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Analysis of Risk Management Planning and Perception to Counter the Terrorist Threat within the Health Sector of European Union Critical Infrastructure Protection.

Evaluation of knowledge, risk perception and attitude of authorities and personnel at EU hospitals to response to a terrorist attack.

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Executive Summary

Terrorist attacks are frequent and well-publicised in the 21st century, and highlighted by the recent series of attacks in France, the terrorist threat seems to be growing inside the European Union Member States (EU MS). Consequently, the EU has issued direction (EC, 2008) to implement critical infrastructure protection CIP in all EU MS; however, results of work carried out in Work Package 2 (WP2) of the THREATS project (Deliverable Report D2.1) showed the existence of some of gaps in EU health system in respect of preparedness for possible terrorist attacks.

Hospital personnel, when appropriately prepared and trained, are essential for an effective response to both natural and man-made disasters, including terrorist events. Therefore, it is essential to evaluate the attitudes of personnel in respect of risk reduction and readiness for crisis management of terrorist attacks, as well as their willingness to undergo regular training regarding safety procedures and response activities during such events.

Hence, the aim of this research was to evaluate the knowledge, risk perception and attitude of authorities and personnel at EU hospitals to respond to terrorist attacks. A survey composed of 41 questions was sent to 150 European Health care contacts, spread across 28 EU country, using Survey Monkey. To increase the numbers of responses, a paper version of the survey was distributed during the European Society for Emergency Medicine (EuSEM) congress, held in Turin from 10th to 14th October 2015.

The availability of terrorism response plans, specific preparedness education and training, previous experiences, security measures and equipment, hospital staff attitude and willingness were examined.

The response rate to the survey was 26%. The findings revealed that the perceived threat of terrorist attack against EU health care facilities is considered very unlikely by the majority of responders (80%) compared to other common threats such as general emergencies and pandemics. The majority of hospitals (90%) have never experienced a terrorist attack and a terrorism response plan is rarely present (20%), with hospitals being considered not adequately prepared (49%) or somewhat prepared (46%) to face this possibility.

Security measures to prevent and manage consequences of different type of threats, including terrorism are generally implemented, but hospital staff feel either “not confident” (48%) or “somewhat confident” (47%) of their effectiveness.

The majority of participants (69%) have never participated in any specific training in how to respond to a terrorist attack, but their interest and willingness to improve their knowledge is high (89%). Most of them said that they would be more willing to take part in the response activities during a terrorist attack after specific training (92%), guaranteed availability of proper security measures (81%) and treatment of prophylaxis for various agents (78%). Whilst an attack on a hospital may not be perceived as a likely event, it only takes one shock event such as the Charlie Hebdo shootings in France during 2015 to undermine confidence and erode the viability of the health sector.

1. Introduction

1.1 In the light of the increasing number of terrorist actions perpetrated worldwide in recent years, health sector asset owners, disaster planners and health authorities have highlighted the importance of hospital preparedness in response to such events (Bennett et al., 2006; Becker et al., 2008; Kearns RD e al., 2014). In the last 20 years, terrorist attacks have increasingly been intended to cause maximum casualties, and sometimes also emergency responders and health care facilities may be targeted (Ganor et al. 2013; Eckstein M et al.,1988). However, the current condition of European Union (EU) hospital preparedness, in respect of disasters and human-made crisis such as a terrorist attack, has been reported as insufficient (Djalali A. et al., 2014).

1.2 Analysing risk contingency planning and perception to counter the terrorist threat within the health sector of EU critical infrastructure protection, D2.1 revealed the existence of some gaps in EU health system, regarding preparedness for possible terrorist attacks towards hospitals. Around one third of evaluated EU states still do not consider hospitals as parts of the critical infrastructure; moreover, they neither considered themselves as terrorist target nor have established enough protective security to prevent and manage an attack. This theory is further supported by the work conducted within WP1 that found limited information within the literature to indicate a level of protection for the Health Sector comparable to the protective measures applied to other sectors such as Energy, Water and critical information infrastructure protection (CIIP), further highlighted by the findings of D3.1 that demonstrates the extensive planning and preparation applied by a large hospital in Milan to respond to a mass casualty event, but shows the contingency plan does not extend to include a scenario where the hospital is the target.

Financial shortfall and lack of knowledgeable and competent staff were the main barriers to a desirable level of resilience and preparedness of EU hospitals in case of terrorist events.

1.3 Hospital personnel play a crucial role in responding to both natural and man-made disasters, including chemical, biological, radiological, nuclear, and explosive (CBRN-E) threats, firearms attack and bladed weapon attacks, that could be conducted by terrorists. There is an increasing requirement to provide evidence-based information and training for the hospital personnel who will respond to terrorist incidents

(O'Sullivan et al.2008). Therefore, it is essential to provide EU hospitals with competent personnel, able to fulfill the necessary competencies and capabilities to ensure effective emergency preparedness and hospital business continuity and safety during natural disasters and human-made crisis such as a terrorist attack.

1.4 The purpose of D2.3 is to analyse the situation of current risk management planning and perception within the EU health critical infrastructure sector, evaluating knowledge, risk perception and attitude of authorities and personnel at EU hospitals to respond to terrorist attacks.

2. Methodology

2.1 This study is an observational, cross-sectional study. The survey was conducted between March 2015 and October 2015. All 28 EU countries were included in this study.

In order to evaluate knowledge, risk perception and attitude of EU hospitals staff to respond to terrorist attacks we created a standardised survey composed of 41 questions, subdivided into three different sections: general framework; security measures and equipment; attitude and training.

The survey includes also a consent form and an introductory part to collect general information of the respondent (Appendix 1).

2.2 The questionnaire addresses some of the findings of WP1 (*Threat, risk analysis and security assessment research of the state of the art regarding threats and risks to the health sector and how it is protected as part of the critical national infrastructure within Europe*) and is built on standards and measures extracted from available scientific literature.

The aim of the research was to collect information from hospital staff and analyse their knowledge, attitude, and willingness to contribute to all processes of crisis management for terrorist attacks.

2.3 Elements of the questionnaire. The questionnaire consists of three different sections and elements, as following:

General Framework: the purpose of this section is to collect general information such as the perceived likelihood of a terrorist attack, EU hospital staff awareness about

hospital vulnerability and preparedness towards terrorist threats and their consequences.

Security Measures and Equipment: this section focuses on security measures and equipment adopted by EU Hospitals, with specific regard to their implementation, applicability and accessibility to hospital staff.

Attitude and Training: this section has the purpose of analysing EU hospital staff attitudes to the process of emergency management for terrorist attacks, focusing on their actual preparedness, confidence and willingness to respond. This section explores also hospital staff preparation and training, analysing their attendance on any specific courses and exercises.

2.4 To standardise and validate the survey content, 15 different international experts in the field of hospital resilience and safety were contacted and their feedback was analysed, synthesised and used to improve the survey. A second version of the survey was again sent to the experts, and consensus on the structure and the contents was made to finalise the questionnaire.

2.5 Survey Monkey was selected as simplest suitable way to distribute the survey. Identical e-mail requests were sent to 150 European Health care contacts on the 9th of March 2015; the e-mail included the explanation of the project, privacy and security issues and the link necessary to access the survey. Through this email, we also requested the receiver to spread the survey among his/her colleagues and acquaintances working in EU hospitals. The lack of initial feedback required a further reminder which was sent on the 18th of April 2015. A further reminder was then sent on the 15th of May 2015. To increase the number of responses, a paper version of the survey was distributed during the European Society for Emergency Medicine (EuSEM) congress, held in Turin from 10th to 14th October.

3. Results

3.1 Seventy-five responders participated to the survey. Nineteen of them were disqualified as they declared to work outside of EU member states; 16 participants gave incomplete answers: therefore, we analysed data from the remaining 40 responders, coming from 13 different EU States. As gender distribution, 76% of responders were male. All respondents gave their consent to be nominated to the study. Academic educational level reported a majority of MD (55%), followed by PhD (11%), BSc (8%), MSc (8%), and 18% declared other types of academic degrees. As shown by the figure 1, participants work mainly at university and public hospitals.

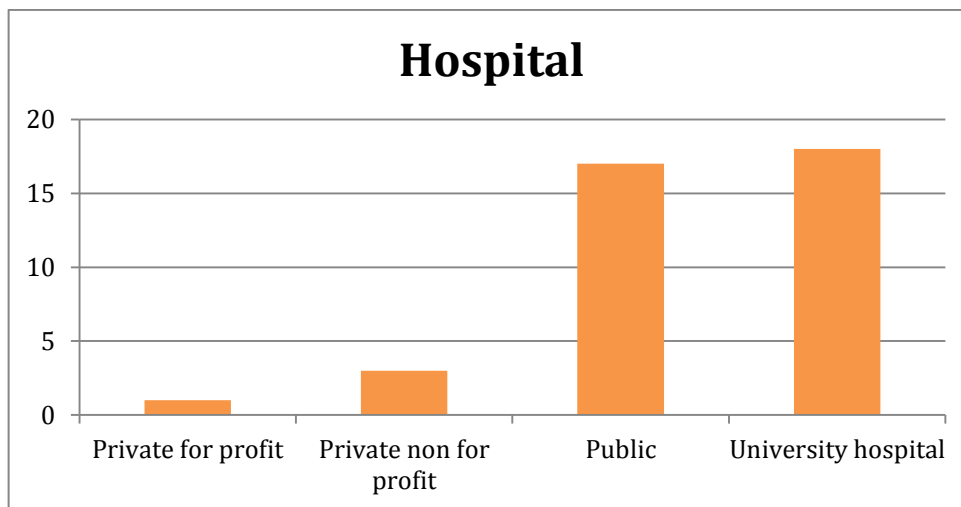


Fig.1. Affiliation of hospitals, which answered to the THREATS questionnaire

Twenty-two participants (55%) had previous experience and/or training in disaster response and management. Nine participants had attended the European Master of Disaster Medicine (EMDM); three of them were involved in training course about disaster management and response, such as SSAI Programme in Critical Emergency Medicine and military training, Medical Response to Major Incidents (MRMI), formulation of evacuation plans; two participants had previously worked with Danish Emergency Management Agency (DEMA) and Danish Civil Defence.

3.2 *General Framework*: thirty-two participants (80%) report the likelihood of a terrorist attack against their hospital to be very unlikely (1 every 20 years). According to six of them (15%), the risk of a terrorist attack towards their hospital is unlikely (1 every 10 years), whereas it is considered as likely (1 every 5 years) by 2 of them (5%). Regarding the likelihood of a terrorist attack in their city/town, 24 participants (60%)

consider this eventuality very unlikely, whereas seven of them (17.5%) consider it as unlikely, seven (17.5%) as likely (1 every 5 years) and two as very likely (5%).

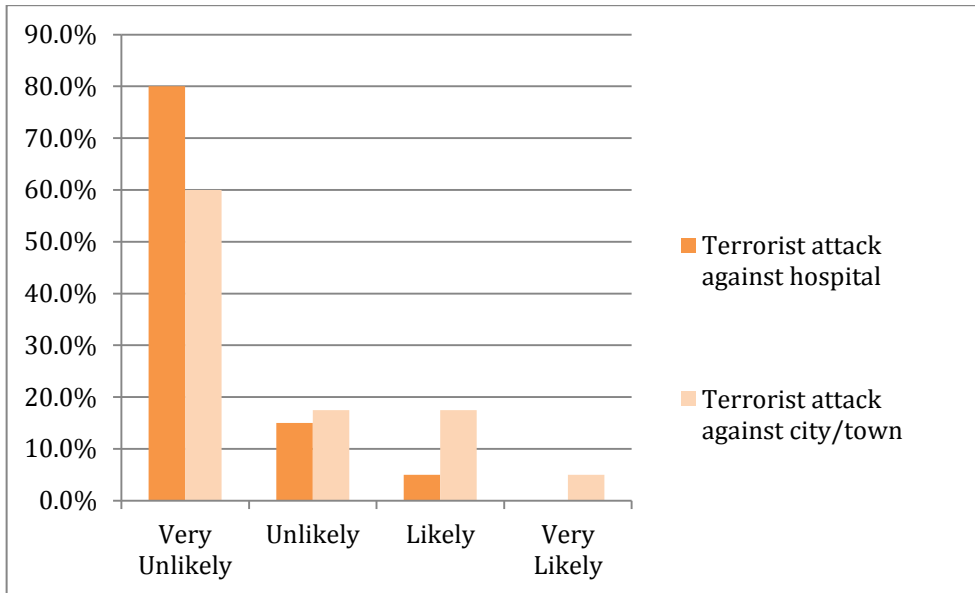


Fig.2. Opinion of the respondents on the likelihood of terrorist attack towards the hospital compared to likelihood of a terrorist attack toward the city/town

With regard to the rank of hospital safety concern, as increasing from 1 to 6, majority of responders pinpoint general emergencies as a priority (median Score of 4.7), followed by health pandemic (4), industrial accidents (3,9), and natural disasters (2.9). Terrorist attacks rank at the bottom of the list, with a median score of 2,2.

The majority of responders (90%) have never experienced a terrorist attack. Two of them had an experience of receiving the casualties of a terrorist attack at the hospital, while one had an experience of a warning to be ready because of a terrorist attack. Moreover, one participant reports his involvement in a school shooting event with eight deaths, while he was appointed as medical commander. According to 21 (54%) participants, their hospital does not have a terrorist response plan; ten (26%) participants are not sure of its presence, whereas 8 (20%) participants were aware of its existence inside their hospital.

In the hospitals where a terrorism response plan is present, participants said that they had a specific delineated role to play within the plan in 47% of cases; said that they did not have a specific role in 42% of cases whereas the remaining 11% of participants were not sure about their potential role.

Considering the type of terrorist attack to hospitals, the participants suggest a list as: incendiary/explosive attack (44%), cyber attack (33%), chemical attack (31%), biological attack (21%), shooting (21%), radiological attack (8%) and nuclear attack

(3%). However, eight participants (21%) believe that there will not be any terrorist attack to hospitals.

With respect to the level of hospital preparedness for a terrorist attack, two participants (5%) answered “prepared”, whereas the majority of responders answered “somewhat prepared” (46%), or “not prepared” (49%). In 87% of cases, hospitals are believed to be able to alert other health structures or other public organisations in case of a terrorist attack.

Security Measures and Equipment: The participants explored actions and precautions which are adopted by their hospital to improve its safety (below):

Access to the sensitive area of the hospital restricted to authorized personnel only	78 %
Closed circuit television cameras with record and archive capability	58 %
Gate control system to control the access of vehicles	50 %
Specific training of security personnel, including the proprietary security force, contractual security personnel, off-duty law enforcement officers	39 %
Alarm system to detect unauthorized entry or attempted entry at critical components	31 %
Screening of visitors who seek to enter the hospital after regular visiting hours, monitoring center	19 %
Suggest screening of visitors in normal visiting hours	14 %

Tab.1 Actions and precautions adopted by hospitals to improve their safety

Forty-eight percent of participants are not confident that those actions and precautions are effective, while the remaining are “somewhat confident” (47%) or “very confident” (5%).

As shown by Fig.3, the majority of responders don’t think that emergency response planning, services, and equipment are adequate to manage and respond properly to potential terrorist attacks; and they believe that their hospitals will not be prepared to guarantee the continuity of business following a terrorist attack.

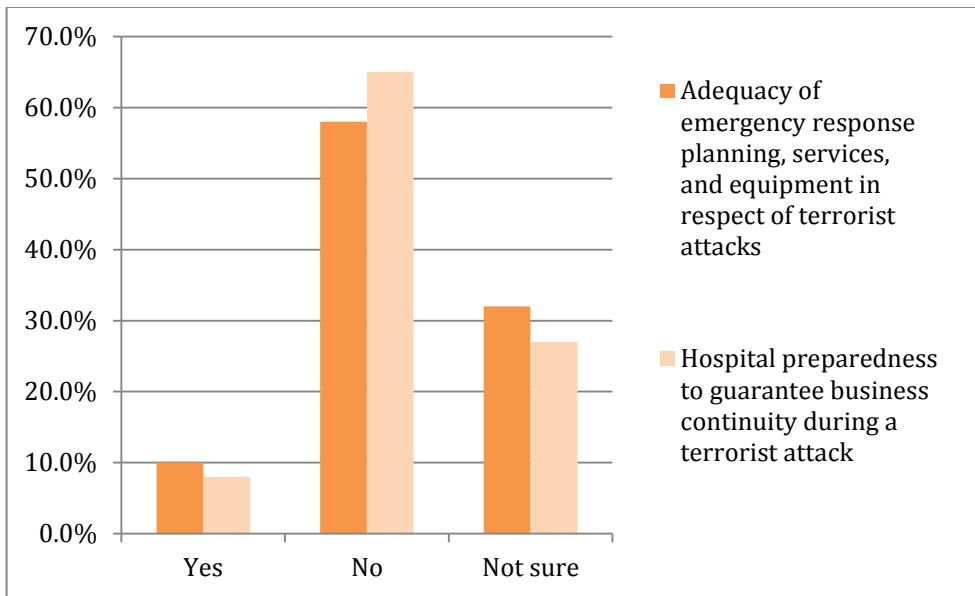


Fig.3 Responders confidence about adequacy of hospital safety measures and ability to guarantee business continuity in respect of terrorist attacks

In the majority of cases (63%), the hospital is not provided with security intelligence regarding terrorist threats; 13 participants (34%) are not aware about security intelligence involvement, while 1 participant (3%) confirmed its presence.

Decontamination facilities are present according to 55% of responders; personal protective equipment (PPE) are present in 58% of cases and are easily accessible by hospital staff according to 70% of responders.

In 53% of cases, hospitals do not have documented pharmaceutical procedures and appropriate supplies for victims and health care providers in the event of a terrorist attack that is likely to require a vaccine or prophylaxis contingency though 34% of participants claim these procedures are present at their hospital.

In the majority of cases (76%) critical and essential facilities are not appropriately designed and managed to withstand disruption caused by a terrorist attack.

Attitude and Training. Participants were asked if it was reasonable to be expected by their employer to continue working during a terrorist event, 46% of participants disagreed, whereas 35% agreed and 19% were not sure.

Eighty-one percent of the responders would be more willing to respond with guaranteed availability of proper security/safety measures; 78% of participants with guaranteed availability of proper treatment or prophylaxis for various dangerous

agents; 69% with guaranteed availability of proper security forces on ground; 6% with guaranteed increment of salary.

As shown by Fig.4, the majority of participants would be more willing to respond with a specific training regarding terrorist attack; in few cases continuing education courses about hospital response to terrorist attack are available.

The majority of participants (76%) agreed that education and awareness programmes are effective at informing hospital staff on what they should do to be prepared for and reduce their personal risk during major emergencies.

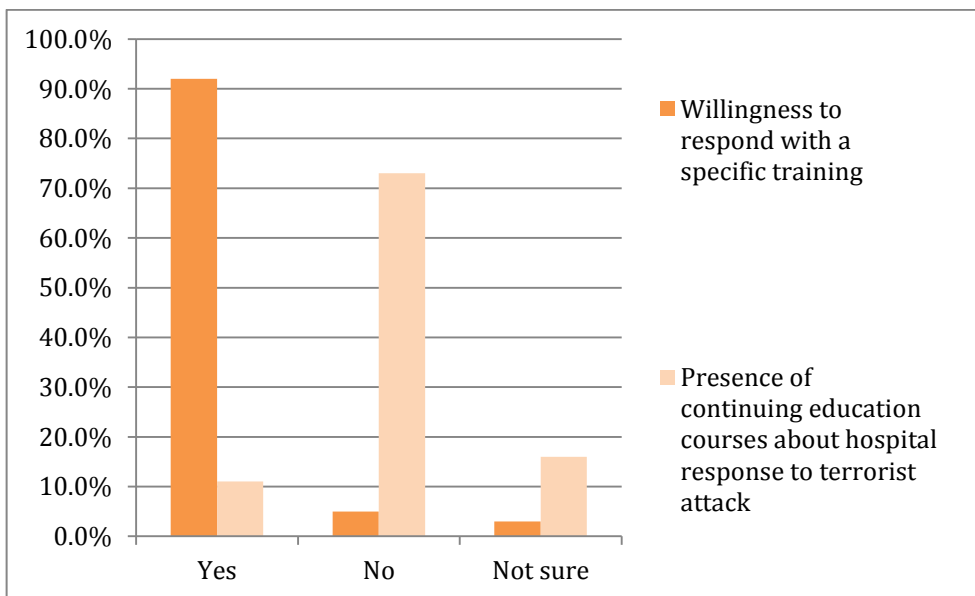


Fig.4 Willingness to respond to terrorist attack after a specific training compared to current availability of specific training

Fig. 5 shows the comparison between participants' confidence of proper safety procedures and their confidence about their knowledge on national/hospital plans to co-ordinate a response against terrorist attacks.

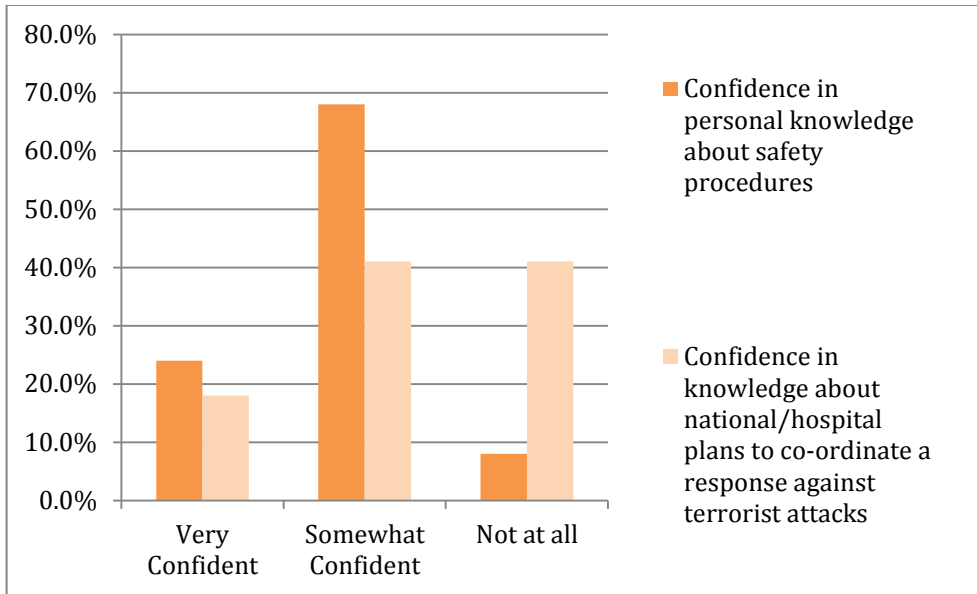


Fig.5 Participants' confidence about their knowledge on safety procedures and national/hospital terrorism plan

When asked if hospital emergency management representatives ever participated to any specific training in how to respond to a terrorist attack, the majority of responders (80%) answered "No"; 69% of them has never participated to any specific training against terrorist attack (Figure 6,7).

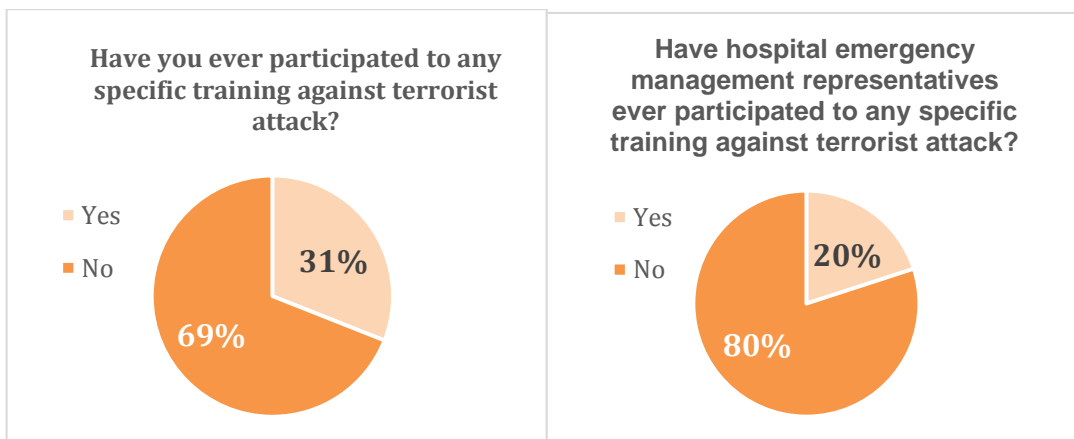


Fig.6,7 Participation to specific training about terrorist attack

Mass casualty drills have been simulated in the 59% of cases, with general disaster/emergency response being the most frequent scenario (86%). Other scenarios were: explosive/incendiary attack (54%), chemical release (45%), biological attack (27%) and active shooter (23%).

As shown by Fig. 8, decontamination training is provided in the majority of cases; 35% of participants have participated in specific training while wearing full PPE.

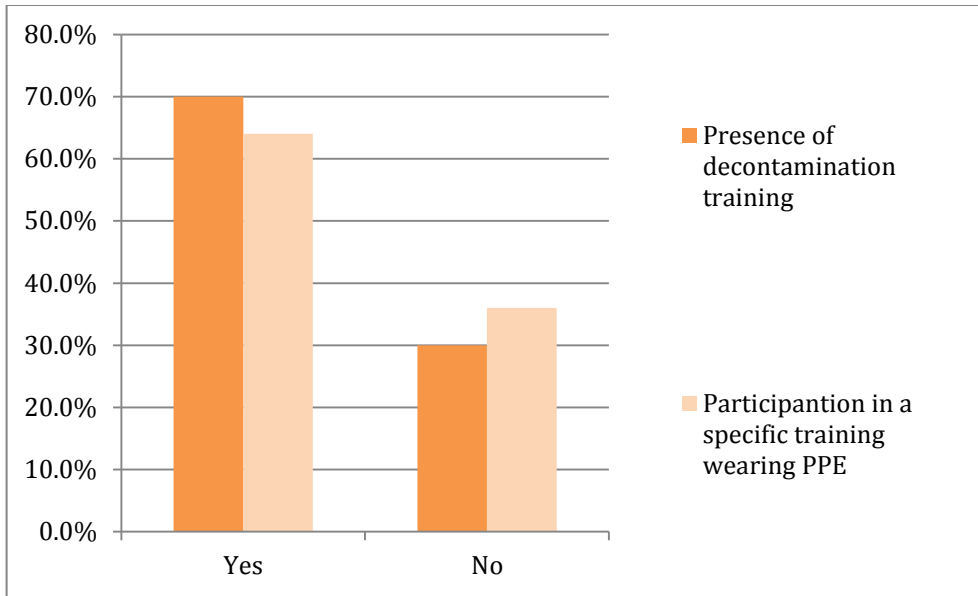


Fig.8 Participants' confidence about their knowledge on safety procedures and national/hospital terrorism plan

Only 37% of participants have received training in the identification, diagnosis, and treatment of biological, chemical and/or or radioactive exposure.

The majority of responders (74%) think that there is currently a lack of training amongst the hospital personnel (Fig.9).

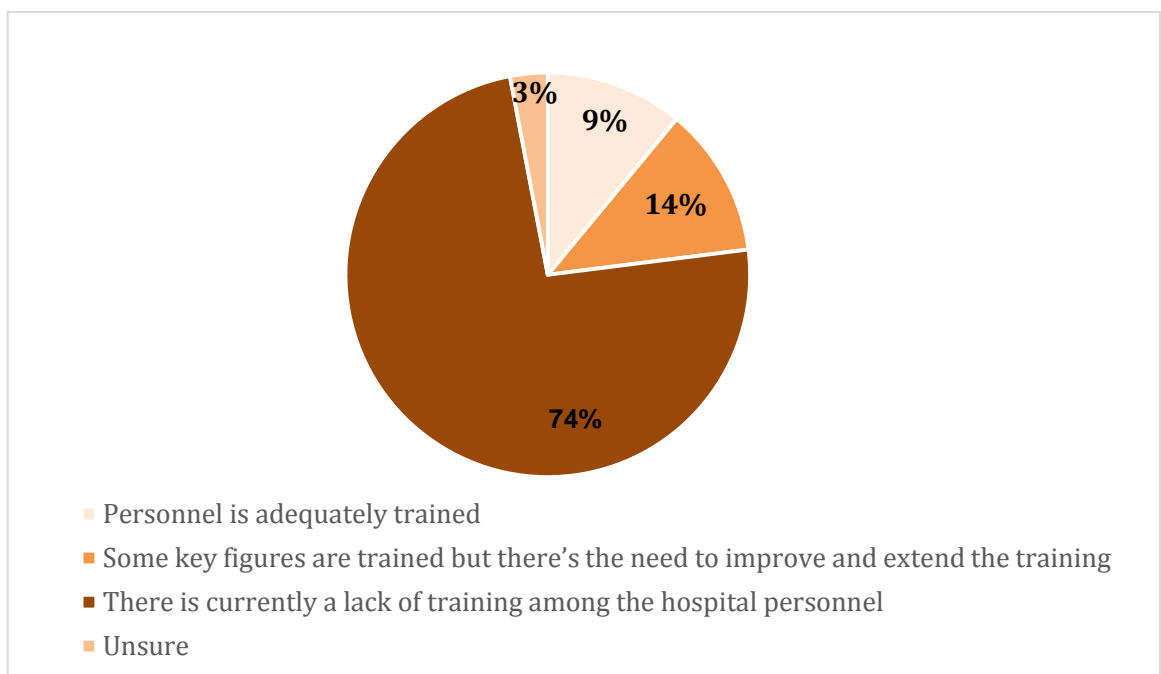


Fig.9 Hospital staff training measures against terrorist attack

Participation in drills/simulations in response of terrorist attack is considered very important by the 48% of participants, and important by 32%; about 89% of responders would be interested in participating in specific training against terrorist attack. When asked if it is worthwhile for their hospital to improve its level of preparedness against terrorism, 49% of responders answered “Yes,”; the remaining answers are distributed between “Yes, but it is not a priority” (45%) and “Not at the moment” (6%).

When asked which do they consider as more important to improve hospital preparedness against a terrorist attack, the majority of participants selected specific training (91%), followed by implementation of security measures regarding access control (64%), involvement of security intelligence (47%), and increase of security personnel (45%). Specific training is also the main measure that participants will be willing to take in order to improve hospital preparedness towards terrorist attack according to 84% of answers, whereas refresher course could be useful according to 11% of them. Finally, participants were asked to identify further projects or programmes that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events; answered included the use of national guidelines for hospitals, mandatory exercises, certification criteria, structural improvement, e-learning activities, stronger hazard and action plans regarding terrorist attacks.

4. Discussion

This study explored EU hospital staff knowledge, attitude and willingness to contribute to all processes of crisis management for terrorist attacks.

The findings of this research showed that the majority of EU hospital staff have high willingness to contribute to risk reduction and response activities during the response of a terrorist attack. However, consistent with current literature, participants of this survey acknowledged the existing lack of training and the need for improvement, regarding hospital preparedness, safety procedures and continuing education.

Despite the European Union Terrorism Situation and Trend Report (TE-SAT) 2015 reported a total of 201 terrorist attacks in 2014, in seven EU Member States, the occurrence of a terrorist attack towards the city/town was considered very unlikely by the majority of participants, and the hospital was rarely considered a possible target.

Terrorism in Finland is very rare event; in fact I don't remember any. School shootings in Finland (2) have been perpetrated by mentally unstable single person. (European law enforcement agency, 2015).

In comparison, the risk of other events such as general emergencies/disaster and health pandemic is considered as less remote. However, terrorism should be considered an emerging threat: recent events showed that hospitals can be acutely affected and they also can represent an attractive primary and secondary target of attack (Ganor, 2013). The results of D2.1 already stressed the importance of additional capacity building and planning in EU hospital resilience and preparedness with regard to possible terrorist attacks. This necessity accompanies demands for increased awareness of EU hospital staff towards the emerging terrorist threat, in order to not underestimate the possibility of potential events.

Participants agree that hospitals are not adequately prepared to face the response of the terrorism threat. A terrorism response plan is absent in the majority of the EU hospitals interviewed according to the results of the survey; a sizeable minority of respondents did not know whether their hospital is provided with the plan or not.

Critical and essential facilities are not believed to be able to withstand disruption derived from a terrorist attack. Moreover, whereas most of hospitals included in the survey adopted a number of actions and precautions to improve their safety, all these measures were considered not effective or not at an acceptable level by the majority of responders, who consequently do not feel safe. These results are congruent with WP2.1: implementation of protective measures to reduce the risk or consequences of a terrorist attack in an EU hospital is still at an insufficient level. Guaranteed availability of proper security/safety measures can work as an incentive for hospital personnel, enhancing their readiness to work during a terrorist event.

Many studies have already explored how hospital workers will not respond equally to different emergency events. (Masterson et al, 2009). Frequently, health care workers are more willing to respond in the event of a natural disaster compared with man-made disasters (Cone et al, 2006; Lanzilotti et al, 2002; Martens et al., 2003). Conducting a survey among Canadian nurses working in emergency department, O'Sullivan et al found that they felt least prepared to deal with radiological and nuclear attacks (O'Sullivan et al, 2008). Similarly, responders of this survey showed the lowest confidence and level of perceived preparation for biological, radiological and nuclear threats. Several factors can be associated with the increased willingness to respond: guaranteed availability of proper security/safety measures, guaranteed

availability of proper treatment or prophylaxis for various dangerous agents and guaranteed availability of proper security forces on the ground.

The literature supports the need for improvement to the training element of crisis preparedness in the field of CBRN among EU hospitals (Barbera et al. 2009). Although the literature reports no direct attack against a hospital using CBRN, the increasing use of CBRN substances as weapons can affect also health care facilities; e.g. The Tokyo subway sarin attack (Okumura, 2005). Even if the risk assessment should dictate the necessity for hospitals to provide relevant facilities and resources, basic capabilities such as PPE and decontamination facilities should be considered essential elements for EU hospitals. Results of this study showed that only in half of cases hospitals were provided with decontamination facilities and PPE, with a notable lack of training recognised by hospital staff.

Responders considered education and awareness programme as very powerful means to prepare hospital staff and reduce their personal risk during major emergencies. Training and education is a critical element of hospital preparedness for possible crisis; adequate training can help hospital workers in the familiarisation with uncommon and non-routine events, such as terrorist attacks, enhancing also their confidence about safety procedures. As a matter of fact, results showed that the willingness of participants to respond to terrorist threats increases together with the availability of proper training: the majority of participants think that participation to simulation and drills in response of terrorist attack is “very important”, expressing also their interest to take part in such training. Only 31% of them have ever participated in any specific training regarding terrorist attack, and mainly about CBRN decontamination procedures.

Responders agreed that specific training is the most important measure that needs to be adopted to improve hospital preparedness, before implementation of security measures and involvement of security intelligence. Nonetheless, currently no continuing education courses about hospital response to terrorist attack are available and only one third of participants has ever participated to any specific training regarding terrorist threats.

Limitations

This study is based on feedback obtained by only 40 responders from 13 EU states. Thus, results may not be entirely representative for the actual situation within the

health sector of the whole EU. Results of this study were survey based, and therefore subject to response bias and individual willingness to report. Because data is voluntarily obtained and reflect the respondents' perceived preparedness, this may not reflect their actual response to a disaster.

5. Conclusions

This study explored that the majority of EU hospital staff have high willingness to contribute to risk reduction and response activities during the response of a terrorist attack. However, significant gaps exist regarding awareness, training and security measures currently adopted by EU hospitals.

The results showed that the perception and awareness within the EU health sector does not reflect an awareness of the current security situation with regard to the terrorist threat; moreover, the strategic management of the health sector has not yet engaged to bring current contingencies to match the current threat. This may be surprising given the number of terrorist related and criminal attacks that have taken place in hospitals in the EU and soft target profile or vulnerability which hospitals present (see D1.1: 2.9-2.11 and D1.3: 3.3.1). In short there is a gap between the perception of the THREATS project researchers on the likelihood of hospitals forming a direct terror target and the beliefs of the workers who were sampled.

The attitudes of hospital staff within the EU as reflected by this, admittedly small, sample contrast with the sense of urgency that might be expected from findings elsewhere in the THREATS project, especially from WP1. The THREATS project have identified potential effects of terrorist attacks which are contained in the three pillars: Physical, Personnel, Information (see for example D1.3). The EU has indicated concern for the protection of CI against terror attacks (D1.3 section 3.1). Some but not all MS have identified Health assets as being a part of their CI (D1.2). The work already carried out by the THREATS project has explained why hospitals might be considered to be attractive terror targets (D1.3, 3.3.1). Given the number of hospital attacks cited in D1.3 section 3.3.1 and the hardening of terrorist attitudes described in D1.2 section 4.1 the THREATS project would argue that terror attacks across multiple hospital sites are a real possibility. The fact that the majority of respondents consider the risk to be small might reflect the natural human capacity

to overestimate the likelihood of what has gone before and is therefore easy to recall and underestimate the probability of new events. This is a known tendency that psychologists call the *availability heuristic* (Tversky and Kahneman, 1973). However the surprising nature of attacks such as the Twin Towers attacks or the Paris Charlie Hebdo attacks adequately demonstrate that you need only terrorists with the motivation and the tools to make previously unthinkable attacks occur. It only takes one attack on an EU CI hospital to make all such CI potential targets. It is argued that the gap between the perception of staff responding to this survey and the evidence presented in WP1 of the THREATS project constitutes a bar to target hardening as well as being a risk factor in itself. There has to be the caveat, however, that the data sampled is not nearly as extensive as would be desirable to make this into a firm recommendation.

Hospital personnel, when appropriately prepared and trained, are essential for an effective response to both natural and man-made disasters, including terrorist events. Specific training regarding the management of terrorist threats, with special regard to CBRN, should be taken in consideration by disaster planners at the EU level, not only to improve hospital staff competencies but also to increase their willingness to respond and their sense of security inside the hospital. Hospital staff as indicated by the small sample the THREATS team were able to engage are eager to understand the terrorist risk and manage it, but underestimate the likelihood of that risk.

The results of this work have provided an interesting insight to the risk and security culture within the health sector across the EU; the consensus of the survey participants did not consider hospitals to be likely targets of a terrorist attack even though the nature of terrorism seems to have moved from hostage type events to more extreme and violent attacks against all sectors of the population. Perhaps the recent attacks in Paris during November 2015 will influence security culture in the immediate future.

A prominent theme throughout the results was the lack of information, training and exercising. Many respondents indicated a willingness to participate in individual and collective education and training. This could be a useful driver for developing and adjusting the security and risk culture within the health sector.

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Appendix A



THREATS: Terrorist attacks on Hospitals: Risk and Emergency Assessment, Tools & Systems



Co-funded by the Prevention, Preparedness and Consequence Management of Terrorism and other Security-related Risks Programme of the European Union

Knowledge, risk perception and attitude of hospitals staff to respond to terrorist attacks

Consent Form

Dear Madam/Sir,

You are invited, because of your knowledge and expertise, to take part in the study “THREATS - Terrorist attacks on Hospitals: Risk and Emergency Assessment, Tools and Systems”. The study has been approved by the European Commission, under the program CIPS. Please see our Web site www.threatsproject.eu .

Your answers will assist our project to deliver the risk reduction toolbox we are developing to protect Hospitals in the European Union from terrorist attacks outside or inside the hospital.

Taking part in this survey is completely voluntary; information provided will be safeguarded, secure, anonymous, and reputational issues managed. You can withdraw from the study whenever you like. The survey will take about 30 minutes to complete.

In case you agree to contribute to study, please, confirm your consent.

Statement of Consent:

- I consent to contribute in this study and answer the survey*
- I don't consent to contribute in this study*

Name and

Surname: _____

Position: _____

Gender: _____

How many years is your work experience in hospitals?

Did you have any previous experience/training in disaster response and management?

- yes no

Academic education level: PhD MD MSc BSc

Field of education: Medicine Nurse Health management Other
(please, specify):....

Hospital: _____

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- Private for profit
 - Private non for profit
 - Public
 - University Hospital

Country: _____

City: _____

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General Framework

1. In your opinion, what is the likelihood of a terrorist attack against your hospital?
 - very unlikely (1 in 20 years)
 - unlikely (1 in 10 years)
 - likely (1 in 5 years)
 - very likely (1 in year)

2. In your opinion, what is the likelihood of a terrorist attack in your city/town?
 - very unlikely (1 every 20 years)
 - unlikely (1 every 10 years)
 - likely (1 every 5 years)
 - very likely (1 every year)

3. In your opinion, which of the following is your greatest hospital safety concern? Rank from “most likely” to “least likely” using numbers from 1 to 6.
 - Natural disaster
 - Terrorist attack
 - Health pandemic
 - General emergency
 - Industrial accident
 - Other (specify)

4. Have you or your colleagues ever experienced a terrorist attack involving either
 - receiving casualties from a terrorist attack,

- responding to a terrorist attack
 - your hospital being attacked
 - any other experience of terrorism
5. Does your hospital have a terrorism response plan?
- yes
 - no
 - not sure
6. If yes, do you have a specific delineated role inside your hospital terrorism response plan?
- yes
 - no
 - not sure
7. Which of the following attack to your hospital do you feel more prepared to deal with?
- chemical attack
 - biological attack
 - incendiary/explosive attack
 - shooting
 - radiological attack
 - nuclear attack
 - none
8. How would you describe your hospital level of preparedness against terrorist attacks?
- not prepared
 - somewhat prepared
 - prepared
 - optimally prepared
9. To the best of your knowledge, is your hospital able to alert other health structures or other public organizations in case of an terrorist attack?
- yes
 - do not know
 - no
10. Is there any other experience of terrorism or other serious event that they are willing to share with us?

Security Measures and Equipment

11. To the best of your knowledge, which actions and precautions are adopted to improve hospital safety? *Mark all that apply*
- access to the sensitive area of the hospital restricted to authorized personnel only
 - alarm system to detect unauthorized entry or attempted entry at critical components

- specific training of security personnel, including the proprietary security force, contractual security personnel, off-duty law enforcement officers
 - gate control system to control the access of vehicles
 - closed circuit television cameras with record and archive capability
 - screening of visitors who seek to enter the hospital after regular visiting hours, monitoring center
 - suggest screening of visitors in normal visiting hours
12. How confident are you that your hospital's security activities are effective?
- not confident
 - somewhat confident
 - very confident
13. Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to potential terrorist attacks?
- Yes
 - No
 - Not sure
14. Do you think your hospital will be prepared to guarantee business continuity during a terrorist attack?
- Yes
 - No
 - Not sure
15. Is the Health service/Hospital provided with security intelligence regarding terrorist threats?
- Yes
 - No
 - Do not know
16. Does your hospital have adequate decontamination facilities for victims exposed to chemical or biological contaminants?
- yes
 - no
 - Do not know
17. Does your hospital have adequate personal protective equipment against CRBN events?
- yes
 - no
 - Do not know
18. If yes, are they easily accessible by hospital staff?
- yes
 - no
 - Do not know

19. Does your hospital have documented pharmaceutical procedures and appropriate supplies for victims and health care providers in the event of a terrorist attack?
- yes
 - no
 - Do not know
20. Do you think that critical and essential facilities are appropriately designed and managed to withstand disruption derived by potential terrorist attack?
- yes
 - no
 - Do not know

Attitude and Training

21. Do you believe working during terrorist event is a reasonable employer expectation?
- yes
 - no
 - not sure
22. In case of a terrorist attack (mark all that apply):
- I will be more willing to respond with guaranteed availability of proper treatment or prophylaxis for various dangerous agents
 - I will be more willing to respond with guaranteed increment of my salary
 - I will be more willing to respond with guaranteed availability of proper security/safety measures
 - I will be more willing to respond with guaranteed availability of proper security forces on ground
 - not sure
23. Will you be more willing to respond if you had specific training regarding response to a terrorist attack?
- yes
 - no
 - not sure
24. To the best of your knowledge, are there any continuing education courses in your country about hospital response to terrorist attack?
- yes
 - no
 - Do not know
25. Do you think that education and awareness programs are effective at informing hospital staff on what they should do to be prepared for and reduce their personal risk during major emergencies?
- yes
 - no
 - Do not know

26. Are you confident of your knowledge of proper safety procedures?
- very confident
 - somewhat confident
 - not at all
27. Are you confident of your knowledge about national/hospital plans to co-ordinate a response against terrorist attacks?
- very confident
 - somewhat confident
 - not at all
28. Have hospital emergency management representatives ever participated to any specific training against terrorist attack?
- yes
 - no
29. Have you ever participated to any specific training against terrorist attack?
- yes
 - no
30. Have you ever participated in an internal mass casualty drill?
- yes
 - no
31. If yes, what scenario was simulated?
- general disaster/emergency response
 - chemical release
 - biological attack
 - explosive/ incendiary attack
 - nuclear/radiological attack
 - active shooting
32. Are you aware of any decontamination training provided in you hospital?
- yes
 - no
33. Did you ever participate to any specific training while wearing full personal protective equipment (PPE)?
- yes
 - no
34. Have you received training in the identification, diagnosis, and treatment of biological or chemical exposure?
- yes
 - no
35. What do you think about the hospital staff training measures against terrorist attack?
- personnel is adequately trained
 - some key figures are trained but there's the need to improve and extend the training
 - there is currently a lack of training among the hospital personnel
 - unsure

36. How important is to participate to drills/simulations in response of terrorist attack?
- very important
 - important
 - somewhat important
 - not essential
37. Will you be interested in participating to specific training against terrorist attack?
- yes
 - no
38. Do you think it is worthy for your hospital to improve its level of preparedness against terrorism?
- yes
 - yes, but it is not a priority
 - not at the moment
39. Which of the following actions are you willing to take to improve hospital preparedness against a terrorist attack?
- specific training
 - refresher course
 - none
40. Which of the following actions do you consider as more important to improve hospital preparedness against a terrorist attack? Mark all that apply
- specific training
 - implementation of security measures regarding access control
 - increase of security personnel
 - involvement of security intelligence
 - other (specify)
41. Can you identify further projects or programs that will reduce your facility's vulnerability to damages and losses, including loss of operation/service, to hazard events?
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The questionnaire, relevant questions and results extracted from the survey

Sections	Questions	Results
General Information	Gender	Male: 28 Female: 9 Not specified: 3
	Country	Austria: 0 Belgium: 3 Bulgaria: 0 Cyprus: 0 Croatia: 0 Czech Republic: 0 Denmark: 12 Estonia: 0 Finland: 1 France: 0 Germany: 4 Greece: 0 Hungary: 1 Ireland: 0 Italy: 11 Latvia: 1 Lithuania: 0 Luxemburg: 0 Malta: 1 Netherlands: 1 Poland: 0 Portugal: 1 Romania: 1 Slovakia: 0 Slovenia: 0 Spain: 0 Sweden: 2 Uk: 2
	How many years is your work experience in hospitals?	<10 years = 14 10-20 years = 12 >20 years = 13 Not specified: 1
	Academic Educational Level	PhD: 3 MD: 20 MSc: 4 BSc: 2 Other: 11
	Hospital	Private for profit: 1 Private non for profit: 3 Public: 17 University Hospital : 19
	Previous experience/training in disaster response and management	Yes: 22 No: 18

General Framework	Likelihood of a terrorist attack against the hospital	<p>Very unlikely (1 every 20 years): 80%</p> <p>Unlikely (1 every 10 years): 15%</p> <p>Likely (1 every 5 years): 5%</p> <p>Very likely (1 every year):0%</p>
	Likelihood of a terrorist attack in the city/town	<p>Very unlikely (1 every 20 years): 60%</p> <p>Unlikely (1 every 10 years): 17.5%</p> <p>Likely (1 every 5 years): 17.5%</p> <p>Very likely (1 every year):5%</p>
	Greatest hospital safety concern (rank from 1 to 6)	<p><i>Median Scores</i></p> <p>General Emergencies: 4.7</p> <p>Health Pandemic: 4</p> <p>Industrial Accidents: 3.9</p> <p>Natural Disasters: 2.9</p> <p>Terrorist Attacks: 2.2</p>
	Previous experiences regarding terrorism	<p>None: 90%</p> <p>Receiving casualties of a terrorist attack: 5%</p> <p>Receiving warning to be ready because of a terrorist attack: 2.5%</p> <p>Other experience: 2.5%</p>
	Presence of a terrorism response plan in the hospital	<p>Yes: 20%</p> <p>No: 54%</p> <p>Not Sure: 26%</p>
	When the terrorism response plan is present, participants have a specific delineated role during the terrorism response	<p>Yes: 47%</p> <p>No: 42%</p> <p>Not Sure: 11%</p>
	Type of attack to the hospital participants feel more prepared to deal with	<p>Incendiary/explosive attack: 44%</p> <p>Cyber attack: 33%</p> <p>Chemical attack: 31%</p> <p>Biological attack: 21%</p> <p>Shooting: 21%</p> <p>Radiological attack: 8%</p> <p>Nuclear attack: 3%</p> <p>None: 21%</p>

	<p>Hospital level of preparedness against terrorist attacks</p>	<p>Not Prepared: 49% Somewhat prepared: 46% Prepared: 5% Optimally Prepared: 0%</p>
	<p>Hospital ability to alert other health structures or other public organizations in case of a terrorist attack</p>	<p>Yes: 87% No: 5% Do Not Know: 8%</p>
<p>Security Measures and Equipment</p>	<p>Actions and precautions adopted to improve hospital safety</p>	<p>Access to the sensitive area of the hospital restricted to authorized personnel only 78%</p> <p>-</p> <p>Closed circuit television cameras with record and archive capability 58%</p> <p>-</p> <p>Gate control system to control the access of vehicles 50%</p> <p>-</p> <p>Specific training of security personnel, including the proprietary security force, contractual security personnel, off-duty law enforcement officers 39%</p> <p>-</p> <p>Alarm system to detect unauthorized entry or attempted entry at critical components 31%</p> <p>-</p> <p>Screening of visitors who seek to enter the hospital after regular visiting hours, monitoring center 19%</p> <p>-</p> <p>Screening of visitors in normal visiting hours 14%</p>
	<p>How confident are you that your hospital's security activities are effective?</p>	<p>Very Confident: 5% - Somewhat Confident: 47% - Not Confident: 48%</p>
	<p>Do you think that emergency response planning, services, and equipment are adequate to manage and respond properly to potential terrorist attacks?</p>	<p>Yes: 10% No: 58% Not Sure: 32%</p>

	Do you think your hospital will be prepared to guarantee business continuity during a terrorist attack?	Yes: 8% No: 65% Not Sure: 27%
	Is the Health service/Hospital provided with security intelligence regarding terrorist threats?	Yes: 3% No: 63% Do not know: 34%
	Presence of adequate decontamination facilities for victims exposed to chemical, biological or radioactive contaminants	Yes: 55% No: 42% Do not know: 3%
	Does your hospital have adequate personal protective equipment against CRBN events?	Yes: 58% No: 37% Do not know: 5%
	Accessibility of PPE by hospital staff	Yes: 70% No: 19% Do not know: 11%
	Presence of documented pharmaceutical procedures and appropriate supplies for victims and health care providers in the event of a terrorist attack?	Yes: 34% No: 53% Do not know: 13%
	Critical and essential facilities are appropriately designed and managed to withstand disruption derived by potential terrorist attack?	Yes: 13% No: 76% Do not know: 11%
Attitude and Training	Do you believe working during terrorist event is a reasonable employer expectation?	Yes: 35% No: 46% Do not know: 19%
	In case of a terrorist attack	I will be more willing to respond with guaranteed availability of proper security/safety measures: 81% - I will be more willing to respond with guaranteed availability of proper treatment or prophylaxis for various dangerous agents: 78% - I will be more willing to respond with guaranteed availability of proper security forces on ground: 69% - I will be more willing to respond with guaranteed increment of salary: 6%

Will you be more willing to respond if you had specific training regarding response to a terrorist attack?	Yes: 92% No: 5% Do not know: 3%
Presence of continuing education courses in your country about hospital response to terrorist attack	Yes: 10% No: 73% Do not know: 17%
Do you think that education and awareness programs are effective at informing hospital staff on what they should do to be prepared for and reduce their personal risk during major emergencies?	Yes: 76% No: 16% Do not know: 9%
Level of confidence about knowledge of proper safety procedures	Very Confident: 24% Somewhat Confident: 68% Not at all: 8%
Level of confidence about knowledge on national/hospital plans to co-ordinate a response against terrorist attacks.	Very Confident: 19% Somewhat Confident: 40.5% Not at all: 40.5%
Have hospital emergency management representatives ever participated to any specific training against terrorist attack?	Yes: 20% No: 80%
Have you ever participated to any specific training against terrorist attack?	Yes: 31% No: 69%
Have you ever participated in an internal mass casualty drill?	Yes: 59% No: 41%
If yes, what scenario was simulated?	General disaster/emergency response: 86% - Explosive/incendiary attack: 54% - Chemical release: 45% - Biological attack: 27% - Active shooting (23%).
Are you aware of any decontamination training provided in you hospital?	Yes: 70% No: 30%
Did you ever participate to any specific training while wearing full personal protective equipment (PPE)?	Yes: 65% No: 35%
Have you received training in the identification, diagnosis, and treatment of biological, chemical and/or or radioactive exposure?	Yes: 38% No: 62%

	<p>What do you think about the hospital staff training measures against terrorist attack?</p>	<p>Personnel is adequately trained: 9% - Some key figures are trained but there's the need to improve and extend the training: 14% - There is currently a lack of training among the hospital personnel: 72% - Unsure: 3%</p>
	<p>How important is to participate to drills/simulations in response of terrorist attack?</p>	<p>Very Important: 48% Important: 32% Somewhat Important: 17% Not essential: 3%</p>
	<p>Will you be interested in participating to specific training against terrorist attack?</p>	<p>Yes: 89% No: 3% Not sure: 8%</p>
	<p>Do you think it is worthy for your hospital to improve its level of preparedness against terrorism?</p>	<p>Yes: 49% No: 45% Not at the moment: 6%</p>
	<p>Which of the following actions are you willing to take to improve hospital preparedness against a terrorist attack?</p>	<p>Specific training: 84% Refresher course: 11% None: 5%</p>
	<p>Which of the following actions do you consider as more important to improve hospital preparedness against a terrorist attack?</p>	<p>specific training: 91% - implementation of security measures regarding access control: 64% - involvement of security intelligence: 47% - increase of security personnel 45%</p>