



EDITORIAL

The **PULSE** Project is a Collaborative Research Project under the European 7th Framework Programme – Theme SEC - 2013.4.1-4: "Development of decision support tools for improving preparedness and response of Health Services involved in emergency situations". You may find more information at <http://www.pulse-fp7.eu>. The overall objective of PULSE is to improve the preparedness and response of Health Services across Europe, involved in emergency situations to mitigate the loss of life and improve survival rates among mass casualties.

As announced in the previous issue of the PULSE newsletter, the main objectives of the second period are the PULSE trials and validation activities. In order to demonstrate the fulfillment of requirements, to display the operational capabilities and to prove the technological and scientific concept as well as to receive feedback from stakeholders, the PULSE platform is to be tested in two trials:

- **An Emerging Viral Disease (EVD) Trial** - a table-top exercise that evaluates the PULSE tools in a SARS-like scenario.
- **A Mass Casualty Incident (MCI) Trial** - a live exercise that evaluates the PULSE tools in a major STADIUM crush scenario.

The purpose of the trials is to evaluate the PULSE Tools in the context of two realistic emergency management situations.

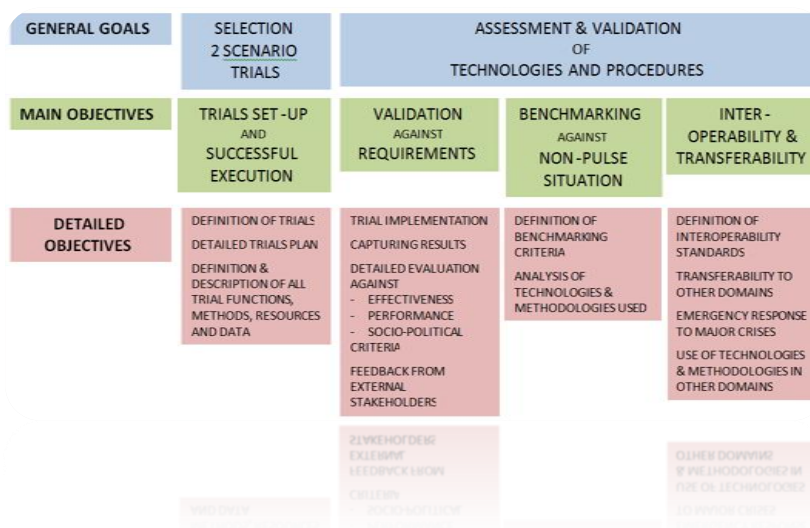
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Trials Overview

PULSE developed technologies and scientific concepts that span over a whole range of scenarios and requirements for medical support during major emergencies in a national and European context. The two application scenarios chosen for the purpose of this project are determined by the goals and objectives depicted below.



Each trial is based on Use Cases selected from the scenarios. For the purpose of evaluation and validation, both scenarios are quite different by hazards involved, geographic distributions, affected assets and people, inherent scenario dynamics and trial specifics. Moreover, by executing the trials in Italy and Ireland, under realistic conditions with healthcare practitioners, enables to encounter nationally shaped emergency routines and differently designed or applied international connections, all having their specific impact on the planning and execution of the trials. Observers from other Countries are attending the Trials and provide feedback on PULSE by way of on-line or paper based structured scoring questionnaires.

EVENTS

PAST EVENTS

PULSE features at the Women in Technology Forum

Dr. Sarah Bourke, CEO of Skytek Limited, spoke at the 'Women in Technology forum' which was held in the National Digital Research Centre in Dublin on the 4th of April 2016. PULSE is an example of the innovative use of technology to manage more effectively major national and international medical emergencies and pandemics.

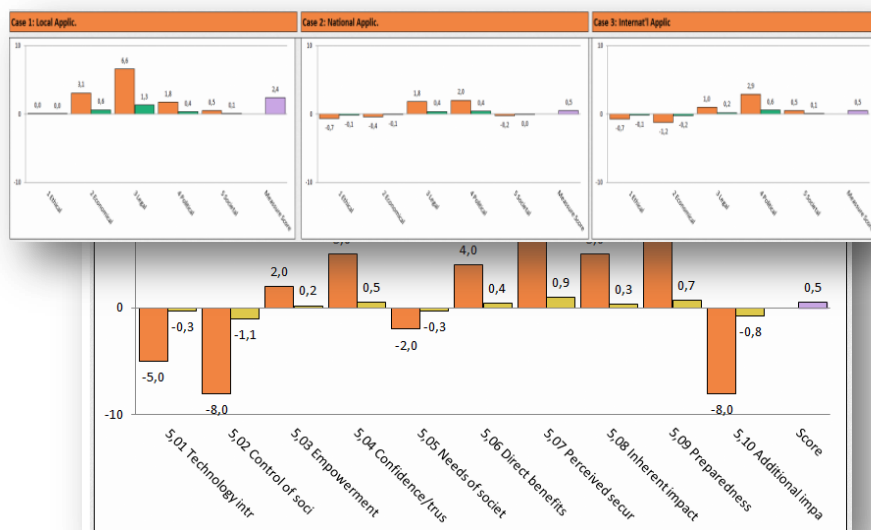
PULSE was presented at the 17th European Congress of Trauma & Emergency Surgery

Daniele Gui and Sabina Magalini, Università Cattolica Del Sacro Cuore (UCSC) – Italy, attended the 17th European Congress of Trauma & Emergency Surgery held at Reed Messe Wien Congress Center, Vienna, Austria on 24-26 April 2016. PULSE was presented into the "CROSS BORDER ISSUES AND ADVANCED TECHNOLOGIES" section.



Legal and Ethical Considerations and Implications of the Trial

The Legal, Ethical, Privacy and Policy Issues (LEPPI) team of PULSE created a framework for ensuring ethical aspects are taken into account both in the planning and the conduct of the trial exercises. The PULSE Ethics Review Committee provided guidance to support this process. Relevant issues that were highlighted for consideration and taken into account in the trial planning and organisation related to how participants are recruited, safety and well-being of participants, informed consent of participants, their wellbeing and safety, recording of information, consideration of sensitive issues and/or personal data. The LEPPI team has created an internal trials monitoring checklist to monitor that these aspects are adequately considered during the trial exercises. Responsibilities of the exercise leaders and researchers involved were also touched upon. For both the trial exercises, the LEPPI team created Information Sheets and Consent Forms to be administered to trial participants. For the MCI trial in Ireland, guidance is also being sought from the Irish Data Protection Commissioner's Office.



EVENTS

PAST EVENTS

PULSE referenced at Maritime Surveillance Workshop

Paul Kiernan, CTO of Skytek Limited, gave a presentation at the Maritime Surveillance Workshop held in Maynooth University on the 22nd April 2016. The workshop brought together various stakeholders to review platforms, sensors & observation methodologies for mapping, monitoring & tracking activities in coastal and off-shore waters around Ireland.

PULSE was presented at the Romanian Association for Security Technique National Conference 2016

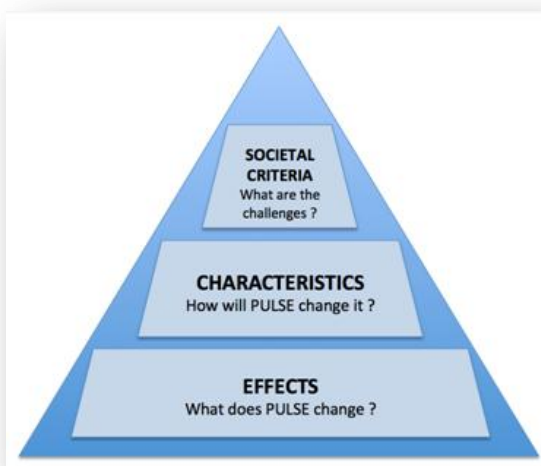
PULSE achievements was presented into the "Alarma" magazine (<http://www.revista-alarma.ro>), special issued published at the National Conference of the Romanian Association For Security Technique, Bucharest, Romania, June 2nd 2016.



Evaluation Methodology

Trials prove the capabilities and deficits of the PULSE system. They provide the environment for measuring the extent to which determined objectives have been achieved concentrating on and measuring the projected PULSE platform functionalities. The evaluation does not cover the behaviour of the exercise participants nor the impact of applied response standards or crisis management plans. The two PULSE scenarios were deliberately designed to be different so the effects generated will vary depending on the scenarios and in the individual use cases applied. Working in the background and remaining more or less invisible and not directly perceptible, not the individual tools but the system as a whole is prime evaluation target for the user community.

Thus, the evaluation focuses on the use cases and how the PULSE system better supports decision-making and operational functions compared to situations without PULSE.



Measures of Effectiveness (MoE) are parameters by which the effects and benefits of the PULSE platform and its components can be described and validated. The second part of the evaluation focuses on the **inherent qualities of the PULSE platform**. This comprises a set of characteristics called **Measures of Performance (MoP)**: Efficiency, Flexibility, Dependability, Scalability, Interoperability, Extensibility, Usability. The third section of the evaluation covers the **Ethical, Economic, Legal-Political, Societal Impact Assessment**, applying a methodology known as Multi-Criteria Decision Analysis (MCDA) particularly developed in the FP7 ValueSec project (<http://www.valuesec.eu/>).

EVENTS

FUTURE EVENTS

URGENT MED EQUITY 2016

URGENT MED EQUITY 2016 Brasov/Romania, 1-4 September 2016 – the XVIIth Romanian National Conference on Emergency Medicine.

EUSEM 2016

EUSEM 2016 Congress Vienna, Austria, 1-5 October 2016 – Xth EuSEM Congress is organised by the European Society for Emergency Medicine (EuSEM), in association with the Austrian Association of Emergency Medicine (AAEM), the German Association for Emergency Medicine (DGINA) and the Swiss Society for Emergency and Disaster Medicine (SGNOR).



WORK PERFORMED : THE EMERGING VIRAL DISEASE TRIAL

The first **PULSE** trial was successfully organized on **30 June – 1 July 2016** at the **National Institute for Infectious Diseases Lazzaro Spallanzani in Rome, Italy**. The main goal was the demonstration and the validation of the effectiveness and performance of the **PULSE** platform in the context of an epidemic viral disease scenario. The event, organized as an extended Table Top Exercise, has actively involved key actors with responsibilities in the management of the emergency situations from WHO, ECDC, national and regional authorities and representatives of hospitals.

More specifically, the scenario foresaw the management of risky situations during the emergence, the development of a pandemic flu, in Germany and in Italy at the start, and then all across the world towards the end of the epidemic.



Different external actors have been invited to the exercise considering that the scenario included elements of cross-border collaboration and European collaboration among different nations. The actors acted as representatives of different and important institutions (e.g. the WHO, the ECDC, Federal Ministry of Health Germany, the Italian Ministry of Health, the Italian Healthcare and Civil Protection Institutions at National, Regional and Local levels and Italian Lead Hospitals). They all have a relevant role in the decision making process during such an emergency. All the invited actors have been selected for their direct involvement in one of the above mentioned Institutions or for their great experience and knowledge regarding the management of similar pandemics.

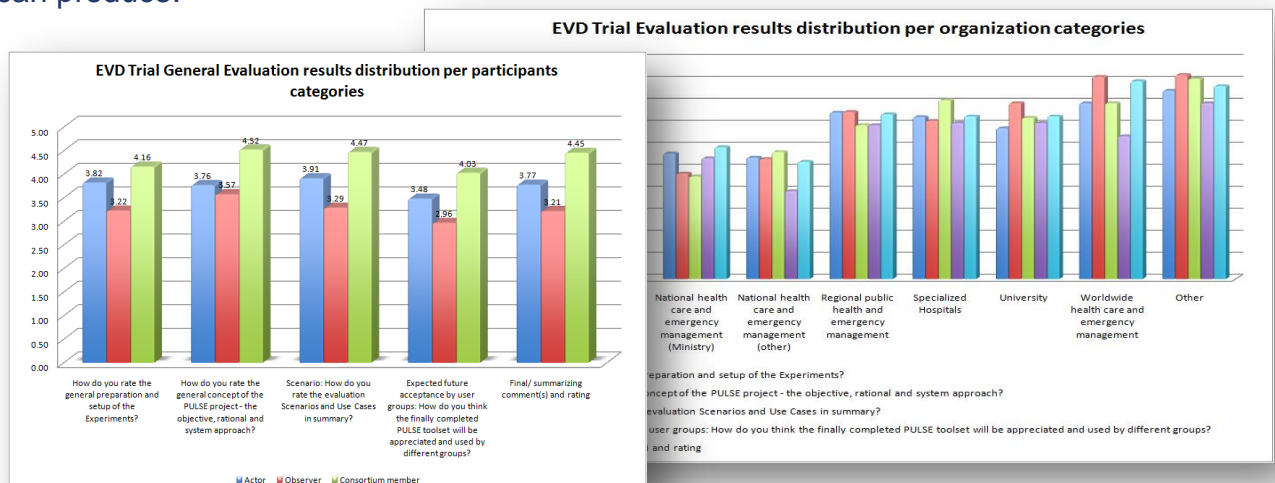
The evaluation has been performed as an Extended Table-Top Exercise (TTX2), such as a classical Table-Top (TTX), enriched with the direct interaction with the PULSE Platform and tools. The trial scenario was subdivided in seven different “scenes”, each one representing a different critical situation during the course of the epidemic.



For each scene, the actors were provided with a short description of the scenario situation and were asked to describe the procedures and the steps that they usually follow during similar situations.

After and a description and a demonstration of the PULSE functionalities and expected support in that specific scenario, they could directly put their hands on the platform by using individually dedicated tablets PCs where they had the opportunity to effectively evaluate the effectiveness and performance of the PULSE functionalities. Evaluation feedback was mainly created and collected via a set of on-line questionnaires.

The evaluation of the questionnaires of the EVD trial has been completed, so we are already able to affirm that the PULSE platform has been very well scored and accepted by the involved actors. This underlines the "added value" a system as the PULSE platform can produce.





PULSE EVD TRIAL OPINIONS

Lights and shadows of a pilot experience:

to contrast an epidemic threat using a Decision Support System

Giuseppe Ippolito MD
Scientific Director
National Institute for
Infectious Diseases Lazzaro Spallanzani

“The experience of the 2009 A/H1N1 influenza pandemic has made the importance of public health preparedness more evident. Different control strategies were applied for decreasing the severity and transmissibility of the disease, tailored on the social structure of the different community involved. These strategies are the product of a multiple decision process taking place before and during the pandemic at all societal and organizational level, in local communities, regions, countries. In order to facilitate, standardize and train the above process, many collaborative research network were set up, mostly in United States,



with the aim to develop simulation models and tabletop exercises that facilitates decision-maker interactions around emergency-response scenarios. These simulations and exercise give policy makers the ability to see the real-time impact of their decisions. The exercise are becoming more and more useful through the support and facilitation by new technologies that can help identifying the communication gaps between responsible authorities and advance the table-top exercising methodology.

To contrast a threat of an influenza pandemic, in 2005 the WHO adopted global pandemic plan that introduced the concept of pandemic phases. In 2009, the “Pandemic influenza preparedness and response: a WHO guidance document” was published. In 2013, WHO released interim guidance for pandemic influenza risk management, which includes restructured WHO global phases (inter-pandemic, alert, pandemic and transition). Actually, pandemic influenza preparedness plans are strongly focused on efficient mitigation strategies including social distancing, logistics and medical response.

In this perspective, in the framework of the Pulse Project, an Extended Table-Top (TTx) was organized based on the direct interaction with the PULSE Platform, in order to support decision-makers in presence of an epidemic. A new flu pandemic scenario was built and organized in different scenes (Pulse Use-Cases).

Through a group of experts in infectious diseases, public health, health care management and epidemiology and with experience in outbreak preparedness and response the epidemic scenario was built to take into account different aspects of the epidemic, weak signal detection, epidemiological spread of disease with cross border implications, medical emergency service and the hospital response.

At first we have verified the correlation between the Pulse-Use Cases and key actions of the Italian flu pandemic plan. PULSE system has been modified by the team of the Italian National Institute for Infectious Diseases Lazzaro Spallanzani INMI) to respect the ECDC document on risk assessment that correlates the probability of an event with its impact.

Based on this verification, we have performed the Table –Top exercise. The main goal of the exercise was to demonstrate and validate the effectiveness and performance of the PULSE tools and platform. The validation and demonstration was based on the simulation of situations that are normally managed without PULSE. The use of PULSE demonstrates a key advantage with respect to the normal way of operating. The overall evaluation of this pilot experience is very positive.

In general, the results of this pilot experience show that there is a need for specific training on the system because there are many actors interacting, internal regulation with experts on this field. This system could be useful also for people without relevant experience in outbreak management and be a very useful repository of information and reference documents. A future implementation limit may be the wireless connectivity: possibility of simultaneous connection of a lot o people via internet is needed. But this is a common problem, to all systems.

Three areas have great potential for development and need to be improved:

- 1) The quality of input data. This mostly relates to the electronic management system already in place, such as the electrical clinical records in the hospital, electronic systems for the monitoring of Emergency rooms access, etc. PULSE has the potential of catch and modeling information from several different sources of data. The possibility to use administrative data from public health services or hospital needs specific clearance by competent authorities.*
- 2) Incorporate the mathematical models to have prediction of epidemic spread at national level. An infectious diseases modeling should be set-up on background experience and information in order to be easily applied to different epidemic contexts and pathogens in order to give to the decision maker an easy tool to input the epidemic specific data and visualize timely the possible scenarios.*

3) Graphical presentation of the data for different stakeholders: number of cases, evolution, etc.

Another important issue is the flexibility. Flexibility is guaranteed through the integration of different intervention models, such as the models for surge capacity. The use of already existing models or the development of a new flexible, and easy to adapt, model could improve the adoption of PULSE as tool also for assessment of resources assessment needed and procurement. These models should be also adapted to the different decisional levels, regional, national, international.

This pilot experience represented an opportunity to critically reassess the key actions, as actually issued by the Italian national pandemic plan and the specific pandemic plan of the Lazio Region. The Current Italian Plan adopts the epidemic phases issued by WHO in April 2005 and updated in 2009, and shares the aims for the public health authorities recommended by WHO for each phase. Each phase includes one or more of the key actions. Each of the key actions involves the implementation of a group of specific interventions for each phase; actors and their responsibilities are identified for each intervention. Considering its role as referral hospital for epidemic emergencies for the national and regional government the National Institute for Infectious Diseases Lazzaro Spallanzani, had the opportunity to critically re-evaluate the processes included in the plan and get ready for an update of the pandemic plan if requested by government authorities. This was an important first result."





NEXT STEP: PULSE MASS CASUALTY INCIDENT TRIAL

The **PULSE MCI Trial** will be held in **Cork, Ireland** on **15th of September, 2016**. The trial experiments will be hosted by the **Health Service Executive Ireland (HSE)**.

This trial exercise aims to perform an evaluation of the PULSE Toolset and meet the training objectives of participants' organizations in relation to Interagency MCI preparation and response. The exercise, named **DISTANT ROCK**, will last one day. The trial details are set out in the on-line multimedia instructional and informational inject, which explains the nature of the PULSE Project, describes the PULSE platform and the MCI "crowd crush" scenario, and sets out the timetable for the exercise, the nature and mechanism of the validation and the methods that will be used to gather their feed-back by way of on-line or paper based targeted questionnaires.

The PULSE MCI Trial scenario includes a range of actors who will become active and make contributions at different stages as the impending stadium crowd crush develops. Among the **key actors**:

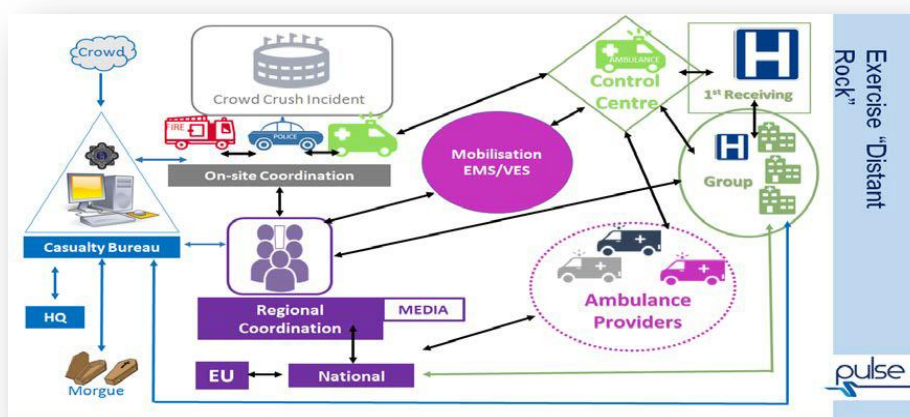
Health Service Executive – Irish National Health Service

Irish National Ambulance Service

An Garda Síochána (Irish Police)

Irish Fire & Rescue Service

Voluntary Emergency Services (St John Ambulance, Irish Red Cross, Order of Malta, Civil Defence)



During the PULSE MCI Trial a wide range of state and non-state resources would be brought into play. The following list contains a number of high level resources from both the Republic of Ireland and Northern Ireland, which would be used:

- ✓ Department of Health staff
- ✓ Local authority staff and equipment
- ✓ Police staff and equipment
- ✓ Fire service and equipment
- ✓ Civilian contractor staff and equipment
- ✓ Stadium event organizers and equipment
- ✓ Staff of the Voluntary Emergency services

The MCI Trial will be conducted in four separate locations:

Stadium : Páirc Uí Rinn is located on the Boreenmanna Road, just off the South Link Road, in the Ballinlough parish. It is just ten minutes walk from Páirc Uí Chaoimh.

Regional Control Center : This will be located in the Central Fire Station

Hospital Emergency Control Team : Cork University Hospital

EMS Dispatch Centre : South/South East Hospila Group HQ Erinville



PULSE at a glance

PULSE- *Platform for European Medical Support During Major Emergencies*

Web site: <http://www.pulse-fp7.com/>

Project Coordinator:

Dr. Sarah Bourke

sarah.bourke@skytek.com

Partners:



UNIVERSITÀ
CATTOLICA
del Sacro Cuore

