

Conclusions Repeated practice in a simulated pedestrian environment helps children learn aspects of safe and efficient pedestrian behaviour. Six twice-weekly training sessions of 45 crossings each were insufficient for children to fully reach adult pedestrian functioning, however, suggesting longer or more intense training may be needed. Future research should continue to study the trajectory and quantity of training needed for children to become competent pedestrians.

Parallel Sessions Monday 19.9.2016 14:30–16:00

Preparedness and Resilience

Parallel Mon 2.1

123 PREPAREDNESS AND REGIONAL DIFFERENCES IN FINLAND

Heikki Laurikainen. *The Finnish National Rescue Association*

10.1136/injuryprev-2016-042156.123

Background Finland is sparsely populated country where infrastructure varies between urban and rural regions. Safety and security services are part of the local infrastructure and provided by the state and local municipalities. Hypothesis is that regional differences, for example lack of rescue and security services in rural regions, has affected preparedness culture and injury prevention among population. Research is needed to define the essence of local resilience.

Methods The research examines regional differences by using data from two separated surveys (1. N = 3000 and 2. N = 1000). The data have been collected on 2015. Analysing data by using statistical methods it's possible to reveal differences, based on regions, among population.

Results There are a significant differences between rural and urban population. Compared to cities most of the Finns rates countryside more safe and secure place to live. Especially those who live in rural area considers countryside safer place to live. In rural areas population also strongly believes, compared to urban population that neighbours are providing assistance in case of emergency. In rural areas population is more prepared to manage in emergency conditions. In rural areas rescue and security services are less provided in urban environments. However results reveal that services are seen as important as in urban areas even supply of services is weaker.

Conclusions These results reveal that population in the rural areas have higher level of self-preparedness than population have in urban areas. Lack of rescue and security services may be one of the key factors to enhance self-preparedness.

124 DISASTER PREPAREDNESS OF PRIVATE SOCIAL SERVICES CALLS FOR COOPERATION WITH THE PUBLIC SECTOR

Merja Rapeli, Helena Mussalo-Rauhamaa. *Ministry of Social Affairs and Health, Finland*

10.1136/injuryprev-2016-042156.124

Background Global warming increases the amount of disasters. The impacts of the phenomenon on social, economic and

ecological environment are, thus, greater than before. Finland is not situated in a very disaster prone area, however, hazardous storms are not unknown to the country. Consequences of disasters are worst for people who are also in normal life more vulnerable, thus, we need knowledge how these population groups have been protected in case of disasters. Disaster preparedness is obligatory for municipal social work and services. The legal obligation does not, though, apply to the private sector. In Finland one third of the social services are produced by private organisations and their responsibility of preparedness planning should be agreed on while purchasing the services.

Methods In our study we explored private social service organisations' adoption of mitigation activities after heavy storms in 2013 and the preparedness measures taken. We sent a questionnaire to all private social service organisations producing residential care in Finland. SPSS descriptive statistics were used to analyse the data. Majority of the clients in these services were the elderly, but included also disabled, clients with mental health and substance abuse disorders, and children taken into care.

Results Our findings showed that the storms had had impacts on the daily activities of nearly one fourth of the service producers. The major impacts had been to energy supply. Various measures were taken to mitigate the effects, though minority had to evacuate their clients. Only 10 per cent of the respondents reported that preparedness planning was a requirement agreed on with the service purchaser.

Conclusions The most vulnerable to disasters are people dependent on others, which most often include those in residential services. Consequently we recommend the service purchases to include private social work and services in their disaster preparedness activities.

125 IMPROVING CRITICAL INFRASTRUCTURE RESILIENCE BY IDENTIFYING VULNERABLE INTERCONNECTIONS

¹Hannes Seppänen, ¹Kirsi Virrantaus, ²Tero Kauppinen, ²Christian Fjäder. ¹Aalto University, Finland; ²National Emergency Supply Agency, Finland

10.1136/injuryprev-2016-042156.125

Background Critical infrastructure (CI) covers the structures and functions that modern societies require to operate continuously. Failures in these infrastructures may cause substantial undesired consequences in other services due to the high degree of interconnectivity of services. Therefore the continuous operation of these services is essential even during a severe failure situations. This study proposes an approach for identifying the vulnerable interdependencies between critical infrastructure (CI) networks so that the resilience of the CI can be improved. The study focuses on the electricity distribution, telecommunications and IT infrastructures.

Methods The study was conducted during the years of 2014 and 2015 for National Emergency Supply Agency in Finland. The study included six workshops where the material was collected based on threat scenario and verified by the participating CI companies that constitute the regional preparedness committees.

Results In order to find the potential vulnerable interconnections the following approach was introduced: a) collect and structure expert knowledge related to essential activities and failure types, b) analyse the data and create causalities, c) model the relevant influence chains and d) identify the local preparedness requirements. The approach assist also in identifying and creating decision support analysis such as geographical vulnerability analysis.

Conclusions The suggested approach provides consistent approach for identifying the critical CI interconnections and preparedness requirements. The benefits of the approach include the creation of common understanding of the interdependencies, establishing common concepts and introducing a systematic approach for identifying and managing the CI interconnections. The benefit of the approach for the CI service providers is the improved business continuity that is achieved by creating comprehensive understanding of the preparedness requirements.

126

CHAIN OF RESILIENCE: AN INNOVATIVE, EMERGING APPROACH TO AN INTERNATIONAL CONUNDRUM

¹Caroline Spencer, ²Natasia Goode, ¹Dudley McArdle, ¹Frank Archer. ¹Monash University, Melbourne, Australia; ²University of the Sunshine Coast, Maroochydore, Australia

10.1136/injuryprev-2016-042156.126

Background The global emphasis on increasing capacity in all communities to meet the growing challenge of disasters threats, be they natural, technological, environmental or manmade hazards, continues to gain momentum. Disaster resilience, now a catch-cry to reduce the effects of disaster impacts on communities commonly, depicts conceptual ambiguity. The stimulus and momentum for building disaster resilience is demonstrated in the economic losses during the period July 2013-June 2014 which saw the fourth consecutive year where disaster losses exceeded \$100 billion; 16,300 people died and 358 internationally reported disasters affected 113 million people. International and national standards and frameworks, such as the UN's *Sendai Framework for Disaster Risk Reduction 2015–2030*; the United Kingdom's *Strategic National Framework on Community Resilience* (2011); the United States' *Disaster Resilience: A national imperative* (2012), and the Australian *National Strategy for Disaster Resilience* (2011) underpin concepts to build community resilience to disasters.

Method A recent review of community and disaster resilience in peer reviewed and selected grey literature identified multiple multidisciplinary definitions.

Results No consistent definition emerged from the review. 'Resilience' presents as a cross-disciplinary, definitional conundrum for those working to build and measure disaster resilience.

Conclusion This paper offers a unique recommendation to build resilience across all sectors of society and all phases of the disaster cycle by adopting and adapting the internationally recognised, successful, community-based 'Chain of Survival' for out-of-hospital cardiac arrest as a Chain of Resilience.

Developing a community-based *Chain of Resilience* holds enormous potential for providing a much needed framework to create a consistent approach to building resilience across all sectors of society while maintaining conceptual flexibility for situational differences.

127

ADAPTING HADDON'S MATRIX AS AN INNOVATIVE FRAMEWORK FOR DISASTER RISK REDUCTION AND COMMUNITY SAFETY

Frank Archer, Caroline Spencer, Dudley McArdle. Monash University, Melbourne, Australia

10.1136/injuryprev-2016-042156.127

Background Frameworks for Disaster Health lack structure and require stronger evidence. Disaster Risk Reduction has become

an international imperative, now guided by the *2015 Sendai Framework (UNISDR)*. Haddon's Matrix has successfully defined injury prevention countermeasures in a range of community settings over the past 30 years. This paper outlines an evolving model to underpin our understanding of Disaster Health and explores both the current and potential use of Haddon's Matrix in the setting of disaster risk reduction.

Methods A literature review was undertaken to enhance the outcomes of the WADEM Education Committee's initial 2008 framework for *International Standards and Guidelines for Disaster Health Education*. A second literature review examined the use of Haddon's Matrix in the disaster domain. The *2015 Sendai Framework* was examined to identify elements potentially relating to Haddon's Matrix.

Results Four domains within Disaster Health were identified:

1. *Comprehensive* approach: the natural history of a disaster structured on the 3 phases of pre-event, event, and post event;
2. *All Agency, Shared Responsibility* approach: stakeholders and conceptual elements in disaster risk reduction;
3. *All Hazards* approach: reflecting both the traditional scope of disasters, and the contemporary scope of emergencies';
4. *Generic Personal Attributes* expected of the humanitarian professional.

Haddon's Matrix is rarely linked to the disaster domain, although a small number of case studies have recently reported adapting this approach to the emergency management setting. Elements identified within the *2015 Sendai Framework* provide an exciting opportunity to adapt Haddon's Matrix in this setting.

Conclusion Haddon's Matrix provides a framework for common communication and structuring the science and evidence-base of disaster risk reduction. It is adaptable to the contemporary concept of disaster resilience and to understanding disasters through the eyes of community safety.

128

DISASTER PREPAREDNESS FROM THE ASPECT OF THREE HELPS (SELF-, MUTUAL- AND PUBLIC- HELP) IN JAPAN

Yoko Shiraishi. Japan Institution for Safe Communities, Japan

10.1136/injuryprev-2016-042156.128

Background Japan is a country at the high risk of natural disasters. About 20% of the earthquakes over magnitude 6 in the world have occurred in Japan. More major earthquakes and related disasters such as tsunami and fire are also expected to hit the country in near future. Therefore, it is a very pressing issue to prepare for those emergent situations. Although governments are working for the preparation and risk management at the different levels, it is quite obvious that the public rescue would not always be available at the damaged sights right after the occurrence of disasters since public agencies could also be seriously damaged. Therefore, it is very important to make individuals and neighbourhood communities capable to rescue and survive by themselves until the public services become available. This study therefore tries to see how communities prepare for the disasters in terms of individuals (self-help) and neighbourhood community (mutual help) with the Safe Community (SC) model.

Methods The written materials such as the application reports to become a member of the international SC network, annual reports and meeting minutes of the taskforce for disaster safety