

**SPECIAL COLLABORATION**Received: April 26<sup>th</sup> 2021  
Accepted: May 21<sup>st</sup> 2021  
Published : September 7<sup>th</sup> 2021**RISK PERCEPTION IN THE MANAGEMENT OF A HEALTH CRISIS:  
EBOLA IN SPAIN. CASE STUDY****Ana Ayuso-Álvarez (1,2), Teresa Blasco Hernández (1,2) and Agustín Benito Llanes (1,2)**(1) National Center for Tropical Medicine (*Centro Nacional de Medicina Tropical*). Madrid. Spain.(2) Collaborative Research Network on Tropical Diseases (*Red de Investigación Colaborativa en Enfermedades Tropicales - RICET*). Spain.

Authors declare that there is no conflict of interests.

**ABSTRACT**

In 2014, the first case of secondary Ebola infection outside Africa detected in Spain, caused a sense of global threat. This study assesses Risk Perception among the health personnel and identify the agents that amplified or reduced it. Through a snowball sampling, 5 in-depth interviews were carried out. Inclusion's criteria: treating the patient suspected of Ebola and/or of having been actively involved in the management of the crisis. Triangulation and member checking were used to validate findings. Field work was between February and June 2015. In Risk Perception's construction were involved Formation, Management of Information and Trust. Political and Health Authorities, Media and Unions acted as amplifiers whereas the Expert Committee and Hospital Management as reducers. Peer-to-peer behavior acted as a reducer among the medical staff and as an amplifier between the nursing and cleaning staff. This information would be relevant to better manage a health crisis of this characteristics.

**Key words:** Ebola, Risk perception, Healthcare professionals, Spain.

**RESUMEN****Percepción del riesgo de los profesionales sanitarios ante el primer caso de infección secundaria por ébola en España**

En 2014, el primer caso de infección secundaria por ébola fuera de África detectado en España provocó una sensación de amenaza global. Este estudio evaluó la Percepción de Riesgo (PR) entre el personal de sanitario e identificó los agentes que la amplificaron o la redujeron. A través de un muestreo de bola de nieve, se realizaron 5 entrevistas en profundidad, siendo los criterios de inclusión: tratar al paciente con sospecha de ébola y/o haber participado activamente en el manejo de la crisis en el centro hospitalario. Se utilizó la triangulación para validar y verificación los resultados. El trabajo de campo se realizó entre febrero y junio de 2015. Los factores claves en la construcción de Percepción de Riesgo fueron la formación, la gestión de la información, el trato percibido por el personal sanitario y la confianza en las autoridades sanitarias. Las autoridades políticas y sanitarias, los medios de comunicación y los sindicatos actuaron como amplificadores de la PR, el Comité de Expertos y la Dirección del hospital lo hicieron como reductores de la PR. El comportamiento entre iguales actuó como reductor entre el personal médico y como amplificador entre el personal de enfermería y de limpieza. Se trata de información relevante de cara a manejar situaciones de crisis sanitarias de similares características.

**Palabras clave:** Ébola, Percepción del riesgo, Profesionales de la Salud, España.

## BACKGROUND

The first known outbreak of Ebola was in the Congo (formerly Zaire) in 1976 and since then the virus has been circulating in different countries of Africa<sup>(1)</sup>. In 2014, the Ebola epidemic reached an unprecedented scale, prompting the World Health Organization (WHO) to declare the first international alert in March and to regard it as an international public health emergency in August.

During the epidemic in Africa, one of the groups with the highest volume of infected people was health workers<sup>(2,3,4,5)</sup>. On October 6, 2014, the first case of secondary Ebola infection acquired outside Africa was detected in Madrid, Spain, in a health professional who had treated a repatriated Spanish missionary<sup>(6)</sup>. Then new cases appeared in other countries such as the United States and United Kingdom (ABC news, October 14<sup>th</sup>, 2014; CNN, October 14<sup>th</sup>, 2014)<sup>(7,8)</sup>, causing a sense of global threat.

The western world and the health community in particular, had already faced other epidemics of infectious diseases such as HIV, SARS and avian influenza, which had a greater capacity to transmit the disease ( $R_0$ ). However, they did not attain the same sense of global threat caused by the Ebola virus<sup>(9)</sup> (EVD), highlighting the difference between risk and risk perception.

Although there are multiple definitions of risk (R), the most consensual defines it as the probability of suffering an adverse event whose outcome is usually uncertain<sup>(10)</sup> and the magnitude of its quantifiable consequences. Risk perception (RP) is a feeling of threat experienced by an individual and involves an assessment of the likelihood of experiencing an adverse event and its consequences<sup>(11)</sup>.

Previous experiences of international health crises showed that RP among health professionals

can modify their behaviors and influence their intention to protect themselves and/or expose themselves to certain risk factors, and even block the institutional response to a crisis<sup>(12,13,14)</sup>.

The objective of this study was to study Risk Perception among Healthcare Professionals at the Alcorcón Foundation University Hospital (HUFA) who treated the first case of EVD in Spain, to identify the elements on which the sensation of threat was based and the agents who amplified or reduced it.

## SUBJECTS AND METHODS

**Study setting, population and design:** On October 6<sup>th</sup>, 2014, a patient with suspected Ebola admitted to the emergency department of the University Hospital Universitario de Alcorcón (HUFA). It was the first case of contagion contracted outside Africa, and it occurred in a health professional who had attended two Spanish expatriates. The case generated unprecedented social alarm, the appearance of two more cases, in UK and USA, increased even more the global feeling of threat. A case study<sup>(15)</sup> was conducted. In December 2014, we contacted the Hospital's research unit and through a snowball sampling, identified professionals who had been in direct contact with the patient or who had been decisively involved in the management of the crisis. Field work began in February and lasted until June, after that was literally impossible to perform more interviews.

The in-depth interview was used as a research technique and a sociological analysis of the discourse was carried out.

**Participant recruitment:** The inclusion criteria were: having had direct contact with the suspected EVD patient and having actively participated in the management of the crisis at the hospital. A total of 5 in-depth interviews

were conducted. The first interview took place three months after the case was dismissed (and considered past the crisis) and the last 6 months later. Despite their scarcity, all the persons who attended the case were interviewed. Two of them were highly exposed (HRS) to the patient (doctor and nurse), two others were subject to low exposure (LRS), supporting the professionals who attended the patient (two doctors) and the last interviewee was probably not exposed (LPRS), (psychologist). These five interviews allowed us to address the three risk exposure scenarios defined by the Ministry of Health, Social Services and Equality in the protocol of December 3<sup>rd</sup>, 2014<sup>(16)</sup> (table 1).

All the interviewees were health personnel; three were men and two were women.

**Interview script:** The following risk perception models were used to develop the interview script: the Risk Perception Model<sup>(17)</sup>, the Extended Risk Perception Model<sup>(18)</sup> and the Social Model of Risk Amplification and Reduction<sup>(19)</sup>. Information was collected on the emotions and feelings experienced by the professionals after the arrival of the patient with suspected Ebola, how they were manifested and the impact they had on the isolation room, the emergency department and the hospital in general. They were also asked about the role

**Table 1**  
**Risk's scenarios of exposure to ebola virus in health sector.**

| <b>Exposure to high risk (HRS)</b>  | <b>Exposure at low risk (LRS)</b>  | <b>Low probability of exposure (LPR)</b>  |
|---|--|---|
| Workers who attend cases in the investigation or patients with EVD.                             | Personnel whose work activity does not include contact with body fluids, contaminated material or cadaver body with EVE (for example, guardians, orderlies, other cleaning workers). | Workers without direct attention to the public or more than 1 meter away or with collective protection measures that avoid contact (for example, administrative, ambulance driver). |
| Laboratory personnel handling contaminated materials.   |  |   |
| Personnel handling corpses of patients suspected or deceased by EVE.                            |  |   |
| Cleaning personnel who have contact with contaminated fluids, secretions, material or aerosols. |  |   |
| <b>Requirements</b>   |  |   |
| PPE components for protection against fluids and, where appropriate, against aerosols.          | Availability of gown (resistant to penetration of fluids), surgical mask, gloves, glasses or face shield and, where appropriate, hose or boots.                                      | No need to use EPI.   |

played by some agents during the crisis - the media, authorities, expert committee, management, and trade unions. Each interview script was adapted to the risk scenario and role of each interviewee (doctors, nurses and psychologists). The duration of the interviews was between 60-90 minutes, and the interviews were recorded and transcribed.

**Data management and analysis:** In order to see the emotions and feelings that were generated during the crisis among health professionals, the interviewees were asked to describe how they experienced the entry of the missionaries to the country, the arrival of the case to the hospital, her stay in the isolation room, the week after the case was disclosed out of the hospital, and months later when she was discharged. This information, in addition to identifying the most important emotions and feelings at each moment of the crisis, allowed us to see the evolution of risk perception. To visualize it, a scale (0-3) was built. Fear was chosen as a reference variable because it was the emotion shared by all professionals and because its management was mainly responsible for the different behaviors among groups. Fear was assigned the value=2 and the rest of the variables were configured according to the degree of proximity and intensity with respect to the reference variable: panic=3, concern=1 and forgetfulness=0.

A sociological analysis of discourse was carried out from an abductive logic<sup>(20,21)</sup>, beginning with an analytic process of decomposition of discourse in elementary units, in search of categories capable of giving meaning the social reality studied, followed by a synthesis or inductive process that seeks to establish the connection of the context with the discourse, giving it meaning. The validation of the discourse interpretation was done by two strategies: Triangulation - two researchers did the discourses analysis and their respective findings were compared from each other (inter-subjectivity),

it was also used to control inter-rater reliability-, and the main findings were discussed with the interviewees.

This study has been carried out following the principles of the Declaration of Helsinki and the Belmont Report. All the interviewees signed an informed consent.

## RESULTS

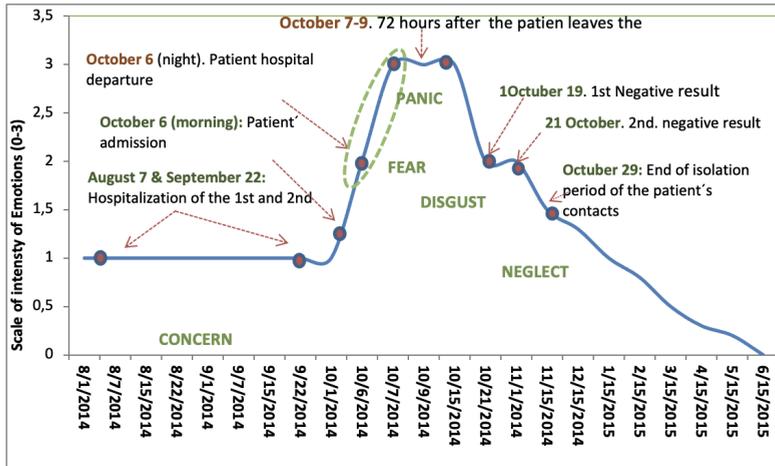
In order to achieve the study's objectives, health professionals were asked how they experienced the arrival of the patient and the ensuing health crisis.

**Risk Perception Construction among Healthcare Professionals:** The discourse of health professionals shows that Risk Perception is a dynamic process in permanent reconstruction, depending on how events are developed, resolved and interpreted (figure 1).

The progress of Risk Perception enabled the identification of different moments (12 hours of admission, 42-72 hours and later days) and spaces (isolation ward, emergency department, hospital) in which different emotions emerged and on which the RP was based. In the progress of the RP, 5 stages were clearly identified, which were characterized by: concern, fear, panic, disgust and finally neglect (table 2).

In the isolation room, where the patient was for 12 hours, peace and quiet reigned, while in the rest of the emergency service, fear gave way to panic. This meant that the morning shift nurses, who were put under great pressure by the union, refused to care for the patient and the cleaning staff did not want to clean or remove contaminated material from the isolation area after the patient left the HUFA. During the 42-72 hours after the patient was transferred to the Carlos III Hospital, panic spread to the rest of the hospital.

**Figure 1**  
**Progress of Risk Perception.**



Legends: Reference Variable Fear (2), Panic (3), Disgust (1), Neglect (0)

**Table 2**  
**Emotions and feelings associated with Risk Perception.**

| Stages  | Emotions & Feelings associated with RP  | Verbatim  |
|---|---|---|
| 1. Prior to the patient's arrival at the HUFA | Concern   | "I think there was a feeling of uncertainty about what might happen, we expected an immigrant but not a health worker... There was concern rather than fear about what would happen." (I.3, LRS)  |
| 2. Patient time in the emergency room         | Concern<br>Uncertainty<br>Unease<br>Anxiety<br>Loneliness<br>Helplessness<br>Fear | "That same day there were moments of unease when injections were administered to the patient, and there were moments of fear [...], a moment of shock when we were very, very alone. We didn't know what had failed, and we didn't know if the patient had infected more people or if we were going to have a flood of cases." (I.2, HRS)   |
| 3. 48-72 hours later                          | Panic<br>Stress<br>Abandon<br>Helplessness<br>Disgust                             | "I think that those first 48-72 hours, maybe those first four or five days until things were focused, yes, there was a great deal of excitement in the hospital, all the staff were very afraid and there was a feeling of insecurity and panic [...] In other words, it was like the pendulum theory: we went from a situation where nothing was going on, to an explosion of panic." (I.5, HRS) |
| 4. Hospital isolation                         | Perplexity<br>Anger<br>Disgust  | "Aside from the people who have wanted to go voluntarily, the others have been deprived of their freedom: it's like putting them in prison... And without any benefit." (I.3, LRS)  |
| 5. Six months later                           | Resignation<br>Neglect  | "... it was a while ago, it was very difficult. The people who went through it did so very intensely and afterwards you feel like you have to turn the page, [...] It no longer interferes with your daily life." (I.5, HRS)  |

The health professionals commented that although everyone experienced fear, it was how fear was managed that explains the different behaviors of the groups.

*“Of course it’s scary, but that’s why we’re professionals: we deal with it so that others aren’t afraid, which is what the management did. Of course, they’d be afraid! Why wouldn’t they be? But they managed it well.”* (I.3, LRS)

In the management of fear, mastery, competency and agency were critical to face the risk. When the panic spread through the emergency room, only one nurse offered to attend to the patient, when we asked him why he could control the fear answered that he was responsible for the Viremia Zero program in the Hospital, he was more prepared than his colleagues to control the risk of contagion, he had knowledge, experience and was also responsible for the nursing team and therefore:

*“It was my duty to do so.”* (I.2, HRS)

In this discourse, two key elements on which the Risk Perception was based can be identified: training and information management. They state that training was scarce, theoretical and only given to selected staff. It was aimed at emergency personnel, forgetting highly exposed groups such as cleaning staff at high risk:

*“(Before the arrival of the patient) we were briefed on how to recognize Ebola, and... We were shown a diagram on how to put on and remove the suit, nothing practical.”* (I.5, HRS)

They identify the preventive medicine professionals providing the training, insisting on the low probability that a case occurring, the defence of a protocol with errors in case definition, and not having contact with patients, as a serious problem that deprived such expertise of its legitimacy and leadership in the eyes of other professionals:

*“...At our hospital, those responsible for providing training in preventive medicine were not respected by the employees; they distrusted their information... People were afraid and that fear was not overcome by saying: Here the protocol says you can do it. In addition, they needed to say... look how I’m doing it... That has been a serious problem.”* (I.1, LRS)

The training also had a pendulum effect in the sense that, at the beginning, it was practically non-existent and then spared no effort once the case occurred, reflecting, according to health professionals, the improvised manner in which the response to the crisis was prepared.

*“[After the arrival of the patient] ...Two boys were training all the staff against the clock in putting on and removing the Personal Protective Equipment. That stress hasn’t gone away [four months later].”* (I.2, LRS)

Regarding the information received, they acknowledge that they paid scant attention to the protocols, thinking that an EVD case is unlikely. They emphasize that information management was initially politically contaminated, and that the decision to bring in the repatriates owed more to the international image of Spain that they wanted to project, than to an estimate of their ability to cope with this situation. This was characterized by an information vacuum.

*“...the flow of information was not correct (I1, HRS). ...At 18:00 in the evening I received a message ‘the news is already on the internet’, so I asked the doctor if they had already confirmed it, and he answered ‘no’, and I said: ‘Let’s go online’, and we typed in: ‘Alcorcón’, ‘Ebola’, and it said ‘Alcorcón confirmed positive’.”* (I.3, LRS)

They state that the information transmitted in the press conference convened by the Health Department, contributed to cause surprise and

great concern, since it reflected the considerable ignorance of the political-health authorities regarding the disease.

*“[Referring to the Press Conference] If you suddenly convey a strange message, digress and hesitate in a crisis situation, it causes panic, because you say ‘he thing is... you don’t know what you’re saying’ or you say, ‘no, you say something’, ‘no, you say something’... then you wonder, ‘but who’s in charge here? My God. Wasn’t this under control?’ ...I think there was a feeling that nobody was doing anything, that everybody was on their own, and that... caused chaos and was a perfect breeding ground for it to explode .” (I.5, HRS)*

This, together with the institutional information vacuum at the onset of the crisis caused the media to be the sole source of information, issuing alarmist messages without a counterpoint.

*“...They did their job, it’s true that they amplify things, but I prefer that noise to the information vacuum... They are the fourth estate and thank goodness they exist.” (I-1, LRS).*

The health professionals conclude that the response to the crisis was characterized by improvisation, lack of coordination in the response and management of the situation, as well as lack of empathy from the political health authorities towards health professionals.

*“The person in charge of preventive medicine had to call three times to have the PCR done, they told us it was a flu [at that moment the protocol case definition was wrong], and the third time they had to contact higher authorities because apparently we had no idea that it was a case of Ebola.” (I.3, HRS)*

*“While the news was emerging in the press, they were telling us on the phone, that they*

*still didn’t have the result, and that felt VERY BAD... You complain, you cry, and you tell everyone who wants to hear it.” (I.5, LRS)*

*“[The arrival of the patient] was a moment of shock, it is a very serious illness that requires special handling and we were very alone... We didn’t have the contact list until three days later; we woke up with our isolation room closed, unable to work and not knowing what to do in case someone else appeared infected, ehh..., so afraid, really afraid...” (I.3, LRS)*

In the continuous assessment that health professionals were undertaking of the crisis management, the treatment received by the health policy authorities played an essential role.

*“[When they came to move the patient] ...that was the K.O. blow they gave us, because... first they send us an Ebola case, ‘here’s the Ebola patient, there you go’, they don’t want to do the diagnosis, they don’t tell us the result, they don’t transfer the patient, they took less time to bring him from Liberia! And to top it all off..., they point out our shortcomings to us... because when they come to you all kitted out [the staff that came to transfer the patient to the Carlos III Hospital came equipped with everything recommended by the CDC, while at the HUF A they were using the equipment left over from the crisis caused by the Avian Flu], means ‘blimey, what have I gone and done, I might die from this’.” (I.3, LRS)”*

*“...so, we’ve gone from doing nothing to kidnapping people [referring to isolation], because some of those workers were threatened by the authorities to go in, because of course they say ‘...look mate, if you don’t go voluntarily, we’ll just tell the court and send you to the police’ is that voluntary?” (I-1, LRS). “...On top of you doing your job well, bam, I’ll lock you up for 3 weeks as punishment.” (I.3, LRS).*

Trust appears as the result of that evaluation. Among health professionals, a huge distrust of the health and political authorities was created, while at the same time trust in the hospital management's response and its capacity to resolve the crisis was strengthened.

*"...As a hospital we didn't receive any support from anyone... everything was done from here, inside by the professionals of the hospital and by its management team... We trusted each other, here in the hospital, but as for them [referring to political and health institutions and authorities], it leaves me speechless... They did everything possible to infect us [laughs ironically]. That can be the summary."* (I.3, LRS)

In this dual process of trust construction-deconstruction, the treatment that health professionals perceived to have received from the political-health authorities played a key role.

**Agents that acted as amplifiers and/or reducers of Risk Perception:** When asked about the role played by the Political and Health Authorities, the Media, the Trade Union, the Expert Committee and the Hospital Management in Risk Perception, the first three were found to act as amplifiers of the feeling of threat.

*"There was a panic attack... I think due to lack of information... And because it went from being a medical debate to a political... That was explosive [...] The political authorities were a long way off from doing their job properly."* (I.3, HRS)

*"That day they came immediately [referring to the union] and the union delegate put a lot of pressure on the emergency unit, telling [the nursing staff] that they were not trained properly, not to go in, that the risk was very high, then everyone got very, very, very nervous, to the point that they all started saying they were not going to go in, they were very afraid."* (I.2, HRS)

*"The transmission of panic was increasing with the media, causing a wave of panic that was unbearable and out of control. Half the country was going mad, there was a panic attack."* (I.5, HRS).

Meanwhile, the management and the management team of the HUFA and the Expert Committee acted as reducers:

*"...They reacted with composure [referring to the Hospital management], especially the manager, whose approach was very executive and organized, reporting information and being transparent about what had been done. Briefings were given to all the staff in three days... which described what to be afraid of and what not to be..."* (I.3, LRS)

The behavior and attitude between colleagues acted as a reducer of the threat among the medical staff and as an amplifier between the nursing and cleaning staff.

*"I'm not worried [nurse], it's my colleagues who are making me worried."* (I.2, HRS)

*"...That is, the experience with her [the patient] was calm, the doctor was very calm..."* (I.2, HRS)

These agents used both training and information to amplify or reduce Risk Perception.

The political and health authorities, with the news blackout at the beginning, confusing and ambivalent messages, as well as statements in which they played down the importance of training, caused considerable anxiety, helplessness, disgust and anger, and huge distrust towards the institutional response, which focused only on handling the outbreak and the management of the Risk, neglected the protection of the health professionals and the treatment of the patient.

Alarmist messages and a failure to check information against that of the media caused huge social alarm which, according to health professionals, led to excessive measures taken by the political and health authorities against health professionals (isolation). This decision was considered arbitrary, unjust and lacking scientific evidence, which contributed to reinforce the stigma to which they were subjected and to discredit those health professionals who had maintained that after the protected contact with the patient, they could continue working. They state that this situation contributed to an increased feeling of threat, and caused an internal crisis in the HUFA that again triggered a feeling of disgust, betrayal and despair among the health professionals.

The union used the lack of training to send clear and direct messages to the nursing staff, informing them of the non-obligatory and dangerous nature of patient care. The health professionals consider that it was the only agent who was concerned about their protection, and also the main responsible for fear becoming panic among nursing staff. Regarding the cleaning staff, it is stated that they did not receive training or information.

The unequal access to training and information between groups caused conflicts between them, opening serious gaps in the co-operation required to ensure good case management. They state that the greatest risk of contagion was experienced when the patient left the HUFA and, the isolation room had to be cleaned and the contaminated material removed, a task performed voluntarily by a health professional following the refusal by the cleaning staff to do so.

The health professionals believe that the HUFA management and leadership team contributed to reducing the Risk Perception since they wanted from the beginning to form an

Expert Committee among the health professionals. Access to training and information was provided for all staff and the necessary resources required to face the crisis made available. Regarding the Expert Committee, they say that when they were allowed to act, the political decontamination of the information and the management of the situation began.

*“The turning point was when suddenly the politicians stopped talking, when Dr. Simon [Expert Committee spokesperson] was in charge of reporting, then that sense of panic, of fear, went away.”* (I.5, HRS).

While the behavior between peers and the union exerted enormous pressure on the health professionals, the media basically affected the political and health authorities. The reaction of the former was to refuse to treat the case and the latter to isolate the health professionals.

## DISCUSSION

The results of this study demonstrate that both Risk Perception and Trust are social constructs that depend upon and are influenced by emotions and feelings.

For neurobiology, emotion is an automatic reaction to a stimulus that generates a reaction in the body, while feelings are defined as the mental expression of emotions, where the stimulus intervenes, the bodily reaction that it generates and the ideas that accompany this reaction<sup>(22)</sup>. Neurobiology shows that emotions and feelings are the basis of our social behavior; from them, we reason and make decisions<sup>(22)</sup>. However, it does not allow us to understand the different behavior of the groups that intervene in the outbreak (medical, nursing and cleaning staff).

The patient's arrival at the HUFA acted as the stimulus that triggered fear in all groups. Justified fear is considered from the perspective

of neurobiology as the best security policy, as there are numerous occasions on which it has helped to save many lives<sup>(22)</sup>. In this study, this emotion was well managed by the medical staff, but gave way to panic among the cleaning and nursing staff. It was this jump, from fear to panic, which was responsible for the different behaviors. However, what made one group capable of managing fear when other groups could not? Answering this question requires placing the different groups in the context of the health system, in the hierarchical and power relations that exist between them and that acquire their most immediate manifestation in unequal access to training and information, tools with which the Risk Perception was constructed and which it interprets and confronts risk.

The response to the crisis, and the definition of risk scenarios, was formulated by and for the medical personnel, neglecting other highly exposed groups. Although the power relations between doctors and nurses<sup>(23,24,25)</sup> have been well studied, the relationships between health and non-health groups have not. An exception is the study by Lancaster et al. on communication and cooperation among professionals, where it is concluded that the work is carried out independently and with little communication, and that hierarchical and subordinate relationships exist. It concludes, along with other studies<sup>(24,25,26)</sup>, that the coordination and intervention of medical personnel, nurses and the rest of the staff is critical in preventing errors and avoiding the fragmentation of patient care. These are conclusions consistent with the results of this study and which show that not paying attention to the cleaning staff was a huge risk in managing the outbreak, causing conflicts between groups and a transfer of responsibilities.

The different sources of exposure (the amplifying or reducing agents of the Risk Perception) to which each group was exposed and their capacity to mitigate them, there is also

the unequal access to the essential tools required to tackle the situation (training and information). The amplifiers of the Risk Perception exerted an enormous influence on the nursing and cleaning personnel and the reducers acted mainly on the medical personnel. Studies on Risk Perception affirm that the media exert some influence on the PR that occurs at the population level<sup>(27)</sup>. At the individual level, the information provided by the people who have gone through this experience (peer behavior) and direct information (the union)<sup>(24,25,26,27)</sup> exerts a greater influence. The combination of these elements gives the groups different tools to manage the fear that may explain their differing behaviors.

Although the Trust was not identified as the objective of this study, it emerges in the discourse of health professionals as a result of the evaluation they make of crisis management and their perceived treatment by political and administrative authorities. Trust is a multidimensional concept that has a cognitive component (based on rational and instrumental judgments) and an affective component (based on relationships and affective bonds generated by interaction, empathy and identification with others)<sup>(28,29)</sup>. Trust is especially necessary where there is a high risk, because it increases tolerance to uncertainty, reduces social complexity by going beyond the available information and generates behavioral expectations that replace the lack of information. In this sense, trust makes it easier for healthcare professionals to take risks when the results are uncertain.

There are multiple studies that demonstrate that trust is an element of social capital that intercedes in the success or failure of public health interventions<sup>(30,31,32,33)</sup> and influences professional practice, and that once the crisis is overcome, it is part of the knowledge base of health professionals with which they will face future crises<sup>(34)</sup>. Despite its importance, trust is rarely present in

debates about public health planning or in planning and intervention programs.

**Study limitations:** The main limitation of this study is the low number of interviews. Regarding this we have to say; first, for security reasons the number of people in contact with the patient is small and second there came a time when it was impossible to find people who wanted to participate in the study. In spite of this, all the people involved in the handling of the case were interviewed; this is the only work in Spain as far as we know that has collected this information. The limited number of interviews does not allow extrapolating the results, but it shows some gaps in the responses to health crises of these characteristics that can condition the control of an outbreak, and evidences the need to continue developing research in this line.

## CONCLUSIONS

In a globalized society, international health crisis situations, capable of causing enormous social alarm, such as Ebola, are increasingly plausible. This study contributes to enhance the knowledge of Risk Perception, demonstrating how it is constructed, which agents intervene in the process and its impact upon response. Training, Information and the Trust in health authorities are presented in our study as basic tools with which health professionals face risk and reduce uncertainty. It shows the importance of aligning Risk and Perception of Risk in a health crises. Developing more studies along this line would undoubtedly contribute to a better planning, management and control of future health crises.

## DISCLAIMER

The people who have developed this study present independent research, and the results and opinions derived from it are therefore in a personal capacity and do not necessarily reflect the position of the Carlos III Health Institute.

## REFERENCES

1. CDC. Outbreaks Chronology: Ebola Virus Disease | Ebola Hemorrhagic Fever | CDC [Internet]. 2017 [citado 21 de noviembre de 2017]. Disponible en: <https://www.cdc.gov/vhf/ebola/outbreaks/history/chronology.html>
2. Poletto C, Gomes MF, Pastore y Pionti A, Rossi L, Bioglio L, Chao DL *et al.* Assessing the impact of travel restrictions on international spread of the 2014 West African Ebola epidemic. *Euro Surveill Bull Eur Sur Mal Transm Eur Commun Dis Bull.* 23 de octubre de 2014;19(42).
3. Fitzpatrick G, Vogt F, Moi Gbabai O, Black B, Santantonio M, Folkesson E *et al.* Describing readmissions to an Ebola case management centre (CMC), Sierra Leone, 2014. *Euro Surveill Bull Eur Sur Mal Transm Eur Commun Dis Bull.* 9 de octubre de 2014;19(40):20924.
4. Fasina FO, Shittu A, Lazarus D, Tomori O, Simonsen L, Viboud C *et al.* Transmission dynamics and control of Ebola virus disease outbreak in Nigeria, July to September 2014. *Euro Surveill Bull Eur Sur Mal Transm Eur Commun Dis Bull.* 9 de octubre de 2014;19(40):20920.
5. Sprenger M, Coulombier D. Preparedness is crucial for safe care of Ebola patients and to prevent onward transmission in Europe - outbreak control measures are needed at its roots in West Africa. *Euro Surveill Bull Eur Sur Mal Transm Eur Commun Dis Bull.* 9 de octubre de 2014;19(40):20925.

6. Lópaz MA, Amela C, Ordobas M, Domínguez-Berjón MF, Álvarez C, Martínez M *et al*. First secondary case of Ebola outside Africa: epidemiological characteristics and contact monitoring, Spain, September to November 2014. *Eurosurveillance* [Internet]. 8 de enero de 2015 [citado 21 de noviembre de 2017];20(1):21003. Disponible en: <http://www.eurosurveillance.org/content/10.2807/1560-7917.ES2015.20.1.21003>
7. ABC news. Texas Nurse Says Hospital Should Be «Ashamed» of Ebola Response - ABC News [Internet]. [citado 22 de noviembre de 2017]. Disponible en: <http://abcnews.go.com/Health/texas-nurse-hospital-ashamed-ebola-response/story?id=26255005>
8. Yan H. U.S. nurse with protective gear gets Ebola - how could be happen? - CNN [Internet]. [citado 21 de noviembre de 2017]. Disponible en: <http://edition.cnn.com/2014/10/13/health/ebola-nurse-how-could-this-happen/index.html>
9. Davtayan M, Brown B, Folyan MO. Addressing Ebola-related stigma: lessons learned from HIV/AIDS. *Glob Health Action*. 2014;7:26058.
10. Rosa EA. The logical structure and policy implication (SARF). En: *The social amplification of risk* [Internet]. N. Pidgeon; R. Kasperson; P. Slovic. United Kingdom; 2003. p. 47-79. Disponible en: [https://books.google.es/books?hl=es&lr=&id=4Ry6ar929bMC&oi=fnd&pg=PA47&dq=Rosa+E.+A.++\(2003\).+The+logical+structure+and+policy+implications+\(SARF\)&ots=wtKPdiCty&sig=55nNuGun9Nn3mu87U6ZCSTF017Y#v=onepage&q&f=false](https://books.google.es/books?hl=es&lr=&id=4Ry6ar929bMC&oi=fnd&pg=PA47&dq=Rosa+E.+A.++(2003).+The+logical+structure+and+policy+implications+(SARF)&ots=wtKPdiCty&sig=55nNuGun9Nn3mu87U6ZCSTF017Y#v=onepage&q&f=false)
11. Rayner S, Cantor R. How Fair Is Safe Enough? The Cultural Approach to Societal Technology Choice1. *Risk Anal* [Internet]. 1 de marzo de 1987;7(1):3-9. Disponible en: <http://onlinelibrary.wiley.com/doi/10.1111/j.1539-6924.1987.tb00963.x/abstract>
12. Devnani M. Factors associated with the willingness of health care personnel to work during an influenza public health emergency: an integrative review. *Prehospital Disaster Med*. diciembre de 2012;27(6):551-66.
13. Maunder R. The experience of the 2003 SARS outbreak as a traumatic stress among frontline healthcare workers in Toronto: lessons learned. *Philos Trans R Soc Lond B Biol Sci*. 29 de julio de 2004;359(1447):1117-25.
14. Tam D, Lee S, Lee SS. Impact of Sars on Avian Influenza preparedness in Healthcare workers. *Infection* [Internet]. 2007;35(5):320-5. Disponible en: <http://www.ncbi.nlm.nih.gov/pubmed/17882357>
15. Coller X. Estudios de casos. Madrid: Centro de Investigaciones Sociológicas; 2005. (Cuadernos Metodológicos, n. 30).
16. Ministerio de Salud, Servicios Sociales e Igualdad. Protocolo de actuación frente a casos sospechosos de enfermedad por virus Ébola (EVE). 2014.
17. Sjöberg L, Moen BE, Rundmo T. Explaining risk perception. *Eval Psychom Paradigm Risk Percept Res Trondheim* [Internet]. 2004 [citado 12 de julio de 2015]; Disponible en: [http://paul-hadrien.info/backup/LSE/IS%20490/utile/Sjoberg%20Psychometric\\_paradigm.pdf](http://paul-hadrien.info/backup/LSE/IS%20490/utile/Sjoberg%20Psychometric_paradigm.pdf)
18. Lewis I, Watson B, White KM. Extending the explanatory utility of the EPPM beyond fear-based persuasion. *Health Commun*. 2013;28(1):84-98.
19. Kasperson JX, Kasperson RE. The social amplification of risk: assessing fifteen years of research and theory. En: *The social amplification of risk* [Internet]. N. Pidgeon; R. Kasperson; P. Slovic. United Kingdom; 2003. p. 13-46. Disponible en: [https://books.google.es/books?hl=es&lr=&id=4Ry6ar929bMC&oi=fnd&pg=PA47&dq=Rosa+E.+A.++\(2003\).+The+logical+structure+and+policy+implications+\(SARF\)&ots=wtKPdiCty&sig=55nNuGun9Nn3mu87U6ZCSTF017Y#v=onepage&q&f=false](https://books.google.es/books?hl=es&lr=&id=4Ry6ar929bMC&oi=fnd&pg=PA47&dq=Rosa+E.+A.++(2003).+The+logical+structure+and+policy+implications+(SARF)&ots=wtKPdiCty&sig=55nNuGun9Nn3mu87U6ZCSTF017Y#v=onepage&q&f=false)
20. Ruiz Ruiz J. Análisis sociológico del discurso: métodos y lógicas. *Forum Qual Soc Res* [Internet]. 2009;10(2, art 26):32. Disponible en: [https://www.researchgate.net/publication/45686596\\_Analisis\\_sociologico\\_del\\_discurso\\_metodos\\_y\\_logicas](https://www.researchgate.net/publication/45686596_Analisis_sociologico_del_discurso_metodos_y_logicas)
21. Pierce CS. Pragmatismo y abducción. Lecciones de Harvard sobre el pragmatismo (Lección VII). En 1903 [citado 4 de mayo de 2017]. Disponible en:

- <http://www.unav.es/gep/HarvardLecturesPragmatism/HarvardLecturesPragmatism7.html>
22. Damasio AR. En Busca De Spinoza. Neurobiología en de la emoción y de los sentimientos. [Internet]. 6a ed. Barcelona: Ed. Crítica; 2009. Disponible en: <http://gredos.org/Varios/Damasio%20Antonio%20-%20En%20Busca%20De%20Spinoza.pdf>
  23. Fagin CM. Collaboration between nurses and physicians: no longer a choice. *Acad Med J Assoc Am Med Coll.* mayo de 1992;67(5):295-303.
  24. Porter S. A participant observation study of power relations between nurses and doctors in a general hospital. *J Adv Nurs.* junio de 1991;16(6):728-35.
  25. Tang CJ, Chan SW, Zhou WT, Liaw SY. Collaboration between hospital physicians and nurses: an integrated literature review. *Int Nurs Rev.* septiembre de 2013;60(3):291-302.
  26. Lancaster G, Kolakowsky-Hayner S, Kovacich J, Greer-Williams N. Interdisciplinary Communication and Collaboration Among Physicians, Nurses, and Unlicensed Assistive Personnel. *J Nurs Scholarsh* [Internet]. 1 de mayo de 2015;47(3):275-84. Disponible en: <http://onlinelibrary.wiley.com/doi/10.1111/jnu.12130/abstract>
  27. Wahlberg AAF, Sjöberg L. Risk perception and the media. *J Risk Res* [Internet]. 1 de enero de 2000;3(1):31-50. Disponible en: <https://doi.org/10.1080/136698700376699>
  28. Gambetta D. Trust\_making and breaking cooperative relations.pdf [Internet]. 1998 [citado 21 de noviembre de 2017]. Disponible en: [https://www.nuffield.ox.ac.uk/users/gambetta/Trust\\_making%20and%20breaking%20cooperative%20relations.pdf](https://www.nuffield.ox.ac.uk/users/gambetta/Trust_making%20and%20breaking%20cooperative%20relations.pdf)
  29. Lewicki RJ, Bunker BB. Developing and Maintaining Trust in Work Relationships,. En: *Trust in Organizations: Frontiers of Theory and Research.* London: Sage Publication; 1996. p. 114-39.
  30. Blasco-Hernandez T, Ayuso-Alvarez A. Determinantes sociales de la transmisión del Ebola en West Africa. En: *Ébola: tan cerca y tan lejos.* Madrid; 2015.
  31. Ezezika OC. Building Trust: A Critical Component of Global Health. *Ann Glob Health.* octubre de 2015;81(5):589-92.
  32. Jegede AS. What led to the Nigerian boycott of the polio vaccination campaign? *PLoS Med.* marzo de 2007;4(3):e73.
  33. Singh JA, Mills EJ. The abandoned trials of pre-exposure prophylaxis for HIV: what went wrong? *PLoS Med.* septiembre de 2005;2(9):e234.
  34. de los Reyes López M, María Pérez Gómez J, García Olmos P, Borrell Carrió F, Gracia Guillén D. Relaciones entre profesionales sanitarios. *Med Clínica* [Internet]. enero de 2001;117(9):339-50. Disponible en: <http://linkinghub.elsevier.com/retrieve/pii/S0025775301721070>