Conclusions Given increasing incidence and narrowing of inequalities more effective preventive interventions are needed.

Safety management, Strategies and Policies, Traffic safety

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| 418 | **RISK ASSESSMENT OF FURNITURE AND PRODUCT LAYOUT USING INJURY BIG DATA** |

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Background Environmental modification is highlighted as one of the most effective method in child injury prevention, and environmental modification requires analysing and predicting possible injury situations corresponding to not only products themselves but also layout and interaction of them. However, guardians rely not on injury data or children's development data but on their experience and subjectivity now.

Methods We developed a system to analyse injury situations corresponding to layout of products and furniture. First, the developed system creates statistical model of injury by performing natural language parsing for big data on injury situation collected in medical institutions. Then based on both the created statistical model of injury and children's development data, the system predicts possible injury situations in a target layout of products

Results The current system allows a user such as a parent and a designer to easily estimate climbable areas or objects that can be reached by a child. The visualisation of climbable areas and reachable objects informs the user about possible injury situation in a target environmental layout. To demonstrate the validity of the developed system, we compared the actual injury data with the prediction. The detailed data on actual injury and situation information were collected by home visit investigations of four houses, and the simulation succeeded in predicting 13 of 14 actual injuries.

Conclusions In this study, we developed injury analysis and prediction system. The system allows a non-specialist to easily grasp a possible serious injury situation corresponding to a target layout of products and furniture. It is useful for determining the arrangement of products and furniture and the storage place of dangerous objects for injury prevention.

| 419 | **HOW TO PREDICT FUTURE IN RISK MANAGEMENT** |

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Background The goal in risk management is to define threats and to minimise risks in upcoming operations and actions. The problem is that risk management tools are usually based on things that have already happened, and related safety investigations and reports.

Description of the problem Vastly changing operational environment requires the ability to foresee future operations and the threats related to it. Our flight safety organisation made an observation that the risk management tools generally used could not answer to this demand. With this in mind the Air Force started to develop a systematic risk management tool for pointing out future threats and for planning the actions for minimising the risks.

Results The Finnish Air Force built up a risk management tool in which the experience, knowledge and know-how of our employees are made use of in the best possible way, as the tool gathers their ideas and forms focuses for future flight safety. In our tool the organisational filters are minimised for the safety information to pass the decision holders and the Air Force Commander. This tool enhances safety culture as it makes personnel work with flight safety issues and it also gives them recognition for their efforts. The Finnish Air Force has had good results using this tool. One example is the Finnish Defense Force reform that caused vast changes in our command structure, operations and personnel. With this tool we have been able to reduce the impact of the reform on flight safety.

Conclusions With this risk management tool we can modify our future operations so that most of the threats foreseen will not come true. The tool combines know-how of root level personnel and flight safety organisation still leaving the operational freedom for every level of the organisation. This tool also has a significant influence on safety culture.

| 420 | **DEVELOPMENT OF THE SAFETY MANAGEMENT SYSTEM AT ENTERPRISES** |

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Background Safety management system (SMS) can be considered as a key concept in the success of high level of occupational health and safety in the industrial enterprises. However establishing an SMS may only formally lead to excessive bureaucracy, window coupling and additional costs, especially for small and medium-sized enterprises. The paper concentrates on the analysis of relationships between the key elements in safety management and finding solutions to enhance safety level in different types of the industrial companies.

Methods Safety auditing by the MISHA method was used as the main tool to study the current safety level in the manufacturing companies. Additionally, qualitative data from safety interviews were studied and interpreted. During the study in 2014, 24 safety interviews were conducted in 16 Estonian manufacturing companies. The investigated enterprises were first divided into two groups: OHSAS 18001-certified and OHSAS 18001 non-certified. But the latter proved to have a significant difference in the safety level based on its affiliation: corporated enterprises showed better results in the safety activities than locally owned companies.

Results The study showed that the implementation of OHSAS 18001 will not automatically ensure high safety activities in the company. However, holding an OHSAS 18001 certification creates a basis for the systematic work in the area of safety management, hazards identification and prevention, and promotes strong improvement process put in use. The novelty of the paper lies in the conceptual model of the safety management system, that provides the key elements in formal, real and combined safety using qualitative and quantitative processing of audit results.