. By way of example, between 1996 and 2010 there were 971 lawsuits filed for infections caused by MRSA and *C. difficile*, costing the British taxpayer £35.2 million. Lawsuits for MRSA dropped, but those due to CDI [60] remained.

In Spain, of the 971 medical lawsuits filed in the autonomous communities of Aragon, Cantabria, Extremadura and La Rioja, 2.98% were due to nosocomial infections. At the beginning, the emergence of the concept of nosocomial infection in demands was almost synonymous with estimation. Hospital contagion was taken to be the acquisition or spread of a disease due to insufficient sterilisation or lack of antiseptics, involuntarily putting pathogenic microorganisms into contact with people at hospital facilities or health centres. In these lawsuits, the burden of proof is reversed, the respondent being responsible for proving the existence of and compliance with the appropriate rules. Centres must comply with and have their own protocols for the prevention and control of diseases, including the appropriate infrastructure to fight and, above all, prevent infections. However, is it not enough to merely have

these protocols in place, centres must also put them into practice and comply with them. It is not having such protocols or not properly implementing them that distinguishes negligence from what may be considered a complication.

In addition to the problems we have mentioned, the lack of specialisation of the judiciary in medical matters complicates decisions. In recent years and given the rise in such lawsuits, rulings have become much more balanced and fairer. We believe that practice and case law tend to suggest that the majority of infections contracted by patients upon admission are caused by basic illnesses or by external agents, which are beyond the responsibility of health centres. More than 85% of contentious-administrative or civil lawsuits are dismissed and more than 99% of criminal lawsuits do not result in convictions.

One of the most common problems for judges is correctly interpreting the concept of 'early' within the context of decisions that depend on 'early' diagnosis or treatment.

Conclusion:

Although nosocomial infection is one of the main causes of preventable problems after admission to hospital, the number of lawsuits relating to nosocomial infections in Spain is low. Overall, 85% of contentious-administrative or civil lawsuits are dismissed and more than 99% of criminal lawsuits do not end in conviction.

Providing judges with specialised training in this area would result in fairer and more balanced outcomes.

QUESTION 9.

What is the role of journalism in presenting to politicians, issues of nosocomial infection, as a state responsibility? The English example.

Exposure:

In the late 1990s, a particular interest in nosocomial infections and their reduction emerged in England with the drafting of the first documents to establish a control plan [61]. The figures of 300,000 hospital-acquired infections per year at a cost of over £1 billion, sometimes resulting in death, were passed on to the public. The data was particularly paradigmatic for two diseases, bacteraemic infections caused by MRSA, which were attributed to some 9,000 deaths per year, and the growing epidemic of *C. difficile* infections, initially with hyper-toxigenic strains and involving high morbidity rates and costs. Perhaps an example of this public awareness is the so-called 'Stafford Hospital scandal', which occurred around 2008 when an investigation revealed poor hygiene and infection control conditions going back to 2005, this being related to an increase in deaths. The scandal was so serious that David Cameron had to apologize to the nation.

The coverage of these and other facts by the mainstream media in the UK raised public awareness of the problem, ranging from the general public through to the political class and parliament. The legislation that was drafted to control both

diseases, while at the same time laying down rules to improve hospital hygiene in general and ensuring data is better recorded, has borne fruit with very marked reductions in terms of both problems, reductions that do not have comparisons of the same size in other European countries, where the problem has not reached the political class and has therefore not been translated into legislation [62].

In Spain, the media is provided with information on new developments in this field from groups and societies such as the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC), the Spanish Society of Virology, and the Epine study, which is carried out by the Spanish Society of Preventive Medicine and Public Health. In addition, attention is also often paid to what other societies say and to certain information from trade unions involved in the health sector. In Spain, a paradigmatic case that changed the attitude of prevention in many hospitals and represented a real milestone, particularly in terms of prevention as measured by ambient air pollution in the operating room, was the case of an outbreak of invasive aspergillosis associated with major cardiac surgery in a large referral hospital.

The view of the specialised media on nosocomial infections is radically different from that of mainstream media. In order to understand the informative approach of the latter, we must first summarise the changes seen in media outlets throughout the economic crisis, changes which meant a decrease in real health specialists and turned journalists into jacks of all trades, i.e. masters of none. This is a widespread phenomenon that has resulted in a worsening of the quality of information. In general, the approach taken by the mainstream media in terms of nosocomial infections is one of scandal, without any clear intention of actually creating public opinion or giving the legislature a mandate on which to act.

Conclusions:

The role of the media as opinion formers and as vehicles for putting the necessary pressure on the legislative power in terms of issues of major interest for the public, such as hospital infections, is considered essential. The English example is perhaps the most notable one in the last two decades in this regard.

QUESTION 10.

What potential interest could a training programme on nosocomial infections aimed at journalists attract and what would be its conditioning factors?

Exposure:

Nosocomial infection is a relatively recurrent news item in the media with a significantly greater presence in the specialised health media than in the mainstream media. The news which is most often reported (in more than 90% of cases) involves a negative event (news, crisis, study, report, etc.) which focuses on generally worrying, if not alarming, data.

The reliability of the sources of information involved, es-

pecially nowadays with the Internet and social media playing a role they should not be playing, but which the general public allows them to play, are in most cases unreliable.

Various studies (American Publishers Federation, WHO, EFPIA) conclude that eight out of ten sources of health information do not offer the reliability that the importance of issues in this field require (or should require).

On a daily basis, journalists receive a whole host of information in different ways and formats and often do not have time to discern in depth what is interesting and what is not. The volume of work and the consequent lack of time also have a decisive impact on the quality of information.

Within this context, specialised journalists and particularly those specialised in health matters are becoming increasingly scarce. Media outlets, both mainstream and specialised ones, have fewer and fewer experienced staff, which is very clearly reflected in the information they publish. The field of health information is paradigmatic in this regard.

There is an unquestionable cause-effect relationship between training and information. The training of those who provide information is a key element in ensuring better quality information.

Faced with such a situation, we believe that specific training is not only appropriate, but essential and should be offered in this and many other areas.

Conclusion:

A training programme for journalists on nosocomial infection and its determinants would not only be interesting, but necessary.

QUESTION 11.

What does the general public expect in terms of health information on infections provided by newspapers and other forms of media?

Exposure:

In order to be able to analyse the preferences of readers of health information and give an informed opinion on the possible interest of readers in nosocomial infection, it is necessary to carry out a review of the issues that have played a leading role in health information in Spain in recent years, in order to identify patterns and compare them with nosocomial infection.

Furthermore, it is important to define the concept of 'health information reader', due to the notable differences between the approach and content of generalist newspapers and their health supplements and those specialised in health information.

The information the media are interested in, investigate and publish is directly related to the interests of those consuming such information. This is why the concerns and interests of the general public are often a determining factor in prioritising certain issues over others [63]. In this sense, health

information has experienced a notable growth in recent years, coinciding with the increase in concerns for health identified in the barometer carried out by the Centre for Sociological Research (Centro de Investigaciones Sociológicas - CIS). By way of example, if we compare the barometer carried out by the CIS in April 2004 with the same period in 2018, we see that the percentage of respondents who consider health as their main concern has almost doubled, from 5.3% to 10.3%, or in other words, from being the tenth most pressing problem for the general public to the fifth [64] [65].

It is interesting to see how often a topic takes priority in such an intense way, either because of the seriousness of the information in question or because of the period of time it covers, that it manages to monopolise the conversation. This is especially true in the field of health, so much so that different studies have been able to relate each year to a health issue that the press focused on more than any other. Although we will not include them all, here are some examples: 2002 - AIDS, boosted by the World Congress held in Barcelona, 2004 - Avian Influenza, 2005 - Smoking Law, 2009 - Influenza A, 2011 and 2012 - funding and sustainability of the NHS, 2014 - Ebola and 2015 - Hepatitis C treatment.

Once the topics of greatest interest have been identified, we find that the vast majority of those that have generated the greatest number of articles and reader demand in the last 18 years have common patterns. Information on infectious diseases with a high impact on the general public stands out above any other. In addition, in the last five years, this news has change and even combined with the discussion on the sustainability of the system and health management (the case of hepatitis C is particularly significant) [66-68].

It can therefore be concluded that nosocomial infection is an issue that may indeed be of interest to readers of health information, insofar as it contains many aspects common to the major health issues that have played a leading role in health information in recent years. Today's reader, much more informed and with vast resources at their disposal, expects more than just mortality figures, prevalence data or various statistics. The nature of nosocomial infection raises questions that any of us would ask ourselves as a patient, and allows us to approach its coverage from different perspectives.

In addition to defining the concept, listing the most common infections and the main routes of infection, it is interesting to address issues such as the safety measures the Autonomous Communities and hospitals are currently implementing, and what costs they entail for the system, as well as the measures that both health professionals and patients can implement on a day-to-day basis in terms of prevention.

Another topic of interest is the extent of the link between reducing the risk of infection and early discharge, and analysing the implications of such measures for patients.

It is also important to inform readers about the potential legal responsibility of hospitals, in addition to the treatment that health insurance companies provide for this type of infection. It is also important to clarify that there are treatments

available for this type of infection, and how this relates to drug resistance, given that this is a current issue in which the European Union is involved, and which it is closely related to the treatment of nosocomial infections.

The approach that can be taken to nosocomial infection is broad and involves different approaches. How information is prioritised is decided by the readers themselves. As far as health information is concerned, there is no single yardstick, although there are succinct differences between those who read mainstream newspapers and those who regularly read specialised newspapers.

Conclusion:

Nosocomial infection is of potential interest for readers of health information. The nature of nosocomial infection makes it possible to provide readers, whether of mainstream or specialised media, with interesting information on aspects ranging from legal to clinical issues, and also to relate it to other current news such as drug resistance or early discharge.

QUESTION 12.

What aspects would an expert in Ethics consider about the missions that health professionals and journalists must fulfill to help reduce Nosocomial Infection?

Exposure:

The ethics of journalism and the media is a widely developed discipline of exceptional importance, given the great influence of the media on people's behaviour. It is not for nothing that they are called "the fourth estate".

The first problem that arises is that of what its functions are. The first, which is universally accepted, is that of "informing". Reporting means reporting what happens. The journalist would be, in this case, a mere transmitter, who makes public what in principle is not. The publicity of life's events undoubtedly has an important ethical component, since it allows corruption to be uncovered that would otherwise go unnoticed. But it also has another highly negative component, especially when things or behaviors come to light that belong to people's private lives, and therefore threaten their intimacy and privacy.

It follows from the above that publicising events cannot be considered good in itself, nor can one take refuge in the argument that the function of journalism is simply to "report", as if it were possible to put oneself in a position of pure "neutrality". No matter how often it is stated, this supposed neutrality does not exist, because it cannot exist. In fact, the journalist does not report everything he hears or sees. He selects what he thinks is "newsworthy" and can give him a "headline", the more flashy or even scandalous the better. Thus, it completely breaks any purported neutrality slogan.

The journalist is an informer, but an informer who has the enormous capacity and responsibility to create "public opinion". I do not think that it is possible to distinguish clearly,

however much one may claim, between information and opinion. The former is not neutral or value-free, unlike the latter, which is value-laden. It's all value-laden, whether we want it or not. And professional responsibility always consists of the same thing, in the way we handle the specific values of each profession. This happens to the judge, the doctor, the politician and, of course, to the journalist. There is no doubt that values related to health, life and well-being are of great concern to society, which is also looking for information in the media. So there is a demand. The problem is in the supply. First of all, because much of the information found, for example, on networks, is in most cases unreliable. On the other hand, the media, which are commercial companies, are more interested in the "news" that may be profitable for them than in the other that may be more valuable or more useful for the citizen.

Here is an example. Medical errors will always be more "newsworthy" than adverse event prevention programmes, even though the health and social importance of the latter is far greater than that of the former. This shows that the aims of journalism and health care are not only not the same, but often not the same, and may even be antagonistic.

Is it possible to reconcile the two, to make them converge in a middle point that can be satisfactory for both parties? Of course it is. That is the role of meetings such as the one that has led to this opinion document. Only mutual knowledge, the exchange of opinions and points of view, health education for journalism professionals and journalism education for health professionals can increase awareness on both sides and create a "culture" of this type of problem. Which is probably what we're missing.

Conclusion:

Information is never neutral. It is always "loaded with values". Hence, their quality will depend on how they are handled. Only collaboration between journalists and health professionals can avoid biases in assessment and thus improve information on health issues, and more specifically on hospital infections. A field in which truthful and careful information is extremely important, because only it can put an end to the myth, so widespread today, that in the age of antibiotic therapy it is no longer necessary to take the universal precautions of prevention and asepsis that many people today consider to be typical of times happily overcome.

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