

**NO - FEAR**

Network Of practitioners For  
Emergency medical systems  
and cRitical care



**NO-FEAR's summary of main  
findings, gaps and lessons  
learned from M24 to M30**

<b>Project title:</b>	Network Of practitioners For Emergency medicAl systems and cRitical care				
<b>Project short name:</b>	NO-FEAR	<b>Grant agreement number:</b>	786670		
<b>Author(s):</b>	Luca Leonardi, Monica Linty				
<b>Lead partner:</b>	UPO	<b>Contributing partners:</b>	ALU, UCSC, MDA, UNS, and all partners		
<b>Work Package</b>					
<b>Dissemination level:</b>	Public	<b>Contractual due date</b>		<b>Actual Submission Date</b>	

This publication only reflects the view of the NO-FEAR Consortium or selected participants thereof. Whilst the NO-FEAR Consortium has taken steps to ensure that this information is accurate, it may be out of date or incomplete, therefore, neither the NO-FEAR Consortium participants nor the European Community are liable for any use that may be made of the information contained herein.

This document is published in the interest of the exchange of information, and it may be copied in whole or in part providing that this disclaimer is included in every reproduction or part thereof as some of the technologies and concepts predicted in this document may be subject to protection by patent, design right or other application for protection, and all the rights of the owners are reserved.

The information contained in this document may not be modified or used for any commercial purpose without prior written permission of the owners and any request for such additional permissions should be addressed to the NO-FEAR coordinator.

© Copyright 2019 – All Rights Reserved

## 1. Executive Summary

NO-FEAR project is bringing together a pan-European network of practitioners, decision and policy makers in the medical and security fields. They are collaborating to achieve a common understanding of needs, as well as - in collaboration with academia and industries – increase the EU innovation potential that could better fill the operational gaps and recommend areas for future innovations.

NO-FEAR main objectives are to:

- create a long-lasting community of practitioners, interacting with a network of suppliers and academia,
- elaborate an innovation roadmap, with practical recommendations for uptake,
- advise relevant Research and Innovation projects,
- support market uptake of EU research results,
- issue policy and regulatory recommendations enabling collective procurement,
- indicate priorities for standardization,
- support quick wins and practical short-term results,
- implement a transactional dynamic portal providing fora, a catalogue, marketplace and flexibility to address new threats.

The findings detailed below are can be found in the NO-FEAR portal, categorized in the specific sections and linked with the respective pillars.

## 2. Table of contents

1. Executive Summary .....	3
2. Table of contents .....	4
3. Abbreviations .....	4
4. Summary of the findings in project's lines of action from M24 to M30 .....	5
Work Package 1 – Ethics Requirements, human, social and legal issues.....	5
Work Package 2 – Management, Networks, dissemination and exploitation .....	9
Work Package 3 - Acute Care of the patient .....	10
Work Package 4 - Acute care operations in the security related incidents .....	13
Work Package 5 - Education and training of personnel and volunteers.....	30
Work Package 6 – Innovation monitoring and uptake .....	33
Table of the Webinars delivered .....	39
QUICK WINS .....	43

## 3. Abbreviations

CA = Consortium Agreement

DoA = Description of the Action

EC = European Commission

GA = General Assembly

PC = Project Coordinator

PM = Project Manager

PO = Project Officer

NMB = NO-FEAR Management Board

WP = Work Package

## 4. Summary of the findings in project's lines of action from M24 to M30

Work Package 1 – Ethics Requirements, human, social and legal issues

### Research and Innovation monitoring

A huge part of WP1's activity comprised the planning, implementation and conduction of an online survey on *Security critical incidents*. From M24 to M30 the English questionnaire, which was jointly developed by WP1 partners **ALU**, **MDA**, **NorCross**, **TRI** and **UIBK**, was translated by NO-FEAR partners in seven languages, i.e. French (**HMN**), German (**ALU**), Hebrew (**MDA**), Italian (**UniCatt**), Romanian (**DSU**), Spanish (external help), and Norwegian (**NorCross**). All translations were added to the English online survey by **ALU**. In addition to the ethical review of the survey by **UniCatt**, an approval was also given by **MDA's** research committee.

The Questback/unipark platform was used to perform the survey which was launched on 9/23/2020 and closed on 12/5/2020. All participants were asked to provide their informed consent in compliance with GDPR. **WP1 partners** tried hard to gain at least 50 completed questionnaires from each of the nine countries selected to participate in the survey. The survey was disseminated via the NO-FEAR network and via the networks of all WP1 partners. Except for Spain the aim of at least 50 completed questionnaires was reached by December 2020 (cp. Table 1). The survey has been visited by 2445 users. In total 1235 participants completed the full questionnaire. Currently, the survey data is being processed for statistical analysis.

Table 1: Completed Questionnaires by Country

Country	Completed questionnaires
<b>Austria</b>	243
<b>England</b>	83
<b>France</b>	73
<b>Germany</b>	291
<b>Israel</b>	133
<b>Italy</b>	74
<b>Norway</b>	130
<b>Spain</b>	32
<b>Romania</b>	157
<b>Other</b>	19

**Trilateral** participated in WP1 planning meetings, where they provided input and feedback on WP1 activities. Trilateral also supported the work of WP1 through dissemination and communication

activities including email campaigns, a press release and social media posts to encourage completion of the research survey conducted as part of WP1.

**UIBK** has done desk research to get an overview on relevant guidelines, research and best practice in pandemics. UIBK has provided several research updates with relevant literature.

**UIBK** is currently conducting surveys on the psychosocial state of different population groups during the COVID-19 pandemic. We are implementing a longitudinal study design to collect data at three different points in time. We focus on students, the general population in severely affected areas in Austria, health care workers in Austrian hospitals, emergency staff and volunteers in Europe as well as spontaneous volunteers providing help within Team Österreich.

The surveys include general questions on the perception and compliance of response measures, socio demographic data as well as stress experience, traumatic stress, well-being and resilience using questionnaires such as the Perceived Stress Scale, Impact of Events Scale – Revised, the WHO-5 and Sense of Coherence Scale.

The first measurement has been conducted in June/July 2020, the second measurement point has been in November/December 2020. A third measurement will be conducted in early 2021. Table 2 gives an overview of completed questionnaires.

*Table 2: Overview of completed questionnaires*

Overview of completed questionnaires of staff and volunteers

Group of participants	Measurement 1	Measurement 2
<b>EMS</b>	637	454
<b>PSS/crisis intervention</b>	251	202
<b>Hospital personnel</b>	130	98
<b>firefighters</b>	120	96
<b>police</b>	61	50
<b>Social services</b>	43	166
<b>Elderly (long-term) care</b>	30	33
<b>Military</b>	13	7

Statistical analysis is currently processed. First results show higher stress levels and lower well-being in EMS staff and volunteers from measurement point 1 (June/July) to measurement point 2 (November/December). Degree of exposure, younger age, female gender are risk factors in both measurement points. Sense of coherence is a protective factor.

Additionally, UIBK conducted focus group discussions and interviews on Psychosocial Support during the Covid-19 pandemic. We compare the results with our analysis of interviews and focus groups on terrorist attacks and shooting incidents.

Moral injury plays an important role in the pandemic. Research shows that moral injury of Health Care Workers may result in a) a loss of trust in organizations and leadership, b) a loss of trust in oneself and c) a loss of job commitment.

### Areas of Main R&D Gaps/ Requirements to fill Capability Gaps

NorCross found that there are existing training and tutorials on how to deal with and understand how violence against healthcare workers occurs. What is lacking is a more complete set of training actions, a low threshold tool that can be applied into any context, to prevent and reduce violence against medical first responders. On this note, it was decided to develop such a tool to provide an overall conceptual and methodological approach to help ambulance and pre-hospital personnel increase their resilience in the face of risks encountered as they work. This training manual is called *Training Manual for Ambulance and Pre-Hospital Response in Risk Situations, TARRS*.

**TRAINING MANUAL**  
for Ambulance and  
Pre-hospital Response  
in Risk Situations



HEALTH IT'S A  
CARE MATTER  
IN OF LIFE  
DANGER & DEATH

 Norwegian Red Cross

The overall goals of this training manual are to:

- Equip ambulance and pre-hospital personnel with simple practical skills to improve their security and mitigate the impact of violence,
- Offer a starting point for organizations providing ambulance and pre-hospital services seeking to review and reinforce their existing procedures in terms of preparedness and security management.

Bringing in personal dimensions as a factor to mitigate risk of violence fits well with the WP 1 pillar. We believe that one's own behaviour will play a huge role on this matter when responding to security critical incidents. Dealing with the experiences and the impressions after will also become a factor for the next response.

NorCross has found that there is an unmet need for intercultural competency training in the ambulance and pre-hospital setting. Stereotyping of groups or assuming that all members of a culture act, believe and think alike, can lead to negative societal relationships as well as poor patient care. Knowing your own perceptions, the context and risks associated, one can achieve safer behaviour and safer access by being aware of and learning about these elements.

#### Structure:

TARRS contains of two parts. Part one has been completed, ready for piloting and evaluation (when part 2 is completed). Part one includes three sections: 1) understanding the concept of violence

against healthcare 2) the legal framework and how to understand your own rights and responsibilities within international and national legislation and 3) a presentation of the risk management approach to be used when the workshop modules are carried out in part 2. These are the backdrop for the workshop modules/ sections in part 2.

Rather than a prescriptive how-to guide, the training manual offers general guidance to be applied to a broad variety of contexts, scenarios, and can be adapted according to local practices. Part 2 of the training manual is designed to actively involve participants in the learning process and to develop practical recommendations for context-specific situations. The participants will be guided through points of reflection, discussions and group work. The participatory approach is a key element in ensuring contextualization and ownership of the recommendations developed.

### Overview:

Modules that are currently under development and are considered completed in the first quarter of 2021:

#### **MODULE 1: CONTEXTUALIZING RISK MANAGEMENT**

**Section 1:** healthcare in danger

**Section 2:** risk management approach – operationalizing risk methodology (including incident reporting)

#### **MODULE 2: CONTEXTUALIZING SAFER BEHAVIOUR**

**Section 3:** safer behaviour

- CoC
- Uniform
- Professional dialogue / communication
- Situational awareness
- CRT

**Section 4** managing aggression and interpersonal violence

**Section 5:** stress management, psycho-social trauma and debrief procedures

**Section 6:** lessons learnt: follow up recommendations

### **Priorities as regards standardization**

Guidance is necessary on MHPSS prevention and intervention that fits to different organizational types and different phases of the disaster. **UIBK** wrote a short guidance document and put it on the portal and we contributed to the Manchester Briefing.

**UniCatt:** Standardization vs. harmonization is a context which emerges in many projects. It is interesting to assess efforts towards standardization and harmonization likewise as well as the necessary timing for the achievement and the structural differences and implications on ethical issues of the results of both. This would be a valuable instrument for the definition of a common set of standards in ethics and towards the shortening of the divide between theory and ethics in the field.

## Best practices and Lessons Learned

**UniCatt:** The issue of the full comprehension of the difference between anonymization and pseudonymization represents a valuable lesson learnt. The difference is not always well understood in the general public but also, and this is surprising, in a minor measure among some elements of the research community. This has emerged more when the GDPR has set forth stricter data protection regulations. The lesson learnt, therefore, is that it is important to provide non-invasive (in terms of time consumption) training modules in research programs to provide a correct guidance on the issue.

**UIBK:** On an organisational level, it has been shown, that during pandemics resilient hospitals are characterized by decentralized decision making by caregivers, have nurses among the hospital executive staff (who know what is needed “at the front”), have flexible scheduling, invest in continuing education and unit-level self-government are more resilient than other hospitals.

On the level of leadership organisational justice reportedly plays an important role in how the crisis is experienced. This includes perceived justice on a relational level such as taking concerns and needs of staff seriously, as well as on a strategic level, which includes making transparent and comprehensible decisions, and evaluating decisions that had to be taken quickly by including healthcare professional’s views on those decisions. Good and transparent communication as well as a dialogue and feedback loops between leadership and personnel are the basis of healthcare worker’s trust and health. This can help to understand what purpose certain orders serve and to find out whether and how certain orders can be adapted into a more stress relieving way of achieving the same goal.

On the level of the individual several risk and protective factors are at work. Degree of exposure, younger age, female gender are risk factors in HCW. Psychological flexibility and sense of coherence are protective factors.

Work Package 2 – Management, Networks, dissemination and exploitation

### Communication Overview

<i>Communications (M24- M30 / May-Dec 2020)</i>		
<b>Website</b>	Sessions	<b>8,800</b>
<b>NO-FEAR Twitter account</b>	Followers	<b>524</b>
	Following	<b>370</b>

	Average monthly tweet impressions	<b>17,545</b>
<b>NO-FEAR LinkedIn account</b>	Connections	<b>454</b>
	Posts (Cumulative)	<b>225</b>
<b>NO-FEAR Facebook</b>	Followers	<b>199</b>
	Posts	<b>74</b>
<b>Conferences attended by partners</b>		<b>2</b>
<b>Workshops / other events attended by partners</b>		<b>11</b>
<b>Workshops, trainings, and webinars organised by partners</b>		<b>16</b>
<b>Press Releases</b>		<b>23</b>

### Overview of the Suppliers and Academia Network (SANE) and the Practitioners, Decision and Policy Makers Network (PDPM)

	Registered on Portal	NOT Registered on Portal	Consortium Members	Total Academia	Total Suppliers	Total
<b>Total SANE</b>	115	33	19	46	100	148
	Registered on Portal	NOT Registered on Portal	Consortium Members	Total Practitioners	Total Policy Maker	Total
<b>Total PDPM</b>	168	82	15	214	36	250

### Work Package 3 - Acute Care of the patient

#### Research and Innovation monitoring

WHO developed and constantly updates “**WHO Academy: Covid-19 Learning**”, an app designed for Health Care Workers where to find up-to-the-minute guidance, tools, training, and virtual workshops. The app is available in 7 languages and it is easy to use<sup>1</sup>.

**Telehealth systems** and apps are extremely important to connect families, patients and HCWs and to promote information sharing during and after hospitalization due to COVID-19. These apps can be used to share pictures, videos, medical information and to teach families how to take care of the

<sup>1</sup> <https://www.who.int/about/who-academy/the-who-academy-s-covid-19-mobile-learning-app>

patient when he/she will be discharged in a simple and safe way. One example is 01 May Vicino@TE, developed by APSS-Trento, Italy but many more apps can be found on the internet. Clearly, those apps should be easy-to-use and cross-platform, always considering privacy and GDPR compliance as a primary goal.

**Be + Against COVID** is an app and website addressing Health Care Professionals emotional needs. In particular it is developed considering the problems, the needs identified for each problem and related resources that are available on the website/app. The research around this app/website also agrees on the possibility to translate and adapt (from a cultural and organizational points of view) the content to other Countries<sup>2</sup>.

### **Areas of Main R&D Gaps**

Regarding SARS-COV2, further research is indicated in the following areas:

- Virus mutations and virulence
- Children's role in transmission and COVID in children
- Reinfection: when and why
- Vaccines efficacy and duration of immunity (from vaccine or infection)
- Role of anti-inflammatory monoclonal antibodies
- Optimization of symptomatic treatment procedures
- Utility of Point-of-care LUS for COVID (currently it is highly observer-dependent), correlation of LUS Score with treatments and the LUS score with the prediction of treatment success/failure (prognostic value).

### **Requirements to fill Capability Gaps**

Further studies are also necessary to define the usefulness of convalescent plasma in COVID-19 patients.

Procurement requires a bottom-up approach when buying new device (end-users should provide specification and be involved in the purchase process).

Guidelines are needed to implement the safety of family visits for hospitalized patients.

Timely communication from the government and supranational institutions is necessary to rapidly apply guidelines, diagnostic methods and treatments.

Surge of ICU beds must be evaluated according to a Return of Investment methodology. Training of personnel has to be considered when increasing ICU beds.

---

<sup>2</sup> Mira JJ, Vicente MA, Lopez-Pineda A, Carrillo I, Guilabert M, Fernández C, et al. Preventing and Addressing the Stress Reactions of Health Care Workers Caring for Patients With COVID-19: Development of a Digital Platform (Be + Against COVID) JMIR Mhealth Uhealth 2020;8(10):e21692

A rapid and effective training for using Lung Ultrasound in interstitial pneumonia both in diagnosis and in monitoring is needed.

Further studies are needed on ethical impact of crisis care decisions and strategies for managing stress and anxiety among the staff.

### **Priorities as regards standardization**

Several meetings were held between TFC, NEN and UCSC with the decision to adopt as a guideline the document 'Overview of damage control surgery and resuscitation in patients sustaining severe injury'<sup>3</sup>. The document focused on damage control resuscitation from the incident location to the hospital Operating Room (OR), taking into account permissive hypotension, fluid needs, pelvic binding, use of POCUS (Point of Care Ultrasound) as a guide for invasive maneuvers (e.g., thoracic drainage), treatment communication during transport, damage control surgery (packing). The document suitability for standardization was assessed. It was determined that the measure to be taken was to setup a page on the NO-FEAR portal that contains a link to this document and to declare why it should be looked on in a positive light. Details of the person recommending the document should also be captured. This would be a starting basis to put in place on the portal a NO-FEAR mechanism for fellow consultants to determine the suitability of recommend documents for their needs.

A list of materials (drugs, lab materials, PPE, devices, ...) needed in case of pandemics for EMS, hospitals and nursing homes should be developed. The list should be adaptable to various context and co-designed with users, sellers, supply chain, and logistics professionals.

### **Best practices and Lessons Learned**

- 1) The use of convalescent plasma has been adopted in many Countries when there is no treatment available for emerging infection-related disease (in 2014 WHO published a position paper on this topic<sup>4</sup>) reducing viral load and mortality.
- 2) Nursing homes should perform in house COVID testing.
- 3) A centralized procurement system for PPE should be in place where and when needed (if possible, anticipating the needs) for hospitals and nursing homes. This reduces the risks of fraud and non-compliance of PPE.
- 4) NHS should provide remote and in-place support with teams for geriatric, palliative care, hygiene, training and psychological support as well as interdisciplinary groups to develop and apply specific action plans. Governments should also provide surge staff provide in particular for nursing homes.
- 5) The supply chain of materials should be re-designed developing multi-source strategies, geographically diversified procurement, and production. Domestic production should be implemented also with factory conversion to avoid dependency from other Countries. Public-private partnerships can be beneficial as well.
- 6) Different Institutions delivered guidelines that sometimes were in conflict.

---

<sup>3</sup> <https://www.uptodate.com/contents/overview-of-damage-control-surgery-and-resuscitation-in-patients-sustaining-severe-injury>

<sup>4</sup> [https://www.who.int/bloodproducts/brn/2017\\_BRN\\_PositionPaper\\_ConvalescentPlasma.pdf](https://www.who.int/bloodproducts/brn/2017_BRN_PositionPaper_ConvalescentPlasma.pdf)

- 7) "Door to door" COVID tests can be a useful strategy when the number of tests to be performed is limited, while the "drive-through" approach is better when a huge number of people are to be tested.
- 8) COVID patients can be transported using the principle of "cohorting" using minibus or other means.
- 9) Lung Ultrasound (LUS) is useful for diagnosis of COVID pulmonary involvement but also as a follow-up diagnostic procedure for patients with interstitial pneumonia in ED, ICU and wards.
- 10) In Spain all ALS (Advanced Life Support) ambulances are equipped with Portable Ultrasound.
- 11) In Nursing Homes LUS was used as a triage method, moreover it was used before the availability of the antigen testing (Antigen Analyzer).
- 12) LUS has a high sensitivity (higher than Thoracic X-Ray and comparable to Lung CT) but low specificity (meaning that the typical B-lines are common in other pathologies such as pulmonary oedema or fibrosis). The recommendation is to use LUS when there is a high prevalence of the disease such as in pandemic situation, since it shows a low specificity.
- 13) Pathological finding of lung parenchyma can be found in poorly-symptomatic COVID patients.<sup>5</sup>

#### Work Package 4 - Acute care operations in the security related incidents

##### **Research and Innovation monitoring**

Current EU projects Horizon 2020 on COVID-19:

There is a huge number of EU project looking at different aspect with COVID-19. Here I will shed light on a few that might be of interest, though the NO-FEAR project probably will slowly move back to the original agenda. See annex 1 (end of the document).

WP4 Collaborated with the PROACTIVE project. The lessons learned in relation to the COVID-19 response were presented at the PROACTIVE Mid-Term conference on October 28<sup>th</sup>, 2020.

##### **Areas of Main R&D Gaps**

RINI organized a webinar on 'Innovative Solutions for Disinfection Methods'. Nine organizations (SANE members) presented their solutions addressing the key gaps identified by the practitioners.

---

<sup>5</sup> Sorlini C, Femia M, Nattino G, et al. The role of lung ultrasound as a frontline diagnostic tool in the era of COVID-19 outbreak [published online ahead of print, 2020 Oct 22]. Intern Emerg Med. 2020;1-8. doi:10.1007/s11739-020-02524-8

NorCross found that there are existing training and tutorials on how to deal with and understand how violence against healthcare workers occurs. What is lacking is a more complete set of training actions, a low threshold tool that can be applied into any context, to prevent and reduce violence against medical first responders. On this note, it was decided to develop such a tool to provide an overall conceptual and methodological approach to help ambulance and pre-hospital personnel increase their resilience in the face of risks encountered as they work. This training manual is called *Training Manual for Ambulance and Pre-Hospital Response in Risk Situations, TARRS*.

**TRAINING MANUAL**  
for Ambulance and  
Pre-hospital Response  
in Risk Situations



HEALTH IT'S A  
CARE MATTER  
IN OF LIFE  
DANGER & DEATH

 Norwegian Red Cross

The overall goals of this training manual are to:

- Equip ambulance and pre-hospital personnel with simple practical skills to improve their security and mitigate the impact of violence,
- Offer a starting point for organizations providing ambulance and pre-hospital services seeking to review and reinforce their existing procedures in terms of preparedness and security management.

The scope of WP 4 is the **acute care operations in security related incidents**. Here, contingency planning and preparedness are key elements, and methods for threats and risk assessment, mapping of scenarios, contingency planning especially for the safety environment play important roles in keeping ambulances and hospital staff as safe as possible when responding to a security incident. TARRS seeks to meet some of these needs at the operational level by offering a guidance, through participatory approach, to an easy and digestible way of including safety and security matters in medical operations.

Through workshops, TARRS, will help give insight to the dangers that ambulance and pre-hospital personnel may encounter and make the participants reflect on what their own perception of danger is. Creating a common ground for the hazards that exists will make the operational application of risk methodology uncomplicated and accessible. By implementing this methodology, participants will be able to act with increased awareness of risk during a mission and thus reduce the risk of threats, violence and even death. The main focus of emergency medical personnel is to save lives. TARRS is a supplement for safer access to do this job.

Structure:

TARRS contains of two parts. Part one has been completed, ready for piloting and evaluation (when part 2 is completed). Part one includes three sections: 1) understanding the concept of violence against healthcare 2) the legal framework and how to understand your own rights and responsibilities within international and national legislation and 3) a presentation of the risk

management approach to be used when the workshop modules are carried out in part 2. These are the backdrop for the workshop modules/ sections in part 2.

Rather than a prescriptive how-to guide, the training manual offers general guidance to be applied to a broad variety of contexts, scenarios, and can be adapted according to local practices. Part 2 of the training manual is designed to actively involve participants in the learning process and to develop practical recommendations for context-specific situations. The participants will be guided through points of reflection, discussions and group work. The participatory approach is a key element in ensuring contextualization and ownership of the recommendations developed.

#### Overview:

Modules that are currently under development and are considered completed in the first quarter of 2021:

#### **MODULE 1: CONTEXTUALIZING RISK MANAGEMENT**

**Section 1:** healthcare in danger

**Section 2:** risk management approach – operationalizing risk methodology (including incident reporting)

#### **MODULE 2: CONTEXTUALIZING SAFER BEHAVIOUR**

**Section 3:** safer behaviour

- CoC
- Uniform
- Professional dialogue / communication
- Situational awareness
- CRT

**Section 4** managing aggression and interpersonal violence

**Section 5:** stress management, psycho-social trauma and debrief procedures

**Section 6:** lessons learnt: follow up recommendations

#### **Requirements to fill Capability Gaps**

RINI engaged the SANE members through surveys and emails to invite members to present relevant topics.

DSU Sent invitations to the network of practitioners to attend the webinars and be actively involved in the discussions, and shared with them the conclusions resulted from the webinars.

#### **Priorities as regards standardization**

#### **Best practices and Lessons Learned**

##### PPE for health providers (Personal Protective Equipment for Biological agents):

WP4 created a collection of gaps, needs, and new ideas for the use of PPE to find out:

- How to produce PPE in a more environmentally friendly way?
- How can we mitigate PSS impact (mainly for healthcare workers themselves)?

An international collection of almost 80 issues identified, from personal experience of healthcare professionals working with PPE and COVID-19 patients, research materials, articles etc. These were identified and categorized into five major themes:

#### Masks

- Limited availability of masks (especially during a pandemic when in high demand)
- No standards available on the quality of masks or when to wear a mask
- Re-use and decontamination of masks
- Environmental issues with single-use masks
- Psychosocial implications for the patient when wearing a mask
- Heat/visibility issues when wearing a mask

#### Operational Issues

- Bulky nature, ill-fitting PPE makes it difficult to do the job
- Availability of trained staff at varying hierarchical levels
- Ineffective shift patterns – long hours
- Limited training on wearing and using PPE, no standard guidelines
- Severe impact psychosocially in terms of incorrect/ unavailable PPE/ limited counseling for PTSD
- Self-contamination during doffing of PPE due to limited training, space, and abilities

#### Availability, Quality-Standards and Cost

- PPE not available to all healthcare providers and limited local providers
- PPE provided to Healthcare providers according to status in organization
- PPE not tailored to users, resulting in an incorrect fitting
- Physical exhaustion accelerated in PPE due to heat
- No globalized standards/ procedure/ guidelines for PPE when responding to a pandemic in a hospital environment

#### Information Sharing

- Identification and Location, vital signs monitoring of Responder when wearing PPE
- The ability to remotely monitor hazardous threat in real-time
- Data analysis during and post-crisis
- Remote command center and Responder interoperability
- Sharing of patient information
- Sharing of information to the public via the media

#### Environmental Impact:

- Disposal of contaminated PPE
- In the production of PPE there are elements of plastic
- Concept of one use, throw away PPE rather than reusable

- A balance between importing and for each country/ hospital to become more self-sufficient  
Consider transportation, storage space and the risk of throwing away out of date PPE

WP4 then developed a four-question questionnaire for the manufactures to explore the innovation potential around producing environmentally friendly, safe, and comfortable PPE for healthcare personnel.

### **COVID-19 webinars:**

Since January 2020, COVID-19 pandemic spread worldwide, affecting countries, communities, individuals and organizations. During this reporting period, WP4 organized seven webinars identifying the following lessons observed and areas for improvement, by sharing knowledge and experience of Emergency Medical Service (EMS) personnel and hospital emergency department staff from acute care organizations in Africa, Asia, Europe and the Americas.

### **Main issues identified in the following webinars: Caring for team members in COVID-19; A chance to learn from other National Societies; EMS experiences in COVID-19; EMS - new daily routines in COVID-19; Hospital organization in COVID-19; and EMS operations - lessons learned**

The webinars took place on (respectively) 16.3.20, 27.3.20, 7.4.20, 11.5.20, 3.6.20, and 23.6.20.

#### **Lessons learned (what worked and should be retained):**

- Public support (emotional and material) has been significant.
- Personnel have been exceptionally motivated and engaged.
- EMS personnel gained new experience and skills (such as taking PCR samples) by working with PPE.
- Inter-agency cooperation and coordination has been effective.
- Ongoing updates of treatment protocols (as data became available) are useful to address the new risks and increase personnel safety. Adjustment of “normal treatment protocols” to “COVID-19 reality” to increase teams’ knowledge and response capacity.
- Triage of ALL incoming EMS calls for possible COVID-19 case definition is essential to reduce risks to responders. On-scene evaluation (and decisions for appropriate PPE levels) is also mandatory, as well as reducing the number of personnel in direct contact with the patient pre-evaluation. Minimum PPE (face masks) should be mandatory for all patient encounters – for EMS, patients, and anyone accompanying the patient.
- The medium matters. “Just in time” training is useful for personnel and daily briefings, delivered digitally/remotely (possibly by using the tablets used for patient records). Online training and webinars proved to be effective tools for updating knowledge and staying in touch with personnel. Personnel prefer “human interaction” (e.g., teleconferencing) to reading documents.
- “Unit spirit” is important. Team leaders play a crucial role and should take overall responsibility for technical issues and morale.
- International cooperation and information sharing helps personnel to support each other and share lessons learned, such as the results of security research projects (including social media analysis and sterilization of used material with plasma).

- Many resources are publically available, including tools for logistics planning.
- Volunteers, personnel from other services, and personnel from “less essential services” (such as training departments and administrative positions) were essential to sustain and augment EMS services during the peak of the crisis. Working to sustain those capacities for the next peak is a major challenge.
- The volunteers contributing to the system (including MDs and nurses) need to be managed well, to receive Psychosocial Support (PSS) and training on PPE use.
- The situation is stressful for responders and their loved ones. A comprehensive PSS plan is essential to reinforce a sense of belonging and being taken care of. Readily-available on-shift food and drinks (when shops were closed) and care provisions for responders quarantining at home were particularly essential to team members.
- Setting up a “health surveillance” protocol for personnel is key.
- PPE donning and doffing training, including for team members not usually involved in “PPE operations”, is key to building confidence and competency. This includes Infection Prevention and Control (IPC) training, including getting to know risk and mitigation strategies along with technical aspects of donning/doffing. A “Buddy System” helps team members check and reassure each other.
- Implementation of a hotline / web chat / email for questions from EMS personnel provided both “technical assistance” as well as psychosocial support for team members.
- Patients have been effectively reallocated based on bed availability (especially ICU beds). Means of transport used include ambulances, trains, helicopters and fixed-wing airplanes.
- The use of buildings with large spaces to set up “emergency hospitals” proved beneficial. Emergency hospitals should be part of an “existing” hospital (an annex rather than a separate entity).
- Using hotels for “hospitalization” of mild cases or recovering patients proved efficient.

#### To be improved:

- Long Term Care (LTC) facilities are among the most vulnerable locations. Specific pre-hospital and acute care protocols are needed, as transporting LTC patients to a hospital is not always in their best interests.
- As the COVID-19 outbreak declines, social and economic welfare needs increase and new "vulnerable" groups emerge.
- The impact of the long-term scale-down in “regular health care activities”, together with the long-term health effects of COVID-19, on the health needs of the population is still to be understood.
- It is critical to reassure the public that it is safe to call EMS or go to the ER.
- EMS are looking into incorporating “telemedicine” tools to 1) assess patients in home isolation and 2) provide a physician assessment (for services that don't have a physician onboard) to decrease the number of ER transports for patients who could be attended to outside of the hospitals. This requires proper regulatory and financial frameworks.
- In cases where health care systems were overwhelmed by the number and severity of cases, health care workers (HCW) had to make difficult decisions to minimize patient care. A clear

ethical framework and psychosocial support are needed to ease the emotional burden on HCW.

- Emergency management plans (including infrastructure) should be revisited in light of lessons from the first outbreak. The need to have flexible structures (both physical as well as procedural) that allow for easy up and down-scaling are essential. The main challenge at this point in time is scaling up again, in the event of a new peak of patients.
- Health care personnel are not used to working in a “command structure”. This resulted in delays in decision-making and conflicting instructions. “Incident Command” systems used by health care organizations should be adjusted.
- The shift from a “health care emergency” to a “national emergency” in many cases was not foreseen in the crisis management contingency plans, which created a lack of clarity on roles and responsibilities.
- As health care is not a “normal” participant in “crisis management structures”, communication and coordination was sometimes challenging.
- Differences in dispatch protocols between different dispatch centers were a challenge to EMS.
- A ‘hub and spoke’ approach (providing different level of care to different categories of patients) was not always respected. New care paths for discharged patients should be considered to free hospital beds.
- Non-Invasive ventilation uses 4 times as much O<sub>2</sub> as intubation and can impact O<sub>2</sub> storage.
- Rescue services were still working even though organizations had around 25% of staff in quarantine or sick. Having plans to reduce the risk is necessary, including separating workers into “capsules” who do not meet each other, strict disinfection facilities for common work areas, prohibiting joint meals, mitigation plans for the eventuality of large absences and programs to care for sick / under quarantined workers are essential.
- Due to movement restrictions, there were fewer fire and rescue calls. EMS calls reduced in some cases and were normal or higher in others. This creates a major challenge for services whose budgets are based on “reimbursement per service”. The cost of each EMS run increased dramatically (due to PPE costs and the need to pay “overtime” to replace absent personnel). Compensation for EMS services, and a new budget model should be considered.
- Personnel in “high risk groups” required changes to their job assignments. This is especially critical with EMS services with large numbers of volunteers, many of them elderly. The long term impact of career choices and personnel profiles is yet to be understood.
- Should HCW be asked if they would volunteer to work with COVID-19 patients? (In some cases physicians were asked, while nurses not).
- HCW's needs include COVID-19 testing, accommodation, travel requirements, and other needs during isolation.
- HCW, while very cautious with their IPC procedures on-duty, don't necessarily follow the same level of compliance off-duty.
- Many logistics aspects became “bottlenecks” for the operation – consumables supply and storage, “biohazard” waste management being two examples.

- Logistics self-sustainability of providers must be considered along with “critical items stockpiles” at the regional/national level, along with centralized procurement for items like PPE, Oxygen, certain medications, and ventilators.
- COVID-19 requires close monitoring of resources and capacities, and real time monitoring of availability. In a fragmented system like health care, service is often delivered on a voluntary basis with no “systems” to support this (especially as health care is not considered in many cases part of the “civil protection system”).
- Support personnel (such as cleaning staff) often have their needs and concerns overlooked. It is key to look at the whole chain of those involved.
- Disinfection procedures are often harmful to the equipment (such as the use of Hypochlorite solution 5000 ppm).
- Live training have been suspended, as simulation is key in acute care and pre-hospital training. In a reality where COVID-19 is here to stay, training of new providers and scaling up their skills are essential, there is a need for new and safe training methodologies.
- To meet the needs of large numbers of critical care patients, physicians and nurses, who had not been on ICU teams, were trained. The level of their skills should be assessed, a working modality created along with a program to retain skills for a future outbreak.
- HCW need to address emotional aspects to patients, their relatives and the community.
- Stigma and fear sometimes affected the acceptance of HCW by their communities.
- The new path of care for patients (separated “COVID-19 ER”) sometimes created delays in patient care and flow.
- Different response models in the EMS, with some services designating “dedicated COVID-19 units”.
- It is possible that a peak in EMS calls for “respiratory syndrome” is a predictor of a rise in COVID-19 patients.
- Change and better coordination is needed in treatment protocols between health care facilities, with different outcomes for patients. This includes also the need to harmonize the pre-hospital care protocol with the intra-hospital care protocol (e.g. patients who are intubated in the pre-hospital setting, but were not to be intubated according to the hospital protocol).

### **Main issues identified in Challenges and possible solutions for the PSS impact of wearing PPE webinar**

The webinar took place on 9.7.20.

- HCW (Health Care Workers) wearing PPE are going through a process of loss. They experience the sense of losing skills, in some cases skills they worked hard to gain – touching patients, showing empathy – which create barriers to communication. HCW should recognize this loss and the fact they need to process it, in order to come to terms with it and allow the acquisition of new skills needed for this situation. Anger associated with PPE use is sometimes transferred to the patient.
- The working environment of HCW has changed significantly due to COVID-19. Discussing with the HCW the new environment, risks and possible mitigation strategies (especially

those helpful for their peers) is an essential step in supporting them in dealing with this new situation. This discussion should include our "new emotional state" (e.g. while wearing PPE) and reduced personnel challenges.

- COVID-19 poses unique challenges for training personnel for Infection Prevention Control (IPC) measures and the use of PPE (donning and especially doffing), to create trust in their capacities and support them. A special challenge is the "risk group" that requires adaptation.
- HCW often sense fear associated with PPE use of making a mistake, contracting the virus and transmitting it to their loved ones" This fear could be reduced by using a "buddy system" while donning and doffing the PPE. 'Buddy' pairs observe each other donning and doffing to ensure the proper processes are followed. In case of a larger operation, a dedicated IPC officer should be appointed to ensure the proper procedures are followed. This increases the sense of safety of the personnel involved.
- PPE gives a sense of "depersonalization" both for the HCW as well as to the beneficiaries. Strategies used and proposed included:
  - a. "Personalization of the PPE" – writing your name and role on the PPE, attaching your picture to it.
  - b. Requesting "colored PPE" by function "normally used" in Health Care (e.g. blue or green).
  - c. Transparent facemasks could be made available (to be followed up). These masks are especially important while communicating with persons who have a hearing impairment (who assist themselves by lip reading).
- Dedicated "support lines" and systems for HCW responding to COVID-19 / COVID-19 suspected patients have been created. These lines dealt with: a) "technical" questions on COVID-19-related issues (use of PPE, disinfection, etc.) and b) provided "peer support" to the team members.

The role of team leaders has been as critical to team members feeling safe and taken care of. A feeling of support engendered by leaders proved to be a key factor in the ability of team members to keep on providing service despite hardships. The sense of "being taken care of" proved essential to the team morale and required a proactive approach (e.g. outreaching actively to all those at home quarantine, making sure those in quarantine have all their basic needs met). Team leaders needed coaching and support in these roles.

COVID-19 operation is an opportunity to openly discuss the needs of HCW for psychosocial support (PSS), and the appropriate channels to provide it, as the PSS needs are more evident during this crisis where they otherwise may have gone neglected (in many cases by the HCW themselves).

- Clear instructions and training on PPE are key to the sense of safety. One of the challenges during the operation were changes (sometimes frequent) in the guidelines. Providing clear and transparent information on the reasons for changes was essential to maintain trust in the guidelines and to help fight rumors (such as "this change is not to increase safety, but reduce costs").

Protocols on the use of PPE must include factors such as heat stress and recuperation after the use of PPE (hydration), to ensure a holistic safety approach - not just "donning / doffing".

- It is extremely important to understand the beneficiary perception of the PPE, and not to assume we know what the perceptions are. Cultural differences have been observed (in some countries not wearing PPE is considered an "anti-social behavior" while in other countries very few use PPE). At the same time, there are personal differences in the perception of PPE among the public. These may include fear, not understanding why the HCW is threatened by me, or fully appreciating that the HCW is protecting her / himself and me and feeling safer in the interaction with a HCW in full PPE.

The following mitigating strategies have been offered:

- a. It is extremely important to clearly communicate with the beneficiary why PPE is needed, why specific types of PPE are used, and allow time for questions (e.g. beneficiaries may not understand why on TV HCW's wear full suits, while the HCW providing them care is only wearing a mask, goggles, gown and gloves – which might be inaccurately assumed to be reckless).
  - b. Whenever possible, allowing both the HCW and the beneficiary to choose the type of intervention – virtual without PPE, or Face-to-Face using PPE (both by the HCW and beneficiary). The ability to choose has been greatly appreciated by both HCW and beneficiaries, and gives them a sense of control otherwise lost while using PPE. This also allows for recruiting more volunteers, as some will agree only to provide "remote services" (especially volunteers in "high risk groups").
  - c. In longer-term health related interventions, beneficiaries have been offered with the opportunity to wear PPE so they can experience the hardships encountered by HCW. This created a better understanding from the beneficiaries and increased trust.
- PPE use can be associated with sickness/being COVID-19 positive, along with the stigma associated with persons being sick/positive. This is very important for Red Cross/Red Crescent National Societies who are providing services to persons who are "potential cases" (e.g. taking tests – "home sampling" for people under home quarantine), and their family/neighbors see the team arriving with PPE. This might end with a refusal of service, with dire consequences. COVID-19 anti-stigma campaigns should address these issues.
  - Clear guidelines on the rationale of the use of PPE, from the very beginning, preferably for all HCW across sectors, is essential in creating trust and ensuring proper utilization of a scarce resource. Any change in the guidelines must be transparently communicated and explained to frontline responders.
  - Current PPE is cumbersome, hot, and impairs communication and patient assessment. This PPE is based on other outbreaks with pathogens that are close to COVID-19. We need to a) better understand the spread of the virus and adjust the PPE accordingly, and b) design more "user-friendly" PPE that is c) also more environmentally friendly.
  - Shortage in the supply of PPE resulted in competition between different organizations over the limited quantities available.
  - Many instances of counterfeit PPE (items provided does not meet the claimed standards) were identified. Health care services, don't have the capacity to test equipment to verify if it meets the standard. Normally, standard institution-certified laboratories did not have the capacity to meet the demand to validate equipment.

### Challenges/needs:

- To better understand the spread of the virus and adjust PPE and “normal treatment protocols” (e.g. aerosolizing procedures) accordingly.
- Better design of PPE better fit for purpose (specifically for COVID-19).
- To create a system for validation of PPE.
- To maintain the capacity to scale up and scale down the COVID-19 operation as needed.
- Methodologies for acquisition and reinforcement of skills and simulation, in an environment of “social distancing”.
- More environmentally and “equipment friendly” disinfection procedures.
- Addressing HCW fatigue

Statement associated with the use of PPE by HCW(Used as a "problem statement" for the beginning of the webinar, and possible discussion points later)

1. The most frightening part of using PPE is knowing that even a small mistake might end in me being sick and contaminating my beloved ones. (more than 50% of the webinar participants voted for this statement as the most relevant for them)
2. Not being able to use my assessment skills while using PPE is very frustrating for me
3. I'm trained to provide "human care", and while I'm dressed with PPE I feel that I'm scaring my patients.
4. I see everyday patients who need human contact and are deprived of that. Surrounded by people in space suits, often replaced by robots and cameras
5. How am I supposed to communicate with a patient with my mouth covered? This is very stressful for me.
6. Mental health in front line workers- Identify and properly address mental health abnormalities in individuals who are at higher risk.  
Shortage of workers increase working and mental pressure in healthy workers
7. Mental health care for medical staff - Why and what to do when the staff is reluctant to receive psychological help? They say they don't need a psychologist but more rest and PPE
8. Emotional distress among healthcare workers - Ethical obligations, Fear of personal safety and well-being of colleagues and family

### **Main lessons identified in "Use of Isolation Chambers by EMS in COVID-19 Response" webinar**

The webinar took place on 23.7.20.

- There is great variance between EMS systems in the use of Isolation chambers (from no use what so ever, to all confirmed patients should be transported in a chamber, and all the variants in between).
- Isolation chambers were designed to be used for patients whose bodily fluids pose a risk to the HCW (e.g. Ebola patients who are sweating, vomiting and suffer from diarrhea). As this is not the case with COVID-19 patients (contamination spread by droplets from the respiratory tract), most probably, from the risk perspective, there is no scientific evidence to demonstrate the need for transporting COVID-19 patients in isolation chambers.

- Most of the EMS using isolation chambers, do not use them in ground transport (using their own ambulances), but while transporting patients in other means (mainly fixed and rotating wing), the owner of the transportation device, demands the use of isolation chambers in order to "protect the vessel". This is especially true, for aircraft and helicopters, mainly due to the corrosive nature of the disinfection agents and their possible damage to the aircraft's avionics.
- The use of the isolation chamber requires a specific SOP, which includes not just the use of the chamber, but also the specific roles and actions of each team member. The team has to be trained in those procedures.
- Preparing a patient for a transfer in an Isolation Chamber is a time consuming processes (reported more than 2 hours down to about 54 minutes with a highly trained team).
- A specific "checklist" for transfer of patients using an Isolation Chamber has been developed. The checklists cover all the aspects (including informing the relatives and having their consent to the transfer).
- The checklist has some specific considerations:
  - a. Type of patients to be transferred (only stable patients, as medical interventions are not possible while the patient is encapsulated in the chamber).
  - b. Only sedated patients to be transferred in the chamber, to avoid the "claustrophobic" feeling while being in the chamber.
  - c. Sedated patients required higher doses of medications (mainly in airplanes)
  - d. What are the drugs to be used during the transfer (out of the many a patient could be receiving at the ICU)
- If the means of transportation are other than ambulances (from one hospital to the other), the coordination should look into the whole cycle – from hospital to the means of transportation (train, aircraft), and from the means of transportation point of arrival to the admitting hospital (e.g. police escorts, ambulances at the destination etc.).
- As the EMS crew is in contact with the patient, even if Isolation Chambers are used, the EMS crew still has to use PPE (in accordance with the EMS local SOP).
- Protecting and disinfecting the equipment used to transfer COVID-19 patients is a major issue, as many disinfecting agents damage the equipment.
- While considering the use of Isolation chambers, the following issues should be considered:
  - a. The "general public" perception, who witnessed the isolation chamber being used.
  - b. The safety of the patient and of the team while using the chamber.
  - c. The impact on the emotional wellbeing of the patient transferred in the Isolation Chamber.
  - d. Time and effort associated with the use of the Isolation Chambers.
  - e. Disinfection of the Isolation Chamber (where and by whom, as many EMS systems will consider this as a HAZMAT operation).

**Needs:**

- Research on the spread of the COVID-19 and the protection needed, including ventilated patients.
- Harmless and more environmentally (and equipment) friendly disinfection agents.

- Discussion with the aviation industry on the transport of COVID-19 patients in air vessels, the risks and mitigation.

### **Main lessons identified in the "Innovative Disinfection Technologies" webinar**

The webinar took place on August 27<sup>th</sup> 2020

#### **A. Background:**

- The COVID-19 virus is a highly contagious pathogen that created the need to frequently disinfect equipment and surfaces, to eliminate the risk of the COVID-19 transmission touching “contaminated surfaces”. At the early stages of the COVID-19 pandemic, surfaces were sprayed as often as after each contact with a suspected patient or as a minimum every 8 hours. As per standard IPC (Infection Prevention Control) procedures, the standard solution used is Sodium Hypochlorite (NaClO) 0.1% (for suspected cases) and 0.5% for confirmed cases.
- The frequent use of Sodium Hypochlorite resulted in damage to the vehicles and equipment, manifested mainly in electric cables and metallic surfaces (with significant rusting).
- Sensitive equipment (as electronic equipment) cannot be disinfected using Sodium Hypochlorite, so Isopropyl Alcohol 70% was used to wipe the equipment.
- The objective of the webinar was to present new technologies, more friendly to the equipment, and to the environment.

#### **B. Main issues observed:**

- An important lesson observed is that "traditional" disinfection methods employing high concentrations of bleach – when used with high frequency – are harmful to equipment and vehicles. They are also not environmentally friendly. Health care organizations (intra-hospital as well as pre-hospital care) are looking to different global providers for innovative disinfection solutions.
- There is no clear international standard (known to the consortium members) that defines the effectiveness of cleaning. e.g., if a provider claims that the product “eliminates 98% of the pathogen” – is this good enough?
- What is the standard test used to determine “percentage of pathogen eliminated” (so different products can be compared)?
- What is the standard used to determine long term safety to human beings exposed to the residuals of the material without PPE (with different vulnerabilities, such as underlying medical conditions, pregnant women, children)?
- What is the standard used to assess the long-term impact on equipment (different types of equipment), considering frequent use of the product/technology?
- Are there any specific disinfection requirements due to specificities of the SARS2 – COVID-19 pathogen?
- Masks and other PPE are being reused without disinfection, putting worker health and safety at risk and increasing the spread of COVID-19 and other pathogens.

- Disinfection of N95 masks damages the elasticity of the mask, impairs fitting to face structure, and reduces the effectiveness of the mask.
- Proper re-use of masks and other PPE currently entails processing away from the using unit (Potential spread of infection during handling, workers do not necessarily get their own mask back- reduces work compliance).
- Air Purification systems not utilized or effective in hospital environments.

### **Main lessons identified in "COVID-19 operation - Emergency Call Centers and Operations Centers" webinar**

The webinar took place on 13.8.20.

- Call takers and dispatchers need psychosocial support, as they are dealing with people who are sometimes at high stress, may become verbally aggressive. Others are dealing with guilt as they feel they have "exposed their colleagues to a positive case".
- Stigma plays a major role while people are calling for help, including delays, request for EMS personnel "not to be seen" (e.g. meeting the ambulance away from the actual home). Stigma and fear might interfere with processing the needed data from the caller.
- EMS systems have seen delays in the calls for help, even in critical situations (stroke, heart attacks), due to the public afraid of interacting with health providers and facilities.
- EMS organizations are looking for alternative solutions, to reduce the "patient – health care provider physical interactions" and unnecessary transportation to hospital, mainly using telemedicine.
- Having a designate "COVID-19 Point of Contact" at the PSAP and EMS field crews, proved to be efficient and leads to better communication and coordination.
- Call takers would instruct the caller to ensure that the patient and those on scene wear a mask before the ambulance arrives (to the degree possible).
- Protocols minimizing the personnel at the dispatch agency to essential personnel only (no visitors), and separating the personnel into groups ("working capsules") are essential.
- Physical social distancing (including not allowing joint meals for example), increased hygiene protocols have been put in place.
- Disinfection of electronic equipment in the PSAP is a challenge as agents like Sodium Hypochlorite in high concentration will be harmful to the equipment.
- PSAP (Public Safety Answering Points) organizations have contingency plans, for the eventuality of an "outbreak among PSAP staff". These contingencies will include:
  - a. Having a roster of personnel who recently left (e.g. retired).
  - b. Having a roster who are reassigned to other public safety jobs (field positions, promoted).
  - c. A different shift pattern (sometimes reducing staffing when possible).
  - d. Having "backup" facilities, to be used in case the "main facility" has to be disinfected.
  - e. Having the IT system that allows call reception by call takers situated away from the PSAP (e.g. personnel working from home).

- PSAP have seen a very significant increase in the calls, as other "hotlines" set up to deal with the public inquiries, were overwhelmed or not prepared to deal with the volume of calls ("No system will be able to deal with the calls from 5 million worried citizens"). PSAP had to take a clear policy on how they would deal with the "none emergency COVID-19 calls". A variety of policies were identified – from "we answer all calls" on one side of the spectrum, to "if it is not an emergency it is not a PSAP issue". Mitigations organizations used:

- a. Using technology to help prioritization of incoming calls (IVR – boot)
- b. Set up of "dedicated COVID-19 call centers" staffed by none emergency medical dispatchers (e.g. volunteers).
- c. Create a "home care system" that can provide answers.
- d. Liaise with the other agencies that have the capacity to answer the need
- e. Have updated information that allows answering simple queries (and needs) easily.

- Most of the "COVID-19 calls" are for information, worried persons, etc. Providing clear, concise and updated information, along with providing guidance and reassurance to the caller are the most important features of those calls. Psychosocial support to the callers is Key. Constantly updating the information, and disseminating it to all those who respond to the calls is a challenge.

For the future we must understand what are the most effective means of interaction with the public and different groups in the public (as for example – not everyone is on social media), to create alternative means of effective two way communication with the public (the public needs an interaction, not just one sided information).

- All incoming emergency calls are triaged for "possible COVID-19".

Screening criteria includes:

- Travel history
- Sign and symptoms (fever / respiratory syndrome / some include others as loss of taste and smell)
- People under quarantine, living in the same household with a confirmed patient
- Testing history

In some organizations AI is used to search for "keywords" in the dispatch log. In some organizations, if the call goes above a certain threshold an alert will appear on the responding unit screen (in any case, dispatchers are instructed to alert the responding team on the identified possible COVID-19 risk on the scene).

"COVID-19 calls" must be triaged by a medical emergency call taker, as the layperson cannot tell a "respiratory distress" from "COVID-19 symptoms", this will be even more important during seasonal influenza period.

- Some organizations use "site specifics" as a risk factor, specifically, any case in a long term health care facility will be considered as a COVID-19 risk.
- PSAP organizations have seen a high incidence of cyber-attacks (considering the rise in cyber-attacks globally during the COVID-19 outbreak). These implied heighten cyber security protocols.
- PSAP organizations had difficulties bringing parts of equipment (e.g. radios, computers), which is normally brought from abroad, due to the almost shut down of air traffic. This implies thinking of "PSAP critical equipment stockpile".

- EMS organizations should look into their contingency plan in case of a radio outage (e.g. due to the need to shut down a dispatch center), and consider alternative communications options.
- Coordination with admitting health care facilities became a challenge (for COVID-19 and None COVID-19 patients, due to the need to screen patients at the hospital triage). Integration of C4I systems that have real time information on beds availability was very important to help on this.
- Having a C4I system at the PSAP that allows sharing real time information with all the relevant stake holders, increases dramatically the situational awareness of the PSAP (especially when it comes to sharing real time information with public health that are not part of the "regular" PSAP partners).
- EMS COVID-19 dispatches should be differentiated between:
  - Emergency calls, with the patient involved being "suspected/confirmed COVID-19" (these calls are not limited to home calls, as persons not respecting home quarantine, or unaware of their condition can be involved in emergencies outdoors, trauma, and even drowning).
  - Transfer of confirmed cases to and from a hospital and other health care facilities (usually none – urgent transfers).Many EMS have created a separated system for the COVID-19 transfers, with dedicated personnel, resources and a different dispatch system.
- Constant review of protocols, necessary updates and briefings of personnel are essential. Personnel must be aware of the reasons for the changes in protocols (in order to ensure their confidence in the instructions they receive).
- PSAP activated their "crisis management protocol" to run the operation. Increasing response capacity is a major challenge (personnel, IT equipment and the needed software).

### **Main lessons identified in the "Silent Hypoxia and the Use of Pulse Oximetry for COVID-19 Patients in the Pre-Hospital Setting" webinar**

The webinar took place on 29.10.20.

#### A. Background:

- Hypoxia – lack of Oxygen in the tissues (Hypoxemia – lack of Oxygen in the blood), is a life threatening condition
- Direct measurement of the Oxygen requires a blood test (gases in the blood). An assessment of the oxygenated blood can be achieved using a technology called Pulse Oximetry (very sensitive to color)
- As per WHO standards – a COVID-19 patient with Pulse Ox of 94% and below is seriously sick
- **As per the textbook – Hypoxia is clinically manifested**
- During COVID-19, a growing body of evidence on patients who don't feel very sick, and are apparently well in a preliminary evaluation, but have low O2 saturation (some time as low as 80%). This phenomenon is called "**Silent Hypoxia**" (as there is very little clinical presentation of the Hypoxia), or "**Happy hypoxia**" (as the patients seem happy despite being hypoxic).

B. Main issues observed:

- Health Care Workers (HCW) must be familiarized with "silent hypoxia", as this is a potentially life threatening condition. Training must include the proper use of pulse oximetry.
- Assessment of possible / confirmed cases requires modified skills that have to be created among responders (with the limitations of simulation in a social distancing environment, creating major challenges to those training).
- While for some EMS Pulse Oximetry is considered as a basic vital sign to be obtained by BLS (Basic Life Support) personnel, this is not the case for all the services. (Introduced in the past, to support care for patients who need their saturation level within a certain range of parameters (as Acute Coronary Syndrome, Stroke, some trauma patients).
- Though Pulse Oximetry is a simple and very useful technology, EMS personnel has to be well trained in its use, and possible pitfalls due to issues around the way the reading is obtained, issues with the device, external temperature, color of the finger nail etc.
- Commercially available pulse oximeters, while being accessible to the general public as per their low price, does not always meet a good quality standard.
- Though the limitations of pulse oximetry with regards to the accuracy of the reading are well known they are mainly around the lower spectrum of readings, thus have little impact on the decision making (no real difference in the decision for a patient with Sat O<sub>2</sub> 84% and for the one with 78% in the pre-hospital setting).
- For patients suspected / confirmed as COVID-19 patients, Pulse Oximetry has proven as a very useful tool to assess the severity of the patient's condition.
- Pulse Oximetry (together with temperature measurement and report on sign and symptoms) has proven as very useful for long distance monitoring of patients staying at home, after an initial assessment and training by a physician (reducing the need for direct physician – patient contact).
- Having patients equipped with pulse oximeters at home, increases the confidence of family members in their capacity to handle the situation and the sick person.
- Having patients at home with pulse oximeters, provides health care providers with an important decision making tool for their treatment decisions.
- Due to the difficulty to properly auscultate patients while wearing PPE, HCW rely more and more on pulse oximetry to assess patients. Saturation becomes a key parameter in the triage of suspected/confirmed COVID-19 patients, and their categorization into the appropriate referral path.
- Some patients have rather normal saturation while in rest. It is advised to ask the patient to engage in minimal effort (e.g. short walking around). Some patients present a dramatic drop in saturation following this minimal effort (a very important indicative sign for patients with "silent hypoxia").
- More scientific research as needed:
  - a. To better understand the pathophysiology of the syndrome (though there are some possible explanations, e.g. that since the onset of the hypoxia is gradual, the receptors "get used" thus does not activate "emergency respiratory response mechanisms" until a very late phase of the situation).

- b. A better understanding of the epidemiology of "silent hypoxia" (e.g. prevalence, reports it is more frequent in elderly patients).
- c. The relation between alteration in cardiac functions and respiratory functions has to be studied further, e.g. the origin of chest pain complaint of COVID-19 patients (cardiac or hypoxic) (a study conducted by BioBeat, on 500 COVID-19 patients, points out the alteration in cardiac function comes first).
- New remote sensing (telemedicine) of several parameters, with wearable devices, allow for 24/7 safer monitoring of patients. These tools are also useful for the monitoring of the wellbeing of responders using PPE.
- "Traditional telemedicine" (a video chat with the patient), with the patient might be misleading, as the patient may have minimal complaints and seems clinically rather well. Best practice: Self-monitoring of pulse oximetry by patients. These recommendations could be considered as recommendations for primary health care providers as well.
- In order to have better decision making based on saturation, more index should be developed. The prehospital SpO<sub>2</sub>i/RRi ratio needs further investigation because it might help to identify non-clinically obvious ARFs (Acute respiratory Failure) and correlation with severity
- COVID-19, highlighted that clinical decisions on the field with regards to the treatment given to a patient, are influenced by the availability of resources in the health care chain. Besides the ethical implications, real time coordination mechanisms, tools and technology should be studied.
- As high flow Oxygen therapy is considered of high risk for the HCW (potential spread of aerosol), new technologies for the pre-hospital setting, especially for the crowded back of an ambulance should be studied. High flow Oxygen therapy and other none-invasive ventilation, are key, as the prognosis of these patients is better than that of those mechanically ventilated. The risk to the HCW and the precautions taken should be taken into consideration while taking these decisions.
- As the use of pulse oximetry at home is becoming more and more popular, along with 24/7 monitoring of other clinical parameters, data management tools and technologies will be needed, especially due to the cases of "false alarms" of cheap devices.

## Work Package 5 - Education and training of personnel and volunteers

### Research and Innovation monitoring

- <https://ifrc.csod.com/client/ifrc/default.aspx>: Online training platform of the IFRC, offering short courses and peer-to-peer learning paths for free.
- Proposed QUICK WIN: WHO Academy App: A COVID-19 Resource for Healthcare Workers  
The WHO Academy's mobile learning app was developed specifically for health workers and is designed to enable them to expand their life-saving skills to battle COVID-19.

### Areas of Main R&D Gaps

- During COVID-19 pandemics, personnel suddenly also needed training in specific ICU-skills such as lung protective ventilation, prone positioning. Courses and training activities must be developed and delivered to all personnel in an efficient and quick way

- During COVID-19 pandemics, live trainings have been suspended. In a reality where COVID-19 is here to stay, training of new providers and scaling up their skills are essential, there is a need for new and safe training methodologies.

### **Requirements to fill Capability Gaps**

- During COVID-19 pandemics, the majority of healthcare workers were responding to a large-scale public health emergency for the first time. Most of healthcare workers never studied disaster medicine or global health in medical or nursing schools, thus missing important concepts and skills to be applied during a big scale emergency. Disaster medicine, operational public health concepts and population-based health management concepts must be addressed already in medical and nursing schools.

### **Priorities as regards standardization**

- The rapid insurgence and spread of COVID-19 generated an immediate need of training and education of all the healthcare personnel working in the hospital receiving COVID-19 patients. Ad hoc curricula need to be developed and appropriate ways of delivering the training need to be suggested

### **Best practices and Lessons Learned**

#### 1) Reallocation of personnel and related training

The reallocation of personnel to ICU, ED and COVID-19 wards created the sudden need for training and education. Some lessons learned and best practices were identified:

- In UZ- Brussels hospital every department is responsible for organizing their own training, specially designed for the needs of that department. In the ED the principle of just in time training was applied, which seemed to be good approach.
- “crash courses” are developed for personnel being reallocated to the ED:
  - o COVID-19 for beginners
  - o Handling PPE
  - o How does the ED work?
  - o Working with the electronic medical records of the ED
  - o Prevention and Control training
  - o Risk mitigation strategies

#### 2) Crash courses for hospital personnel

COVID-19 was associated with some specific needs and practices. The following “crash courses” for own personnel focused on those special needs were selected as best practices:

- o Difficult airway
- o Principles of invasive ventilation
- o Principles non-invasive ventilation
- o Lung protective ventilation

#### 3) Advanced care planning

Given the immense burden of Covid on the hospitals, it's very important to address advanced care planning very early. This should be a multidisciplinary initiative and the personnel needs to be adequately trained and informed.

#### 4) EMS

Very specific training needs:

- Training in PPE and how and when to use which PPE in order to keep our fast car as clean as possible
- Disinfection of fast car

- Airway management in the prehospital scene and how to handle a difficult airway
- How to handle all medical devices and how to clean them
- Training in advanced care planning and mental well-being were very important in the prehospital setting.

5) Healthcare staff should be better prepared for the crisis management. Training is fundamental, not only on how to protect themselves, but also on how to react and to respond to difficult situations, how to expand the hospital surge capacity, how to triage patients at the admission and how to triage patients to decide who needs ICU, who needs intubation and who doesn't.

6) The medium matters. "Just in time" training is useful for personnel and daily briefings, delivered digitally/remotely (possibly by using the tablets used for patient records). Online trainings and webinars proved to be effective tools for updating knowledge and staying in touch with personnel. Personnel prefer "human interaction" (e.g., teleconferencing) to reading documents.

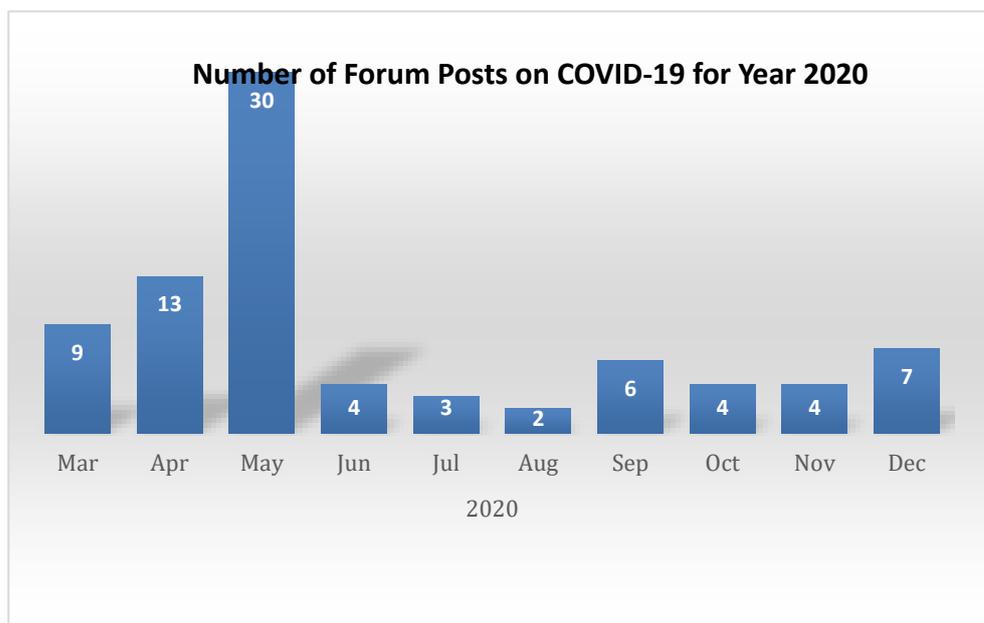
7) The volunteers contributing to the system (including MDs and nurses) need to be managed well, to receive Psychosocial Support (PSS) and training on PPE use.

8) Lessons learned on Just in Time Training collected during joint activity with other CSA projects available here: <https://www.practitionernetworks.eu/just-in-time-training/>

## Work Package 6 – Innovation monitoring and uptake

### Research and Innovation monitoring

For the past year, COVID-19 has been key focus across all WPs. On the NO-FEAR portal, over 80 posts related to COVID-19 has been posted on the NO-FEAR portal's forum with topics ranging from Prehospital EMS Readiness to research and field findings on COVID-19. In addition, NO-FEAR has been collaborating with multiple sister projects, for example PROACTIVE (<https://proactive-h2020.eu>).



2020 was marked by rapid emerging of PPE (personal protective equipment) designated for pandemic response, tools for airway management, “internet of medical device”, remote medicine and alternative training approaches. All these led to the growth of these relevant markets, whereas others, like disaster medicine were neglected, due to lack of interest, budget or relevance.

It is expected that as the pandemic becomes controllable in the following years, the market will return to its previous trends. However, new and promising trends like remote medicine and virtual reality-based training are here to stay and will gain momentum in their development.

#### Cross-Platforms Synergy:

Work is ongoing for the advancement of the API for these three platforms No-Fear, Stair4Security (<http://cen-stair4security.eu>) (aggregator) and Encircle (<https://www.encircle.eu>). Presently, Encircle and Stair4Security can communicate and as proof of concept has been derived. Project Proactive have now expressed interest. Focus now turns to the development of the API. The API

will exist within an ecosystem that is designed to support practitioners with regards to standardization and better practices that work for them.

## Research and Innovation projects monitoring

### COVID-19/ pandemic related

#### Population Health Information Research Infrastructure, PHIRI

Grant agreement ID: 101018317

Status Ongoing project Start date 1 November 2020 End date 31 October 2023

Coordinated by SCIENSANO, Belgium

**Objective:** A structured European mechanism for COVID-19 exchange to organize and share information between countries is urgently needed, especially in the area of population health. Information on the broader impacts of COVID-19 on the health of populations is needed to facilitate multidisciplinary European research and underpin decision making. PHIRI aims to facilitate and support open, interconnected, and data-driven research through the sharing of cross-country COVID-19 population health information and exchange of best practices related to data collection, curation, processing, use and reuse following ELSI and FAIR principles. It has the objective: to provide a Health Information portal for COVID-19 with FAIR catalogues on health and health care data, to provide structured exchange between countries on COVID-19 best practices and expertise, and to promote interoperability and tackle health information inequalities.

#### The European watch on cybersecurity privacy, cyberwatching.eu

Grant agreement ID: 740129

Website: [Cyberwatching](https://cyberwatching.eu)

Status Ongoing project Start date 1 May 2017 End date 31 July 2021

Coordinated by TRUST-IT SERVICES LIMITED, United Kingdom

**Objective:** "cyberwatching.eu addresses the DS-05 call by defining and promoting a pragmatic approach to implement and maintain an EU Observatory to monitor R&I initiatives on cybersecurity & privacy, throughout EU & Associated Countries. These initiatives will be clustered, with a cluster tool, and themes identified, leading to an online catalogue of services for cybersecurity & privacy, showcasing market uptake and advancing EU sustainable competitiveness. A supply & demand marketplace of EU cybersecurity products & services, as well as the inclusion of an end-users' club, ensures that perspectives of SMEs as well as other relevant stakeholders are properly taken account of. Ultimately, a cybersecurity & privacy ecosystem will be created, offering prime and guided access to the cyberwatching.eu catalogue of services & marketplace & ensuring feedback in terms of effectiveness & usability of research results.

#### An INtegrated next generation PREParedness programme for improving effective inter-organisational response capacity in complex environments of disasters and causes of crises, IN-PREP

Grant agreement ID: 740627

[Project website](#)

Status Ongoing project Start date 1 September 2017 End date 28 February 2021

Coordinated by INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS, Greece

**Objective:** European countries confront the rising specter of transboundary crises, which cross national borders as well as policy boundaries with speed and ease, threatening the continuing functioning of critical infrastructures and the well-being of many citizens. Transboundary crises pose a specific set of complex challenges for which Europe is – despite recent policy initiatives (e.g. Decision No 1313/2013/EU) – still ill prepared. We recognize three challenges that need urgent attention. First, member states need to develop **shared response planning**. Second, **countries need to share information in real time**. This sense-making challenge requires a way to have multiple countries and agencies create a shared picture of an emerging crisis based on multiple sources (different countries, many agencies). Third, countries need to coordinate the use of critical resources to ensure a timely response and to avoid waste and misspending. These challenges are hard to meet in any type of crisis or disaster, but especially in a transboundary context that lacks a dominant actor. IN-PREP will establish and demonstrate a next generation programme by enabling a reference implementation of coordination operations (Handbook of Transboundary Preparedness and Response Operations that synthesises the lessons learnt, recommendations, check-lists from past incidents) and a training platform (Mixed Reality Preparedness Platform a novel IT-based tool, which holistically integrates Information Systems (IS) and Situational Awareness (SA) modules over a decision support mechanism and the visualisation of assets and personnel) to the entirety of civil protection stakeholders (firefighting units, medical emergency services, police forces, civil protection units, control command centres, assessment experts) to meet these challenges. The proposed framework will not only improve preparedness and planning but can be also applied during joint interventions, thus improving the joint capacity to respond.

### [EpiShuttle: Isolation and Transportation of Infectious Disease Patients, EpiShuttle 2.0](#)

Grant agreement ID: 848951

Status Ongoing project Start date 1 May 2019 End date 31 October 2021

Coordinated by EPIGUARD AS, Norway

#### **Project description:** A safe solution for infected patients

Infectious disease outbreaks are responsible for thousands of deaths globally. The travelling patterns of our modern society further increase the health, economic and security risks associated with such outbreaks. Specialised isolation units (SIU) were developed by EpiGuard, comprising a group of medical doctors who laboured to contain Ebola infection. They came up with the EpiShuttle solution after three years of research – a one-person, hard-top (polycarbonate), reusable SIU. Under the EpiShuttle 2.0 initiative, EpiGuard aims to combine modern gas disinfection technology with EpiShuttle to make their technology cost-effective and applicable for the wider global market worth billions of euros.



This project has received funding from the European Union's Horizon 2020 programme, under grant agreement no. 786670

## **Not COVID-19 related**

### **Law Enforcement agencies human factor methods and Toolkit for the Security and protection of CROWDs in mass gatherings, LETS-CROWD**

Grant agreement ID: 740466

[Project website](#)

Start date 1 May 2017 End date 31 October 2019

Coordinated by ETRA INVESTIGACION Y DESARROLLO SA, Spain

**Objective:** LETS–CROWD will overcome challenges preventing the effective implementation of the European Security Model (ESM) with regards to mass gatherings. This will be achieved by providing the following to security policy practitioners and in particular, LEAs: (1) A dynamic risk assessment methodology for the protection of crowds during mass gatherings centred on human factors in order to effectively produce policies and deploy adequate solutions. (2) A policy making toolkit for the long-term and strategic decision making of security policy makers, including a database of empirical data, statistics and an analytical tool for security policies modelling, and (3) A set of human centred tools for Law Enforcement Agencies (LEAs), including real time crowd behaviour forecasting, innovative communication procedures, semantic intelligence applied to social networks and the internet, and novel computer vision techniques. **LETS-CROWD will be a security practitioner driven project, fostering the communication and cooperation among LEAs, first responders, civil protection and citizens in the fight against crime and terrorism during mass gatherings by a set of cooperation actions.** The project will put citizens at the centre of the research and will assess and evaluate how security measures affect them, and how they perceive them, while respecting EU fundamental rights. LETS-CROWD impact will be measured under practical demonstrations involving seven LEAs and relevant emergency services units. In order to facilitate the assessment of the performance, transferability, scalability and large scale deployment of these solutions, the demonstrations will be conducted following eleven use cases.

### **Innovation activity to develop technologies to enable a pan-European interoperable broadband mobile system for PPDR, validated by sustainable testing facilities, BroadWay**

Grant agreement ID: 786912

[Project website](#)

Status Ongoing project Start date 1 May 2018 End date 30 June 2022

Coordinated by PUBLIC SAFETY COMMUNICATION EUROPE FORUM AISBL, Belgium

**Objective:** The BroadWay project will take the first procurement steps to enable 'interoperable next generation of broadband radio communication systems for public safety and security' to improve Public Safety and Disaster relief organisation's (PPDR's) service to Europe's citizens, and enhance interoperability across borders. The primary goal of this project is to: 'Procure Innovation activity to develop and demonstrate TRL8 technologies that will enable a pan-European interoperable broadband mobile system for PPDR, validated by sustainable testing facilities' This project implements a Pre-Commercial Procurement (PCP) with the purpose to realise innovative solutions for the implementation of the 'SpiceNet Reference' architecture as defined by the BroadMap project. A pan-European pilot system will be developed within the timeframe 2021, validated by sustainable test capabilities, and to the satisfaction of a European wide team of public safety

practitioners. The BroadWay partnership is comprised of 11 buyers in 11 countries, who represent the organisations with responsibility for transition to broadband for Public Safety Communication within their country. All buyer partners are from EU member states. 4 are the direct responsible Ministry within their country, and 7 are the delegated authority in their country, responsible to operate public safety communication networks. Our buyers represent the operation of public safety communication for 1.4 Million public safety practitioners in their respective countries. 49 practitioner organisations from a total of 19 countries have offered to take part in the pilot validation/evaluation activities as members of our Practitioner team. A total of 60 additional organisations have expressed their support for the BroadWay project. The BroadWay team, plus this additional support, covers a total of 23 European Countries with 7 additional countries represented by their ministries responsible for public safety communication.

### Areas of Main R&D Gaps

More attention will be given to quality assurance systems. Medical device manufacturers will be required to hold and maintain robust and vigorous QC/QA systems to ensure that the produced medical devices will maintain high standards of quality. In the previous report it is pointed at the fact that end users might look for cheaper products produced faster. As longer QMS processes will make the price higher and the overall process longer, it is of great importance if the quality assurance systems are more streamline and efficient.

Below is the summary of the research focus of the various WP of NO-FEAR:

- **WP3:** Transport and transfer of patients from scene to hospital. In addition, further focus has been placed on COVID-19 Hospital Response, e.g. Optimization of symptomatic treatment procedures and vaccinations.
- **WP4:** A number of topics have been addressed in relation to COVID-19, including PPE, innovative solutions for disinfection methods and risk assessment.
- **WP5:** Investigate of the needs, gaps and lessons learned to advance face-to-face learning in small groups and large conferences, live demonstrations and exercises to a virtual distance learning approach. In parallel, WP5 will continue analyzing Just-in-time training techniques applied to the COVID crisis, as a continuation from the past months.

### Requirements to fill Capability Gaps

Ongoing email, social media, platform updates has been conducted to engage with the SANE and PDPM networks. In addition, multiple webinars requesting input from suppliers regarding possible solutions has been proposed.

## **Priorities as regards standardization**

European Union Medical Device Regulation (EU MDR) readiness has dominated medical device manufacturer's focus recently. For a manufacturer, authorized representative, importer, or distributor of medical devices in the EU, compliance is required. Recently, the European Council voted 27–0 to adopt an amendment to delay the application of the Medical Devices Regulation by one year. EU MDR, originally scheduled to go into effect on May 26, 2020, will now take effect on May 26, 2021.

## **Best practices and Lessons Learned**

Work is ongoing for the advancement of the API for three platforms NO-FEAR, Stair4Security (aggregator) and Encircle. Presently, Encircle and Stair4Security can communicate and a means of proof of concept has been devised. The Proactive project has now expressed an interest to join the engaging projects. Our focus now turns to the development of the API for these platforms. The API will exist within a better practice ecosystem that is designed to support the practitioners with regards to standardization and better practices that will work for them.

Furthermore, several meetings and discussions were held with the WP4 Leader as well as the active members of T6.6 (TFC and NEN) with regards to supporting the ongoing work in this work package. Three mini projects were identified for development and additionally are being worked on:

1. Standardization gap analysis
2. Lessons learnt analysis
3. Vaccination Better Practice

### **Standardization Gap analysis:**

Based on the initial work by NEN on the acute care of the patient across three primary Operation pillars 'Onsite, Transport, Hospital', a presentation to the WP4 team was given in. Feedback was received from a number of participants at the meeting. More work is needed to advance the development of the standardization gap analysis. A start has been with linking the project findings (gaps, needs, lessons learned etc.) to the mapping tool. One of the objectives of the tool is to structure project findings and therewith facilitate uptake by the standardization community (new standard, amendments existing standards, other standardization deliverable). Additionally, extending the tool to other stakeholders is considered. Work is ongoing and further meetings are planned to advance this work.

### **Lesson learnt analysis:**

Based on initial discussions with the WP4 Leaders it was determined that much benefit could be derived from an analysis of the lesson learnt reports arising from the several workshops undertaken in this work package. It is believed that some of the findings will identify the need for a new standard or possibly an amendment to an existing standard. It is also believed that some the findings might

need to be directed to the WHO. The CEN TC391 chairperson was invited to join the network and, in her capacity, going forward will liaise directly with NO-FEAR.

**Vaccination Better Practice:**

This is an area that was identified that would benefit from the development of a better practice guide and will be looked at going forward.

In addition to the above-mentioned discussions, T6.3 members have looked into the market analysis for emergency organizations.

**Market Analysis:**

Emergency organizations manage a steady budget for procurement, training, operations and development. However, the pandemic pushed the EMS, rescue, military and hospitals to a rapid budget shift that is mainly focusing on COVID-19 response. This is not a “fashion” change, but an emergent necessity to continue operations under the circumstances. In general, the Medtech market occupies a challenging but opportunity-rich space in 2020-2021. Increased demand, new product types like digital health and software as medical device (SaMD), and promising market growth projections bode well for device makers. To fully capitalize on the market opportunities and for the preparation to meet the challenges of an evolving industry in 2020, companies will need to be nimble and innovative. To achieve those aims, digitizing quality and production systems offers stakeholders a pathway to reduce the cost of quality, improve regulatory preparedness and increase manufacturing efficiency.

Table of the Webinars delivered

TITLE	DATE	SCOPE	SPAEKERS
Hospital organization: COVID-19	June 3, 2020	The objective of the webinar is to share experiences and lessons learned of hospitals globally, on their COVID-19 response, and the way hospitals or changing the work environment in order to improve our current and future operations.	SAMUR PC <ul style="list-style-type: none"> <li>• Hospital 12 de Octubre Madrid</li> <li>• CREMIDEM</li> <li>• Policlinico Gemelli</li> <li>• SAMU - AP-HP – France</li> <li>• University Hospital Brussels – Universitair Ziekenhuis Brussel</li> <li>• Israel: Ministry of health, Man power management, Mechanical ventilation decision making</li> </ul>

<p><b>Nursing homes and COVID-19 – learning day by day</b></p>	<p>June 4, 2020</p>	<ul style="list-style-type: none"> <li>- provide an overview of the response and activities performed with regards of nursing homes</li> <li>- share experiences and solutions with relevant stakeholders</li> <li>- outline ethical/societal/psychological implications</li> </ul>	<ul style="list-style-type: none"> <li>- Peter Daly, Chief Emergency Management Officer at HSE Ireland</li> <li>- Catherine Bertrand, specialist in Anesthesia and Intensive Care from AP-HP, France</li> <li>- Natividad Ramos MD, supervisor in SAMUR Protección Civil, Madrid</li> <li>- Giulia Trentino, responsible for purchases, Policlinico Italia, Italy</li> </ul>
<p><b>Just-in-time training: a joint live webinar on best practices and methodologies in the medical, flood response and CBRN fields</b></p>	<p>June 18 2020</p>	<p>Five pan-European networks of security practitioners presented top keynote speakers with different backgrounds, providing insights and first-hand experience obtained during real disaster events.</p>	<p>Luca Ragazzoni, (CRIMEDIM); Zsolt Kelemen, Head of the EUSDR PA5 Disaster Management Working Group; Elizabeth Benson Police Inspector, Head of Performance Development at West Midlands Police</p>
<p>EMS operations: lessons learned</p>	<p>June 23, 2020</p>	<p>The objective of the webinar is to share experiences and lessons learned of EMS providers globally, on their COVID-19 response, in order to improve our current and future operations.</p>	<p>I-procure Security Project, International Association of Fire Chiefs Fire Chiefs, SAMU RN – Santiago, Chile, London Ambulance Service, SAMUR P.C, Madrid, University Hospital Brussels – Universitair Ziekenhuis Brussel, Bavarian Red Cross, Magen David Adom, Israel</p>
<p><b>INTERVIEW: 'Meet the Experts', COVID-19 series: Convalescent Plasma Treatment for COVID-19 Patients</b></p>	<p>Added online on July 29, 2020</p>	<p>Explaining and share the use of plasma in infectious diseases as well as in COVID-19 pandemic; Have an overview of the ongoing clinical trials</p>	<p>Prof. Gina Zini, MD, PhD is Associate Professor and Director of the Cord Blood Bank at Catholic University of Sacred Heart, as well as Director of the Blood Bank at Fondazione Policlinico Universitario A. Gemelli IRCCS.</p> <p>Interviewed by Prof. Sabina Magalini, MD, Senior Surgeon of the Emergency and Trauma Surgery Unit at the Fondazione Policlinico Universitario A. Gemelli IRCCS and Assistant Professor of Surgery at the</p>

			Rome Catholic University School of Medicine.
Working in PPE and PSS	July 09, 2020	During the COVID-19 pandemic, the use of PPE by health care providers has increased dramatically, changing the work environment and the ways of communication with the patients. It also had an impact on the level of care provided to the patients. In this webinar, practitioners shared and discussed their experience of using PPE, and what mental implications it might have for them, for their close ones, and for the patients.	Psychosocial Support Center, Red Cross Red Crescent Magen David Adom, Israel
COVID-19: use of isolation chambers for EMS transports	July 23, 2020	Isolation chambers and transportation equipment was in use during the COVID-19 pandemic, mainly when there was a need to transport confirmed COVID-19 patients. Many organizations use various types of isolation chambers for transportation of patients, and in this webinar, their experience during the pandemic was presented, focusing on the needs and gaps the use of this equipment brings.	Philippine Red Cross, SAMU RN – Santiago, Chile, IAFC, USA, Magen David Adom, Israel
COVID-19 operation – Lessons Learned from emergency call centers	August 13, 2020	Operation centers and call centers are the first meeting of the caller with the responding organization. During COVID-19, many agencies reported on an increased call flow, creating overloads and delays in responses. The objective of the webinar is to share experiences and lessons learned of call centers operators, on their COVID-19 response, in order to improve our current and future operations.	E Plus, Kenya, IAFC, USA, Bavarian Red Cross, Germany Magen David Adom, Israel SAMUR P.C, Madrid, Spain
Innovative disinfection technologies	August 27, 2020	COVID-19 being a highly contagious pathogen created the need to frequently disinfect equipment and surfaces, to	Zapsteri, Clean Bit, Plasmatreat, cbrn protection, Vesimin,

		<p>eliminate the risk of COVID-19 transmission touching “contaminated surfaces”. At the early stages of COVID-19, surfaces were sprayed as often as after each contact with a suspected patient or as a minimum every 8 hours. As per standard IPC (Infection Prevention Control) procedures, the standard solution used is Sodium Hypochlorite (NaClO) 0.1% (for suspected cases) and 0.5% for confirmed cases. The objective of the webinar was to present new technologies, more friendly to the equipment and to the environment.</p>	<p>Novaerus, Microclean Solutions, Cleanmix, MDF 500</p>
<p><b>WEBINAR: COVID-19: New wave, old problems?</b></p>	<p>October 16, 2020</p>	<p>Understand and compare:</p> <ul style="list-style-type: none"> <li>• The current state of the COVID-19 pandemic in their respective countries</li> <li>• Differences and similarities between the ‘first wave’ of COVID-19 in early 2020 and the current situation</li> </ul> <p>Preparations for other upcoming seasonal challenges, such as the flu</p>	<p>- Chaim Rafalowski, Disaster Management Coordinator, Magen David Adom (MDA) - Paloma Miravet, SAMUR-Madrid / Dirección General de Estrategia, Prospectiva y Coherencia (DGEPC) - Barbara Juen and Alexander Kreh, Working Group on Trauma and Emergency Psychology, University of Innsbruck (UIBK) - Ives Hubloue and Sofie Pauwels, Research Group on Emergency and Disaster Medicine, Vrije Universiteit Brussel (VUB)</p>
<p>Use of pulse-oximetry in COVID-19</p>	<p>October 29, 2020</p>	<p>During COVID-19, a growing body of evidence on patients who do not feel very sick, and are apparently well in a preliminary evaluation, but have low O2 saturation (sometime as low as 80%). This phenomenon is called "<b>Silent Hypoxia</b>" (as there is very little clinical presentation of the Hypoxia), or "<b>Happy hypoxia</b>" (as the patients seem happy</p>	<p>Dr. Dario Gonzales - FDNY Chief Mike McEvoyF-- IAFC Chiefs Dr. Catheriene Bertrand SAMU AP HP Dr. Kilian Bertho – Paris fire fighters Dr. Andrea Conti - CRIMEDIM Dr. Judith Gutierrez – Hospital 12 de Octubre - Madrid Dr. Arik Azienkraft - BIOBEAT</p>

		despite being hypoxic) and it was addressed in the webinar.	
<b>The Role of Lung Ultrasonography in the COVID Pandemic</b>	November 17, 2020	Discussion around LUS use in and outside the hospital; how signs of pneumonia relate to the other signs of COVID-19; potential triage applications; and required training in the various countries/settings discussed.	<ul style="list-style-type: none"> <li>- Ervigio Corral Torres, Head of the Department of Training and Healthcare Quality at SAMUR Civil Protection, Madrid</li> <li>- Dr. Cristina Sorlini, Emergency Medicine Consultant, San Carlo Borromeo Hospital</li> <li>- Dr. Michiel D'Hondt, Anaesthesiologist and Emergency Physician, ZNA Stuivenberg Hospital, Antwerp, Belgium</li> <li>- Dr. Bélaïd Bouhemad, Department of Anesthesiology and Intensive Care, C.H.U. Dijon, Dijon Cedex, France</li> <li>- Dr. Diego Mariani, Trauma Surgeon at the Azienda Ospedaliera di Legnano, Italy</li> <li>- Dr. Daniele G. Biasucci, Intensivist and Critical Care Sonographer in Neurosciences and Trauma Critical Care, Intensive Care Unit, Department of Intensive Care Medicine and Anesthesiology at the Fondazione Policlinico Universitario A. Gemelli IRCCS, Rome.</li> </ul>

## QUICK WINS

<b>Transparent masks improves communication and are especially important for communication with elderly patients or patients with hearing problems.</b>	
<b>Lung Ultrasonography for COVID-19 patients</b>	