Grant Agreement number: 608078

Project acronym: IMPRESS

Project title: IMproving Preparedness and Response of HEalth Services in major criseS

Funding Scheme: Collaborative Project (CP-FP)

Date of latest version of Annex I against which the assessment will be made: 2014-04-09

Periodic report: Y2 Periodic Report

Period covered: from 2015-05-01 to 2016-04-30

Name, title and organisation of the scientific representative of the project's coordinator 1:

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1 Usually the contact person of the coordinator as specified in Art. 8.1. of the Grant Agreement.
2 The home page of the website should contain the generic European flag and the FP7 logo which are available in electronic format at the Europa website (logo of the European flag: http://europa.eu/abc/symbols/emblem/index_en.htm logo of the 7th FP: http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos ). The area of activity of the project should also be mentioned.
DECLARATION BY THE SCIENTIFIC REPRESENTATIVE OF THE PROJECT COORDINATOR

I, as scientific representative of the coordinator of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;
- The project (tick as appropriate)¹:
  - ✓ has fully achieved its objectives and technical goals for the period;
  - □ has achieved most of its objectives and technical goals for the period with relatively minor deviations.
  - □ has failed to achieve critical objectives and/or is not at all on schedule.
- The public website, if applicable
  - ✓ is up to date
  - □ is not up to date
- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 3.4) and if applicable with the certificate on financial statement.
- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 3.2.3 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the Coordinator: Mr. Babis Ipektsidis

Date: 30-06-2016

For most of the projects, the signature of this declaration could be done directly via the IT reporting tool through an adapted IT mechanism.

¹ If either of these boxes below is ticked, the report should reflect these and any remedial actions taken.
1 PUBLISHABLE SUMMARY

1.1 PROJECT CONTEXT AND OBJECTIVES

Countries are facing major challenges to protect their populations from an increasing number of potential health threats in the future. Preparedness and prevention plays a significant role in ensuring an efficient response to national and international crises. Emergency Medical Services (EMS) systems form an integral part of any public health care system: their primary function is to deliver emergency medical care in all emergencies, including disasters and crises. It is widely recognized that an effective disaster response is heavily dependent on pre-existing local system capacity and capabilities than on external assistance. In the early stages of a health crisis, the ability to respond depends on the level of preparedness of the local community (citizens and volunteers) and health services. An efficient and well-structured EMS system ensures the achievement and maintenance of the skills necessary to deal with disasters, while disaster preparedness not only helps to identify organizational gaps but in many cases helps to minimize the consequences of a hazardous event so mitigate the risk and avoid potential crises.

There exists a huge variety in the occurrence and characteristics of major incidents. In general, an adequate major incident management system has to deal with two basic challenges. First, there is a disproportion between the needs and the available human and material resources: limitations in the response capacity (coordination, triage teams, search & rescue, Advanced Life Support and transportation squads, ground vehicles, and other health and psychosocial interventions), not only with respect to the number of people affected (quantity) and the time constraints (emergency) but also concerning the nature of the needs (quality). In disasters, characterized by disruption of infrastructure, facilities and/or services, this imbalance is even more serious and long-lasting. Secondly, very often there is inadequate information, low levels of risk perception and possibly scientific uncertainty or public concern and awareness with respect to the causes, nature and extent of the health issues involved and the risks that they may represent. The field on which this situation is more dramatic is that of medical rescues where every minute of delay can mean death and suffering for numerous victims. In a society that regularly reminds us of the vulnerability of man in the face of natural or man-made events, one of the major tasks for governments and crisis managers is to ensure attentive prevention and an appropriate response to disasters.

On the other side of the spectrum, the critical factors are more related to analysis and decision-making. A situation e.g. where there is an actual or potential risk of a major exposure to an unusual serious health hazard for a community (or which is perceived as such) can result in a public health crisis.

A Decision Support Tool (DST) needs to be capable to deal with the whole scope of health emergencies, from a single accident, over multi-casualty and mass-casualty situations to the most complex disasters. For health professionals to be able to use this tool in extra-ordinary situations, they must have experience in using its functionalities in daily practice. The extra-ordinary approach and special arrangements, does not only relate to the emergency response, but must be implemented for all phases of the management cycle.

IMPRESS aspires to provide a consolidated concept of operations, for the health sector to be able to effectively prepare and coordinate response activities, which will be supported by a Decision Support System (IMPRESS DSS), operating at the different command levels. The goal of IMPRESS will be to aid in the guiding of health services becoming more proactive, better prepared and interoperable with other emergency response organisations, while at the same time integrating volunteers and cross border assistance teams more effectively into the process.

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All types of emergency situations require – from a health perspective - extra-ordinary competencies, skills and attitudes, and thus specific education and training, the broader scope of which is commonly called ‘disaster health’. Mass emergencies, like major accidents and classical disaster, must be dealt by a structured mobilization of additional or specialized material and teams, combined with a more efficient use of the available resources (e.g. using methods of triage and triage, improved coordination, etc.). Public health crises require surveillance with early detection and early warning, extra-ordinary (often cross-border) decision making and control strategies, follow-up research & structural measures, all of which relies on timely (pro-active) and adequate exchange of information and communication.

Also, after a major emergency it is essential to provide on-going assistance, restore key services and infrastructure, organize socio-economic recovery, reconstruction and development as well as integrate lessons learned in future risk management and preparedness. In a nutshell, previous incidents confirmed the need for a “whole of community” approach in planning and responding to a disaster, and confirmed that a healthcare preparedness program must address the entire healthcare community in its preparedness activities. Regardless of the threat, an effective medical surge response begins with robust hospital-based systems and effective Healthcare Networks to facilitate preparedness planning and response at the local level. Simply put, strong and resilient Healthcare Networks are the key to an effective state and local emergency response to an event-driven medical surge. In addition, trauma Centers, Hospitals, and Healthcare Systems face multiple challenges daily in addition to the growing list of man-made and natural threats. Emergency department overcrowding, the rising uninsured, and an aging population all inhibit the healthcare system’s ability to respond effectively.

**All in all, IMPRESS aims to advance the preparedness of emergency medical services (ambulance dispatch centers, hospitals, volunteer communities, etc.) in numerous ways, including planning for all-hazards, increasing surge capacity, tracking the availability of beds and other resources using electronic systems, and developing systems that are interoperable with other response teams.** The IMPRESS general objective is to provide preparedness and response capabilities through guidelines and tools where ultimately, the routine use of these capabilities will sharpen their application in larger disaster scenarios.

### 1.1.1. The IMPRESS Objectives and Scope

In order to realize the IMPRESS concept, the project aims to satisfy the following core objectives, as reported in Annex I:

**Objective 1: Re-balance the disproportion between response needs and capacity**
IMPRESS aims to support decision makers of the health emergency domain through structured mobilization of additional resources regarding material, logistics and health personnel. Also, it will provide a general picture of special resources, both teams and equipment, and finally it will improve the efficiency and efficacy of available resources through organizational measures such as e-triage, avoidance of unnecessary initiatives and enhancement of cooperation and communication of various health services at regional, national and international level.

**Objective 2: Remediate the information deficits and decision making problems with respect to the nature, scope and causes of crisis events that threaten the Health Status of a Community**
This objective will be addressed through rapid and adequate collection and exchange of data and information, fast, transparent and truthful communication of facts and interpretations, extra-ordinary decision making and swift reactions. The IMPRESS DSS, procedures and methodologies will provide a long-term structural improvement of emergency health services.
Objective 3: Health services response and preparedness improvement
The IMPRESS solution aims to enhance response and preparedness of emergency health services through efficient planning, training and decision making, tracking and allocating resources using electronic systems, and developing interoperable tools and systems. Moreover IMPRESS DSS will provide a training module that will provide decision makers and health emergency personnel with considerable experience and it will strengthen their skills and know-how regarding not only day to day operations but also crisis events, by increasing surge capacity.

Objective 4: Enhancement of Intra- and Inter-Organisational interoperability in EMS
The IMPRESS project will provide a framework which enables the exchange of data and information by establishing a common ground for interoperability between stakeholders in the emergency response domain through a taxonomy and operation framework. Based on the above, the DSS will provide a layer of abstraction that will ensure cooperation of relevant agencies and information exchange needed for strategic level decisions which may include scenario analysis, definition of operational procedures and resource allocation.

1.2 Work performed and main Y2 reporting period results

Our main focus in the Year 2 reporting period M1-M24 has been on achieving the following major goals:

1. Interaction with the Ethical Review Committee and next release of ethics and data protection and privacy guidelines
2. Finalization of the design and architecture specification of the IMPRESS system and its components
3. Component development of initial versions of each component and system integration towards the release of the 1st integrated IMPRESS platform
4. Unit testing and IMPRESS pilot scenario specification, as well as organization and preparation towards the 1st IMPRESS real-life pilot in Palermo, Italy
5. Training platform development and release, as well as 1st version of the training module
6. Awareness and dissemination, stakeholders engagement and 1st version of exploitation plan
7. Project and technical coordination, communication and collaboration, quality assurance and continuous interaction with SAG members
8. Corrective actions and improvement of Year 1 work in response to Y1 review recommendations

Our main results in this period are summarized as follows:

1. Revised Year 1 work according to Year 1 review recommendations and re-submission of a number of Year 1 Deliverables on IMPRESS conceptual framework and taxonomy definition, IMPRESS HEMS approach specification, including psycho-social aspects, analysis of threat scenarios and related past cases, risks and risk factors across Europe as well as lessons learnt, IMPRESS scenarios specification, validation and benchmarking methodology definition, initial IMPRESS architecture and components design specification, dissemination plan and activities, SAG workshops reporting, etc.
2. 2nd SAG workshop organization, continuation of interviews and personal contacts with experts and end users, collection of experts know-how and feedback on domain requirements, constraints and limitations in relation to the IMPRESS context, user requirements analysis
3. 2nd version of analysis results on ethical, privacy and data protection issues in collaboration with the re-formulated Ethical Review Committee
4. Final version of the IMPRESS business process model and workflows definition and of the high level architecture, with respect to the revised user and domain requirements and constraints
5. Final version of the design specification of the DSS components: LOGEVO, SICKEVO, SORLOC and of the data warehousing (WARSYS) and Data Harmonization Components (initial and final versions)
6. Definition of the Semantic Reference Model (final version)
7. Design of the both the initial and the final versions of the Incident Management tools (INCIMAG and INCIMOB) and of the Training component
8. Development and unit testing of the initial version of the IMPRESS components (DSS Tools: SORLOC, SICKEVO/PATEVO, LOGEVO, WARSYS and Data Harmonization Component) and system integration planning, respective activities and release of the 1st Integrated IMPRESS platform
9. 1st release of training component and 1st version of training e-course/module
10. Update of the dissemination plan and achievement of a number of dissemination activities (update of project web site, social media marketing, participation to events, publications, networking with stakeholders). Clustering with other EU funded projects (THREATS, Proactive, Concorde).
11. Project management, monitoring and reporting, tasks planning, quality assurance, collaboration, risk management and mitigation. Coordination, planning and implementation of consortium tasks to address Y1 review recommendations. Project plenary and technical meetings organization, regular telcos for progress monitoring. SAG members interaction and workshops organization.

1.3 EXPECTED FINAL RESULTS AND POTENTIAL IMPACT

IMPRESS will result in:

- a core taxonomy for the health services involved in emergency management, as well as a semantic reference model (ontology) for the specific domain, taking into consideration current standards and specifications for interoperability purposes.
- a HEMS approach which is most suited for in European countries deployment, taking into consideration current adopted approaches and providing a comprehensive overview of the role, responsibilities and interactions of clinical and public health providers, given proper attention to the requirement of cross-border and multi-cultural implementation. Abstraction will be made from the country-specific legal formalities and organizational traditions, and the typology and categorization of the health services will take a more generic format of operational functions and responsibilities.
- a new operating framework based upon a distributed, modular, scalable system, that will be able to connect systems from different organizations into a common advanced holistic response framework, catering for the necessary interconnection and interoperability layers
- an integrated and interoperable multi-agency coordination and collaboration, COP, reporting and Decision support system to effectively and timely manage and respond, as well as optimize available resources during the management of large scale health emergencies. Those solutions will help the different health agencies to share and combine information and resources, which in turn will help them to act in concert rather than as independent organizations. At the same time, the information sharing and combination will help all Health Emergency Units to build a more complete picture of the crisis response from the fragments of data available to them. As a result, they will be better able to coordinate and distribute resources across the event, increasing the efficiency and effectiveness of a Health Emergency response.
- training component and associated training material as well as lessons learnt collection tool that will facilitate the easy deployment, use and know-how of end user operators and decision makers.

IMPRESS will thus be able to improve the efficiency of health services operations in both preparedness and response stages, which will have a direct impact on the quality of services provided to citizens, better and more direct provision
of emergency pre-hospital medical care, reducing the cost and speed of providing these services. All of these translate into more lives saved.

Moreover on a European level, emergency operators welcome the opportunities to receive international help in large-scale disasters when needed. However, this international assistance lacks full practical applicability since interoperability issues on several levels – from organizational, procedural down to technical levels – are not yet resolved. IMPRESS will enhance interoperability in crisis events.