

A Framework for “New Actors” in Emergency Response Systems

Kayvan Yousefi Mojir
Linköping university
kayvan.y.mojir@liu.se

Sofie Pilemalm
Linköping university
sofie.pilemalm@liu.se

ABSTRACT

Using actors from different societal sectors can improve the response operation quality in emergency management. The different roles, tasks and responsibilities these actors have in response operations and the legal frameworks they work within influence their needs for proper information system support. There is thus a substantial need to study and systemize the concept of “new actors” before providing them with technical solutions. In this study, a framework is constructed showing 14 dimensions of new actors that need to be considered when new actors are studied in more detail.

Keywords

Emergency response system, new actor, framework, first responder.

INTRODUCTION

Emergency response systems (hereafter referred to as ERS) are complicated systems in which numerous organisations, individuals, systems, techniques, and methods participate. An emergency situation may evolve unpredictably over time and the response time is further affected by different factors, e.g. data gathering techniques, information quality, decision-making processes, and, not the least, collaboration between actors (Berlin & Carlström, 2011). Response time is crucial since inefficiency in response operation is a threat to peoples’ lives and may cause material damage, leaving society burdened with huge costs.

One way of decreasing response time and enhancing the quality of the response operation is by using other societal resources than the professional response organisations, (e.g. the rescue services, the Police and the ambulance services). The potential benefits from bringing in new actors have been highlighted in different studies. Sund (2006a) shows how using actors from different societal sectors can improve the overall response operation quality. Also, in sparsely populated areas, professional response organisations may be far from the incident location and in extreme cases not even in reach of the emergency. It has been shown that informal structures, social networks, volunteer help, and non-profit groups play an important role for the safety in these areas (Pilemalm, Stenberg, Andersson Granberg and Axelsson, 2012). Other reasons for bringing in new actors are general financial cut-backs in the number of services provided by traditional response organisations, e.g. in Sweden. However a categorization of new actors, their identity, roles and needs as related to them acting as first responder, is obviously needed but often missing, as shown in the above studies. For example, organised actors (e.g. the Red Cross) probably have different needs and competences than the unorganised actors (individuals). The different roles, tasks and responsibilities new actors have in response operations and the legal frameworks they work within in turn influence their needs for proper information system support. There is thus a substantial need to study and systemize the concept of “new actors” before providing them with technical solutions.

STUDY AIM AND OBJECTIVES

The aim of this study is *to construct and describe a tentative framework around the concept of “new actors” in ERS*. This framework is intended to be used as support to researchers and practitioners when studying more rigorously different types of new actors, the tasks they can do and the information technology (IT) support they need. Emergency situations as defined in this study vary from everyday accidents to large-scale crisis and catastrophes.

BACKGROUND

In this section, the general background of the concept of new actors in ERS, and the study settings are described.

The concept of new actors in research

In this study, *new actors* are defined as existing or completely new actors who are not officially an integrated part of current ERS -but who may help in an emergency situation to shorten the response time or to compensate limited number of ordinary actors. They are called new, not because of their identity or functions but because their lack of integration into current ERSs and since investigating their needs and characteristics is a relatively new research area. To use new actors in emergency response organisation is a concept that has gained ground in recent years, both in research and practice. For instance, in the United States (US), Community Emergency Response Teams (CERT) aims to provide people with basic training to be able to partake and collaborate in emergency situations. In Finland, the government insists on using volunteer actors to improve safety in sparse areas of the country (Rescue Services Management Forum, 2008). In Sweden using non-professionals as first responders (FRs) has been suggested as a solution to decrease response time (Sund, 2006a). In hurricane Katrina it was argued that if the first persons at the incident site acted as FRs it will help the response operation (Tierney, Beve and Kuligowski, 2006). However, as shown by Pilemalm et al. (2012) there is still little discussions on different types of new actors, their role in different types of emergencies, their responsibilities, and competences.

STUDY SETTINGS

In 2009, the Swedish government gave a mission called “strategy for strengthening the societal resources in coping with emergency situations” to the Swedish Civil Contingencies Agency (MSB). This simply means to use other actors other than professional response organisations in parts of emergencies or to combine and let them collaborate with professional resources. In Sweden, the four major professional first responder organisations include the rescue services, the Police, the ambulance services and SOS Alarm. A number of research projects have been carried out and successively come to distinguish between different categories of new actors. The most prominent are identified as: a) Semi-professionals, b) Volunteer organisations and individuals, and c) Laymen.

There are further some municipalities in Sweden that have already tried to use new resources in order to either decrease response time or compensate for the limited number of ordinary resources available in the ERS. In Öckero municipality, Gavin et al. (2012) study the possibilities of alternative solutions to improve the response operation quality. The County administrative board of Örebro has conducted a project that emphasises on the three vital sectors that need support in the emergency situation: electricity supply, communication (phone, mobile, and internet) and transportation infrastructure. Using complementary resources such as volunteers is discussed as a possible solution to strengthen the societal preparedness.

METHOD

This study is based on qualitative research methods, relying on a documents review and interviews. The document study comprises public official reports from MSB, published reports and other relevant articles in the domain of ERS. Seven reports and 15 scientific papers were reviewed. As for the interviews, four semi-structural interviews were performed with active practitioners in the domain of ERS. Interview questions were based on the concept of using new actors in the ERS. Three of the interviewees are MSB employees with years of experience in ERS, e.g. on evaluation of response operations and on strategies for strengthening the response resources. They have also had other roles in the ERS such as fire engineer, researcher, supervisor and project manager. The fourth interviewee is working as a guard whose team supports the fire rescue services in different emergencies. Three researchers performed the different interviews. One of the researchers did the data analysis and the two others reviewed the emerging results. Data was analysed based upon coding methods (Myers, 2009) in order to organise and categorise the data. Data was tagged and labelled based on the important issues of using other actors in ERS pointed out by interviewees, documents, and projects. Based on the categorization, a framework that illustrates different dimensions and aspects of new actors in ERS was constructed.

FINDINGS

From the data analysis, 14 dimensions of new actors emerged and constitute the base for the framework. The framework aims to visualize important dimensions of new actors’ identities. Each dimension is explained briefly, as identified in the documents and reported by the respondents in the interviews.

1. Type

Both the documental studies and the interviews show that new actors are of different types according to their identity and characteristics. The first group is *semi-professionals* meaning persons whose primary profession is not to respond to emergencies but who can support the ERS on the basis of their primary profession, if they have extra training for this. Elderly care personal, guards, and building technicians are examples of occupational

categories that, in theory, can assist professional response organisations. *Private persons* (in this framework we call them laymen) are also important because if they are aware of what they should do when they arrive to an accident scene, they can intervene in an effective way. *Volunteers* is a third actor type that can be activated in case of an emergency situation. They come in various forms and size such as e.g. the Swedish Sea Rescue Society, Red Cross, Swedish Climbing Federation or small clubs and local sport groups.

2. Role

New actors may have different roles depending on the emergency situation they are involved in. From the documents review and interviews, three different roles are identified. New actors can be seen as *First Responders (FRs)*, *assistants* or they may have a *supportive* role in any given emergency situation. In Sweden, there are different standby (on call) resources available at municipality level and they can arrive first at the accident scene as FR. For example building maintenance personal can act as FR when a fire take place in a building and start to put out the fire or save lives before the fire rescue services arrives at the scene. Private persons such as bystanders can also intervene sooner if they have basic training to start first aid (Stenberg, Blondin and Andersson Granberg, 2010). Guards in municipalities can help fire rescue services as assistants to enter the buildings on fire more quickly because they usually know building entrances and have the keys to enter. They can also be observers and send first vital information to the fire rescue services. Volunteers can play a substantial role in the emergency situation. They may act as FR to help people with for example heart attacks as is the case in “SMS Life Saving” project (<http://www.smslivraddare.se/>). They may also have supportive roles such as in oil spills accident to sanitize the environment or to take care of victim’s relatives.

3. Incident Type and task

Both the documental study and interviews show that new actors act differently in different incidents. Two of the interview respondents emphasise that new actors as FR may well become increasingly important in case of health problems, fires and traffic accidents. If somebody intervenes as a FR and starts early operations, it has substantial impact on the eventual outcome. For example, in a heart attack situation, time is a vital factor and if somebody administers cardiopulmonary resuscitation (CPR) in the first 15 minutes, there is a huge chance to save lives. Fires are more controllable if somebody starts to extinguish it in the first fire phase. In forest fires, volunteers can help to look after missing persons and also provide the transport services available, as well as vehicles or appropriate tools. There are however also incidents that new actors should not intervene without awareness of the possible consequences. Neck fractures, emission of dangerous substances, and terrorist attacks are examples of such incidents.

4. Training

While the documents speak little about training, the collected data from the interviews points out that the type of training for new actors to have great impact on their participation in response operations. With extra basic training of semi-professionals they can act as a FR in order to do something at the early stage of an incident such as first aid, fire harness, etc. Private persons can be trained even from primary school to know what they should do and not do when they arrive at an emergency scene. Continuity of training and exercises keep new actors prepared for action.

5. Problems

Different problems emerge when using new actors in the ERS. Those most mentioned in the study were fear, bad feelings, and employment issues. The documental study shows that when people arrive at an accident scene they may fear to intervene for different reasons. The common major obstacle pointed out by the interview respondents was also fear. For example, most people believe that a fire is not controllable and when a house is on fire it will burn down. With a few hours training in this case people will know how to control and contain the fire. The interview respondents also imply that semi-professionals do not always feel good or secure to operate in other fields than their own. Employment issues are also unsolved in many situations such as job conditions, financing, and job safety. Another problem arises when new actors are not seen as part of the ERS by the professional actors (attitudes) and they are only called upon when the professional actors are not enough or readily available.

6. Accessibility

The interview with the expert active in using volunteers in ERS shows that there are different ways to access and activate new actors in the ERS. They can be activated upon request by ordinary actors or they may evaluate the situation and be activated by themselves (self-deployment). There also many people who are interested in volunteer organisations but there is not any clear method that shows how one can contact to these organisations.

7. Structure

Documents and interviews point to different structures for new actors either as organised structures (e.g. volunteer organisations) or unorganised structures (e.g. individuals such as bystanders). Spontaneous volunteers such as ad-hoc mobilization of individuals and groups at the accident scene are also another unorganised structure for new actors. There are studies (e.g. Pilemalm et al., 2012) that show that social structures and unorganised actors play an important role in emergency situations in extremely densely populated areas.

8. Legal issues

The interview with the expert working with projects of using volunteer actors shows that legal problems arise on many occasions. In conclusion, it is not clear what Swedish laws state about responsibility, limitation, and task of new actors in response operations. What new actors are legally allowed to do and not to do must be investigated more thoroughly. What data they are allowed to access and not, and what first aid they are allowed to carry out are common reported issues where Swedish laws are unclear.

9. Cost-benefit analysis

In heart attack cases, 42 persons are estimated to be saved instead of 26 when fire rescue services are used together with health care personal in response operations. This, since sometimes the fire rescue services can arrive faster to the accident scene. There are 4 times more fire rescue service stations than ambulance stations in some Swedish small or sparse areas. If response time within a certain time limit becomes 1 minute shorter, 50 lives can be saved instead of 42 (in the above). However, if more lives are to be saved more resources will need to be prepared and more equipment is needed, which in its turn is associated with increased costs (Sund, 2006b). What are the actual costs and benefits associated with using new actors is important when they are used in response operations.

10. Responsibility

The expert active in using volunteer in ERS implies that Swedish citizens may not feel responsible in emergency situations since they pay high taxes and have a tradition of authorities to take the responsibility. It is not the same in other countries e.g. as in Germany and Austria. In these countries, citizens feel more obliged to intervene in response operation as volunteers much because they have received training for this purpose. On the other hand, as reported above, there are also people who are interested in volunteer organisations and work but are lacking the infrastructure to be integrated into the ERS. To formulate the expectations of new actors should be studied in more detail.

11. Equipment

The interview with the guards who help the fire rescue service in response operations, shows that inappropriate equipment brings difficulties in response operations. The guards complained about useless radio systems which are not portable. They had problems to send information to the fire rescue services. What equipment new actors should have in order to be able to support a response operation is crucial. For instance, in the SALSA project in Stockholm, taxi drivers were equipped with defibrillator in their cars to give aid to people with heart attacks (Hollenberg, 2009).

12. Competence

From the analysed data it is not clear that what competences are most important for developing new actors. Training for fire fighting, first aid, and cardiopulmonary resuscitation (CPR) are examples that were pointed out in interviews. Categorization of different competences, associated needs and expected contributions to different incidents need to be studied further.

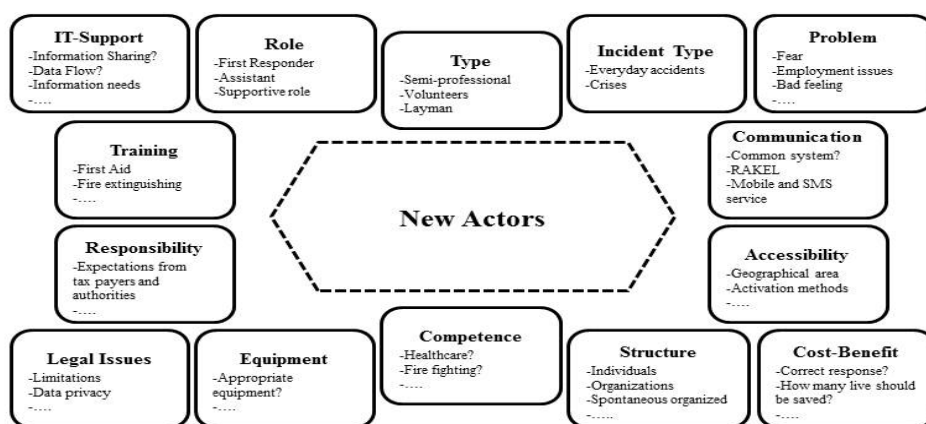


Figure 1. Different dimensions of new actors

13. IT support

Both the documental study and interviews clearly point out that the use of IT can facilitate new actors' participation in response operations. IT can help them to gain a situational understanding and make them able to integrate to other actors by creating an integrated infrastructure for collaboration. At the same time the respondents discuss the difficulty of information sharing, distribution and dissemination when using new actors. What information new actors need depends strongly on the type of operation since each operation has its own characteristics. The outlining issue of proper IT support must be studied more in-depth for different cases.

14. Communication

Transferring the voice and pictures between different actors facilitates the situational understanding as several respondents have stated that in the interviews. Good communication is the base for good collaboration and can support coordination between actors, it is generally claimed. However, the interview study shows that actors in the ERS are using their own alarming centre and operator to communicate with one another. They do not communicate directly. There is not a clear method available on how new actors should communicate with professional response organisations and with each other. Some of them are using radio and some are even using mobile phones. There is an interest to integrate communication systems to help to speed up the communication and decision making. In Sweden, the RAKEL system can be an option for communication between new actors and professional ones. SMS services are also used in the “SMS Life Saving” project. Even local radio stations are used to call many people at once. However, service costs are also important. The RAKEL system is for instance more expensive than mobile and SMS services.

In Figure 1, the 14 dimensions identified above are integrated to a framework that show how new actors can be studied from different perspectives. Dimensions in the figure have not been put in any specific order and correlations between dimensions are not yet investigated in this study but will be part of future research.

DISCUSSION AND FUTURE WORK

It seems that there is a need – to change the traditional ERS to include new actors. However, developing new actors in the traditional ERS is intriguing and challenging both for academic research and practitioners. In this study a framework was constructed. It is intended to serve as a means for researchers and practitioners by showing different dimensions of new actors which need to be considered when they are studied in more detail in concrete project environments.

The framework is tentative and thus subject to change and evolution. Some of the dimensions may need to be divided into two parts or one may create sub-categories and clusters for dimensions to make the framework more useful. How these dimensions are connected and affect each other should also be more thoroughly studied. For example, as have been touched upon, the role that new actors have in ERS affect their responsibilities, information support must be developed in line with the current legal system, different communication solutions are associated with different costs, different trainings result in different competences et c. In relation to this, an obvious future task is to develop an appropriate method on how to apply this framework for analysis of different kinds of “new actor” cases.

This study has been performed in Sweden and describes Swedish circumstances and experiences. However, the identified dimensions in themselves are general and not associated to any specific context. Therefore, the results are generalizable and can be used in other countries as well. In this research, the next step is to apply and test the framework on a triple case study, involving new actors in three local rescue services in Sweden.

ACKNOWLEDGMENTS

This work was supported by Swedish Civil Contingencies Agency (MSB) and was performed at Centre for Advanced Research in Emergency Response (CARER).

REFERENCES

- Berlin, J. M. and Carlström, E. D. (2011) Why is collaboration minimised at the accident scene? A critical study of a hidden phenomenon. *Disaster Prevention and Management*, 20(2), 159-171.
- Gavin, H., Cardell, M., Svensson, C. and Lundin, A. (2012) Larm- och incidenthantering i Öckerö kommun [Alarm and incident management in Öckerö municipality] Ernst & Young.
- Pilemalm, S., Stenberg, R., Andersson Granberg, T. and Axelsson, A. (2012) Emergency response in rural areas, ISCRAM Conference, Vancouver, Canada.
- Hollenberg, J. and Riva, G. (2009). Dual dispatch early defibrillation in out-of-hospital cardiac arrest: the SALSA-pilot. *European Heart Journal*; 30; 1781-1789
- Myers, M. (2009) *Qualitative Research in business management*, SAGE Publications, part 3.
- Rescue services management forum (2008) *Rescue Services Strategy 2015*, Ministry of interior, Finland
- Stenberg, R, Blondin, M. and Andersson Granberg, T. (2010) *First Responders. What is it really?* CARER Report 2010:1, Linköping University Electronic Press, Sweden
- Sund, B. (2006.a) Sambruk av samhällets jour- och beredskapsresurser är lönsamt! [Is cooperative use of the on call and emergency standby resources profitable?] Räddningsverket [Rescue Services Agency]: Karlstad.

9. Sund, B. (2006.b) Tidig hjärtlungräddning av samhällets jour- och beredskapsresurser vid hjärtstopp[Early cardiopulmonary resuscitation by on-call and standby resources in heart attacks]: Handelshögskolan vid Göteborgs universitet.
10. Tierney, K., Beve, C. and Kuligowski, E. (2006) Metaphors Matter: Disaster Myths, Media Frames and their Consequences in Hurricane Katrina, American Academy of Political and Social Science, 604, SAGE