UCC-LED RESEARCH TO SUPPORT EMERGENCY PREPAREDNESS

UCC is leading an international consortium that has secured €3.5 million in EU research funding to standardise procedures in crisis management. The three-year project aims to develop new decision support systems to co-ordinate emergency planning, preparedness, response and recovery across borders. Report by Grace Heneghan.

Large-scale disasters require immediate response under time pressure, rapid decision-making, appropriate allocation of resources, prioritising casualties and casualty evacuation, administering first-aid, dealing with human and psychological stress, and efforts to limit the level of devastation. All of this becomes more complicated in the case of cross-border catastrophes and current solutions do not fully address all of the challenges.

To overcome these present shortcomings, partners of a new international consortium – S-HELP (Securing-Health Emergency Learning and Planning) – will develop a range of decision support tools and systems for the management of all four phases of an emergency situation: planning, preparedness, response and recovery. Training and crisis-management communication will also be included in the project.

PROACTIVE AGENCIES
Co-ordinated by Dr Karen M Neville, principal investigator and managing director of the Centre for Security Management Research (CSMR), Business Information Systems at UCC, the international consortium is funded by the EU's Seventh Framework Programme for a three-year period.

Dr Karen Neville, Managing Director of CSMR, UCC and Dr Andrew Pope, Development Co-Lead, UCC. (Pic: Tómas Tyner, UCC)

Neville said that by linking all the relevant agencies, the idea is that the authorities can further improve their existing cross-border emergency action plans, like those regularly activated in exercises at county or regional basis around Ireland. In the general scheme of things, she did think that in terms of Ireland's level of preparedness and readiness "all of the agencies, north and south, are very proactive".

However, crucially, the new system will also work between different countries, using detailed and wide-ranging information such as paramedic skills in each jurisdiction or whether one country's firefighting equipment matches the other's hydrants.

The UCC researchers' initial design led to their selection to head up the S-HELP consortium, and more detailed development plans have been drafted since March. The system essentially aims to improve the timeliness and quality of information available during a crisis or disaster.

In addition, an integrated tool-kit will be developed making it possible to judge quickly the size of the emergency and help decision-makers manage incidents involving large numbers of agencies across different borders.

Having well-trained, competent and motivated people on the ground in an emergency is vital to dealing with it effectively. The reality, however, tends to be limited ongoing training and a lack of standardised procedures between

countries.

"When analysing how the different agencies respond to an emergency in a single country, there are huge issues involved with all the agencies working together, linking their own systems and inter-agency communication during a disaster. This problem is amplified when the incident involves several countries," notes the project co-ordinator.

This reduces the effectiveness of an international response to emergencies and results in people on the ground being ill-prepared in situations that require split-second decision-making in the middle of the chaos and fury of an emergency.

"According to research a lot of responders think that they communicate very well during the crisis, but it's only afterwards at the evaluation stage that they realise what they could have done better. On top of that there's the risk that responders will probably pay too much attention to what the media is saying."

S-HELP Consortium: UCC-BIS, Lund University, Sweden, ASSERT Centre, UCC, TUGraz, Austria, University of Vienna, Austria, Health Service Executive and Northern Ireland's Public Health Agency, as well as Magen David Adom, Israel, accelopment AG, Future Analytics Consulting, Ireland and Vector Command Limited, UK. (Pic: Tómas Tyner, UCC)

THREE TEST-SCENARIOS
Regular and consistent training coupled with joint exercises are key to good emergency planning.

The use of real-world emergency scenarios is the best way to train people who may be involved in responding to an emergency.

In the S-HELP project such scenarios will be devised and carried out by the UCC team in partnership with the HSE and Northern Ireland's Public Health Agency (PHA), as well as Magen David Adom (MDA), Israel's national aid society and blood bank service.

"In talking with our partners in the HSE, PHA and MDA about making sure we can test the system properly, we chose three scenarios which we thought were the best and also the most likely in these different areas."

Over the next two years, the team will roll out three training-based scenarios to identify problems in current cross-border emergency plans and to see how the S-HELP solution will address them, and if the software system can be expanded elsewhere.

One scenario will simulate a cross-border chemical explosion between the Republic of Ireland and Northern Ireland, another will entail a major flooding incident in London, and a large-scale biological incident in Israel.

"These scenarios of flooding, chemical spills or biological incidents will test everything that the European Commission – as the main stakeholder – is looking to investigate under the terms of this research."

Neville had created what she described as "a matrix" of all possible incidents from which to choose for these training-based scenarios – terrorist attacks, explosions, chemical spills and flooding incidents, biological incidents. "This enabled the team to research the similarities in emergency planning and response between each incident.

"We will design the scenarios this year and roll them out to test different aspects of the system and evaluate each one." In the interim she said they have been invited to attend other inter-agency exercises to see how 'S-HELP' can be incorporated into these events.

PROJECT PARRNTERSHIPS
In addition to its three main partners – the HSE, Northern Ireland's Public Health Agency and Israel's national aid society and blood bank service Magen David Adom – the S-HELP team also consists

of three private small and medium-sized companies (SMEs): accelopment AG, Future Analytics Consulting and Vector Command Limited, and four academic institutions: Sweden's Lund University, the ASSERT Centre in UCC, and Austria's TUGraz and the University of Vienna. There is also complementary and world-leading expertise in security, learning, decision-making and emergency management.

S-HELP is completely in line with the key regulation in the field of emergency medicine from the European Committee of Standardisation and will set new standards in crisis management – before, during and after an emergency. As such, it will be the leading example of protecting people's lives through effective emergency learning and planning.

SOCIAL MEDIA ELEMENT
The system will allow greater harnessing of information from social media, so emergency services can be directed by co-ordinators to or from places or incidents.

Neville says that a lot of responders think they communicate very well, adding that it's only in the aftermath of an incident during the evaluation process that they realise what they could have done better.

"You cannot control social media but you can certainly make sure to send out the right information, and also to gather the right information from it. With S-HELP I have focused on educating the public and how the public would behave and what information they would need in the event of a disaster."

She says that the University of TUGraz in Austria will concentrate on how such information should be filtered to frontline responders and how it should be presented. "In the event of such disaster situations the media are very helpful and it's important that everyone knows exactly what's happening."

Apart from the social media element, other aspects will involve integration of live weather information, mapping likely flows for floodwaters, and allowing better planning for the aftermath of catastrophes.

IMPROVING INTEROPERABILITY
Neville and her team have looked at existing incident management systems. "These seemed to be very static in terms of equating, for example, the skills of a

FACTFILE ON S-HELP
(Securing-Health Emergency Learning Planning)

Decision Support System
The S-HELP Decision Support System (DSS) will provide a unique mechanism to assist stakeholders and end-users to work together for co-ordinated, effective and evidence-based decisions at all stages of emergency management. The tools delivered by S-HELP will result in improved preparedness and response of health services involved in large scale and/or cross border emergency situations.

Project Objectives
S-HELP is a people, process and technological solution to emergency situations. The central aim of the S-HELP project is to develop a holistic-framed approach to healthcare preparedness, response and recovery. More precisely it aims to:
- Define an interoperability standard to enable communication and co-ordination across different geographical areas and cultural settings.
- Facilitate a collaborative end-user and support partner-driven solutions to meet the needs of different users from Ireland, the UK, Sweden, Austria and beyond.
- Define and apply an interoperability standard for multiple agencies jointly responding to a disaster.
- Advance the design and application of current available solutions, to improve preparedness, response and recovery in emergency situations.
- Deliver decision-supporting tools for emergency preparedness, response, recovery, tested, evaluated and enhanced through end-user designated emergency scenarios.

Project Details
Co-ordinator: University College Cork
Contact: Dr Karen M. Neville, UCC
Duration: 36 months
Budget: €3.5 million
Funding Programme: FP7-Security
Area: ICT

Partners:
- Accelopment AG, Switzerland
- Magen David Adom, Israel
- Future Analytics Consulting Ltd, Ireland
- HSE, Ireland
- Lunds Universitet, Sweden
- Public Health Agency (PHA) Northern Ireland
- Technische Universtität Graz (TuGraz), Austria
- Universität Wien, Austria
- VectorCommand Ltd, UK

paramedic in the Republic to the UK, Germany or Israel."

One of the academic partners in the consortium – the University of Vienna – will work on the interoperability element for the three chosen scenarios by investigating the personnel, equipment and skill-sets involved in these exercises.

"This information will be automated in S-HELP, so that the decision-maker on the border, for example, will know the exact resources they will be allocating and this should also be the same between other countries. This means that emergency response procedures and skill-sets will be standardised nationally and more importantly between countries."

So, in the event of a real flood, chemical spill or biological incident, S-HELP will record the levels of communication, the resources available and the level of interoperability between two different countries working together.

"There will also be an opportunity for S-HELP to use real incidents training exercises for future incidents," noted the project co-ordinator, adding that it will be essentially important that the exercise can be used for sharing lessons learned with other countries.

PROTOTYPE PLANS
The consortium also aims show that a prototype of S-HELP could be successfully deployed to any future emergency incidents or disasters. "As part of the proposal for this project, the European Commission is expecting to see a plan in place to commercialise the prototype."

Neville explained that this is the norm for every project funded by the EU's Seventh Framework Programme – "the Commission expects to see a commercial prototype in place, once the research is complete, with the potential of job creation etc".

Under the S-HELP project a certain number of voluntary agencies will also be invited to take part in the exercise. "For example, we have already spoken to the Red Cross in Austria, and we aim to take on more Red Cross branches across different countries. There are also plans to involve other voluntary bodies down the line," Neville noted in conclusion.

No one can predict when a large-scale disaster will strike, but strike they will. There is great comfort in knowing that a project like S-HELP is on hand to break through and improve the emergency response, care, and aftermath treatment of what nature (or man) has in store.

Given the battering that Cork sustained from recent flooding, it is fitting that UCC will lead the international EU research project.

A simulated cross-border chemical explosion between the Republic of Ireland and Northern Ireland, is one of three scenarios to be rolled out.

Magen David Adom (MDA), Israel's national aid society and blood bank service, is one of the partners in the S-HELP group.