



03-04  
OCTOBER  
LUXEMBOURG  
2019

# EU-SAFETY

Research for enhancing  
impact of strategies  
and actions

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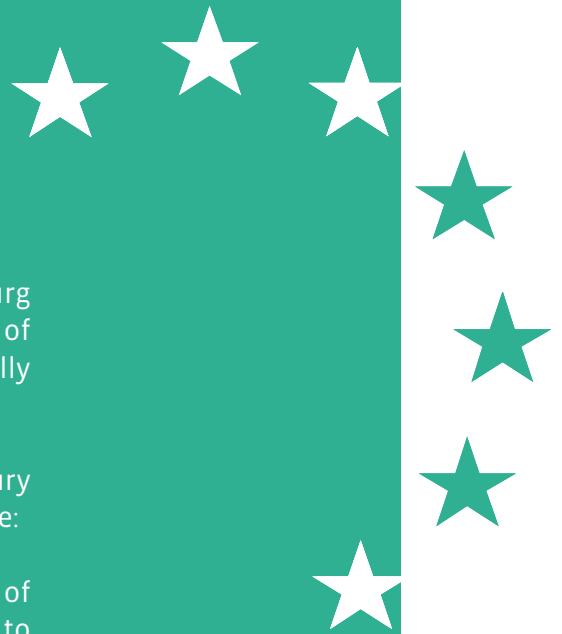
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# Welcome to EU-SAFETY 2019



Organized by EuroSafe in collaboration with the Luxembourg Institute of Health, this conference builds on the series of European Injury Prevention Conferences successfully organised over the past decades by EuroSafe.

Through the series of European Conferences on Injury Prevention and Safety Promotion EuroSafe wants to promote:

- › Better sharing of resources: To organise the exchange of injury data and successful practices in prevention and to develop partnerships for joint projects across sectors.
- › Better policies: To raise political awareness as to the impact of injuries and to mainstream the injury prevention in a coherent manner across European policy agenda's and programmes.
- › Focused actions on injury prevention priorities in Europe: To establish purpose driven networks to ensure on-going development, implementation and evaluation of efforts in view of making Europe a safer place.

The conference covers a wide range of topics related to injury prevention and safety promotion, such as road safety, safety at work, home and leisure safety and consumer safety.

The conference also provides ample opportunities for cross-cutting communications between sectors and disciplines to address issues such as: translating research into practice and policy; injury related socio-economic inequities; ageing societies; technological developments; social marketing; alcohol, fatigue and distraction.

The series of EuroSafe bi-annual conferences take place in the EU/EEA region and is hosted in rotation by EuroSafe members.

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# EU-SAFETY

Research for enhancing  
impact of strategies  
and actions

03-04 October  
Luxembourg

[eu-safety2019.lih.lu](http://eu-safety2019.lih.lu)

## Programme

# Programme at a glance

## ► Thursday, October 3<sup>rd</sup>

- 08:30 Registration
- 09:00 Welcome and Key Statements
- 09:45 **Plenary Session 1**
- 10:30 Coffee Break
- 11:00 **Break Out Sessions 1&2**
- 12:00 **Pitch Presentations Sessions 1&2**
- 12:30 Lunch Break
- 13:30 **Break Out Sessions 3&4**
- 14:30 **Pitch Presentations Sessions 3&4**
- 15:00 Tea Break
- 15:30 **Break Out Sessions 5&6**
- 16:30 **Plenary Session 2**
- 17:30 Networking Activities
- 19:00 Reception

## ► Friday, October 4<sup>th</sup>

- 09:00 **Break Out Sessions 7&8**
- 10:00 **Late Breakers/Pitch Presentations Sessions 5&6**
- 10:30 Coffee Break
- 11:00 **Break Out Sessions 9&10**
- 12:00 **Plenary Session 3**
- 13:00 Closing Remarks
- 13:15 Farewell Lunch
- 14:00 **Post-conference Business Meetings**

# Programme

Thursday 3<sup>rd</sup> October 2019

8.30 - 9.00 Registration

## LOCATION: SALLE JOSÉ ENSCH

9.00 - 9.45 **Opening session: Welcome and key statements**

(Chair: Dr Jean-Claude SCHMIT, Director of Health, Ministry of Health, Luxembourg)

> Mr Etienne SCHNEIDER, Minister of Health Luxembourg, Luxembourg

> Mrs Violeta BULC, Commissioner for Transport, European Commission (t.b.c.)

> Dr Zsuzsanna JAKAB, WHO-Regional Director for Europe, Denmark (t.b.c.)

9.45 - 10.30 **Plenary session 1: "Challenges in health promotion and injury prevention" // p.15**

(Chair: Prof Laetitia HUIART, Director of the Department of Population Health, LIH, Luxembourg)

PS1.1 "Strengthening the UK's Capacity for Product Safety: Strategy 2018-2022",  
Graham RUSSELL, CEO Government Office for Product Safety and Standards, UK

PS1.2 "The role of culture in safety",  
Nicholas J. WARD, Professor of Mechanical Engineering, Montana State University, USA

10.30 - 11.00 Coffee Break

## LOCATION: SALLE JOSÉ ENSCH

11.00 - 12.00 **Break out session 1:  
Consumer Product Safety // p.17**

(Moderators: Zeynep YILDIZELI &  
Ron GAINSFORD)

**OP1.1** E-commerce of safe children's products:  
a common view for SMEs, consumers and  
authorities. ARENAS MOTILLA, María Cruz et al.

**OP1.2** Child safety in cars: an observational  
study on the use of child restraint systems  
in the Netherlands. HERMANS, Mariëlle et al.

**OP1.3** An enhanced model for assessing  
choking risk in children for consumer  
products. GREGORI, Dario et al.

**OP1.4** The impact of the UK national 'Safe at  
home' Safety equipment scheme on  
hospital admissions for childhood injuries.  
ORTON, Elizabeth et al.

**OP1.5** Analyses of the European Injury  
Database (IDB) for product related injuries.  
KRUL, Inge et al.

## LOCATION: SALLE EDMOND DUNE

**Break out session 2:  
Injury Surveillance & Research - part 1 // p.23**

(Moderators: Dritan BEJKO &  
Persephone DOUPI)

**OP2.1** Using registries in injury surveillance:  
following transition from emergency care to  
primary care. PANNEMAN, Martien et al.

**OP2.2** Increase injury surveillance capacity in  
Eastern Europe. PEEK-ASA, Corinne et al.

**OP2.3** Affordability and availability of child  
restraints in an underserved population in  
South Africa. PUVANACHANDRA, Prasanthi et al.

**OP2.4** Machine learning and deep learning  
techniques to code injury data from French  
and/or German language narratives  
registered in hospital's Emergency  
Departments. SCHNELL, Michaël et al.

**OP2.5** Drowning surveillance in Denmark:  
combining different data sources on  
drowning mortality. LAURSEN Bjarne et al.

#### LOCATION: SALLE JOSÉ ENSCH

12.00 - 12.30

##### Pitch presentations session 1:

##### Child Safety in Action // p.29

(Moderators: Ashley MARTIN & Gabriele ELLSÄSSER)

**PP1.1** Risk factors for burn accidents in children of 0-4 years old: a prospective study. VAN ZOONEN, Eva et al.

**PP1.2** Paediatric drowning deaths in Ireland: A ten-year review. HAMILTON, Karina et al.

**PP1.3** Child and adolescent road deaths and injuries in developing countries: the case of Lebanon. AL-HAJJ, Samar et al.

**PP1.4** Traumatic brain injuries in a large paediatric hospital in Georgia. CHIKHLADZE, Nino et al.

**PP1.5** Survey of primary care paediatricians in Europe on child injury prevention. BREGANT, Tina et al.

#### LOCATION: SALLE EDMOND DUNE

##### Pitch presentations session 2:

##### Injury Surveillance & Research // p.34

(Moderators: Dritan BEJKO & Persephone DOUPI)

**PP2.1** Traumatic brain injury: a three-country assessment of in-patients treatment and care. COMAN, Madalina et al.

**PP2.2** Medically attended injuries among Albanian population, 2013-2017. QIRJAKO, Gentiana et al.

**PP2.3** Patient safety culture in Bulgarian private and public hospitals. STOYANOVA, Romyana et al.

**PP2.4** Occupational safety in Republic of North Macedonia. TOZIJA, Fimka et al.

**PP2.5** Falls in patients with Parkinson's disease. ERAKOVIC, Jevto et al.

**PP2.6** Assessment of TBI patients' health status by the Glasgow coma scale at pre-hospital and emergency department level. MINDRIGAN, Eugen et al.

12.30 - 13.30

Lunch Break

13.30 - 14.30

##### Break out session 3:

##### Child Safety in Action // p.41

(Moderators: Ashley MARTIN & Gabriele ELLSÄSSER)

**OP3.1** Trends in injury related fatalities in the Irish pediatric population: a review of national mortality data. MCGARVEY, Cliona et al.

**OP3.2** Pediatric burns among Syrian refugee communities in Lebanon: evidence to inform policies and programs AL-HAJJ, Samar et al.

**OP3.3** Deeper insights on trampoline related injuries – a multinational study based on EU-IDB. ELLSÄSSER, Gabriele et al.

**OP3.4** Safe falls – safe schools: reducing instinctive injury-associated gestures during backwards falls. TORONJO-URQUIZA, María Teresa et al.

**OP3.5** Injury prevention photosphere: an intervention for use by families and community-based professionals. DEAVE, Toity et al.

##### Break out session 4:

##### Road Traffic Safety part 1 // 47

(Moderators: Gerald FURIAN & Elizabeth LUMSDEN)

**OP4.1** The observed prevalence of use of safety devices on motorized vehicles in Italy. GIUSTINI, Marco et al.

**OP4.2** Walking against or with traffic? Evaluating pedestrian fatalities and head injuries in Taiwan. PAI, Chih-Wei et al.

**OP4.3** Risk factors for motorcycle crash in novice riders. MÖLLER, Holger et al.

**OP4.4** The safety of people who drive for work in the gig economy: A perfect storm of risk factors? CHRISTIE, Nicola et al.

**OP4.5** Pedestrians treated at Dutch emergency departments: An overview of road traffic accidents as well as fall accidents on public roads. NIJMAN, Susanne et al.

**Key statements** Mr Matthew BALDWIN, DG MOVE, Deputy Director-General

**LOCATION: SALLE JOSÉ ENSCH**

**14.30 - 15.00**

**Pitch presentations session 3:**

**Child Safety in Action // p.53**

*(Moderators: Ashley MARTIN & Gabriele ELLSÄSSER)*

**PP3.1** The role of civil society in child safety in Europe. SCHOLTES, Beatrice et al.

**PP3.2** Cyprus five years strategy plan for the prevention of unintentional childhood injuries: comprehensive program for the playground safety. GEORGIU, Irene et al.

**PP3.3** The Giant's House - A safer environment for children in and around the house. BOON, Erik et al.

**PP3.4** 1st TRIP SAFELY: Transport of new-borns in cars. Model of intervention in hospitals – Portuguese experience since 2011. BOTTE, Helena et al.

**PP3.5** Application of new technologies in education of parents in Serbia - mobile application on child injury prevention. MARKOVIC, Marija et al.

**LOCATION: SALLE EDMOND DUNE**

**Pitch presentations session 4:**

**Road Traffic Safety // p.58**

*(Moderators: Gerald FURIAN & Elizabeth LUMSDEN)*

**PP4.1** How do we get from B to C?

Is accident investigation still a part of the answer to road safety? TVERAAEN, Mona.

**PP4.2** Driving behaviour in depressed patients vs healthy controls. Findings from a driving simulator study. TSOUTSI, Vagioula et al.

**PP4.3** Road safety: A pilot-study of an online tool to improve traffic behaviour of employees. HERMANS, Mariëlle et al.

**PP4.4** The safe system approach to protect children in road traffic. MERSCH, Jeannot.

**15.00 - 15.30**

Tea Break

**15.30 - 16.30**

**Break out session 5:**

**Methodologies for Safe Community programmes // p.63**

*(Moderators: Eva VAAGLAND & Peter SPITZER)*

**OP5.1** SIGAPÉ - community based project to promote safe walking to school. NASCIMENTO, Sandra et al.

**OP5.2** Establishing a local infrastructure for safety based on global visions, national policies and local conditions. VAAGLAND, Eva J.

**OP5.3** On traffic safety promotion: policy and action plans in Vestfold County, Norway. LAURITSEN, Anne Sofie et al.

**OP5.4** "IDEAS"- A digital tool for using knowledge and data as a driving force to strengthen local safety promotion efforts. VAAGLAND, Eva J.

**OP5.5** The national strategy « VISION ZERO » in Luxembourg. SUNNEN, Annick

**Break out session 6:**

**Safety in Sports and Leisure // p.69**

*(Moderators: Jari PARKKARI & Laurent MALISOUX)*

**OP6.1** Sports and sports injury risk – Results of the Austrian exposure survey. BAUER, Robert et al.

**OP6.2** Drowning prevention programs through lifesaving sport and possible extrapolation to other European countries. GONZÁLES DIAZ, Inés et al.

**OP6.3** Using innovative communication channels to change behavior – Ireland's drowning prevention campaigns evaluated. SWEENEY, Roger.

**OP6.4** The Italian surveillance of ski accidents: analysis of risk trend and determinants of injury in the Aosta Valley. PITIDIS, Alessio et al.

**OP6.5** The effect of shoe cushioning and body mass on injury risk in recreational runners: a randomized controlled trial. MALISOUX, Laurent et al.



**LOCATION: SALLE JOSÉ ENSCH**

**16.30 - 17.30**

**Plenary session 2: "Building the evidence-base for effective strategies and actions" // p.75**

*(Chair: Errol TAYLOR, Chairman EuroSafe, CEO RoSPA, UK)*

PS2.1 "Implementation opportunities in injury prevention: is the public health approach still valid in the 21st century?",

*Margie PEDEN, Head of the Global Injury Programme at the George Institute for Global Health, Oxford, UK*

PS2.2 "Building the evidence-base for child home injury prevention: findings from a five year programme of research",

*Denise KENDRICK, Professor of Primary Care Research, Division of Primary Care, University Park Nottingham*

PS2.3 "Multidisciplinary perspective on the risk and protective factors associated with suicide and self-harm",

*Prof Ella ARENSMAN, National Suicide Research Foundation, Ireland*

› Closing remarks on the first day Errol TAYLOR, Chairman EuroSafe, CEO RoSPA, UK

**"Luxembourg National Research Fund opportunities"**

Sean SAPCARIU, Programme Manager, National Research Fund Luxembourg

**17.30 - 19.00**

Networking activities

**19.00**

Reception

# Programme

Friday 4<sup>th</sup> October 2019

## LOCATION: SALLE JOSÉ ENSCH

09.00 - 10.00

### Break out session 7:

#### Prevention of Intentional Injuries // p.79

(Moderators: Jonathon PASSMORE & Ella ARENSMAN)

**OP7.1** Self-reported perception on suicide phenomenon and suicidal risk exposure for young people in Lithuania. STRUKCINSKIENE, Birute.

**OP7.2** Risk factors associated with abusive parental practices within the ecological model. JORDANOVA PESHEVSKA, Dimitrinka et al.

**OP7.3** Safety and well-being in adolescents with adverse childhood experiences. JORDANOVA PESHEVSKA, Dimitrinka et al.

**OP7.4** Risk factors associated with suicidal thoughts among 50+ years old residents. Results from the SHARE survey in Luxembourg. BUCKI, Barbara et al.

**OP7.5** European Alliance against Depression: Prevention of suicidal behaviour by community based 4-level interventions. HEGERL, Ulrich et al.

10.00 - 10.30

### Late Breakers / Pitch presentation session 5:

#### Injury Surveillance & Research part 2 // p.91

(Moderators: Dritan BEJKO & Persephone DOUPI)

**PP5.1** Remote maintenance on a robot cell and secure integration into the company's internal process. MALISA, Viktorio et al.

**PP5.2** Water risk versus traffic risk. CANO NOGUERA, Francisco et al.

**PP5.3** Drug and alcohol use in drowning deaths recorded by the Irish National Drug-Related Deaths Index (NDRDI), 2004-2016. O'SULLIVAN, Michael et al.

**PP5.4** Water safety policy in Scotland. LUMSDEN, Elizabeth et al.

10.30 - 11.00

Coffee Break

## LOCATION: SALLE EDMOND DUNE

### Break out session 8:

#### Action on Falls Prevention in Older People // p.85

(Moderators: Birgitte BLATTER & Tatiana ALVES)

**OP8.1** Falls in older people in domestic and leisure settings – data from EVITA system. ALVES, Tatiana et al.

**OP8.2** Accidental falls – the leading cause of injury related mortality and hospitalization in the elderly in Croatia. BRKIĆ BILOŠ, Ivana et al.

**OP8.3** Stand up stay up 2016-19 - a programme to raise the level of falls prevention activity across England. MARTIN, Ashley.

**OP8.4** Development of an evidence-based implementation toolkit for the Falls Management Exercise programme (FaME). ORTON, Elizabeth et al.

**OP8.5** Project TOM: results of implementing a multifactorial approach to prevent falls and improve autonomy in community-dwelling older adults. VAN DER VEEN, Rozan et al.

### Pitch presentation session 6:

#### Road Traffic Safety // p.95

(Moderators: Gerald FURIAN & Elizabeth LUMSDEN)

**PP6.1** Epidemiological study of injury cases in a tertiary care hospital in Delhi based on national injury surveillance format. HITAKSHI SH. et al.

**PP6.2** Assessment of the causal factors of the pedestrian's injuries in Georgia 2016. CHACHAVA, Tamar et al.

**PP6.3** Strengthening road safety legislation in Republic of North Macedonia. TOZIJA, Fimka.

**PP6.4** On the crossroad of the road safety legislation, risk factors knowledge, safety culture and road users' behaviour. PITSKHELAURI, Nato et al.

**PP6.5** Effect of preventive measures in mortality for road injuries in Brazil. VASCONCELOS, Cintia et al.

11.00 - 12.00

**LOCATION: SALLE JOSÉ ENSCH**

**Break out session 9:**

**Injury Surveillance & Research part 2 // p.101**

*(Moderators: Persephone DOUPI & Dritan BEJKO)*

**OP9.1** Alcohol related emergency department treatments in the Netherlands: alcohol intoxications and alcohol related injuries. NIJMAN, Susanne et al.

**OP9.2** Risk factors associated with unintentional injury. Results from the European Health Examination and Interview Surveys in Luxembourg, BEJKO, Dritan et al.

**OP9.3** Poisoning injuries takes too many lives – mapping and prevention need to be developed and increased in Sweden. EKMAN, Robert et al.

**OP9.4** A new method for estimation of occupational injuries and diseases economic burden in five European Union countries. MOFIDI, Amirabbas et al.

**OP9.5** Feasibility of standardized reporting schemes on home and leisure injury risks and relevant safety measures for EU countries. KISSER, Rupert et al.

**LOCATION: SALLE EDMOND DUNE**

**Break out session 10:**

**Road Traffic Safety part 2 // p.107**

*(Moderators: Gerald FURIAN & Elizabeth LUMSDEN)*

**OP10.1** Traffic safety culture and interactions between motorists and cyclists. OTTO, Jay et al.

**OP10.2** Effective ways of engaging parents/ caregivers in their children's road safety education. O'TOOLE, Sarah et al.

**OP10.3** Deprivation and road traffic injury comparisons for 4-10 and 11-15 year-olds. O'TOOLE, Sarah et al.

**OP10.4** Road traffic injuries in children in Serbia-possibility for more action. MARKOVIC, Maria et al.

**OP10.5** Scenario generation for testing Automated Driving using crash databases. PERVEEN, Simon et al.

12.00 - 13.00

**LOCATION: SALLE EDMOND DUNE**

**Plenary session 3: "Innovation in injury prevention and safety promotion" // p.113**

*(Chair: Ron GAINSFORD, Honorary Member EuroSafe, Advisor British Toy and Hobby Association, UK)*

**PS3.1** "New Technologies: challenges and opportunities for enhancing safety", Klaus ROBATSCH, Head department on research & knowledge management, Road Safety Council, Austria

**PS3.2** "The big data and information technology revolution in injury prevention; are we lagging behind?", Birgitte BLATTER, Head Monitoring & Research, Consumer Safety Institute, the Netherlands

**PS3.3** "How a smart home can be a safer home?", Martyn ALLEN, Head Electronic Dept., Electric safety First, UK

13.00 - 13.15

Closing remarks by Errol TAYLOR, Chairman EuroSafe and **Launch of EU-Safety 2021**

**13.15 - 14.00** Farewell Lunch

**14.00 - 17.00** Post-conference Business meetings:

**LOCATION: SALLE JOSÉ ENSCH**

Injury Surveillance-Network (EU-IDB)

**LOCATION: SALLE EDMOND DUNE**

European Child Safety Alliance (ECSA)

**LOCATION: LOBBY**

European SafeComm Network (ESCON)

# Luxembourg Institute of Health

Research dedicated to life

The Luxembourg Institute of Health (LIH) is a public research organisation at the forefront of biomedical sciences. With its strong expertise in population health, oncology, infection and immunity as well as storage and handling of biological samples, its research activities are dedicated to people's health.

At LIH, more than 350 individuals are working together, aiming at investigating disease mechanisms and developing new diagnostics, innovative therapies and effective tools to implement personalised medicine. The institution is the first supplier of public health information in Luxembourg, a strong cooperation partner in local and international projects and an attractive training place for ambitious early-stage researchers.

## **Department of Infection and Immunity (DII)**

Clinical-translational and fundamental research centre focusing on infectious and inflammatory disease mechanisms to develop the next generation of diagnostic biomarkers and immunotherapies.

## **Department of Oncology (DONC)**

Fundamental research in the field of cellular and molecular mechanisms of tumour progression and resistance to therapies with a specific focus on neuro-oncology, lung and blood cancer.

## **Department of Population Health (DoPH)**

Interdisciplinary research centre focusing on epidemiology and public health and performing fundamental, patient-oriented and population-based research.

## **IBBL (Integrated BioBank of Luxembourg)**

NF S96-900 and ISO 9001 certified, and ISO 17025 accredited institute offering biospecimen-related services and biobanking infrastructure.

# Plenary Session 1:

## Challenges in health promotion and injury prevention

### PS1.1

#### Strengthening the UK's Capacity for Product Safety: Strategy 2018-2022

Graham Russell

CEO Government Office for Product Safety and Standards, UK

Product safety in the UK has historically been solely regulated by trading standards within local authorities. Following high profile events including the tragic fire at Grenfell Tower, where a fridge freezer was involved, and public concern about the effectiveness of product safety recalls, a Working Group on Product Recalls and Safety recommended national oversight was needed. This also recognised that changes in consumer purchasing behaviour, innovation in both product design and supply chains, the impending exit from the EU and the increasingly stretched local authority system meant that doing nothing was not an option.

The Office for Product Safety and Standards was launched in January 2018, with a remit to provide national scientific and technical capacity for product safety and support trading standards. One of our first actions was to set out our strategy for product safety. We set out our vision as a *'trusted product safety system that delivers protection for consumers, fairness for business and a competitive market place defined by outcomes of safety and public confidence'* and four mutually reinforcing ways that we would drive action – to analyse, inform, enforce, and build. These four objectives recognised the need to use a broad toolbox to be an effective regulator.

Over the last year we have built the organisation recruiting an additional 100 people and creating specialist teams, whilst also delivering across our four objectives. On 'analyse' we have set up our intelligence unit to assess product safety threats, invested £2m in research on emerging hazards, new safety solutions and behavioural insights and begun work on improving risk assessment methodologies. On 'inform', campaigns to raise

consumer awareness of safety issues such as lasers, button batteries and buying online have reached over 2 million consumers, our advice to businesses online has been simplified and our behavioural insights research has begun to inform development of a digital tool for consumers. On 'enforce', we have led a review of the safety compliance systems of white goods manufacturers, providing national oversight, and have reviewed a safety issue in tumble dryers which has led to the machines being recalled. Lastly in 'build', we have provided an extensive programme of free training for trading standards officers to build their capability, enabled trading standards to access testing facilities and begun to build our own laboratory testing capability.

One year on from the publication of our strategy, we have built a national regulator capable of action on improving safety outcomes. But challenges remain. Access to data on injuries caused by products is a serious data gap we are working to fill, through building partnerships with fire services and the NHS and use of social media monitoring, but we can do more. Our research programme continues, and our challenge now is to use our growing evidence base to support regulatory delivery that protects consumers against hazards from products whilst enables innovation and technology in the product market. Changes in technology are at the front of our thinking, the expanding array of data available, technological advancements in product design and in the way products are supplied to consumers (e.g. 3D printing) are all live issues and our enforcement efforts need to tackle the increasing threats from online and consumer to consumer sales. We will work in active partnerships with organisations across the safety landscape to build a more resilient system. Our ambition is to create a shared understanding of risk and the right interventions to mitigate and control risk and to provide practical tools, tested with users, to enable all those with a role in delivering safety to better fulfil their roles and deliver improved protection.

## PS1.2

### The role of culture in safety

Professor Nicholas J. Ward

*Director, Center for Health and Safety Culture,  
Montana State University, USA*

Currently, there is growing interest in the role of culture in traffic safety. Traffic Safety Culture can be defined as “the shared belief system of road users and stakeholders that influence behaviours and actions that influence crash risk”. This presentation will discuss the key components of a culture-based approach including (1) examining the role of shared beliefs in deliberate risk taking and (2) aligning the goals and strategies of multiple stakeholders with a shared vision. In contrast to traditional approach to traffic safety, these key components ensure that improvements in traffic safety are sustainable over time.

Based on this discussion, the presentation will then give an example of applying this approach to increasing protective behaviour (e.g., seat belt use). This example will demonstrate important principles and guiding framework to apply this approach to any public health issue. This framework emphasizes the importance of stakeholder partnerships in developing, integrating and implementing strategies that significantly improve and sustain public health. Accordingly, the presentation will discuss effective processes and important success factors for establishing an engage, effective and enduring partnership.

There are two processes that need to be intentional for there to be successful change within a partnership. First, there is a need for a change management process. This type of process manages the conditions for change, methods of communication, and implementation of strategies to ensure the effectiveness and commitment of the partnership. Second, the problem-solving approach to address the change topic must be appreciative rather than deficit based. By focusing on the strengths of the partnership and the actions they enable to reach a shared generative vision, participants will be more engaged, innovative and resilient in their efforts to find effective solutions.

The presentation will conclude by examining how this framework and culture-based approach can be applied in other contexts including workplace injuries and interpersonal violence. By exploring how shared beliefs relevant to these contexts increase risk taking, we may be able to reduce related deaths and injuries. Key to the success of this approach will be identifying the key stakeholders, which may require overcoming “silos” to align their efforts toward a shared vision of the future.



# Break out session 1:

Consumer Product Safety



## E-commerce of safe children's products: a common view for SMEs, consumers and authorities

María Cruz Arenas Motilla<sup>1</sup>, Karina Pernias Peco<sup>1</sup>, Sandra Nascimento<sup>2</sup>, Antonio Di Stasi<sup>3</sup>, Jiri Stastny<sup>4</sup>, Elena Llorca<sup>5</sup>

<sup>1</sup>Technological Institute for Children's Products and Leisure, Spain; <sup>2</sup>Associação para a Promoção da Segurança Infantil, Portugal; <sup>3</sup>Università Politecnica Delle Marche, Italy; <sup>4</sup>Association for Toy and Play Czech Republic; <sup>5</sup>Universidad de Alicante, Spain

**Introduction:** According to EUROSTAT's e-commerce statistics, children's products such as clothing, toys or furniture are one of the best-selling products on the Internet. The level of protection of consumers against the risks of products sold online is far below the level of protection offered through the traditional store. According to recent OECD statistics, 68% of products banned or recalled from the market were supplied online. Consumers, business and consumer authorities need to improve their skills for the purchase, sale and control of children's products sold online, respectively. This research aims to develop open educational resources, using information and communication technologies, to provide training specifically designed for e-commerce of children's products from the point of view of product safety.

**Methods:** The LEAN E-LEARNING DESIGN method was used as the starting point to create e-COM 4 CHILDREN educational resources. This method is a new application of the Lean Canvas tool for training courses. The key elements of the methodology to develop this training were: 1. Target audience 2. Needs of the potential users 3. Value proposition (competencies) 4. Course structure 5. Metrics evaluation system 6. Didactic proposal 7. Technological proposal 8. Unique values 9. Sustainability proposal.

**Results:** Two main results have been obtained within this research:

1. A multimedia ICT tool enriched as interactive comic aimed at consumers in general.
2. An adaptive MOOC (massive online open course) aimed at professionals of industry, consumer associations and market surveillance, where the training itinerary is adjusted to the characteristics of the users individually and their rhythm of execution to the student learning rhythm.

These tools provide training on the e-commerce of children's products, focused especially on the safety of products sold online, taking into account the profile of the user. They are available in five European languages, with free and open access via Internet. The pedagogical design is focused on five key tools: learning, activities, resources, interactivity and assessment. It covers topics such as consumer rights, children's products safety, market surveillance or ethic principles in the e-commerce.

**Conclusions:** e-COM 4 CHILDREN project has developed pioneer and innovative open educational resources using ICT-based methodologies, in order to provide training on the e-commerce of children's products from the product safety perspective, according to the current European legal framework. These resources constitute practical tools to improve the skills of the stakeholders involved in children's products safety sold online.

**Keywords:** consumer product safety, safety legislation and enforcement, innovations in safety education

## Child safety in cars: an observational study on the use of child restraint systems in the Netherlands

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**Introduction:** To minimize children's injuries due to car accidents, Dutch law requires that children under 135 cm are transported in child restraint systems (CRS) approved by EU-legislation. Many mistakes can be made when using CRS, resulting in unsafe transportation of children. In 2013, 73% of the Dutch children aged 0-4 were transported unsafely (van Beeck et al., 2014). To determine the situation in 2018, the study was repeated and extended. The study's aim was to investigate, by observing the (mis)use of CRS, to what extent children (under 9 years old) were transported by car safely.

**Methods:** A cross-sectional observational study was conducted. In July and August 2018, parking lots of nine sites in the Netherlands were visited by researchers. Arriving or departing Dutch drivers, who transported children under 9 years old, were eligible to participate in the study. After giving informed consent, drivers were interviewed by one researcher by means of a questionnaire, while the other researcher observed the (mis)use of the CRS using a checklist. Misuse was defined as follows: CRS inappropriate for the child (based on length and weight) and/or CRS wrongly installed in the car and/or child improperly restrained in CRS. A child was transported unsafely, when scoring a 'misuse' on one or more of these indicators. Additional analyses on factors possibly influencing (un)safe transportation of children (e.g. drivers' sociodemographic information) were performed using questionnaire data.

**Results:** 392 drivers and 470 children were included in the study. 77 children were installed in a baby seat, 197 in a toddler seat, 159 in a booster seat or cushion and 37 were not transported in a CRS (22 incorrectly, 8 correctly (over 135 cm) and of 7 children length was unknown). Results showed that 83% of the children were transported unsafely: 7% of the CRS were inappropriate for the child, 49% of the CRS were wrongly installed in the car and in 59% the children were improperly restrained in a CRS. Additional analyses showed that children had a higher chance of safe transportation when the driver was a parent (OR 0.308, 95% CI 0.11-0.88).

**Conclusions:** Eight out of ten children were not transported safely in cars. Many children were transported in an appropriate CRS, but many mistakes were made when installing the CRS in the car and restraining children in the CRS. Information should be provided to drivers (especially (grand)parents) to improve safety of child transportation in cars.

**Keywords:** child and adolescent safety, road safety

## An enhanced model for assessing choking risk in children for consumer products

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**Introduction:** Choking injuries in children are a relevant public health issue worldwide. Estimating products' injury risk would improve the burden of such injuries, allowing for the development of ad hoc prevention strategies. However, clinical datasets on foreign body (FB) injuries do not generally use a standardized coding of the products causing the injuries.

**Methods:** The Susy Safe ([www.susysafe.org](http://www.susysafe.org)) is an international project on FB injuries in children. It represents one of the few examples worldwide of a systematic collection of data on FB injuries in children, and has collected more than 26,000 cases. Recently, a standardized coding of the products reported in the registry has been introduced. This allows for the estimation of a risk model using exclusively epidemiological data. The model can produce risk estimates related to specific products (based on dimensions, shape, and consistency) targeted to specific age and gender groups of children. Such model, although accurate in most circumstances, has proven to be inadequate when the amount of evidence is limited for a given combination of objects' and children's characteristics. To overcome such limitations, a model enhanced version has been developed. This includes, in a Bayesian framework, the incorporation of experts' opinions in the model. A Bayesian Beta-Binomial model has been implemented to

compute the risk of hospitalization of a FB injury (severe injury according to the definition of Department of Trade and Industry in the UK). Vague (Uniform distributions) and weakly informative (Beta distribution with parameters  $< 1$ ) prior distribution have been considered. Conditional risk (median of the posterior distribution by FB type and age class of injured children) has been reported.

**Results:** Conditional risk of severe injury (an injury that leads to hospitalization) is reported for each FB type and age class. As an example, 4% of the injuries related to bead and pearl (category 00000000 in the Susy Safe coding) requires hospitalization, leading to an absolute risk of severe injury equal to  $20.6\% \times 4\% = 0.82\%$  (95% credibility interval: 0.5%-1.2%).

**Conclusions:** A Bayesian model has been developed to assess the risk of severe FB injuries combining data from the Susy Safe Project and expert a priori. Different scenarios (from vague to weakly informative a-priori distributions) have been considered. When vague, weakly informative prior distribution is considered, the posterior distribution of the risk is driven by the observed data (likelihood distribution). In this context, experts provide useful information to be used for risk estimation even for the less frequent FB categories. The lack of data is indeed replaced by the experts' a priori. Finally, the Bayesian framework allows for updating the risk estimates in a sequential fashion as soon as new data become available (online learning).

**Keywords:** surveillance, research methods, and evaluation, child and adolescent safety, consumer product safety and safety of services

## The impact of the UK national ‘Safe at home’ Safety equipment scheme on hospital admissions for childhood injuries

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**Introduction:** Unintentional injuries are a leading cause of preventable death for children under five. Most are home injuries and disproportionately affect children living in deprived households. Between 2009/11 the UK Government funded a £14million (GBP) home safety equipment scheme in England (Safe At Home). The intervention targeted families with children aged under five, in receipt of means-tested state financial support in high injury-rate areas. We report the scheme’s impact on injury-related hospital admissions in the under fives.

**Methods:** Household-level equipment allocation data were used to identify areas that did (intervention) and did not (control) implement the scheme. Control areas were matched to intervention areas on pre-scheme injury rates, deprivation and rurality. The aggregated injury-related hospital admission rates were calculated before, during and after implementation in intervention and control areas.

**Results:** The mean study population was 2.7 (intervention) and 2.6 (control) million children under five at baseline (2004-2006), rising to 3.3 (intervention) and 3.2 (control) million after the scheme’s implementation (2013-2015). Overall 51% were male, 8% lived in rural areas and the mean deprivation score (Townsend) was 1.95 (SD 3.71) in the intervention group and 1.13 (SD 3.14) in the control group. A total of 64,590 intervention-area families received equipment including safety gates (86% of families), bath mat (82%), cupboard locks (78%), corner cushions (67%), fire guards (52%), window restrictors (38%) and/or cord winders (28%). Half the eligible families (50%) had 4-5 pieces of equipment.

At baseline (January 2004) the hospital admission rate for any home injury was 1.15/1000 children/year (95% confidence interval 1.12-1.18) in control areas and 1.26/1000 (1.23-1.29) in intervention areas. Immediately after the scheme ended (January 2012) the hospital admission rate for any home injury was 1.23/1000 (1.20-1.25) in control areas and 1.38/1000 (1.36-1.41) in intervention areas. When hospital admissions were restricted to those that could plausibly be prevented by the equipment (e.g. stair fall), injury rates were 0.31/1000 (0.30-0.33) in control areas at baseline, rising to 0.38/1000 (0.37-0.39) immediately post intervention and 0.34/1000 (0.32-0.35) in intervention areas at baseline rising to 0.37/1000 (0.36-0.38) post intervention. A controlled interrupted time series analysis is ongoing.

**Conclusions:** Over 64,000 families received home safety equipment between 2009-11 in a national home safety equipment scheme in England. In the context of rising potentially equipment-preventable hospital admission rates, preliminary analysis suggests intervention areas experienced a slower increase in injury rates than control areas. Findings from the interrupted time series analysis will be presented.

**Keywords:** home safety, safety equipment, injury prevention

## Analyses of the European Injury Database (IDB) for product related injuries

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**Introduction:** Many consumer products have the potential to cause injuries to users. Studies reveal that in around 15 percent of incidents the injury could have been prevented by improved user instructions and/or better design of the product. In half of these cases the injury was due to product malfunction. Monitoring of product related injuries is crucial for ensuring product safety in Europe.

The European Injury Data Base (IDB) is used for monitoring injuries treated at Emergency Departments (EDs). Besides injury mechanisms and types of injuries, the IDB registers all products involved in the injury; either by triggering the accident, producing the injury or by being otherwise involved. Therefore, the IDB database is an excellent tool for analyses of product-related injuries. The aim of this study is to identify the most important products involved in injuries treated at European EDs.

**Methods:** The European Injury Data Base (IDB) is based on national injury surveillance efforts, with participating countries annually collecting injury data from Emergency Departments in a selection of hospitals. In some countries, basic IDB data are collected routinely in all hospitals. In the majority of countries IDB data are collected in a limited number of hospitals, preferably a representative sample of hospitals - nationwide or in one of the regions or provinces.

For this study, all ED-treatments – registered in 18 EU countries, n=911.699 - for unintentional injuries caused by products are included in the analyses. Data from the period 2012-2016 are analyzed.

**Results:** Initial results show that almost half of the product related accidents occurred at home. Four out of ten patients were children under 18 years of age. Further analyses will focus on establishing top rankings of specific products involved in accidents, like children's toys in young victims, or power tools in patients aged 18-64. Results will be presented on differences in most hazardous products between age groups, and across EU countries. Especially products involved in childrens' injuries will be discussed.

**Conclusions:** The European Injury Database (IDB) provides important Emergency Department data on the involvement of consumer products in injuries. In-depth analyses of these data can guide the identification of specific hazardous consumer products and on differences in product involvement in accidents across EU countries. In addition, specific injury mechanisms in product related accidents provide valuable information for improvement of consumer product safety and consumer product guidelines.

**Keywords:** consumer product safety, product related injuries, child safety, research





# Break out session 2:

Injury Surveillance &  
Research - part 1

## Using registries in injury surveillance: following transition from emergency care to primary care

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**Introduction:** The Dutch Injury Surveillance System (DISS) records characteristics of all injured patients who attend the emergency department of 14 hospitals in the Netherlands, and is an important source for national injury surveillance and trend monitoring. Since 2001 a gradual decrease in injury related ED treatments was observed in treatments of mild injury, whereas rates of severe injury treatments remained unchanged. This might be related to a general policy in the Netherlands aimed at more involvement of general practitioners in emergency care. The objective of this study is to explore if the ED trend in mild injury results from a shift from emergency care into primary emergency care or extra-mural primary care, and a decrease in self-referrals at the ED.

**Methods:** A retrospective observational study was performed with representative injury data sets of DISS records and primary care (GP) records, both covering the period 2013-2017. Incidence trends in mild injury (i.e. contusion, abrasion, laceration) vs. severe injury (i.e. fracture, brain injury), and emergency vs. primary care injury treatments were calculated and compared. Incidence trends in referrals and self-referrals based on DISS records, were calculated.

**Results:** In 2013 a total of 700,000 injury related visits were observed in the DISS registry; 260,000 mildly injured patients attended the ED, 390,000 patients were severely injured (50,000 cases were unclassifiable). In the same year about 1.2 million GP consultations related to mild injury were recorded. Five years later the trend in mild injury related ED-visits had decreased with 38.5% (OR 0.885; 0.874-0.897) while the mild injury related GP consultations raised with 25.2% (OR 1.058; 1.050-1.066). The incidence of self-referrals at the ED over the past ten years dropped by 87.5% (OR 0.795; 0.790-0.799).

**Conclusions:** The findings support the assumed influence of higher primary care involvement in emergency care on the ED incidence of injuries. While health care policy changes affects the trend in mild injury related ED-visits, ED treatment registry remains a reliable source of injury surveillance, if trend monitoring is confined to severe injuries. Primary care registry can be useful to maintain the coherent picture of the costs and incidence of injuries and related health care use.

**Keywords:** injury surveillance

## Increase injury surveillance capacity in Eastern Europe

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**Introduction:** Traumatic injuries greatly affect both adults and children's physical and psychological well-being. Injuries are among the leading causes of death and disability worldwide and contribute disproportionately to premature life lost, with higher rates in middle- and low-income countries. As part of the U.S. NIH-funded iCREATE Project (Increase Research Capacity in Eastern Europe), an emergency-based injury registry was pilot tested in Armenia, Georgia and Republic of Moldova.

**Methods:** Registry guidelines and codes from WHO, ICD-10, IDB-JAMIE (European Injury Database) and the Iowa Trauma Registry were used to develop the iCREATE Injury Registry. The registry was pilot tested by retrospectively extracting data from patient records collected in 2018 in three emergency departments (ED) in Armenia (N=3460), one ED in Georgia (N=638) and two ED in the Republic of Moldova (N=6143).

**Results:** Participating hospitals treated from 9000 to 48000 patients in 2018. Preliminary descriptive results indicate that the majority of injuries occurred at home: 55.9% (Armenia), 53.7% (Georgia) and 57.1% (Moldova). The majority of injuries were unintentional and the main mechanism of injury was a fall: 53.2% (Armenia), 53.0% (Georgia), 56.9% (Moldova), followed by other 24.1% (Armenia), 21.6% (Georgia) and 19.9% (Moldova), and cut/pierce 10.9% (Armenia), 10.7% (Georgia) and 11.8% (Moldova). The proportion of road traffic injuries treated in emergency care was 7.6% in Moldova, and around 6.4% in Armenia and Georgia.

**Conclusions:** Similar to countries where injury surveillance is in place, the main mechanisms and location when injured could be identified using the existing records. These preliminary assessments support the possibility of implementing a minimum database to document injuries in all three countries. Additional work will follow to implement an on-going prospective injury surveillance system to estimate the burden of emergency treated injuries at the country level. Having an on-going injury surveillance system will support specific prevention actions for different types of injury among population risk groups.

**Keywords:** injury surveillance, mechanism of injury, place of injury occurrence, low-middle income countries



## Affordability and availability of child restraints in an underserved population in South Africa

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**Introduction:** In Cape Town, South Africa, road traffic injuries are the leading cause of death in children aged 5–14 years. Child restraints, when correctly installed and used, can be very effective. A child up to 4 years of age has a 50% lower risk of injury in a forward-facing child restraint and 80% lower in a rear-facing seat. For children aged 5–9 years, child restraints reduce injury by 52%, whereas for seat-belts alone the reduction is only 19%. Observational data show that children and young adults are less likely to use seat belts than adults. Barriers for increasing child restraint use, particularly in Low and Middle Income Countries (LMIC) include cost, knowledge and awareness and relatively low safety standards for vehicles. There is little empirical data to support this. This ongoing study aims to address the current gap in the scientific literature surrounding the barriers to child restraint use in a middle-income setting of Cape Town, South Africa.

**Methods:** This study involves a mixed-method approach combining observational studies of child restraint usage with a cross-sectional survey administered by trained local interviewers to vehicle drivers carrying children to assess the current usage, availability and affordability of child restraints. The observational study and survey are currently being conducted in 6 randomly selected sites within the study area. A standardised questionnaire was developed and translated into the local languages.

**Results:** Data collection will be complete in the next month. Descriptive analyses, together with univariate and multivariate logistic regression analyses will be carried out to determine whether factors such as geographical area, presence or absence of child restraint, type of car, age and gender of driver are associated with restraint use.

**Conclusions:** To the best of our knowledge, this is the first affordability and availability study of child restraints to be carried out in South Africa and in the African region thereby contributing greatly to the limited scientific literature in this field. Whilst evidence-based strategies to promote seat-belt usage in LMIC have been well researched, the same is not true of child restraint usage and as such, this study provides essential information regarding barriers to the use of, and willingness to pay for child restraints amongst underserved populations in South Africa.

**Keywords:** child and adolescent safety, road safety, observational study, child restraints

## Machine learning and deep learning techniques to code injury data from French and/or German language narratives registered in hospital's Emergency Departments

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**Introduction:** Injuries are a major public health problem and analysis of their causes and circumstances is important for prevention. Injury narratives collected routinely at hospital's Emergency Departments (ED) are a valuable source of information. Two levels of data coding, a Minimum Data Set (MDS) and a Full Data Set (FDS) are foreseen by the European Injury Data Base Network (IDB-Network) based on ED collected narratives. However analysing and coding textual injury data of a large number of cases is a burden for sustainable ED based injury surveillance system. Successful use of Artificial Intelligence (AI) for injury analysis have been reported mainly in countries with only one official language. We aim to use machine learning and deep learning techniques for coding textual injury data in German and/or French language collected in hospital's ED.

**Methods:** Classification models were trained, using gradient boosted trees approach for MDS and recurrent neural network of type Long Short-Term Memory (LSTM) for FDS, to automatically code injury narratives. About 70% of the 66,000 FDS and 390,000 MDS data manually coded from 2013 to 2017 were used as training set. The trained classification models were used to separately predict the coding for each MDS and FDS

variables, independently of the narrative language. The remaining available data was used for testing. Several approaches were evaluated, using training sets, features or data preparation methods. F1-score or harmonic mean of the Predictive Positive Value (PPV) and Sensitivity (S) was used to evaluate performance.

**Results:** A single approach using count vectorization for text analysis and few key features provided good results with average weighted F1-score ranging from 70% to 99%. However, performance for unknown value coding remains low, even after removing stop words. Classifiers had difficulties identifying correct combination of body parts and injury type if several injuries were reported in the narrative.

**Discussion:** Automatically coding German and/or French injury narratives for both FDS and MDS using only one classification model for both languages is promising. In a first stage AI could be used to improve data quality by adding double data entry (human and AI). In a later stage typical and frequent ED treated injury cases could be directly coded automatically, reducing manual data entry workload.

**Keywords:** deep learning, machine learning, injury surveillance, injury narratives, IDB-Luxembourg

## Drowning surveillance in Denmark: combining different data sources on drowning mortality

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**Introduction:** Two different sources are typically used for surveillance of drowning mortality: media information and mortality statistics. Media information is easily accessible but may suffer from lack of completeness and lack of information on manner of death, e.g. suicide may be under reported. Mortality statistics may be more precise and complete, but information on the drowning event may be scarce. The purpose of the Danish statistics on drowning mortality is to combine information from all available data sources, to obtain the most complete and precise statistics.

**Methods:** Information on drowning deaths in Denmark obtained from media, from death certificates, and from the rescue service are combined in to comprehensive statistics. The information from the different sources are compared to avoid double counting. The most reliable information is used for the statistics.

**Results:** The surveillance using this method covers the period from 2001 to 2016. In total 1,722 drowning deaths are reported; among these 954 were caused by unintentional drowning, 595 were suicides, and five were homicides. For 168 cases the manner of death was undetermined. The annual number of drowning deaths in Denmark has decreased from 137 in the year 2001 to 75 in the year 2016. For the years 2014-2016, out of the 258 deaths registered during this period 167 were reported by media, 203 by the mortality statistics, and 29 by the rescue service.

**Conclusions:** The combination of the different sources results in statistics necessary to obtain full coverage of the drowning deaths. Further, the details on the circumstances of the drowning (place, activity, drug use etc) are useful for the prevention of drowning. However, the processing of the data is time consuming and may be delayed due to the late availability of mortality statistics.

**Keywords:** drowning prevention, surveillance

# PITCH Presentations / SESSION 1

## Child Safety in Action

### Risk factors for burn accidents in children of 0-4 years old: a prospective study

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**Introduction:** Children 0-4 years old are more frequently admitted in the Dutch Burn Centres than any other age group. For this reason the Dutch Burns Foundation has been organising prevention campaigns aimed at caregivers of young children. These campaigns are based on known risk factors. However, the most recent study on risk factors for burn accidents is more than 10 years old. The aim of this study therefore, was to determine current risk factors for burn accidents in children 0-4 years of age.

**Methods:** Eligible were children 0-4 years old treated in the in- or outpatient clinic of the three Dutch burn centres. Information on personal, environmental- and behavioural circumstances during the burn accident was prospectively collected during one year in 2017-2018 from patient records and a structured questionnaire. Relevant determinants of behavioural- and environmental circumstances during the accident were identified. Personal characteristics were compared to the general population in order to identify risk factors for burn accidents.

**Results:** In total 533 patients were included (boys: 53%). Their median age was 18 (12 SD) months. In 41% of the accidents the cause was tea (68%), coffee (20%) or hot water (12%) spilled from a cup. In 55% of these cases the child was actively pulling the cup. Accidents with spilled hot liquid happened often in close proximity to the person who was responsible for the child; 89% was located in the same room and 58% saw the accident happen. Patients with a migration background were at increased risk (RR=1.83) for burn accidents as well as patients who lived in a neighbourhood with a low Social Economic Status (SES).

**Conclusions:** Eighteen months of age, a migration background and living in a low SES neighbourhood are important risk factors for burn accidents in children 0-4 years old. Prevention programs should focus on these risk factors.

**Keywords:** burns prevention, risk factors, children, accidents

## Paediatric drowning deaths in Ireland: A ten-year review

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**Introduction:** Drowning is the second leading cause of unintentional death in Irish children, a statistic mirrored worldwide. It occurs more commonly in adolescent males engaged in seasonal unsupervised activities or in children aged <5 years with access to swimming pools and unprotected water sources. Preschool aged children have the highest mortality. To tailor future preventative initiatives, a critical assessment of current trends in drowning related accidents is necessary.

**Methods:** A retrospective review of data obtained from the National Paediatric Mortality Register was performed. Details of the epidemiology of drowning deaths in Ireland (2006-2016) were examined to identify current trends and risk factors. Cases recorded as 'accidental drowning' or 'drowning' were included. An age range of 0-15 years was applied.

**Results:** There were 36 deaths recorded (2006-2016). 31 (86%) were male. Distinct age peaks were observed, with 89% of deaths spread across two age ranges: 17/36 (47%) deaths occurred in the 0-5-year category, while 15/36 (42%) fatalities were noted in 10-15-year olds. The vast majority of the deaths (82%) in the <5yr group occurred when the child was unsupervised. Deaths were more likely to occur away from the victim's home (86%), with deaths occurring in freshwater (44%), seawater (19%), domestic/agricultural (19%) and indoor swimming pools (14%). Almost half (47%) of all deaths occurred in the summer months with 31% occurring in the month of July.

**Conclusions:** Drowning accidents are an important cause of preventable death, a clear majority of fatalities occurring in males. Discrete age peaks should direct preventative efforts towards these at-risk groups. Regular review of drowning accidents could identify potentially modifiable risk factors, informing future preventative initiatives. Examples include: equitable access to formal swimming lessons; targeted water safety programmes; affordable entry to safe swimming environments, ensuring teenagers have an alternative to unsupervised freshwater sources; regular audit of swimming facilities to ensure a high standard of excellence in safety is achieved; awareness of international best practice models which could be adopted or adapted for Ireland.

**Keywords:** child and adolescent safety, water safety and drowning prevention

## Child and adolescent road deaths and injuries in developing countries: the case of Lebanon

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**Introduction:** Road Traffic Injury represents a major public health problem, claiming the lives of millions of individuals globally with a disproportionately higher burden in developing countries. Similarly, Lebanon borne a substantially high toll of road traffic mortality rate reaching up to 15 deaths per 100,000 population, particularly among the youth population. The ongoing regional war and the influx of more than 1.5 million refugees into Lebanon exacerbated the road traffic injury problem with the increased number road users. This study aims at capturing primary child and adolescent road deaths and injuries for the first time in Lebanon with the goal to assess the burden of child and adolescent injuries in the country.

**Methods:** Data was collected from multiple sources including police reports and hospital patients medical records for a 3-year period of time (2015-2017). Almost 3,000 unique cases of child and adolescent deaths and injuries were retrieved from police reports and 32 hospitals geographically distributed across Lebanon. Data was abstracted into a data collection form designed based on international guidelines from WHO and the European Commission on transport safety. Analysis were conducted to quantify the nature of child and adolescent injuries, its pattern and to identify their circumstances and risk factors.

**Results:** Among the 3000 cases, 8% resulted in child and adolescent deaths. Sustained road injuries were distributed across various nationalities Lebanese (66%), Syrian (22%) and Palestinian (3%). Significantly higher proportion of male (76%) were noticed compared to female. Most road victims were pedestrians (39%), followed by car occupants (28%) and motorcycle riders (18%). There is a clear association between child increased risk of road injuries and the different governorates increasing with the governorate's low socio-economic status. A significant relationship exists between road type and the severity of child injuries ( $P < .5$ ), with the vast majority of deaths and injuries (39%) taking place in a 'two-way traffic not physically divided'.

**Conclusions:** Concerted efforts should be dedicated to translating knowledge generated from this study to identify priorities for injury prevention policies and programs and to implementing context-sensitive road traffic injury interventions. These interventions will help to mitigate the impact of road injuries on the youth population, ultimately contributing to improving health and wellbeing of families and communities in Lebanon.

**Keywords:** child and adolescent safety, road safety, safety legislation and enforcement

## Traumatic brain injuries in a large paediatric hospital in Georgia

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**Introduction:** Traumatic brain injury (TBI) is a leading cause of death and disability worldwide and a major public health challenge. Children are a particularly vulnerable population because they may suffer from life-long disability. Study of TBI with reliable and high quality data represents the basis for effective strategies for injury prevention. In the Republic of Georgia, TBI reporting for hospitalized patients has followed international E-health standards. This study examines epidemiological features of paediatric TBI from the biggest paediatric hospital in Georgia.

**Methods:** Georgian National Centre for Disease Control database for 2018 was used to identify TBI cases treated at the largest paediatric hospital in Georgia. Cases were included based on the S06 diagnosis coded of ICD-10. Descriptive statistics were used to describe the patients and their traumatic brain injuries.

**Results:** The Iashvili Children's hospital treated 296 paediatric brain injuries in 2018. TBIs were more common in boys (61.1%) than in girls (38.9%), and patients aged 10-14 were most frequent. 4.4% of male patients and 1.7% of female patients required more than 15 days of in-patient treatment. More than two thirds of children had suffered TBI due to falling (66.6%), followed by road traffic injuries (18.9%) and other type of blunt force (14.2%). 54.3% of all TBI patients required at least one day of hospital stay. Most of the TBI patients (74.3%) were brought to the hospital by private transportation. In-patient treatment was completed in 98.9% of cases, three male patients (1%) died. In all three cases of lethal outcome, the cause of injury was road traffic.

**Conclusions:** Based on existing data, it was possible to study just part of TBI epidemiological properties. TBI national reporting formats do not cover information about location and time of injuries, place of occurrence, therapeutical treatment and severity of the illness. Accordingly, current official data reflects incomplete picture on the TBI in the country, including paediatric TBIs. Implementing an injury surveillance system to specifically document injuries and external risk factors would be valuable for a more complete TBI's epidemiological assessment.

**Keywords:** brain injuries, paediatric injuries, national reporting system



## Survey of primary care paediatricians in Europe on child injury prevention

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**Introduction:** Unintentional injuries are the leading cause of death among children aged 5-19 years in the WHO European Region and the major cause of mortality and morbidity, representing the significant loss of the lives of 115 children who succumb to injuries in Europe daily. The role of paediatrician in the primary care setting (PCP) in ensuring injury prevention is by counselling to children and families as well as engagement in community. Injury prevention counselling should be provided as a part of the well-child exam. The initiative of the research-working group of the European Confederation of Primary Care Paediatricians (ECPCP-RWG) created a survey on the role of PCPs in injury prevention in Europe.

**Aims:** With a web-based survey 1) to compare daily routine and injury prevention in primary care settings 2) to highlight preventative solutions to determine a common set of goals and strategies, which could be efficiently and effectively managed by the PCPs in Europe.

**Methods:** The web survey in English was preceded by two sequential pilot surveys. The resulting final version consisted of 1 comment and 25 short multiple-choice questions. Participants were contacted by email via their country's representative. An existing database/email list of European Confederation of Primary Care Paediatricians of 18 European countries organised in 21 societies was used. Data were captured electronically at source, anonymized, analysed by SPSS, ver. 21.

**Results:** We obtained 624 responds from countries (Spain: SEPEAP 9.62% and AEPAP 13.30%, Germany (BVKJ) 22.12%, Italy: ACP 14.10% and SICUPP 2.88%, France: AFPA 7.37% and SNPF 4.17%, Israel (IAPA) 7.85%, Slovenia (SZD) 6.09%, Hungary (HGYE) 4.49%, Austria (ÖGKJ) 3.53%, Portugal (SPA-SPP) 2.40%, Belgium 1.76%, Finland 1.44%, Slovakia (SSPPS) 1.12%, Croatia 0.96%, Switzerland 0.64%, Czech republic 0.16%, Lithuania 0.16%, Poland 0.16%; 69.77% of them females, aged 31-40 years 14.79% , 41-50 years 24.76%, the majority 51-60 years 36.50% , 61-70 years 22.83%; 1.28% were older/younger. The average practice has 51-150 patients per 40-h working week: 51-100 and 101-150 both 24.248%; 151-200 17.17%. The majority of work is non-urgent, seen as a gateway for minor injuries only. For serious injury they refer patients to an emergency service in 71.43%; on average up to 10 children per working week have unintentional injuries; of those, approximately half need further referral. Most unintentional injuries that are seen at primary care settings are related to traffic, falls, poisoning, burns. Primary care paediatricians know the general data on mortality and morbidity in their country. They lack sufficient time for injury prevention during their daily practice and they lack ready-made (electronic, printed) materials.

**Conclusions:** Primary care paediatricians are aware of their role but they require additional support in providing it. Generally there is a lack of physical resources, created on a national or international basis (written material - electronic or printed), scientific conferences, and international, harmonised European policy for primary care paediatricians regarding injury prevention. The role of National agencies in injury prevention should be enforced.

**Keywords:** safety promotion policies and action plans



# PITCH Presentations / SESSION 2

## Injury Surveillance & Research

### Traumatic brain injury: a three-country assessment of in-patients treatment and care

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**Introduction:** The burden of Traumatic Brain Injury (TBI) disproportionately affects Low- and Middle-Income Countries (LMICs), as patients from LMICs are twice as likely to die following TBI as in high-income countries. TBI disproportionately affects the young, who have potential life-long disability from neurological deficits, which can lead to long-term risk for Alzheimer disease or stroke. Lack of standardized registries was identified as a priority gap in global TBI.

**Methods:** Identify and describe current TBI data collection practices and capacity in Armenia, Georgia and Moldova. Those no systematic data infrastructure could be used to identify the burden of TBI or to compare treatment and outcomes in these countries. Content analysis and qualitative data assessment by interviewing medical doctors, nurses and administrative staff working in trauma hospitals where TBI patients are admitted in each of the countries.

**Results:** The health systems in Armenia, Georgia and Moldova are in transition, with growing attention to improving health infrastructure. However, acute care systems are lagging behind international standards. Since training in emergency medicine is scarce, the treatment of critical injuries varies substantially across each country, and no trauma systems are formally in place. For example, transfer protocols are not standardized and decisions to transfer a patient to a trauma hospital are based primarily on the treating physician at the local clinic and hospital, which might reduce the proper diagnosis of TBIs. At country level, only Georgia has a non-fatal injury reporting system, whereas Moldova collected some injury data but not as part of a defined trauma registry.

**Conclusions:** Despite growing healthcare and educational infrastructure, trauma registries are not integrated as a health priority to support treatment and care, as well as prevention efforts at local and national levels.

**Keywords:** traumatic brain injuries, injury registry, low-income countries, health systems

## Medically attended injuries among Albanian population, 2013-2017

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**Introduction:** Although injuries in Albania are a leading cause of death and disability, there is still a lack of published studies on hospital treated injuries. According to the National Institute of Statistics, in 2017, injuries in Albania accounted for 820 deaths (3.7% of all deaths). They remain the leading cause of deaths in young people aged 15-39 years (45%).

**Methods:** This study included data on medically attended injuries obtained from the Statistics Service of Trauma University Hospital, Tirana for the period 2013-2017. In this group are included all injured persons treated as in or out-patients in this Trauma Centre, including road traffic accidents, falls, occupational injuries and injuries from firearms. Information was available on age and sex of injured person, the type of medical service in which the patient was treated (intensive care therapy vs. other services) as well as type of injury and injured body part.

**Results:** Overall, the number of medically attended injuries at the Trauma University Hospital increased by 64% from 2013 to 2017. Additionally, the number of hospital admissions increased from 3092 cases in 2013, to 4620 cases in 2017. Nearly one in five injured people (17.5%) required intensive care therapy. Fractures of the limbs and brain trauma were the most frequent injuries. About 70.8% of all injuries were registered among men. 40% of all those who seek medical treatment for an injury were adolescents and young adults aged 15-44 years old.

**Conclusions:** Injuries and medically attended injuries represent a considerable burden for Albania. The increasing number of medically attended injuries reflects an increase in the degree of severity of injuries, leading to increased health costs. The gaps in the existing data system as well as the lack of injury surveillance registers impede the undertaking of concrete evidence-based measures to reduce the incidence of injuries in Albania.

**Keywords:** medically attended injuries, trauma care, Albania

## Patient safety culture in Bulgarian private and public hospitals

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**Introduction:** Hospital patient safety culture presents a problem and challenge for health systems from all over the world, regardless of whether hospitals are private or public-owned. Hospital Survey on Patient Safety Culture was developed by the Agency for Healthcare Research and Quality to provide continuum improvement of quality medical care. The aim of the study was to explore patient safety culture in private and public hospitals in Bulgaria through the web-based Bulgarian version of the Hospital Survey on Patients Safety Culture (B-HSOPSC).

**Methods:** A national cross-sectional Web-based-survey was designed, using the B-HSOPSC. The B-HSOPSC includes 42 questions, grouped in 12 different dimensions measuring patient safety culture based on the five grade Likert scale ranging from strongly agree to strongly disagree. The questionnaire also includes two outcome variables - a patient safety grade and a number of adverse events reported. Medical specialists and other hospital staffs from Bulgarian hospitals took part in the survey. The study was conducted between July 2018 and January 2019. The data were exported directly to SPSS 17.0 statistical software. Data analysis consisted of descriptive statistics and non-parametric Mann-Whitney U test. The level of significance of <5% probability ( $P < 0.05$ ) was adopted.

**Results:** There were 546 valid questionnaires completed online. The results showed that there are significant differences in patient safety culture between public and private hospitals ( $P < 0.05$ ). Generally, private hospitals staff give higher mean scores to all items from the questionnaire, except to items: A5 Staff in this unit work longer hours than is best for patient care ( $2.01 \pm 0.945$  in private versus  $2.32 \pm 1.058$  in public hospitals); A7 We use more agency/temporary staff than is best for patient care ( $3.71 \pm 1.217$  in private versus  $3.95 \pm 1.241$  in public hospitals); B3 Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts ( $2.90 \pm 1.203$  in private versus  $3.41 \pm 1.033$  in public hospitals) and E1, Please give your work area/unit in this hospital an overall grade on patient safety ( $1.82 \pm 0.818$  in private versus  $2.40 \pm 0.973$  in public hospitals).

**Conclusions:** Significant differences of positive scores distribution were found between patient safety culture in public and private hospital. This could be explained by the differences in the organizational culture and management style in the two different hospital types.

**Keywords:** patient safety, HSOPSC, quality medical care

## Occupational safety in Republic of North Macedonia

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**Introduction:** The main objective is to analyze the human rights and obligations of health professionals in the Republic of North Macedonia, the legislative framework and its implementation in practice.

**Methods:** A cross sectional survey has been conducted from October 2017 to November 2017 on a representative stratified sample of 100 physicians with specially designed instrument. The physicians were selected from the Clinical Hospital Tetovo and the General Hospital Gostivar in the Polog Region.

**Results:** National legislation on the rights and obligations of health professionals is harmonized with the European, and is implemented in practice with a significant difference between the information and personal experience of physicians for most of the rights. In general, there are no differences in the implementation of national legislation on the rights and obligations of health workers by sex, age, ethnicity, religion and place of residence. There is significant correlation between the information and personal experience of physicians with their work place for some of their rights, such as the right to work in appropriate working conditions (Pearson Chi-square  $p=.001821$ ).

**Conclusions:** There is a need to improve the implementation of human rights in health care in practice, by education of the health providers for their rights and obligations and compulsory to implement the legislation in practice.

**Keywords:** human rights, obligations, health professionals, patients, legislation

## Falls in patients with Parkinson's disease

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**Introduction:** Parkinson's disease (PD) is a chronic degenerative disease of the central nervous system (CNS) that causes movement and walking disorders, as well as numerous other changes. Most patients experience falls as a result of PD and in most cases falls are recurrent. History of previous falls, poor standing balance, motor-issues such as freezing of gait in particular, brain-related changes, depression and fear of falling are risk factors for falls in PD. Falls often result in activity limitations, participation restrictions, social isolation or premature mortality. Subsequently, fall-associated consequences in PD contribute to higher health expenditure.

**Methods:** The study included 92 patients, of both genders [49 (53%) males, 43 (47%) females]. The inclusion criteria for our study were: confirmed diagnosis of Parkinson's disease (G20 according to ICD X) and patients age 60 years or older. The data was collected by filling a specially designed questionnaire.

**Results:** In this sample 65% of the patients experienced a fall. About 47% of patients experienced recurrent falls. The incidence of falls was slightly higher in men than in women. Patients were more often falling in the community than indoors. 53% of participants were injured during the fall. About 45% of falls required healthcare services and 22% resulted in fractures. More than 50% of the participants restricted their physical activities to avoid harm after experiencing a recurrent fall.

**Conclusions:** Falls are both common and disabling in people with Parkinson's disease, with almost two thirds of the patients reporting a fall. They have devastating consequences in affected individuals, often lead to injuries, secondary immobility, and reduced quality of life. With the increasing prevalence of PD, falls and fractures are expected to have a major impact on health-care systems in the future. Identifying individuals who are at risk of falling, and preventing or minimising falls is a priority for comprehensive patient care.

**Keywords:** falls, Parkinson's disease, older people

## Assessment of TBI patients' health status by the Glasgow coma scale at pre-hospital and emergency department level

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**Introduction:** Traumatic brain injury (TBI) is one of the major causes of death and disability globally with short or long-lasting effects at different levels: thinking, memory, movement, sensation, emotional functioning. Assessing the TBI severity in a timely manner is critical for optimal medical care. Glasgow Coma Scale (GCS) is one of the tools used for this purpose. The aim of this research was to assess the state of consciousness of TBI patients, both at the site of injury occurrence and on arrival at the emergency department (ED).

**Methods:** A TBI Registry was piloted in two large hospitals in the Republic of Moldova for 3 months (August-October 2018) by retrospectively extracting data from existing records of 150 TBI patients. The state of consciousness of the TBI patients was analysed by calculating GCS at the time of injury and on arrival at ED or specialized medical services.

**Results:** According to the obtained results, ambulance medical help was requested in 89.7% of reported cases. At the pre-hospital period, 83.9% of the TBI patients had GCS of 13 to 15, indicating a minor TBI; their status remained stable and did not change at ED. The 9.4% of patients with a GCS of 9 – 12, indicating a moderate TBI, also remained stable from the field to ED. GCS scores varied among the 0.7% and 1.3% of patients with a GCS of 8 in the pre-hospital period and ED indicating severe brain injury, Coma gr I. While, in the case of the injured in the 2<sup>nd</sup> stage of coma, GCS of 6-7p, there was observed an improvement in the injured consciousness status from 3.3% to 2.7% respectively. No changes in the 3<sup>rd</sup> stage of coma, GCS 4-5 for 2.7% cases and no patients were registered in the 4<sup>th</sup> stage of coma, GCS of 0-3p.

**Conclusions:** The health status of the majority of the TBI patients did not worsen from the pre-hospital to emergency department period. The obtained results impose to take an attitude towards the existing situation and developing a national guideline for TBI patient.

**Keywords:** TBI, GCS, pre-hospital care, emergency department







# Break out session 3:

## Child Safety in Action

## Trends in injury related fatalities in the Irish paediatric population: a review of national mortality data

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**Introduction:** Injury is a leading cause of childhood death throughout the EU. For every fatality many more children are seriously injured and a large proportion left permanently disabled. Age specific, population based data is required to enable accurate assessment of the magnitude and characteristics of the injury problem. The objective of this study was to determine the burden of accident and injury related childhood mortality in Ireland by determining the prevalence and characteristics of intentional and unintentional injury related deaths over a twelve year period from 2006 to 2017.

**Methods:** Retrospective review of cause of death information on all deaths <15yrs, registered in Ireland from 2006-2017, with additional detailed information retrieved from autopsy reports reviewed by paediatric pathologists.

**Results:** A total of 4,443 paediatric deaths (<15yrs) were registered in Ireland during 2006-2017, 49% of which were aged >28days. Beyond infancy the leading cause of childhood death during this period (26.5%) was accident and injury. Most were unintentional accidents, children 1-4yrs being most susceptible (3.9/100,000 vs. 2.8/100,000 1-14yrs). Proportionate injury mortality increased gradually with age ranging from <1% of neonatal deaths to 36% of deaths in children 10-14yrs. Road traffic accidents (RTA) accounted for the greatest proportion of accidental injury deaths across all ages (33%). Other important causes of injury death in younger children 1-4yrs were drowning (8%) fires/burns (7.2%), high falls (6.4%) and accidental strangulation (5.6%), while fires/burns (12.7%) and drowning (8.9%) accounted for a greater proportion of deaths in children 5-9yrs. Interpersonal violence accounted for at least 9.5% of all injury deaths and 1.6% of child mortality overall. The rate of injury fatalities in children 1-14yrs has declined by 40% over the period from 2007 to 2016; from an average of 4.2 deaths/100,000 in 2007-2011 to 2.4 per 100,000 in 2012-2016, due largely to a significant decline in RTA fatalities during this period. A male preponderance of deaths was apparent for all categories of injury particularly drowning (88%), accidental strangulation (75%) and falls (69%).

**Conclusions:** Although welcome reductions in childhood mortality rates have been observed in Ireland in recent years, 26.5% of child deaths, attributable to accident and intentional injury are potentially avoidable and warrant further attention. National, age-specific data relating to the nature and circumstances of such deaths will assist in providing evidence based information with which to inform effective intervention strategies.

**Keywords:** child and adolescent safety, surveillance, interpersonal violence

## Paediatric burns among Syrian refugee communities in Lebanon: evidence to inform policies and programs

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**Introduction:** Burn-related injury is a global public health problem with significant rates of morbidity and mortality. The burden of burns adversely affects the paediatric population leading to substantial functional, psychological and economic repercussions. Low- and middle-income countries, including Lebanon, carry a disproportionately greater burden of burn injuries. This objective of this study is to understand the characteristics and severity of the paediatric burn cases within the Syrian refugee camp population residing in Lebanon and to highlight the associated risk factors.

**Methods:** Medical records (n = 347) of a non-governmental organization (INARA) and a primary health care clinic TAHADDI were reviewed. One hundred, seventy-nine (179) cases were included as they met the study criteria of being a Syrian child aged 0-19 years, settled in Lebanon, and has sustained a burn due to living conditions. War-related burn injuries were excluded. We adopted an integrated qualitative and quantitative methods to assess the spectrum and the magnitude of the burn-related injuries on refugee children and their families. Agglomerative hierarchical cluster analysis, using Ward's minimum variance method, was used to identify potential at-risk groups.

**Results:** During this research project, the p-value for all statistical analysis was considered significant below 0.01. The pre-test and the post-test of the control group were compared using the Wilcoxon Signed Rank Test, which indicated no significant differences before and after the treatment in the recurrence of dangerous gestures during the fall for head (p-value = 0.739) and hands (p-value = 0.046). McNemar's test showed that the Safe Falls program caused a considerable decrease (90% approximately) of dangerous natural

**Conclusions:** The results indicate that when exposed to a backwards fall on more than one occasion, children that have not taken part in the Safe Falls program continue to respond with natural gestures associated with injuries. The research shows that the application of the Safe Falls program overwrites children's instinctive response with protective and safe gestures, establishing its effectiveness. This program could contribute to the objective of reducing the risk associated with falls, lowering the severity and quantity of related injuries.

**Keywords:** child and adolescent safety, innovations in safety education, safety promotion policies and action plans, sport and recreation

## Deeper insights on trampoline related injuries – a multinational study based on EU-IDB

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**Introduction:** Trampolines enjoy a high popularity among children at home, on playgrounds and other recreational areas. A German Child and Youth Survey focussing on product use and product related injuries reported that trampolines were the most frequently used sport and leisure objects among 1-2-year-olds. Among the 11-13-year-olds every third injury due to sports and fitness objects was related to trampolines. Furthermore, availability of up to 5 metres diameter outdoor trampolines encourages children to jump collectively increasing collision risk. Recently indoor trampoline parks are spreading causing an increase of serious injury. We aim to investigate and compare the extent and patterns of trampoline related injuries in different countries.

**Methods:** Home, leisure, school and sport injuries registered among children under 18 in the European Injury Data Base (IDB) were used. Additionally, the Netherlands, Sweden/Skaraborg District, Luxembourg and Austria are systematically collecting data on product related injuries in the A&Es (2013-2016). Trampoline injuries were counted when a trampoline (Code 10.0310/IDB codebook) was documented. According to IDB all injuries involving furniture,

child or household products, items for personal use, for sports/recreational activity, tools, machines, building components, have been defined as product related. A descriptive epidemiological study is followed by in-depth case analysis.

**Results:** The incidence of trampoline injuries in children under 18 ranged between 1.5–2.8 per 1,000 in the four countries (in total 11,346). The highest peak is observed among the 5-9-year-olds in three countries (2 to 3 per 1,000 in Luxembourg, the Netherlands, Sweden), whereas in Austria among the 1-to 4-year-olds (5.2 per 1,000). Furthermore, even young children (1-4) showed a high percentage of trampoline injuries (15% - 39%). The incidence was slightly higher among girls in Luxembourg and Netherlands. The hospital admissions vary between 4% and 9% in three countries. The share of trampoline injuries in percentage of product related injuries is higher among the 5- to 9-year-olds (5.4% to 10%). The most frequent locations in the four countries were homes (especially the garden) followed by leisure areas. The most frequent injury mechanisms were falling, collision with person and object followed by overexertion. The injury patterns differ according to age groups.

**Conclusions:** Trampoline related injuries among young children in Europe are frequent. According to the American/Canadian Academy of Pediatric's recommendations parents should be highly discouraged from buying a trampoline for children under 6. Additionally, safety standards should be established for trampoline parks similarly to Australia.

**Keywords:** research, trampoline related injuries, children's safety

## Safe falls – safe schools: reducing instinctive injury-associated gestures during backwards falls

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**Introduction:** Falls are the second cause of death in children by non-intentional injuries. The World Health Organization asks for educational programs and research in this field. The current state of art of this topic indicates that during unintentional backwards falls, the head and upper extremities suffer the most severe injuries. The University of Seville, in collaboration with the European Judo Union, has developed the ‘Safe Falls – Safe Schools’ program, which focuses on teaching children in primary schools to fall safely during physical education classes.

**Methods:** This research studies the efficacy of the Safe Falls – Safe Schools program in reducing school-aged children’s natural dangerous responses to unexpected backwards falls. The intervention took place in the Jacaranda primary school in Seville (Spain), lasting three months. A total of 456 children, aged between six and twelve and with a 1:1 male to female ratio, took part. Twelve classes (306 children) were introduced to the program directly while six other classes (153 children) formed a control group; the latter were taught placebo balance exercises with no relation to falling techniques. After the research had been completed, the Safe Falls program was carried out with the control group as well. Data were collected using the ad-hoc INFOSECA observation scale, which registers the movement of the head and upper limbs during a provoked backwards fall in a safe environment.

**Results:** During this research project, the p-value for all statistical analysis was considered significant below 0.01. The pre-test and the post-test of the control group were compared using the Wilcoxon Signed Rank Test, which indicated no significant differences before and after the treatment in the recurrence of dangerous gestures during the fall for head (p-value = 0.739) and hands (p-value = 0.046). McNemar’s test showed that the Safe Falls program caused a considerable decrease (90% approximately) of dangerous natural gestures of the head (p-value < 0.001) and upper limbs (p-value < 0.001) during backward falls.

**Conclusions:** The results indicate that when exposed to a backwards fall on more than one occasion, children that have not taken part in the Safe Falls program continue to respond with natural gestures associated with injuries. The research shows that the application of the Safe Falls program overwrites children’s instinctive response with protective and safe gestures, establishing its effectiveness. This program could contribute to the objective of reducing the risk associated with falls, lowering the severity and quantity of related injuries.

**Keywords:** child and adolescent safety, innovations in safety education, safety promotion policies and action plans, sport and recreation



## Injury prevention photosphere: an intervention for use by families and community-based professionals

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**Introduction:** Burn and scald injuries in children are common in the UK; 50,000 children under 14 years old attend emergency departments (EDs) annually. Approximately 70% of these children are under three years old, injuries are likely to occur in the home and these children are also more likely to re-attend with a further injury. Health visitors (HVs)(public health nurses) have no guideline or tool for contacts with families post-injury. Following discussion with health visitors and different parent groups, we developed an intervention to support and standardise practice with consequent improvements in family-centred care.

**Methods:** We undertook focus groups with community-based healthcare and child care staff and with a variety of different parent groups to develop an injury prevention photosphere and then to test the acceptability and usability of it. The modified photosphere environment enables a hi-resolution, three-dimensional, photorealistic view of rooms to be constructed from a scene scan using a standard mobile phone camera.

**Results:** We have developed a virtual ‘unsafe’ kitchen, ‘unsafe’ bathroom and living room with hazards labelled invisibly. These can be identified by the user by hovering the cursor over the hazard or clicking it. This ‘identifies’ the hazard and leads to positive prevention messages, incidence/epidemiological data and links to resources for further information. A quiz is included and a poster is generated that can be downloaded. Health visitors and other professionals who work with families with children have an interactive, easy-to-understand, evidence-based, appealing tool to use with parents. If introduced to families it can help parents identify potential hazards for themselves and continuously improve their environment. It can provide opportunities for peer-to-peer support and shared learning. There are presently no solutions similar to this to meet these needs.

**Conclusions:** This photosphere is underpinned by an evidence-base and will help to prevent injuries that have lifelong physical and psychological problems and is expensive for both the NHS (UK healthcare system) and families. It provides a visual interface, using photorealistic images that are largely independent of language. It is an easily distributable and reusable solution that uses generic, low-cost web/mobile technologies and can be applied to any environment e.g. home, school. Adaptations can be made to different age groups or settings e.g., young people, elderly or assisted living support. Once designed and implemented, maintenance is low-cost and simple. It provides opportunities for peer-to-peer support and shared learning (groups/learning cohorts).

**Keywords:** burn and fire prevention, child and adolescent safety, home safety, intervention design, technology – solutions and applications for safety



# Break out session 4:

Road Traffic Safety - part 1



## The observed prevalence of use of safety devices on motorized vehicles in Italy

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**Introduction:** Failure to use seat-belts, child restraints and motorcycle helmets is a major risk factor for vehicle users. The prevalence and magnitude of use of safety devices is well investigated, but the accuracy of results varies considerably, and depends on the methods used and the conditions under which the studies were performed. In 1986 and later in 1988, legislation made the usage of helmet and front seat belts mandatory in Italy. This was then extended to include rear-seat passengers in 1992 and the over 18-year-olds on mopeds in the year 2000. Despite strong evidence of the effectiveness of safety devices in reducing the amount and severity of road traffic injuries, their prevalence of use in some Italian regions is still very low. The purpose of this study is to show an exhaustive overview of current safety devices usage in Italy (Ulisse project).

**Methods:** In a sample of 232,283 road users a road side observational study was executed to monitor the use of seat belts (front and rear), child restraints and motorcycle helmets in 28 cities across the national territory with a resident population of more than 10 million inhabitants (17% of the Italian population). Nine out of ten of the most populated municipalities of Italy participated in the sample (96.4% of that resident population). For each city, the survey was carried out in Urban, Sub-Urban and Extra-Urbana areas. Data were aggregated by three geographic areas: North, Centre and South. Data for front seat belts was also provided for drivers and passengers separately. Demographic data shows a strong concordance between the age distribution of the resident population in the monitored cities and those of the resident general population (Kendall's tau: North 0.9089,  $p < 0.01$ ; Centre 0.9630,  $p < 0.01$ , South 0.9616,  $p < 0.01$ ). Data shows the same concordance between the type of vehicle fleet distribution in

the monitored cities and those of Italy (Kendall's tau: 0.9508,  $p < 0.01$ ).

**Results:** The use of front seat belts shows a dramatic geographical trend ranging from 82.6% (North) to 36.3% (South). Drivers use seat belts more frequently than passengers (63.3% vs. 57.4%). The same North-South trend shows the use of rear seat belts (from 19.0% to 3.3%) and child restraints (from 59.9% to 16.6%). Helmet use was high everywhere in Italy (more than 94%). According to the Prevalence Ratio (PR), the use of front belts, rear belts and child restraints was respectively more than twice, almost 3 times and 6 times higher in the North compared to South; the use of rear belts and child restraints was about twice in urban and sub-urban areas compared to extra-urban area. With the use of Potential Impact Fraction we estimate that the potential reduction of deaths could be around 30%-40% in Southern Italy if car safety devices were appropriately used. Moreover, a 30%-40% reduction in deaths could be obtained if rear seat belts were used in the whole Italy.

**Conclusions:** After the introduction of the driving license with penalty points system (year 2003), the prevalence of use of safety belts rose to 82.1% (North), 71.2% (Centre) and 52.9% (South). Fourteen years later the North of Italy notes substantially the same prevalence (-1.7%), the central regions a decrease (-7.4%) whilst the South of Italy a dramatic drop (-19.5%). the use of rear seat belts and child restraints is still far from an acceptable "physiological" level as well as the use of front seat belts in the South and the Centre. The behavioral attitude of drivers and passengers associated to the perceived control by the police influence the use of seat belts and child restraints. A wide decrease was every time observed in RTA-related mortality or morbidity incidence in Italy in correspondence with the enforcement of the usage of each type of safety device on motor-vehicles.

**Keywords:** road safety, safety legislation and enforcement, surveillance - research methods - evaluation

## Walking against or with traffic? Evaluating pedestrian fatalities and head injuries in Taiwan

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**Introduction:** Allowing contra-flow cycling in one-way streets has been reported to reduce crash risks in Belgium and the UK. Similarly, walking against traffic at roadways where sidewalk is not present substantially improves pedestrian safety. This study examines fatalities and head injuries sustained by pedestrians in back-to-traffic and facing-traffic crashes.

**Methods:** Using police-reported crash data from Taiwan between 2010-2016, fatalities and head injuries were compared for pedestrians involved in back-to-traffic and facing-traffic crashes.

**Results:** Of the 14,382 pedestrians involved in crashes, 10,749 and 3,633 pedestrians in with-traffic and against-traffic crashes, respectively, were reported. Pedestrians involved in back-to-traffic crashes tended to be more fatally injured, and were more likely to sustain head injuries, than those in against-traffic crashes. Results of logistic regression models revealed several influential factors on pedestrian fatalities and head injuries, including elderly pedestrians, male drivers, intoxicated drivers, rural roadways, unlit darkness, limited sight distance, adverse weather condition, midnight hours, and a heavy vehicle as the crash partner.

**Conclusions:** Pedestrians in with-traffic crashes were more likely to sustain fatal injuries and head injuries compared to those in against-traffic crashes. The negative effect of walking with traffic on injuries was more pronounced in reduced-visibility conditions.

**Keywords:** pedestrian crash, walking against traffic, walking with traffic, fatalities, head injuries

## Risk factors for motorcycle crash in novice riders

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**Introduction:** Motorcycle riders have the highest injury and fatality rates among all road users. In depth understanding of risk factors for crash, and characteristics of riders at greatest risk of crash can help in developing targeted measures to reduce injury and deaths from motorcycle crash. In this study we investigated risk factors of crash in a cohort of novice riders in Victoria, Australia. At the time, rider training for learners was not a requirement in the licensing process in Victoria.

**Methods:** We used interview data from a study of 2399 newly-licenced riders (probationary or restricted licence holders) in Victoria from 2010-2012 linked with police-recorded crash and offence data. The outcome measure was self and/or police reported crash at 12 months follow up. The association between potential risk factors and crash were explored in multivariable logistic regression models adjusted for rider characteristics, type of motorcycle, rider training and experience, riding behaviour and attitudes, riding type and conditions and riding exposure.

**Results:** In the multivariable analysis, riders who reported they had been involved in three or more near crashes had 1.86 times (95% CI 1.19-2.90) higher odds of crash compared to riders who reported no near crash events and riders who participated in a pre-learner course had 1.38 times higher odds of crash (95% CI 1.05-1.82) compared with riders who did not attend a pre-learner course. Riders with previous off-road riding experience had lower odds of crash (OR 0.74, 95% CI 0.55-0.99) compared with riders with no off-road riding experience and each additional month of having held a learner licence decreased the odds of crash by 3% (OR 0.97, 95% CI 0.93-0.99).

**Conclusions:** At the time of the study there was no compulsory rider training to obtain a learner's permit in Victoria. It may be plausible that riders who voluntarily participated in an unregulated pre-learner course prior to obtaining a learner's permit became or remained at high risk of crash after obtaining a rider licence. This suggests the importance of regulating pre-learner courses based on evidence of safety benefits for novice riders. Results also suggest a possible safety benefit of lengthening the time a rider stays on a learner's permit.

**Keywords:** novice motorcycle rider, crash, risk factor

## The safety of people who drive for work in the gig economy: A perfect storm of risk factors?

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**Introduction:** The gig economy involves people who get paid per gig or 'piece' whereby service providers are linked to service users via an app (e.g. Uber, Deliveroo). They provide taxi services using their own car or deliver parcels or food by car, van, moped or motorbike or pedal cycle. Very little research has been conducted into the road safety risks of people who drive in the gig economy. The aim of this study was to explore the experience of risk and its management among drivers and their managers engaged in the gig economy.

**Methods:** In-depth interviews and an online survey were carried out among drivers and their managers who are part of the gig economy. Questions focused on the context in which they work, the extent to which they are aware of, create or experience risks, what they perceive as the roles and responsibilities for safety when they drive or ride for work, how they or their employer help manage safety.

**Results:** Interviews were carried out with 48 participants and the survey was completed by 231 respondents. Gig work led some drivers to experience impairment caused by fatigue and pressure to violate speed limits and to use their phones whilst driving. Many admitted to having a collision and experiencing near misses daily. In the online survey 42% said they had been involved in a collision where their vehicle had been damaged and 10% said that someone had been injured, usually themselves. Most respondents (75%) said there had been occasions when they had to take action to avoid a collision. Those on two wheels were more likely to report being in an injury collision and agree that they performed risky behaviours compared to car/van drivers. Those who worked on two wheels were generally younger than those driving cars/vans. Half of pedal cyclists and a third of those driving mopeds or motorbikes were between 17-24 years old and represent a high risk group in terms of crashes. Only a quarter agreed that the company cared about their safety and their views managers confirmed this.

**Conclusions:** The emergence of the gig driver could give rise to a perfect storm of risk factors affecting the health and safety not just of the people who work in the economy but for other road users. Service providers need to be more aware of their employment obligations and provide safeguards for people who generate income for them.

**Keywords:** road safety, occupational safety

## Pedestrians treated at Dutch emergency departments: An overview of road traffic accidents as well as fall accidents on public roads

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**Introduction:** Road traffic accidents are accidents which occurred or originated on a way or street open to public traffic, in which at least one moving vehicle was involved, and resulted in one or more people being killed or injured. A pedestrian is defined as a person walking along a road or in a developed neighbourhood. Those pedestrians who fall while walking along a road without the involvement of a moving vehicle, are usually not included in road traffic injury figures. This study was conducted to make an overview of the incidence and characteristics of patients and injuries among pedestrians treated at Dutch Emergency Departments, including both road traffic accidents as well as fall accidents without involvement of a moving vehicle.

**Methods:** In the Netherlands, the Dutch Injury Surveillance System (DISS) is used for monitoring accidents and injuries treated at Dutch Emergency Departments. DISS collects data from a representative sample of 14 out of a total of 88 Dutch Emergency Departments. For this study we selected all cases in which pedestrians were injured because of a road traffic accident as well as pedestrians who were injured because of an accidental fall on a public road without the involvement of a moving vehicle.

**Results:** In 2017, 3.600 pedestrians involved in a traffic accident (95% CI 2.600-4.700) were treated at Dutch Emergency Departments, which is 3% of all injuries treated for road traffic injuries in the Netherlands. The mean age of these patients was 42 years, and half of the patients had an injury severity of MAIS2+ (51%). A considerably larger group, 24.000 pedestrians (95% CI 21.400-26.900) was treated because of an accidental fall on a road or sidewalk without the involvement of a moving vehicle. The mean age of this group was 55 years, and 61 percent had an injury severity of MAIS2+. Results on different types of injuries, causes of accident and specific age-groups at risk will be presented.

**Conclusions:** Besides pedestrians getting injured in a road traffic accident there is a large group of pedestrians who get injured because of a fall accident without the involvement of a moving vehicle. Most of these victims are elderly and they have more severe (MAIS2+) injuries than road traffic victims. These victims are usually not included in road traffic injury statistics. Therefore, they often lack attention of road safety policy makers, which is a missed opportunity for the safety of pedestrians.

**Keywords:** road safety

# PITCH Presentations / SESSION 3

## Child Safety in Action

### The role of civil society in child safety in Europe

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**Introduction:** The complexity of injury and the multi-sectorial nature of its prevention demands a whole-of-society approach. Engaging with civil society in a form of collaborative governance is central to this approach. Civil society, defined as neither state, nor market nor family, includes organizations such as advocacy groups, charities, professional associations etc. This study looks at the role of civil society organizations in the implementation of child injury prevention interventions in Europe.

**Methods:** The methodology employed was built upon an existing approach, known as ‘organigraphs’. Mintzberg and van der Heyden developed the organigraphs methodology to depict how organizations actually work. We further developed the practical application of this method to explore how interventions in child safety are developed, implemented and monitored across the local, regional, national and EU levels. Professionals working in child safety in 25 European countries were asked to draw organigraphs for an intervention in one of four child injury domains: road, water, home safety or intentional injury prevention.

In addition, an EU Brussels based NGO mapped EU level governance of child safety. Interventions were selected to maximize coverage of injury issues and child age groups, as well as to represent the governance level of implementation (e.g., national, regional or local). The analysis focused on the action surrounding civil society actors, represented by the connectors leading to and from those actors.

**Results:** We received 44 organigraphs in total from 31 participants in 24 countries; nine for intentional injury prevention, nine for water safety, 12 for road safety and 14 for home safety. Civil society actors were present in the majority of Organigraphs and they played multiple and diverse roles including: ‘advising’, ‘funding’ and ‘implementing’ child safety initiatives.

**Conclusions:** The role of civil society, described in this data set, appears to be relatively well-developed. Strong, functional and long-standing partnerships between civil society actors across policy sectors and government may lead to greater capacity to address the complexity of child injury.

## Cyprus five years strategy plan for the prevention of unintentional childhood injuries: comprehensive program for the playground safety

Irene Georgiou<sup>1</sup> and the National Committee for Childhood Injuries Prevention

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**Introduction:** The Ministry of Health, recognizing the importance of the prevention of childhood injuries and poisoning, has decided to renew its first action plan (2006). For this purpose, the current situation in Cyprus for the prevention of child injuries has been recorded, emphasising in all existing laws and regulations regarding this matter. The Advisory Committee for the Prevention of Childhood Injuries and Poisonings, of the Ministry of Health of Cyprus, developed the Plan during a two-day workshop, under the auspices of WHO, with the participation of a big number of local stakeholders. After its completion, the Plan was submitted to and adopted by the Ministerial Council for the implementation of a 5 year strategic plan.

**Methods:** Having identified the gaps and weaknesses of the current legislation on childhood accidents in general, the action plan was prepared. The monitoring and implementation of the action plan was undertaken by the National Committee for the Prevention of Childhood Injuries and Poisonings, of the Ministry of Health of Cyprus. It is important to note that a big number of local stakeholders participate actively in this Committee and this has contributed to the successful outcomes of each action taken. One of the weaknesses identified during the preparation of the Action Plan was the lack of a legal framework regarding the safety in playgrounds.

Therefore, the Committee decided for the year 2018 to focus on organizing a major campaign, aiming to prevent accidents at playgrounds. The campaign focused on 3 population groups:

- › Parents and caregivers
- › Pre-primary and primary school children
- › Competent bodies

**Results:** All the above actions made in 2018 for the prevention of accidents at playgrounds, which were successfully carried out, are considered to be innovative for the Cyprus society. The effectiveness of this big campaign is illustrated by the achievement made by the committee to persuade the responsible government bodies to prepare a draft law on safety in playgrounds. The legislation defines the conditions and technical specifications for the construction and safe operation, maintenance and control of playgrounds. At this stage, the legislation is in the House of Representatives for consultation and the next step is to be approved and then implemented.

**Conclusions:** After full implementation of the above action, it is anticipated that accidents at the playgrounds will be substantially reduced. Moreover, the Committee will keep working on the rest pillars of the action plan (road crashes, drownings and suffocation, falls, poisoning and burns and scalds).



## The Giant's House - A safer environment for children in and around the house

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<sup>1</sup>The Giant's House - Gezinsbond vzw, Belgium; <sup>2</sup>La Ligue Des Familles, Belgium

**Introduction:** In the EU, accidents with young children are still underestimated. It is a given fact though that most of the accidents with children between 0 and 5 years old occur in the home environment. It is difficult to refer to concrete numbers, as a lot of these cases are not always registered in any form of statistic. Burns, fall incidents, poisoning, are a few of the examples where the emergency services or general practitioners have to take care of children's injuries.

**Methods:** The Giants' House is a prevention project and tour about child safety in and around the house. We built a house where everything is magnified 3 times in volume. As an adult, you look around through the eyes of a child of 3 to 5 years. You discover the dangers as if you were a toddler. At the same time you get offered a lot of prevention tips. It is there for all young (grand)parents, professionals, Gezinsbond has organized this 5 times in Flanders. The coming edition for 2020-2021 aims to be present in Wallonia in association with La Ligue des Familles. This new edition takes a new direction by implementing the newest technologies, with a virtual story in Virtual Reality (VR) and Augmented Reality (AR). Next to visiting and experiencing, we offer courses, in collaboration with substantive partners, such as Anti Poison Center, Red Cross Flanders.

**Results:** We create awareness towards the risks for accidents with children in their own home environment. The more people are informed, the more conscious they act and the fewer accidents will occur. Focusing on prevention, the cost of medical care will be reduced, which benefits everyone. Apart from this, we strongly feel that every avoided child injury, is a positive thing. We focused (by communication and cooperation) on more disadvantaged groups, which are generally more difficult to reach. With the latest edition in 2012-2013 (by Gezinsbond), there were partnerships with organizations of people in poverty, immigrant organizations,... 12% of all visitors belonged to such groups. We plan to repeat and enhance these partnerships. It became clear that people who visited the Giants' House indeed had an improved awareness for security in and around the home. Especially the knowledge that interventions in and around the home do not necessarily have to cost (a lot of) money, and examples of limited interventions to make your home safer for small children, were appreciated.

**Conclusions:** We are committed to create awareness towards children's injuries and injury prevention. The Giants' House is a prevention project that proved its usefulness and purpose. By raising awareness for home safety, the number of childhood accidents can be reduced.

**Keywords:** burn and fire prevention, child and adolescent safety, home safety, prevention of intoxications, ...

## 1<sup>st</sup> TRIP SAFELY: Transport of newborns in cars. Model of intervention in hospitals – Portuguese experience since 2011

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**Introduction:** The correct use of child restraint systems (CRS) is very important to reduce death and severe injuries in car accidents. In Portugal, over the last decades, the use of CRS significantly increased, in parallel with the reduction of fatalities in road accidents, with children as car passengers. However, APSI studies demonstrate that more than half of CRS have so severe misuse that can compromise child safety, because there is a lack of reliable, consistent and clear information addressed to families. Besides, the Centre for Disease Control and Prevention states that 1€ spent on prevention counselling by paediatricians contributes to a financial saving of 10€, and 1€ spent on a CRS saves 32€ in health costs.

**Methods:** To increase good counselling on CRS choice and correct use, by doctors and nurses, APSI created a model of intervention that can be replicated in all hospitals with Maternity. A pilot-experience was launched (2011) in Algarve (southern Portugal) involving the 3 hospitals with births. “Alta Segura” (Safe Discharge - 1<sup>st</sup> trip safely) program includes theoretical information (5 hours), practical training of CRS installation in a car seat model and in cars (2h - groups of 4) and 1 year follow up meetings, for professionals who follow pregnant women and children. Hospitals receive leaflets to distribute to families, informative posters for waiting rooms, a car seat model and CRSs to train families on their correct choice and fixing to avoid misuse. On discharge day professionals accompany families to a special identified parking area to verify if parents install the CRS correctly in their car.

**Results:** It is estimated that in Algarve, 80 to 90% of all families receive counselling in this area. APSI studies show that CRS use (children aged 0-12 years old) increased from 83% (2010) to 90% (2016), with a rate of correct use rising from 42% to 55%. Portugal shows a continuous decrease in child mortality rates: 29 (2010/2012), 17 (2013/2015) and 8 (2016 and 2017).

**Conclusions:** The impact of “Alta Segura” program was so important that in 2015 it was launched in two private Hospitals (Lisbon and Porto) and in 2019 in a public Hospital in the north of Portugal. It is also remarkable that in 2012, it inspired the Portuguese Ministry of Health to launch the program “Safe babies, toddlers and children” to train health professionals in primary health care units all over the country, to promote safe transport in cars.

**Keywords:** CRS use and misuse, health professionals training, children passengers, car accidents

## Application of new technologies in education of parents in Serbia - mobile application on child injury prevention

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**Introduction:** In the modern world, the use of digital technologies has become a common way of communicating with users in different areas, and it starts to be more increasingly used by health professionals and associates during their regular work. This is also evidenced by the activities of renowned institutions, such as the British and American Red Cross, who created mobile applications to provide basic information about certain health conditions, prevention, and basic care options.

**Methods:** Meeting the need of our population, the expert team of the Belgrade Institute of Public Health, consisted of public health specialist with long term experience on the field of injury prevention, as well as experienced specialists in information technologies, during the six month process created a mobile application "Injuries of children from A to Z" intended for parents, guardians and all those who take care of children and their safety.

During the development of the application, the most contemporary national and international professional literature was used, and first-aid experts from the Serbian Red Cross were consulted, as well as the relevant pediatricians with long-standing clinical experience.

**Results:** The application was designed to provide the basic information about child injuries and other consequences caused by environmental influences - how to prevent them, but also how to react, or what to do in case of injury occurrence. The content of the application is structured according to the types of injuries- from falls, drowning, burns, insect stings, and animal bites, poisoning, choking, to traffic injuries. Each topic is divided into two parts- one that relates to recommended activities in order to reduce the risk of injury and second related to first aid response if the injury occurs.

**Conclusions:** Mobile application "Child injuries from A to Z" represents the modern way of educating parents in our community and it is the first mobile application of this type in our country as well as on the territory of Balkans region. It represents a useful tool which will help parents to obtain the necessary information quickly, at any time and any place and will be widely promoted through media, continuous medical and parental education. The information given in this application should remind all those who take care of children how important it is to think and act in timely manner, in order to prevent injuries or to reduce their consequences.

**Keywords:** mobile application, child injury, prevention

# PITCH Presentations / SESSION 4

## Road Traffic Safety

### How do we get from B to C? Is accident investigation still a part of the answer to road safety?

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**Introduction:** Norway has the world's lowest number of traffic fatalities per capita. How do we continue the positive development and what part does accident investigation play? The emphasis has been on how the Vision Zero has contributed, and the importance is clearly significant. Is looking in the rear-view mirror not just out of fashion but no longer a valuable source of information? Could the objects not only be "nearer than they appear", but also quite blurry?

**Methods:** Since 2005, all road traffic accidents with fatalities on Norwegian roads have been subject to accident investigation. Over 60 officers on emergency response collect data at the scene of the accident. The work is done in cooperation with the police. The police make use of the same data that has been collected, but they have a different objective - criminal prosecution. Interdisciplinary groups of professionals carry out further investigation and analysis based on data related to the road, the vehicles and the people involved. The findings are categorized and recorded in a database – a basis in the search for effective measures.

**Results:** The entire picture is rarely available. The chain of events can be unclear, and we do not have insight into the victim's observations and interpretations. The puzzle might be incomplete, but the pieces collected play a valuable part. With more data, i.e. crash data from involved vehicles and videos, we spend less time answering *what happened*, but we still have a lot of potential in finding answers to *why*. Those answers are part of the knowledge needed to improve road safety.

**Conclusions:** Although accident investigation should not be the only basis for forming measures and policies, it provides us with the possibility to get a clearer picture and better understanding of road safety. Accident investigation is still an important part of moving from B to C and closer to the Vision Zero.

**Keywords:** road safety

## Driving behaviour in depressed patients vs healthy controls. Findings from a driving simulator study

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**Introduction:** Depression and road accidents are among the four leading causes of morbidity and mortality worldwide. Depression is characterized by mental, emotional and executive dysfunction. Symptoms of depression or adverse reactions to antidepressant treatment, such as lethargy and sleep disorders, are expected to affect both functional level and daily routine of the individual and may have an impact on driving behaviour. The aim of the present study is to evaluate driving performance of depressed patients vs a group of healthy controls.

**Methods:** Forty patients with depression and 20 healthy controls will be finally recruited for the study. Here we present an interim report based on the first 13 patients and 18 healthy controls. Participants complete questionnaires and scales on demographics, driving experience and habits, mental and physical health, and they are asked to drive in a driving simulator. Data extracted from the driving simulator include Standard Deviation of Lateral Position (SDLP); speed and maintaining the distance from the preceding vehicle; change of steering position; and reaction time.

**Results:** Depression was found to be positively related to history of road accidents. Among depressed patients there was a positive correlation between the number of past road accidents with body mass index, total score on the Social and Occupational Functioning Assessment Scale (SOFAS) and daytime somnolence. Fatigue and sleep disturbances were associated with a higher questionnaire score for aggressive driving. Reduced ability to maintain constant vehicle velocity was found to be positively correlated with body mass index and total score for insomnia. A higher SDLP was positively correlated to depression severity and drowsiness/low score on the SOFAS. A positive correlation was found between distance from the preceding vehicle and use of drugs with potential hypnotic effects; also SDLP was negatively correlated to stress levels. Both the later findings show that patients suffering from depression may realise the effects of certain symptoms on their driving abilities and thus drive in a more defensive way than controls.

**Conclusions:** Our interim findings on depression and driving ability show that there are significant differences between the group of depressed patients and those of the controls. Driving performance is negatively influenced by BMI, certain symptoms of depression and sleep disturbances. Patients may be using compensatory mechanisms to counteract some of the effects of depression and its treatment on their driving performance.

**Keywords:** depression, sleep disorders, drugs, driving behaviour, driving simulator

## Road safety: A pilot-study of an online tool to improve traffic behaviour of employees

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<sup>1</sup>Consumer Safety Institute, the Netherlands

**Introduction:** The behaviour of road users is the most important factor for the occurrence of traffic accidents. Risky driving behaviour is related to a higher accident risk. An estimated of 12 – 23 per cent of fatal traffic accidents was a result of alcohol abuse (SWOV, 2016) and there is a relationship between speeding behaviour and the risk of traffic accidents (SWOV, 2012). An innovative online tool was developed to influence road users' behaviour. It consists of short, interactive videos which focus on risky behaviour and its consequences. The aim of this study was to investigate the implementation of the tool in companies and to evaluate the usability and behaviour change.

**Methods:** Employees of four companies have worked with the online tool for one year (november 2017 - november 2018). A total of 84 employees participated in this study. Every six weeks they watched a training about a specific type of road behaviour. Implementation and evaluation of the tool was tested by questionnaires which the employees filled out before start of the online tool (To) and after one year (T1). The questionnaire contained questions on the experiences and appreciation of the tool, and measured knowledge, awareness, attitude and social norm.

**Results:** 51 participants filled out both questionnaires (at To and T1) and were included in the study. 58 Per cent did actually watch the training videos. Participants were very positive, an average score of 8.2 on a scale from 1-10. Participants reported a change in their own behaviour. They reported higher awareness and knowledge of road safety behaviour after participating. However, no significant changes were found, mainly because of the relatively low number of participants and the fact that participants already scored high values on the aspects awareness and attitude at baseline measurement (To). Some participants said they talked more about traffic safety with colleagues and their manager (social norm).

**Conclusions:** Companies value road safety as important. Improving employees' safe behaviour leads to less accidents, injuries, damage, absence and costs. Our online tool is evaluated very positive, by employers as well as employees. Participants reported a positive effect on their awareness and knowledge. The tool is a potential good intervention for companies to promote road safety behaviour. More participants are needed to measure significant effects on determinants of road safety behaviour after working with the online tool.

**Keywords:** road safety, intervention design, monitoring and evaluation

## The safe system approach to protect children in road traffic

Jeannot Mersch

*FEVR European Federation of Road Traffic Victims,  
Luxembourg*

**Introduction:** Nowadays many Road Safety stakeholders support a new approach to reduce casualties in road traffic: The safe system approach, which addresses two main issues: the vulnerability of the human body and the fact that humans will always make mistakes. As children are far from behaving as small adults one should consider their specificities and vulnerability as special road users, mainly as pedestrian or cyclists.

**Methods:** Those who are responsible for the design and maintenance of the traffic system should consider more the special needs of children when walking to school, playing outside and when they want to explore their environment. Transposing the findings of the safe system approach to childrens psychology and physiology by considering their spontaneity, special behaviour and sudden reactions as road users, especially in built up areas. Try to adapt the infrastructure to children specific needs. Road danger reduction should be applied at the source of the danger, that means to eliminate the potential dangers in a pro active way. This means also reducing motorised traffic where children are around, as schools or playgrounds. This will also help to reduce air pollution in those built up areas, coming from vehicles affecting especially children need for fresh air.

**Results:** If a street is safe for children it will be safe for everyone, including elderly road users. If the streets are safe, parents will allow their children to use active mobility, as walking and cycling more frequently which is also in favor of reducing obesity. Good practices on road infrastructure, but also vehicle safety and education via childrens special needs should be defined and recommended. All this need also to be considered in communications and social marketing; and especially in technological developments as ITS and future autonomous driving. Its also about childrens rights: Every child and adolescent has the right to use safe roads.

**Conclusions:** We have to design a road system that is sustainable, forgiving, selfexplaining especially for children to come so close to a Vision Zero. No one should die or get seriously injured when using the streets. Children are our future and those who are responsible for road safety should do all what is possible and all what we know, and we know a lot to better protect them.

**Keywords:** road safety - child and adolescent safety







# Break out session 5:

Methodologies for Safe  
Community Programmes

## SIGAPÉ - community based project to promote safe walking to school

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Liliana Madureira<sup>1</sup>, Sandra Ornelas<sup>1</sup>, Helena Botte<sup>1</sup>,  
Marta Carvalho<sup>2</sup>, Luis Escudeiro<sup>2</sup>

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**Introduction:** A study made by APSI on accessibility and road safety, in Lisbon in 2014, showed that streets around schools were perceived as dangerous by families and one of the main reasons why children did not use active modes to school (walking or cycling). The study also demonstrated that home-school routes were very restrictive to children, due to inadequate road infrastructures, excessive traffic, speed and abusive parking. This project aimed to identify the main obstacles to healthier transport modes and improve children autonomy, accessibility, mobility and safety in home-school trips.

**Methods:** The use of a participatory methodology was a central feature of this project, which allowed the commitment of 226 families and 450 children from five schools in low income neighbourhoods. The main activities implemented were: a) Mobility and walkability study of school routes; b) Organising a Walking Bus; and c) Children lead Community Awareness Campaigns. To measure how children went to school and to assess parent's perceptions of the difficulties and benefits of active travel, a *Home-School Trip Questionnaire* gathered data from parents. Children were involved in the participant observation of road environment and created materials distributed to the community. A Mobile Application to help organise and promote the Walking Bus was developed.

**Results:** It was found that most children either walk or travel to school by car. Families and students identified several obstacles to the active and safe mobility of children, mainly related to vehicles and drivers' behavior, but also how the street was designed and their own safety perceptions. Finally, these results were shown to the community and the municipalities through a booklet that also included recommendations and proposals for a safer and sustainable mobility to school.

**Conclusions:** This project confirmed that there are real obstacles to an autonomous and safe mobility of children to school. Some of them are related with the lack of accessibility and real danger while others with families' perception of risk. Work with the municipalities was made to promote the implementation of some of the children and families' proposals. The instruments and methodologies developed showed to be effective in mobilising communities to a safe and more sustainable mobility to school and aroused the interest of others municipalities that want to replicate this initiative.

**Keywords:** walking bus, walking to school, participation of children, participation of communities, healthy and sustainable mobility, safe routes to school

## Establishing a local infrastructure for safety based on global visions, national policies and local conditions

Eva Jakobson Vaagland

*Norwegian Safety Forum, Norway*

**Introduction:** The Norwegian Act of Public Health states that municipalities shall promote the population's health and well-being, contribute to good environmental conditions and prevent mental and somatic illnesses and injuries. Preventive efforts are given broad attention. The same focus is echoed in other laws and regulations. This gives Norway a supportive framework, and a potential to gain interest for safety work on community level. But public health work is mainly focused on lifestyle diseases and the prevention of these. Much less interest is put into injury prevention and safety promotion, although life lost due to injuries is a major cause of death up to 45 years of age and caring for injuries is costly for national health services. We need to increase awareness about the scope of injuries, causes of injuries and the potential for injury prevention and safety promotion.

**Methods:** Norwegian Safety Forum (NSF), is a non-profit organization, a national advocate for safety supported by the Norwegian Ministry of Health and the Norwegian Insurance companies. NSF is also the national center for Safe Community-work in Norway. To promote a local infrastructure for safety and support the municipalities NSF has developed a national program for community safety based on local conditions, local challenges and available resources, Norwegian laws and regulations, global WHO visions, and Safe Community experiences. The program is developed to meet the specific political and administrative demands put on Norwegian municipalities and will guide them towards better multi-sector cooperation and systematic evidence-based safety efforts. It promotes sustainable projects and

broad participation from all parts of society. NSF offers advice, guidance, tools, networks and seminars. Municipalities that use the model, have a local action group and fulfill the set requirements can apply to be certified as "Norwegian Safe Community".

**Results:** Norway has the largest Safe Community network in Europe with 30 certified communities and about 10 other communities wanting to learn more, or using parts of the program. Our work on community safety is specifically mentioned in the National Program for Public Health, The National Program for Safe Elderly and the National Plan for Road Safety as an endorsed program for local safety work.

**Conclusions:** The model is a useful instrument for municipalities turning global visions and national policies into local realities, and it gives the municipalities a step-by-step program on how to implement safety programs for different target groups and situations.

**Keywords:** local activities, local initiatives, injury prevention, community safety, participation, safety awareness

## On traffic safety promotion: policy and action plans in Vestfold County, Norway

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<sup>1</sup>Sande Municipality, Norway; <sup>2</sup>Vestfold County, Norway; <sup>3</sup>Færder Municipality, Norway

**Introduction:** In Norway, improved road safety has been a goal for over 50 years, the efforts towards which have been spearheaded by the cooperation between the Department of Transportation, The Public Roads Administration, the Police, the Directorate for Health, The Directorate for Education, county and municipal authorities and the non-governmental organisation Trygg Trafikk. This led to the Norwegian Parliament adopting the Vision Zero in 2002. The Vision Zero states that: “No one is to be killed or seriously injured in traffic”. Vision Zero emphasises the moral aspect of reducing traffic accidents and provides an ethical guide and guideline to policy and action plans. This presentation will give examples of how policy-making on national, regional and local levels are translated into action plans and activities carried out by public servants and civil society.

**Methods:** The Vestfold County Public Health Department provides professional and financial support to municipalities in their safety promotion work. Through political processes and the establishment of professional networks, common approaches have been adopted to address topics of concern in a uniform manner. These professional networks meet regularly to share challenges and successes among colleagues from other municipalities. The experiences cut across areas of responsibility: public health; road management; communication and other relevant areas. The Safe Community and Traffic Safe Municipality certification illustrate that safety is a shared responsibility. Municipal plans span wide: from safe road construction and

road and walkway management (i.e. snow and ice removal), to awareness campaigns and the distribution of reflective clothing to children. A partnership model is used to commit local authorities to document and oversee the quality assurance necessary to ensure a common standard for traffic safety. This includes standards for safety on construction sites, minimum standards for road and walkway management, traffic education in schools and kindergartens etc.

**Results:** Traffic Safe Municipalities ensure that kindergartens, schools, health care and administration live up to the set ambitions. There is great variety in and local adaptation to successful traffic safety action plans and activities. E.g.: Through the “Precious Transport” program, leisure organisations are invited to document implementation on practical traffic safety awareness and apply for a monetary reward upon fulfilling the standards.

**Conclusions:** Traffic Safe Municipalities is an example of how policy-making can be translated into action plans and activities carried out by public servants and civil society. Evaluations show that the required systematic work facilitates a broad spectre of locally adapted activities.

**Keywords:** policy making, safety promotion, safe communities, traffic safe municipalities, network



## “IDEAS”- A digital tool for using knowledge and data as a driving force to strengthen local safety promotion efforts

Eva Jakobson Vaagland

*Norwegian Safety Forum, Norway*

**Introduction:** Norwegian Safety Forum (NSF) is a non-profit organization, a national advocate for safety supported by the Norwegian Ministry of Health. The mission is to prevent home and leisure accidents by acting on three levels; projects and activities on local level, lobbying and policy work on national level, partner and contributor on International level. NSF functions as a hub for information with activities, networking and meetings on the agenda. The forum joins forces with members and collaborating partners to reach its goals.

In Norway the national data collected on injuries are incomplete and inconclusive. We do not have local data, and the national data that is available is not very easy to access. As an advocate for safety we need a tool to present data and injury prevention programs in a new way; comprehensible and easily accessible. We came up with IDEAS, the injury data easily accessible solution that combines injury data with ideas and knowledge about preventive work.

**Methods:** A grant from InnoMed (a national competence network for need driven innovation in the health care sector) gave us funding for developing an innovative digital solution. We cooperated with one of the leading companies in information and service design. With their expertise in communication and our knowledge of available data, and best practice we developed a prototype. The digital solution is based on national data, converted to a local setting, using informative graphic solutions, combined with knowledge and best practice on injury prevention programs for different target groups and situations.

**Results:** In February 2018 we could launch a prototype. It has been tested by several communities and organizations. The feed back from these test groups was important and we could adjust and improve the solution. The result from the testing proved that our hypothesis was correct, and we have in place a solid base for further work and a future national solution.

**Conclusions:** Easy accessible data introduced in a logical, comprehensible way, with a local approach, along with information on how to prevent accidents is a way to create more focus and interest for the scope of injuries and possibilities to prevent them.

**Keywords:** injury data, safety awareness, spreading information, promote local activities, community safety

## The national strategy « VISION ZERO » in Luxembourg

Annick Sunnen

*Accident Insurance Association, Luxembourg*

**Introduction:** In March 2016, on the occasion of the 10th edition of the Occupational Health and Safety Forum, a national Charta “VISION ZERO” was signed by several stakeholders in Luxembourg (the Ministries of Social Security, Labour, Health, Transport, Home Affairs, Public Service, the main national trade unions, the national employers’ organizations and the Accident Insurance Association) with the aim of decreasing the number and severity of accidents at work, commuting accidents and occupational diseases. For the period 2016-2022, the national objective is to reduce the frequency rate of work related accidents by 20% compared to 2014. Over the medium and long term, the objective remains the continuous decrease of severe and fatal accidents, meaning zero killed and zero seriously injured worker.

**Methods:** In order to achieve the national goals, the signatories committed themselves to developing and implementing individual action plans. In this context, the Accident Insurance Association developed guidelines for the implementation of individual action plans. These recommendations also apply for companies which officially committed themselves to VISION ZERO. These companies can file their action plans onto the VISION ZERO platform and enjoy the benefits of increased visibility in different media.

**Results:** The media campaign VISION ZERO was launched in June 2017. The campaign shows real witnesses who were victims of an accident at work or of a commuting accident. The campaign was not meant to shock, but to challenge and inform, to raise awareness, to empower and mobilize. By giving real faces and real life situations to the campaign, the experience of witnesses touches people and makes them more aware of the risks they face. The national campaign targets the general public (employees, young workers, future workers), but also companies respectively company directors, managers, executives, designated workers and safety representatives. The aim is also for companies to be aware of and committed to occupational safety and health by creating a culture of prevention. So far, more than 170 companies have joined VISION ZERO. The media campaign was broadcast via the web, social networks, in the press, on radio and cinema spots, out of home (road signs, buses, posters on tram stops, spots on tram screens), testimonial videos on YouTube with subtitles (French, German and English) and during occupational health and safety events (for example: first national health and safety week for the construction sector in June 2017).

**Conclusions:** In Luxembourg the national community for preventing work-related accidents, commuting accidents and occupational diseases keeps on growing – with the national stakeholders, the companies committing to VISION ZERO and general speaking with the company directors, the managers, the designated workers, the safety representatives and the employees.





# Break out session 6:

Safety in Sports and Leisure

## Sports and sports injury risk – Results of the Austrian exposure survey

Robert Bauer<sup>1</sup>, Monica Steiner<sup>1</sup>, Gerald Furian<sup>1</sup>

<sup>1</sup>KFV – Austrian Road Safety Board, Austria

**Introduction:** Sports injuries account for about 15% of all unintentional injuries in the EU (EU Injury Database, 2014). This share varies by country, as does the ranking by type of sports within this share. In Austria, the share of sports injuries is even about 25%, and the five top ranking “accident types of sports” are (IDB Austria, 2018):

- > Soccer (23%)
- > Alpine skiing (13%)
- > Ball Team-Sports (11%)
- > Cycling – leisure & sports (10%)
- > Mountain hiking (7%)

Sports injury prevention is usually focussing on the type of sports that produce the highest absolute numbers of accidents. However, regarding the share of accidents and injuries that could potentially be prevented, the risk of injury might be a better indicator. In order to establish such indicators, KFV conducted an “exposure survey” for a wide range of sports among the Austrian population.

**Methods:** First, a household survey was carried out (n=2 400; residents; above 4 years of age) to figure out how many people practice which types sports at what frequency. Second, the exposure data was linked to accident data as available by the Injury Database Austria (IDB Austria; n=15 000 p.a., hospitalized injuries only) for each type of sports. The IDB Austria is based on interviews with accident victims in hospitals. Two different measures for sports injury risks were calculated for each type of sports:

- > Accident rates: number of accidents per 1.000 people exposed
- > Accident time rates: number of accidents per 100.000 hours exposed

**Results:** The most common types of sports in Austria (top three) were found to be Mountain hiking (39%), Swimming (33%) and Cycling (33%). Accident rates (top three) were found to be highest for

- > soccer
- > school sports
- > and skateboarding

Accident time rates were found to be highest for

- > skateboarding
- > soccer
- > and snowboarding

Further rankings and a discussion of the two different risk measures applied will be given in the presentation.

**Conclusions:** Identifying risky types of sports by objective risk measures helps to focus prevention on the most demanding fields. It will be discussed what amount of risk reduction in common types of sports with high injury risks would be required to significantly reduce the overall burden of injury in sports.

**Keywords:** sport injury risk, sport accident risk

## Drowning prevention programs through lifesaving sport and possible extrapolation to other European countries

Ines González Díaz<sup>1</sup>, Jessica Pino Espinosa<sup>1</sup>, Isabel García Sanz<sup>1</sup>, Álvaro Vega Cid<sup>1</sup>, Ana Domínguez Pachón Rea<sup>1</sup>

<sup>1</sup>Federación Española de Salvamento y Socorrismo, Spain

**Introduction:** According to the WHO, at least 372,000 people die every year by drowning in the world (WHO, 2014), while in Europe this figure amounts to more than 35,000 annual deaths. The majority of these deaths happen due to imprudence of swimmer or because of ignorance about the aquatic environment dangers, so that raising awareness of the real problem is one of the main prevention measures we can adopt. Among the various prevention programs which we can show we highlight the activities that the Royal Spanish Lifesaving Federation (RFESS) carries out using lifesaving sports as a vehicle to achieve the following objectives:

- > Decrease the number of deaths by drowning
- > Increase the knowledge of users regarding accident prevention
- > Provide tools that allow users to avoid accidents or act effectively in case they occur –
- > Create a "lifesaving culture"
- > Know and interpret rules in the aquatic spaces
- > Transfer the innate values of the modality (solidarity, help, equality ...) to other areas of daily life.

**Methods:** Throughout the national territory there are many clubs and sports entities that combine the practice of lifesaving sport with drowning prevention, first aid and CPR.

These activities can be included in the following groups:

- > Self-rescue for babies (0-3 years)
- > Lifesaving schools (+3 years)
- > Lifesaving sport (+6 years)
- > Training for coaches (+16 years old)
- > Master (+30 years)

**Results:** Thousands of participants take part in these initiatives every year, only in 2018 more than 700 competitions took place in our country and more than 6,000 grade schooler took part in a nonfederated way in some of them. Other countries have similar programs or try to start them.

**Conclusions:** Lack of knowledge about dangers in aquatic environment or how to act if an accident occurs makes it necessary to find strategies that allow the population to act effectively in case of emergency. Lifesaving sport is shown as a very effective instrument in the teaching of values and knowledge related to safety in aquatic environment and that can easily be extrapolated to any Europe country.

**Keywords:** water safety, drowning prevention, sport

## Using innovative communication channels to change behaviour – Ireland's drowning prevention campaigns evaluated

Roger Sweeney

*Irish Water Safety, Ireland*

**Introduction:** Drowning is a serious public health issue in Ireland, accounting for 40% of combined road and water fatalities. The author outlines some of the innovative communication interventions that have been implemented to change skills, attitudes and behaviours at aquatic environments so that drownings are prevented.

**Methods:** A particular emphasis is placed on programmes that promote child safety education and those methods that have been successful in delivering public safety media campaigns into local communities. Related national media campaign methodologies will also be outlined as will partnerships with local and national government, university researchers and corporate entities that have partnered to target those at risk of drowning. Overcoming the challenge to educate a demographic that research has shown to not necessarily be interested in learning water safety skills will also be outlined.

**Results:** The number of drownings in 2017 (109) was the lowest since 1952. The average drowning rate per annum in each of the last ten years (127) is 29% lower than the annual average in each of the previous four decades (180), even though we have seen an increase in the numbers of people taking part in aquatic activities. The author will describe the safety promotion initiatives that have best engaged the public and those at-risk communities that have recorded this reduction in drowning fatalities.

**Conclusions:** The author will describe a communications strategy that spans outdoor, radio, digital display, social posts and video, ambient media, PR, resources for schools, press engagements and multi-sectoral partnerships, evaluating the triggers that engaged the public and influenced behaviours so that aquatic environments are enjoyed safely. This paper will inform safety practitioners with practical, innovative communications practices to promote injury prevention initiatives in other jurisdictions.

**Keywords:** safety promotion, alcohol injuries, safe communities, action plans, recreation, water safety and drowning prevention

## The Italian surveillance of ski accidents: analysis of risk trend and determinants of injury in the Aosta Valley

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<sup>1</sup>Italian National Institute of Health, Italy

**Introduction:** The Italian National Institute of Health since year 2003 activated the SIMON system (surveillance of injuries in mountain area) for monitoring injuries in skiable area. This surveillance was performed with the collaboration of: rescue services (Carabinieri, National Police and other rescue services organizations) for accidents data, the mountain cableway companies association for presence on the slopes data, 24h Assistance Snowcare company for insurance data. The surveillance has continued up to year 2006 in the Alps and the Apennines. This network has been recently (year 2017) reactivated in Aosta Valley on initiative of the authorities of this Region and of the mountain cableway companies association. The scopes of the study were: a) to observe the evolution of risk of ski injuries ten years later in a large sample of ski resorts in the Region; b) to assess in the same sample the effect of accident risk factors on the outcome of injury.

**Methods:** The study was based on data collected in a sample of ski resorts longitudinally distributed throughout the Aosta Valley. This sample in the period 2004-2005 was representing in the whole Region 60.5% of the passages at the turnstiles of the mountain cableways operating in the ski resorts. The sample represented also 63.9% of injuries in skiable areas of the Region and included the ski areas of: Courmayeur; La Thuile; Pila; Monterosa and Champorcher. The period 2014-2017 was compared to the period 2004-2005 in terms of exposure to the ski slopes environment, measured on the basis of passages to the turnstiles, and incidence of injured people rescued in the ski areas. The trend of injuries incidence rate ratio was observed. The association

among risk factors and injury outcome was tested by mean of chi-square and odds ratio analysis. A multivariate analysis was performed, by mean ordered logistic regression techniques, to assess the risk factors of injury outcome.

**Results:** The ski is the most used equipment, therefore in the most recent period (years 2016-2017) 82,3% of injured people were skiers and 14,9% snowboarders. Accidental falls represent around 90% of skiing injuries. In the period 2014-2017 versus 2004-2005 the number of passages per hour on the cableways was each year increasing and the number of ski injuries decreased. Consequently, the incidence rate decreased from 1.4 injuries per 10,000 passages to 1 (rate difference: -0.39; CI 99%: 0.29-0.48). As to the risk factors multivariate analysis indicates as significantly associated ( $p < 0.006$ ) to outcome of ED attendance: the difficulty of the slope; the type of equipment; snow condition and type. A combined risk factor summing up the effects of difficulty of the slope, visibility and snow condition shows an OR of ED attendance equal to 3.9 ( $p = 0.007$ ).

**Conclusions:** The Aosta Valley ski accidents surveillance shows an improvement in the safety of ski resorts, given that in the face of an increase of the attendance of the slopes it is observable a decrease in incidence rate of ski injuries. Nevertheless further investigation is needed on the harmfulness of accidents recently observed. The diffusion of equipments alternative to traditional alpine ski could lead to a greater risk, considering that the type of equipment resulted a risk factor for injuries. The difficulty of the slope combined with scarce visibility and hard and icy snow condition increased almost 4 folds the risk of injury requiring ED level care.

**Keywords:** ski injuries, sport and recreation, epidemiological surveillance

## The effect of shoe cushioning and body mass on injury risk in recreational runners: a randomised controlled trial

Laurent Malisoux<sup>1</sup>, Nicolas Delattre<sup>2</sup>, Axel Urhausen<sup>1,3</sup>, Daniel Theisen<sup>1</sup>

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**Introduction:** Shoe cushioning is expected to protect runners against repetitive loading of the musculoskeletal system, and therefore, running-related injuries (RRI). It is a common belief that heavier runners should use footwear with increased shock absorption properties to prevent RRI. Surprisingly, no study has provided evidence on the beneficial effect of increased shock absorption properties on injury risk so far. Therefore, the purpose of this study was to determine if shoe cushioning influences injury risk in recreational runners and whether the association depends on the runner's body mass.

**Methods:** This double-blinded randomized control trial included 848 recreational runners who randomly received one of two shoe models that only differed in their cushioning properties. Global stiffness was  $61 \pm 2$  and  $94 \pm 6$  N/mm in the Soft and Hard versions, respectively. Participants were classified as light or heavy according to their body mass using the median as cut-off (separately for men and women). Training and injury data were collected during 6 months on an electronic platform. An RRI was defined as any running-related musculoskeletal pain in the lower limbs that causes a restriction or stoppage of running for at least 7 days. Cox regression analyses were used to

compare RRI risk between the two groups based on hazard rate ratios (HR) and their 95% confidence intervals (95%CI), controlling for potential confounders. A stratified analysis was conducted to separately investigate the effect of shoe cushioning on RRI risk in lighter and heavier runners.

**Results:** Median body mass was 78.2 and 62.8 kg in men and women, respectively. A total of 24954 running sessions were recorded, of which 97% were performed with the study shoes. 131 participants (15.4%) sustained at least one RRI. Body mass was not associated with injury risk ( $HR=1.00$ ;  $95\%CI=0.99-1.02$ ). The adjusted Cox regression analysis revealed that the runners who had received the Soft shoes had a lower injury risk ( $HR=0.67$ ;  $95\%CI=0.47-0.94$ ). Previous injury was identified as a risk factor ( $HR=1.78$ ;  $95\%CI=1.19-2.65$ ). When stratified according to body mass, results showed that lighter runners benefited from Soft shoes ( $HR=0.54$ ;  $95\%CI=0.33-0.90$ ) while heavier runners did not ( $HR=0.84$ ;  $95\%CI=0.51-1.36$ ).

**Conclusions:** The overall injury risk was lower in runners who had received the soft shoe version. While body mass was not associated with RRI risk, the stratified analysis revealed that only lighter runners actually benefit from higher cushioning, in contrast with popular belief.

**Keywords:** sport and recreation

# Plenary Session 2:

## Building the evidence-base for effective strategies and actions

### PS2.1

#### Implementation opportunities in injury prevention: is the public health approach still valid in the 21<sup>st</sup> century?

Dr Margie Peden

*The George Institute for Global Health,  
Oxford University, UK*

Injuries and violence remain one of the most neglected public health problems of the 21<sup>st</sup> century. Nearly 5 million people lose their lives every year and countless more are non-fatally injured or disabled as a result of road traffic collisions, falls, suicide, violence, drowning, burns, etc. Injuries disproportionately affect young and vulnerable populations and rates are high among low- and middle-income countries or poor populations within high-income countries. Despite the adoption of a number of specific SDG targets addressing injury and violence (targets 3.6, 5.2, 5.3 and 16.1) and the implementation of a multidisciplinary and integrated approach in many countries there appears to be little downward movement in injury trends. So what can and should be done going forward?

The public health approach has long been the anchor to most injury prevention efforts over the last 3 to 4 decades. It has encouraged the collection of complete and comprehensive injury data in order to identify priorities and target groups for prevention actions. Long term monitoring, usually through injury surveillance systems or trauma registries, and evaluation have led to many adaptations to interventions and research, advocacy and case studies have resulted in amended policies, service improvements and behaviour change. But are the traditional mechanisms still

useful? Isn't it time to embrace new and novel approaches and join forces with other movements?

This presentation will discuss five areas where the public health approach could be enhanced by considering newer options:

**1. Improving data** through the digitalization of data, the use of mobile phones to collect information, and the development of a non-proprietary injury severity scoring system.

**2. Building capacity** for research and practice through online knowledge sharing platforms, MOOCs, and co-design approaches. Nurturing public support by engaging with the media to report responsibly and involving the public through social media, gaming, etc.

**3. Focusing scarce** resources by setting priorities based on cost-effectiveness or “best buys” and working more efficiently within strategic partnerships such as Universal Health Coverage, the NDC alliance, cleaner and greener environments, women's health and the private sector.

**4. Focusing on specific populations** such as adolescents or the elderly where major gains can be achieved.

**5. Acting locally** to implement and evaluate interventions through healthy city initiatives and embracing new cleaner mobility options while ensuring safety.

In order to address the problem of injuries and violence, practitioners, researchers and policy makers need to think ahead, embrace technologies and take end-users with them if they are to make the world we live in safer and cleaner for everyone.



### Building the evidence-base for child home injury prevention: findings from a five year programme of research

Professor Denise Kendrick

*University of Nottingham, UK*

**Introduction:** Unintentional injuries among 0-4 year-olds are a leading cause of childhood death and they result in substantial healthcare, individual and societal costs. Despite this, evidence about effectiveness and cost-effectiveness of preventative interventions was lacking.

**Method:** Our research programme focused on preventing thermal injuries, falls and poisoning. We undertook five multicentre case-control studies assessing risk and protective factors, systematic reviews, meta-analyses and decision analyses of home safety interventions. Findings informed design of an injury prevention briefing (IPB) for children's centres for preventing fire-related injuries and implementation support. This was evaluated by a randomised controlled trial comparing IPB and support (IPB+), IPB only (no support) and usual care. Findings subsequently informed a further IPB for preventing thermal injuries, falls and poisoning.

**Results:** Different injury types will be used to illustrate findings from different study designs. The poisoning case-control study found parents of cases were more likely not to store medicines out of reach (Odds ratio (OR) 1.83, 95% CI 1.38-2.42) and not put medicines (OR 2.11, 95% CI 1.54-2.90) or household products (OR 1.79, 95% CI 1.29-2.48) away immediately after use. Narrative reviews and pairwise meta-analysis found home safety interventions increased safety gate use (OR 1.61, 95% CI 1.19-2.17), whilst network meta-analyses found that education plus home safety inspection plus providing and fitting low-cost/free equipment was the most effective intervention for increasing safety gate use (OR 7.80, 95% CrI 3.18-21.3). The most effective intervention was not always the most cost-effective. For smoke alarms the most effective intervention was education plus home safety inspection plus providing and fitting low-cost/free equipment (OR 7.15, 95% CrI 2.40-22.73) but the most cost-effective intervention was education plus providing and fitting low-cost/free equipment (£4500/QALY). The fire prevention IPB was implemented by children's centres, with greater implementation in the IPB+ arm. Compared with usual care, more IPB+ arm families received fire safety advice, and more families in each intervention arm attended fire safety sessions. The intervention did not increase the prevalence of fire escape plans, but did increase the proportion of families reporting more fire escape behaviours (OR IPB only 2.56, 95% CI 1.38-4.76; OR IPB+ 1.78, 95% CI 1.01-3.15). Examples of the IPBs will be shown.

**Conclusions:** Our studies provide new evidence about the effectiveness and cost-effectiveness of home safety interventions. Evidence-based resources for preventing thermal injuries, falls and scalds were developed. These resources increased children's centre injury prevention activity and some parental safety behaviours.

## PS2.3

### Multidisciplinary perspective on the risk and protective factors associated with suicide and self-harm

Professor Ella Arensman

*University College Cork, Ireland*

In recent decades, significant progress has been made in research and treatment programmes for people at risk of self-harm and suicide within the relevant disciplines of psychiatry, psychology, neuroscience, public health, occupational health and social sciences. However, the exchange of knowledge and expertise across the different disciplines is limited. Yet, when facing the challenges with regard to early identification, treatment and prevention of psychiatric and physical comorbidity, and improving our understanding of psychiatric, psychosocial and biological factors associated with self-harm and suicide risk, a crucial step forward will be bringing together the relevant disciplines in building capacity. Multidisciplinary and interdisciplinary research has identified subgroups of people who engage in self-harm and those at risk of suicide.

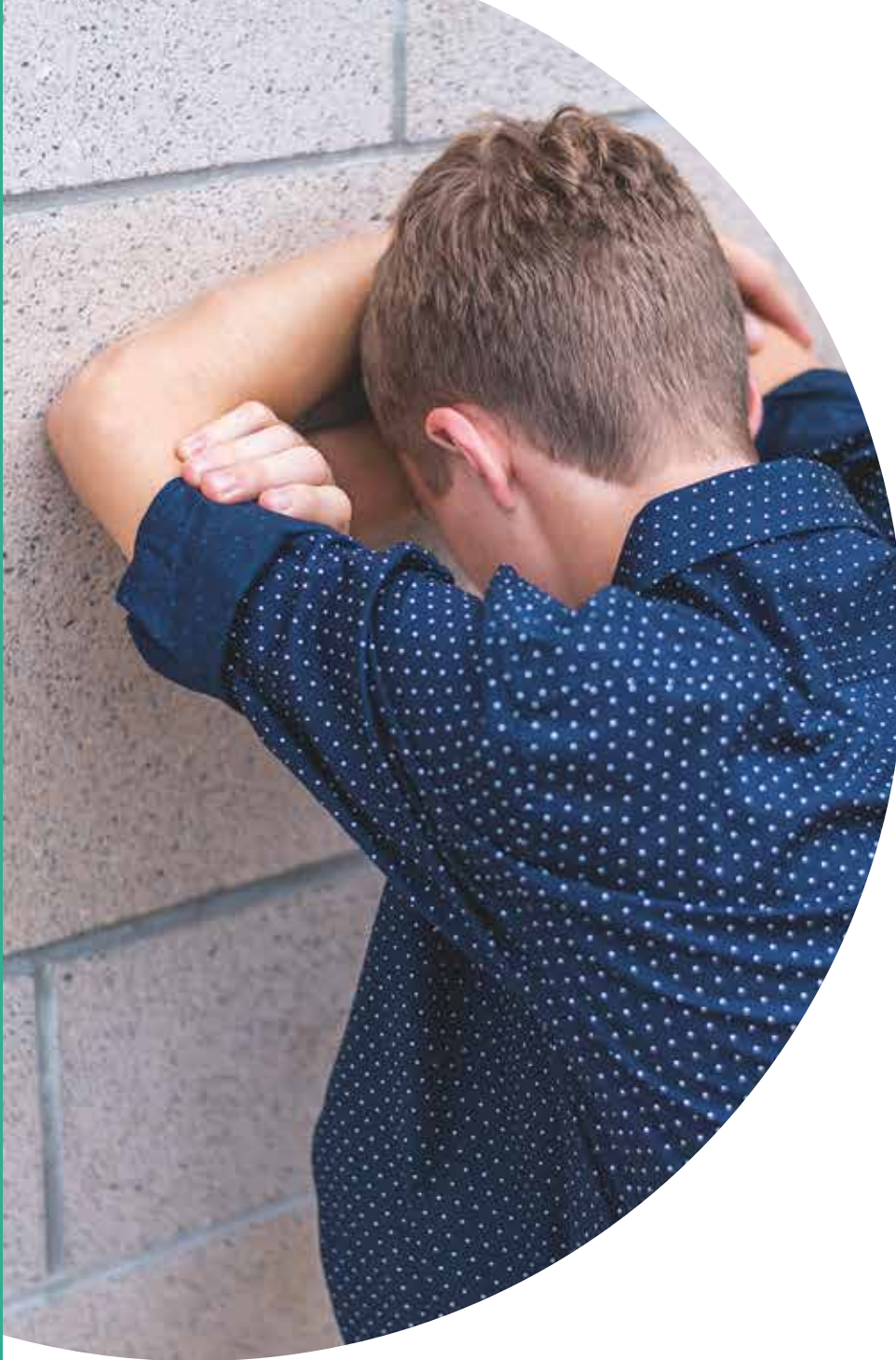
Self-harm in children and adolescents commonly involves self-cutting and intentional drug overdose, and associations have been identified with depression, anxiety, eating disorders, substance abuse, physical and sexual abuse and bullying including cyberbullying. Suicide clustering is four times more common among young people (15-24 years) than other age groups, and there are indications of increasing contagion effects in suicidal behaviour among young people associated with the rise in social media.

Among men and women aged under and over 40 years, important differences have been found in terms of risk profiles associated with suicide and self-harm. The impact of unemployment accompanied by other risk factors (e.g. history of self-harm, alcohol or drug abuse) on suicide rates has been more strongly associated with young men, whereas comorbid mental health and physical problems were more strongly associated with suicide and self-harm in men age over 40 years. Whilst many people in the young and middle age group seem to benefit from evidence based interventions, such as CBT and DBT, recent research has identified a subgroup of people who engage in self-harm with longstanding Posttraumatic Stress Disorder for whom these interventions are not sufficient. Therefore, there is a need for more targeted and tailored interventions geared to specific risk profiles and needs.

My presentation will give:

- > An update on risk and protective factors associated with self-harm and suicide from a multidisciplinary perspective;
- > Insight into comorbidity of psychiatric and physical comorbidity associated with self-harm and suicide;
- > An update on evidence based treatment interventions for self-harm among young people and those in the middle age group;
- > Insight into subgroups of people who engage in self-harm for whom existing evidence based treatments are not sufficient, and proposed enhanced treatments.





# Break out session 7:

Prevention of Intentional  
Injuries

## Self-reported perception on suicide phenomenon and suicidal risk exposure for young people in Lithuania

Birute Strukcinskiene

*Faculty of Health Sciences, Klaipeda University,  
Lithuania*

**Introduction:** Lithuania has been at the forefront of suicide rates in Europe for a number of years and does not leave the top five in the world. In addition, suicide in the group of young people ranks second in the structure of causes of death.

**Methods:** A survey in Lithuania was conducted, and 353 young people aged 19 to 29 years participated. A Chi square criterion and a Spearman correlation coefficient were used.

**Results:** Only one third of young people know that there are various warning signs, whether verbal or behavioural, before suicide occurs, and only less than half of the respondents know that a suicidal intent is talking about it. One-third of respondents do not know that it is possible to help for person with suicidal thoughts or with previous attempts to suicide. One third of respondents believe the myth that only people with mental disorders are suicidal. Many of the investigated young people do not realize the importance of talking openly with suicidal intent, and that timely conversation can help prevent suicide. Half of respondents do not know that suicidal person is not determined to die. Only a minority (one fifth) of respondents think that suicide cannot be justified. One fifth of the respondents had suicidal

thoughts (more – young men). More urban respondents have tried to commit suicide. Half of respondents self-reported suicidal young people in their environment. A positive moderate correlation between young people suicidal thoughts and suicidal attempts, and between family members' suicidal thoughts and their suicidal attempts was observed. Positive moderate correlation was revealed between suicidal thoughts of the young person and suicidal thoughts of the family members, and between the attempt to suicide of the young person and suicidal thoughts of family members. One third of young people have attended lectures or events on suicide prevention. Only a one-fifth of young people think they have enough knowledge to prevent suicide. Girls have more knowledge than that of boys.

**Conclusions:** Young people lack knowledge about the phenomenon of suicide, and they still believe myths about the suicide. One fifth of young people had suicidal thoughts, and young men, urban inhabitants, and suicidal family are at higher risk. Young people lack preventive knowledge and activities. More attention needs to be paid to the awareness rising on the phenomenon of suicide, to education and information, and to suicide prevention.

**Keywords:** self-harm and suicide prevention

## Risk factors associated with abusive parental practices within the ecological model

Dimitrinka Jordanova Peshevska<sup>1</sup>, Nikolina Kenig<sup>2</sup>

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**Introduction:** The use of corporal punishment is the most debated topic in parent-child relationships. Unfortunately, violence remains a severe reality for millions of children around the world as a form of child disciplining. The development of children and young people are the product of a complex set of interacting factors at individual, family and community levels. The aim of the study to examine the effects of the various factors on different levels in child disciplining within the ecological framework.

**Methods:** The data were collected from a national representative cluster household sample that includes 680 households' of parents in the period 2016/2017. All respondents confirmed their informed consent to participate. Computer based interviewed questionnaires were used for gathering data from the respondents. Majority of the items were the subscales from the International Adverse Childhood Experiences Questionnaire: physical and psychological abuse. Subscale from Parenting Questionnaire was used for measuring negative parenting attitudes and relevant socio-demographic questions.

**Results:** The study analysed the relationship between use of parental physical and psychological abuse with factors on individual, family and community levels. Using physical abuse as a child discipline method was associated with: negative parental attitudes, cultural norms, indicators of affluence (owning computers in the household, family being able to travel out of the country), age when the first child was born. Psychological abuse was correlated with negative parental attitudes, cultural norms, number of children at age of 2–14 years in the household, work status over the last 12 months of the parent/caregiver, child possessing his/her own room, household monthly income, possessing computers in the household, family being able to travel out of the country, age when your first child was born.

**Conclusions:** Child parenting and disciplining is a complex process. Current shift from simplistic one factor model, toward an appreciation for the cumulative nature of risk would be an important step advancing in the way we put forward intervention and support programs for child well-being.

**Keywords:** child, disciplining practices, abuse, neglect, adolescents



## Safety and well-being in adolescents with adverse childhood experiences

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**Introduction:** Studies exploring mental health and well-being in children exposed to adverse childhood experiences, suggest that most of the mental health problems appears in adolescence and/or later in life causing poor mental health outcomes. The main aim of the study was to explore the relationship between adverse childhood experiences and understand the negative effect on mental health in adolescents.

**Methods:** The design is a cross-sectional study including adolescents at first- and second-year university students from 12 faculties at the main public university “Ss Cyril and Methodius, Skopje” in the academic year 2016/2017. Total of 622 students are included in the study or 5,5% of the total student age population, using representative two stage quota sample. The main study was completed in the period March to June 2017. Self-administrated questionnaire, signed informed consent was used: Questionnaire for measuring sociodemographic variables such as: age, gender, place of living, living alone/family, ethnicity, education, working status of parents, status of student enrolment (part-time or full time) was used. International Adverse Childhood Experiences Questionnaire was used for collecting information on: physical abuse, psychological abuse, neglect, sexual abuse, living with household member - substance abuser, living with household member imprisoned, living with household member who is mentally ill or suicidal, domestic violence in the family, divorce, separation or death of the parent(s) and other adverse experiences. For measuring depression, DAAS Questionnaire was used.

**Results:** Findings showed significant positive correlation between depression and the total score of the adverse experiences in childhood ( $r=0,224$ ;  $p<0,0001$ ). Univariate logistic regression has confirmed 11 out of 12 adverse childhood experiences as predictors for depression such as: physical abuse (OR: 2,563, 95% CI 1,572 – 4,179  $p=0,0001$ ); psychological abuse (OR: 2,495, 95% CI 1,680 – 3,704  $p=0,0001$ ); neglect (OR: 3,35, 95% CI 1,605 – 6,993  $p=0,001$ ); sexual abuse (OR: 4,95, 95% CI 1,265 – 19,365  $p=0,022$ ); living with household member - substance abuser (OR: 2.297, 95% CI 1,262 – 4,180  $p=0,006$ ); living with household member imprisoned (OR: 2,3, 95% CI 1,012 – 5,224  $p=0,047$ ); living with household member who is mentally ill or suicidal (OR: 4,927, 95% CI 2,747 – 8,837  $p=0,0001$ ); domestic violence in the family (OR: 1,719, 95% CI 1,203 – 2,454  $p=0,003$ ); bullying (OR: 2,444, 95% CI 1,281 – 4,665  $p=0,007$ ); violence in the home (OR: 6,851, 95% CI 2,492 – 18,839  $p=0,0001$ ); community violence (OR: 2,739, 95% CI 1,778 – 4,220  $p=0,001$ ).

**Conclusions:** Violence, abuse, neglect and other adverse childhood experiences are serious public health problem globally and in the country. Revising the predictors influencing mental health of children would enable effective and evidence based preventive programmes targeting adolescents and supporting positive nurturing settings for future generations and society.

**Keywords:** adverse childhood experiences, mental health, adolescents



## Risk factors associated with suicidal thoughts among 50+ years old residents. Results from the SHARE survey in Luxembourg

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<sup>1</sup>D'Ligue - Service Information & Prévention, Luxembourg; <sup>2</sup>Luxembourg Institute of Health, Luxembourg; <sup>3</sup>Directorate of Health, Luxembourg

**Introduction:** Suicide is the most frequent external cause of death in Luxembourg and is recognized as a major public health problem. The risk of dying by suicide increases with age, reaching its peak at 75+ years of age. Identifying suicide risk factors is crucial for suicide prevention. Since suicidal thoughts can lead to self-harm, suicide attempts, and deaths by suicide, they are an indicator of a suicidal crisis. Socio-demographic factors, risk behaviours, and health conditions are associated with suicidal thoughts, but results vary across countries. Our aim was to identify the risk factors associated with suicidal thoughts among 50+ years old residents in Luxembourg.

**Methods:** We did a cross-sectional analysis of Luxembourg's data from the fifth wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) collected in 2014 from 1610 randomly selected residents aged 50+ years. Suicidal thoughts during the last month, socio-demographic characteristics (age, sex, country of birth, education, employment status), health conditions (chronic diseases, sleep problems, depression, physical limitations), and quality of life indicators (CASP-19 index reflecting Control, Autonomy, Self-realisation Pleasure) were collected via face-to-face interviews. Bivariate and multivariate General Estimating Equations were used to analyze the association between risk factors and suicidal thoughts. Variables associated with suicidal thoughts in the bivariate analysis ( $p < 0.1$ ) were included in the multivariate analysis.

**Results:** During the last month, 141 respondents (8.8%) declared to have had suicidal thoughts. In the bivariate analysis, age category, professional inactivity, immigration, educational level, physical limitations, chronic diseases, sleep problems, quality of life, feeling depressed, and being underweight were associated with death wishes. After adjusting for confounding variables, independent risk factors associated with suicidal thoughts were being retired (OR;CI 95% 3.3;1.8-6.1) or unemployed (OR;CI 95% 2.4;1.3-4.6), being a second-generation immigrant (OR;CI 95% 2.1;1.2-3.7), having a low quality of life (OR;CI 95% 8.1;4.0-16.2), being depressed (OR;CI 95% 3.6; 2.2-5.9), and having sleep problems (OR;CI 95% 2.0;1.4-5.9).

**Discussion:** The analyses showed that depression, low quality of life, sleep problems, professional inactivity, and being second-generation immigrant increase the risk of suicidal thoughts in older people. Within the ongoing first national suicide prevention plan in Luxembourg (2015-2019), these results help to identify the most vulnerable in this age group. Further research, such as bigger cohort mental health surveys or psychological autopsies, would allow for more detailed information about the risk factors of suicide and suicide attempts, without having to refer to proxy variables.

**Keywords:** suicide, SHARE survey, physical limitation, risk behaviours, suicidal thoughts

## European Alliance against Depression: Prevention of suicidal behaviour by community based 4-level interventions

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<sup>1</sup>University of Leipzig, Germany; <sup>2</sup>European Alliance against Depression

Worldwide more than 800.000 people die every year by suicide and the number of attempted suicides is estimated to be 20 times higher. Depression and other psychiatric disorders are the main cause for suicidal behavior. The community based 4-level-intervention concept developed within the “European Alliance against Depression” ([www.EAAD.net](http://www.EAAD.net)) combines the only partly overlapping aims to improve the care and treatment of patients with depression and to prevent suicidal behaviour. It has been shown in several controlled studies to be effective concerning the prevention of suicidal behavior (1, 2, 3, 4) and has been implemented in more than 115 regions worldwide. The 4-level intervention concept comprises training and support of primary care providers (level 1), a professional public relation campaign (level 2), training of community facilitators (teacher, priests, geriatric care givers, pharmacists, journalists) (level 3), and support for selfhelp activities of patients with depression and for their relatives (level 4). At level 4, digital self management tools such as the iFightDepression tool (offered by EAAD) are gaining relevance.

Implementation research and systematic process analyses have provided insights in mechanisms relevant for a successful implementation of the 4-level intervention concept in different cultures and health care systems. Becoming simultaneous active at 4 levels has been found to create strong synergistic and also catalytic effects. Via the EAAD and partners from 24 countries, the intervention concept and materials (available in many different languages) are offered to interested region in and outside of Europe.

- 1) Hegerl et al 2006; Psychol Med 36: 1225-1234
- 2) Hegerl et al 2010; Eur Arch Psychiatry Clin Neurosci 260:401-406.
- 3) Székely et al 2013; PLOS One 8: e75081
- 4) Hübner-Liebermann et al (2010): Gen Hosp Psychiatry 32: 514-518.
- 5) Hegerl et al 2013; Neurosci Biobehav Rev; 37: 2404-2409.



# Break out session 8:

Action on Falls Prevention  
in Older People

## Falls in older people in domestic and leisure settings – data from EVITA system

Tatiana Alves<sup>1</sup>, Ana Santos<sup>1</sup>, Emanuel Rodrigues<sup>1</sup>, Mariana Neto<sup>1</sup>, Ricardo Mexia<sup>1</sup>, Carlos Matias-Dias<sup>1</sup>

<sup>1</sup>National Institute of Health Doutor Ricardo Jorge, Portugal

**Introduction:** Accidents at home and in leisure context (HLA), especially those reaching one of the most vulnerable groups of the population such as in the elderly, require the planning, execution and evaluation of preventive interventions and mitigation of the consequences based on epidemiological evidence. The aim of this study was to estimate the frequency of HLA using hospital emergency unit due to fall in patient aged 65 and over and their characterization considering the place of occurrence, type of injury, follow-up in health services and products involved in the accident, in 2018, in Portugal.

**Methods:** Were analysed data from the EVITA system, fed by the HLA registry at the emergency room of the NHS hospital units that participate in this system. Of the 38 hospitals able to participate in EVITA, data came from 21. The frequency and distribution of falls were analysed according to the place of occurrence, type of lesion, hospital referral and products involved. Bivariate comparisons were performed for the categorical variables using the Pearson Chi-square test. The level of significance of the test was set at 5%.

**Results:** In 2018, 30 196 falls of people aged 65 and over were recorded in the EVITA system. The results show more frequently falls in females (65.4%) than in males (34.6%), being these differences statistically significant ( $p < 0,01$ ). The majority of falls occurred at home (64.4%), followed by public areas (9.7%) and outdoor spaces (9.0%), these differences were statistically significant ( $p < 0,01$ ). The type of lesion most frequently observed was bruise (64.1%) and open wound (14.9%). Following the accident caused by falling, 51.5% of the victims were referred to the "unreferred exterior", 29.2% to "referral for consultation", 13.7% have had need of hospitalization and 0,01% were deaths.

**Conclusions:** Considering that a significant fraction of falls can be prevented, this information reinforces the importance of this problem and its magnitude. In addition suggests to targets of prevention programs, future lines of research on specific groups, mechanisms of injury and deepening of research about determinants of falls in older people.

**Keywords:** home safety, falls in older people, EVITA system

## Accidental falls – the leading cause of injury related mortality and hospitalization in the elderly in Croatia

Ivana Brkić Biloš<sup>1</sup>, Petra Čukelj<sup>1</sup>, Verica Kralj<sup>1</sup>, Maja Silobrić Radić<sup>1</sup>

<sup>1</sup>Croatian Institute of Public Health, Croatia

**Introduction:** Elderly people are at an increased risk of accidental falls. A serious fall can result in long term treatment, decreased quality of life and death. The aim of this research is to present the burden of accidental falls in older age (persons 65 and older) population in Croatia.

**Methods:** We used the data on accidental falls (ICD-10 codes W00-W19) from routine mortality and morbidity statistics, and database provided by the World Health Organization (Health for All database). We used Joinpoint Regression analysis to describe trends in mortality from falls in the 65+ age group in Croatia.

**Results:** Falls are the leading cause of injury related deaths in older age (65+) in Croatia. Joinpoint Regression analysis for the period 1995-2017 shows a significant annual percent increase of age standardized (E) mortality rates of 1.33 (1.36 in men, and 1.23 in women). The most common somatic diagnosis in older people that died from accidental falls are fracture of femur and intracranial injury.

Falls are the leading cause of injury related hospitalizations in the elderly. Hospitalization rates in the last 10-year period are increasing, and throughout the period they are higher in women than in men. Average duration of hospitalizations due to falls in population older than 65 is 10.7 days, and average duration of hospitalizations due to fracture of femur in the same population is 13.5 days.

According to the World Health Organization database, age-standardized mortality rate due to accidental falls in people older than 65, for the last available year (2016) in Croatia is 104.4/100 000, which is significantly higher than the last available (2015) average mortality rate for EU members (37/100 000).

**Conclusions:** Accidental falls are the leading cause of injury death and hospitalizations in adults aged 65 years or older in Croatia. Increasing number of older people in Croatia will contribute to even bigger burden of accidental falls and their consequences. With the aim of fall prevention, Croatian Institute of Public Health has prepared an educational leaflet, intended for older people, where they can find the recommendations on how to prevent falls, with focus on the importance of reducing environmental risk factors.

**Keywords:** fall, elderly, injury



## Stand up stay up 2016-19 - a programme to raise the level of falls prevention activity across England

Ashley Martin

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**Introduction:** With over 330,000 hospital admissions for falls among the over 65s in England in 2017-18, falls and fractures are a common and serious health issue facing the nation. The human cost includes distress, pain, injury, loss of confidence, loss of independence and mortality. The total cost of fragility fractures to the UK estimated at £4.4bn which includes £1.1bn for social care. Without a step change in prevention these figures will increase significantly given the ageing population.

**Methods:** RoSPA delivered the Stand Up Stay Up programme using a Theory of Change model and working with 10 local partner areas across seven of the nine English regions. Partners included local authorities, public health, NHS, fire services and third sector organisations. The programme supported them in developing far reaching falls prevention strategies and delivering innovative community interventions. Local interventions varied but include increasing strength and balance training, early identification of those at risk of falling, home hazard assessment, frontline staff training and developing of training for pharmacy staff and opticians. In addition to these partnerships, over 300 organisations joined a national network, actively promoting measures that focus on preventing the first fall. A conference and two learning exchange events enabled the sharing of best practice and innovation and

RoSPA's active involvement in the National Falls Prevention Coordination Group established by Public Health England has enabled this work to influence falls prevention at a national strategic level.

**Results:** Results from a pilot common dataset showing the impact of increased strength and balance activity will be shared. An independent evaluation will also highlight the effect of the programme on increasing falls prevention activity and refocusing the agenda towards prevention. Feedback from staff and participants involved in the community interventions will show how the programme has changed lives and improved health and wellbeing.

**Conclusion and discussion:** This was a major national three-year programme funded through the Department of Health Innovation, Excellence and Strategic Development Programme. The learning from the programme will now feed into the delivery of the National Accident Prevention Strategy and the roll out of falls prevention initiatives in the years to come.

**Keywords:** falls prevention, falls, fractures, ageing population, older people

## Development of an evidence-based implementation toolkit for the Falls Management Exercise programme (FaME)

Elizabeth Orton<sup>1</sup>, Sarah Audsley<sup>1</sup>, Carol Coupland<sup>1</sup>, John Gladman<sup>2</sup>, Natasher Lafond<sup>1</sup>, Philippa Logan<sup>1</sup>, Dawn A Skelton<sup>3</sup>, Clare Timblin<sup>1</sup>, Stephen Timmons<sup>1</sup>, Derek Ward<sup>4</sup>, Denise Kendrick<sup>1</sup>

<sup>1</sup>University of Nottingham; <sup>2</sup>CLAHRC-E; <sup>3</sup>Glasgow Caledonian University, UK; <sup>4</sup>Lincolnshire County Council, UK

**Introduction:** Falls in older adults are a leading cause of unintentional injury. Due to an ageing population, the occurrence of injuries is likely to increase unless more is done to reduce falls risk. Strength and balance exercise programmes such as the Falls Management Exercise Programme (FaME) are recommended nationally but the availability of such programmes is inconsistent across England. The PHISICAL study investigated the implementation of FaME in a range of different localities in England to determine whether the programme retains its clinical effectiveness and fidelity in non-research settings and to identify barriers and facilitators to implementation. Findings were used to develop an evidence-based implementation toolkit to maximise programme availability.

**Methods:** The contents of the toolkit were derived from:

- > Quantitative analysis of FaME programme performance and outcomes
- > Observations of FaME delivery, scoring against quality and fidelity criteria
- > Thematic analysis of shared learning events and semi-structured interviews with professionals and participants
- > Analysis of resources used in programme delivery.

**Results:** A total of 356 older people took part in 29 FaME programmes. Four fifths (79%) were aged  $\geq 70$  and two fifths (39%) were aged  $\geq 80$ . Participants had a wide range of health problems and half (51%) took  $\geq 4$  medications. One third (32%) had fallen in the last year, 30% were at high risk of future falls (30%) and 48% were very concerned about falling. Overall 41% of participants completed at least three-quarters of the FaME programme classes (18 out of 24-weeks). These people increased their physical activity by 170 minutes/week ( $p$  value=0.023), were more confident in their balance ( $p < 0.001$ ) and became less concerned about falling ( $p = 0.01$ ). The number of falls reduced from 1.27 to 1.04/participant/year ( $p = 0.41$ ), though the numbers were too small to show statistical significance. The fidelity and quality of the programme was high with up to 78% of fidelity and 84% of quality criteria met. Security of ongoing funding, having a pool of instructors eligible for training and high drop-out rates were all barriers to implementation. Participants valued the social/mental as well as physical benefits of the programme. The resulting toolkit includes a range of commissioning resources (e.g. business case, specification, briefing notes) informed by the study findings.

**Conclusions:** FaME can be implemented in the community with high quality and fidelity and should be part of a falls prevention pathway. The implementation toolkit provides evidence-based information on how to commission FaME.

**Keywords:** falls in older people, strength and balance, implementation, FaME



## Project TOM: results of implementing a multifactorial approach to prevent falls and improve autonomy in community-dwelling older adults

Rozan Van Der Veen<sup>1</sup>, Sanne Frazer<sup>1</sup>, Mariëlle Hermans<sup>1</sup>, Malou Eilering<sup>1</sup>, Martien Panneman<sup>1</sup>

<sup>1</sup>Consumer Safety Institute, the Netherlands

**Introduction:** The Dutch government is increasingly appealing to self-management and independence of older adults. Also older adults themselves prefer aging in place. However, a first fall is a critical starting point of events that can lead to injury, inactivity, social isolation, more falls and institutionalization. TOM is a multicomponent falls prevention program developed by a public-private consortium (VeiligheidNL, Philips, Nutricia and ONVZ) and aimed at stabilizing and improving the mobility of people aged 65 and over in order to sustain self-management and independent living. The objective of the current study is to assess the impact of TOM on mobility and well-being and its acceptability and feasibility.

**Methods:** This study had a pre- and post case-crossover design. TOM was implemented in five living labs between April 2017 and December 2018. Participants aged 65 and over with an increased risk of falling followed a 14-week evidence-based exercise program, wore a mobility monitor and received nutritional screening, nutritional advice and weekly social support. Impact data were collected by physical tests at baseline and at the end and by questionnaires at baseline, at the end and six months follow-up of each living lab. Acceptability and feasibility data were collected by focus groups with participants and interviews with healthcare professionals at the end of each living lab.

**Results:** A total of 107 older adults (39 men, 68 females) with an average age of 75 participated in TOM. The number of fallers significantly declined [45 (42,1%) vs 26 (24,3%);  $p < 0.05$ ]. Four out of seven physical tests showed a significant improvement: Timed-Up-and-Go test [9.3 sec ( $\pm 2.7$ ) vs 7.9 sec ( $\pm 2.0$ );  $p < 0.05$ ], Functional-Reach test [26.5 ( $\pm 7.1$ ) cm vs 29.3 cm ( $\pm 6.1$ );  $p < 0.05$ ], Timed-Chair-Stand test [15.0 sec ( $\pm 3.9$ ) vs 11.8 sec ( $\pm 3.0$ );  $p < 0.05$ ] and One-leg-Stand test [8.2 ( $\pm 3.1$ ) sec vs 8.9 sec ( $\pm 2.4$ );  $p < 0.05$ ]. Fear of falling significantly decreased [2.04 ( $\pm 0.63$ ) vs 1.89 ( $\pm 0.54$ );  $p < 0.05$ ]. After TOM 64% indicated to have more social contacts and 57.4% felt better. A total of 25 participants joined the focus groups and 30 healthcare professionals participated in the interviews. Participants and professionals were overall positive about the program, highly valuing the social interaction and the multidisciplinary character.

**Conclusions:** Participants of TOM improved on several mobility and well-being impact indicators. Acceptability and feasibility data showed promising results regarding the implementation of TOM. Its multicomponent approach provides a relevant blueprint for a local falls prevention method in order to maintain older adults' self-management and independence.

**Keywords:** falls prevention, mobility, community-dwelling, older adults, multicomponent

# Late Breakers / Pitch Presentations / SESSION 5

## Injury Surveillance & Research part 2

### Remote maintenance on a robot cell and secure integration into the company's internal process

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**Introduction:** Statistically, cyber attacks often occur through remote accesses to machine controls and industrial IT networks. For remote maintenance, it is particularly important that the security implications of security vulnerabilities are controlled and that absolute protection for the machine and the staff is provided. Remote access to industrial robots is described in ISO 10218-2. There, however, no requirements are defined for the security of the remote access.

**Methods:** An analysis between the robot manufacturers represented in Austria has shown that system updates on the controller can be carried out remotely. It is also common that the remote maintenance is used for error analysis to help the operator to locate the error faster. Further remote interaction with the operator of the machine is considered high risk and therefore not implemented. A practical test on a machine has shown that the process sequence described in the standard ISO 10218-2 for the remote maintenance of industrial robots requires additional security and safety measures.

**Results:** Remote maintenance on a robot cell can be implemented as follows

1. The technical documentation of a machine must describe the operating mode Remote maintenance.
2. Remote maintenance between operator and service provider / machine manufacturer, obligations and liability should be agreed in contractual detail.
3. Before starting remote maintenance, the machine has to be in a safe state.
4. The remote maintenance can only be done by fulfilling all requirements described in ISO 10218-2.
5. Additionally the remote maintenance process has to be performed in a secure way.
6. The operator's IT establishes the connection to the remote PC and starts recording the remote maintenance. The remote PC is directly connected to the the robot cell.
7. During remote maintenance, an employee of the maintenance department observes and documents the intervention of the remote specialist.

**Conclusions:** Remote maintenance of industrial plants is used more and more often. For this reason, IT security is especially important for remote maintenance. In addition, when performing remote maintenance of robotic cells, attention is drawn to the additional integrated security and safety measures. Ongoing exercises are necessary so that the personnel and the technology, both hardware and software, can be used in case of remote maintenance securely. Through established and practiced processes, cyberattacks are minimized and the safety of the staff is increased.

**Keywords:** applications for safety, robot, security, safety, remote maintenance

## Water risk versus traffic risk

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**Introduction:** Royal Spanish Lifesaving Federation stated that in 2017 a total of 574 people accidentally died in the aquatic environment. On the other hand, the General Directorate of Traffic of the Government of Spain, published that traffic accidents (excluding pedestrians and cyclists) caused the death of 1401 people. The absolute figures presented in both reports can make us think that traveling in a motor vehicle is more dangerous than doing activities in the water. However, knowing the time that the population is exposed to these risk environments, could help to assess in more detail the risk. For that, the objective of this study is to know the time that Spanish people usually use to travel in a motorized vehicle and the time they spend on water activities.

**Methods:** Throughout the year 2018, an anonymous survey was distributed through a mobile application. It was answered by 1561 people living in different locations in Spain (891 women and 670 men). In addition to the date, age, sex and place of residence, the following questions were asked in the survey: "In the last week, excluding personal hygiene, how many hours did you spend inside the water?" and "In the last week, excluding air, sea and rail transport, how many hours did you spend on a motorized transport?"

**Result:** The population that participated in this research spent an average of 362 minutes (6 hours and 2 minutes) on the water during the summer season and only 110 minutes (1 hour and 50 minutes) during the rest of the year. In contrast, the surveyed population has spent an average of 488 minutes (8 hours and 8 minutes) traveling in motor vehicles during the summer season and 436 minutes (7 hours and 16 minutes) the rest of the year.

**Conclusions:** The results lead us to believe that if we stayed in the water as long as traveling in motorized vehicles, the number of deaths in the water would be very similar or even greater than that generated by traffic accidents. The results of this research show that staying in the water can be even more dangerous than traveling in motorized vehicles. In addition, it is not necessary to stay in the water as long as in motorized vehicles to cause accidental death. To conclude, it is recommended to improve the water safety, at least in the proportion that corresponds to the danger generated by this environment.

**Keywords:** accidental death, drowning, road accident, water accident, motorized vehicles

## Drug and alcohol use in drowning deaths recorded by the Irish National Drug-Related Deaths Index (NDRDI), 2004-2016

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<sup>1</sup>Health Research Board, Ireland

**Introduction:** In Ireland, as with other developed countries, the annual number of drowning deaths has decreased in recent years which may be due to a decrease in overall time spent around water. Drug and alcohol use are known risk factors for drowning, yet few studies have examined their involvement in drowning deaths in Ireland, and none have done so on a national scale. The aim of this study was to examine the trends and role of drugs, including alcohol, in the drowning deaths recorded by the National Drug-Related Deaths Index (NDRDI) and to compare them to the national figures on drownings in order to better understand drug and alcohol involvement in drownings in Ireland.

**Methods:** The NDRDI is the national database for all drug and alcohol related deaths in Ireland, and all deaths in people with a history of drug misuse or drug/alcohol dependence. The main source of data is closed coronial inquests. All deaths due to drowning, recorded by the NDRDI from 2004 to 2016 were analysed. Data was compared with published national data on drowning in the Republic of Ireland.

**Results:** The number of drowning deaths that involved drugs and/or alcohol, recorded by the NDRDI, increased from 18 in 2004 to 41 in 2016, during this period the national drowning figures decreased. The NDRDI recorded a substantial portion of drowning deaths (404, 23%) in the Republic of Ireland. Alcohol was the most common drug found, present in 293 (73%) of NDRDI drowning deaths, with a high blood alcohol level (BAL) found in a large number of deaths; 206 (72%) of deaths had a level of 150 µg/100ml or higher. Benzodiazepines (31%) and anti-depressants (23%) were the most common pharmaceutical drugs found, and were more likely to be involved in female drownings. Males were more likely to have illicit drugs such as cannabis in their system at the time of death. Younger adults (15-39 years old) were more likely to have a positive toxicology result for cocaine or opiates.

**Conclusions:** This study is the first to analyse drug and alcohol involvement in drowning deaths in Ireland and is unique as it draws from a census of all drug and alcohol related deaths. It shows an increasing number of drownings involve drugs and/or alcohol. Alcohol is the most common drug in adult drownings, often at high levels and in combination with other drugs, regardless of gender or age. These results suggest that future prevention campaigns may benefit from focussing on alcohol and/drug involvement in drownings.

**Keywords:** drowning, alcohol, drugs

## Water safety policy in Scotland

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<sup>1</sup>The Royal Society for the Prevention of Accidents (RoSPA), UK

**Introduction:** Approximately 50 people accidentally drown in Scotland every year. Many more are in “near miss” situations and often end up admitted to hospital. Scotland’s Drowning Prevention Strategy was launched in January 2018 with two key targets:

- › Reduce accidental drowning deaths in Scotland by 50 per cent by 2026 and reduce risk among the highest-risk populations, groups and communities
- › Contribute to the reduction of water-related suicide.

The strategy has the specific aim under the first target to “develop water safety across Scotland’s 32 local authority areas and promote the development of water safety policies”. A policy covers numerous aspects which work towards reducing accidental drowning fatalities. The main issue was the uncertainty of the current state of water safety management in Scotland.

**Methods:** In 2013, RoSPA released research results into the approaches adopted by local authorities on water safety. The research found a mixed picture of water safety in Scotland with several local authorities addressing water safety yet with little in the way of uniformity. It was unclear how this had changed and so RoSPA repeated the research in 2018 as a five year follow on study. The study focussed on a self-completion questionnaire which was distributed to contacts within all 32 local authorities in Scotland. The survey had a 100 per cent completion rate. All responses were analysed in both a univariate and bivariate way and open-ended questions were thematically analysed and categorised.

**Results:** The main findings of the study were:

- › Water safety was ranked as an important or a neutral issue in respect to other demands
- › Just under half of the respondents noted that there was a person or department responsible
- › Approximately 40 per cent of authorities had a policy
- › Water safety is afforded some awareness within the local community. However, many of the local authorities had not run a campaign
- › A lack of resources was cited as the main barrier to water safety

**Conclusions:** Overall, a mixed picture was found. Several local authorities were addressing water safety but there was very little consistency or uniformity. In response, RoSPA teamed up with RNLI to run Scotland’s first workshop on creating and managing a policy. RoSPA will continue to work to increase awareness of the need for a policy.

**Keywords:** water safety and drowning prevention

## Pitch Presentations / SESSION 6

# Road Traffic Safety

### Epidemiological study of injury cases in a tertiary care hospital in Delhi based on national injury surveillance format

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**Introduction:** Injuries, intentional or unintentional, constitute a major public health problem. Injury prevention is a cost-effective public health strategy. Data on injury and its determinants are essential for identifying priority issues and high-risk groups and also understanding the underlying causes of injury and improper pre-hospital trauma care.

**Methods:** A cross-sectional study conducted among 843 Injury cases at casualty of Dr. RML Hospital situated in Delhi, India. Selection of patients was done by convenience sampling. Data was collected using interview schedule (Modified from the schedule used under national trauma care Programme) administered by the investigator. Data was analysed using SPSS-pc 23 version.

**Results:** Of the 843 study participants 74.3% were males, 12.9% were illiterate and 90.6% of the participants were residents of urban area. 37.5% injuries occurred among the age group 16-30 years. 90.5% of the injuries were accidental in nature, 7.9% were assault and 1.5% were self inflicted. Maximum burden of injuries was due to RTAs (53.6%), followed by falls (28.2%) and assault (7.9%). There were statistically significant differences between the groups in terms of sex, age, education and occupation ( $p < 0.05$ ). Road was the commonest place of injury overall (58.7%). 63.7% of the RTA victims were motorised two wheeler users, followed by 21.7% pedestrians and 5.8% auto-rickshaw users. First aid was provided only to 12.9% of study subjects. Government hospitals were the most common place of providing a first aid. Personal vehicle was the most common mode of transportation used to bring the injured victim to the hospital (48%) followed by police van (28.8%) and auto-rickshaw (16.5%).

**Conclusions:** 37.5% of the injuries occurred among ages 16-30 years. Maximum burden of injuries (53.6%) was due to RTAs. 2-wheeler users constituted more than 1/3rd of the RTAs. Only 12.9% of the victims received first aid.

**Keywords:** injuries, road traffic injuries, injury surveillance

## Assessment of the causal factors of the pedestrian's injuries in Georgia 2016

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**Introduction:** Road traffic injuries cause an estimated 700 to 1,000 people to die every day. Among the total road traffic fatalities, more than 270 000 (22%) are pedestrians. Road traffic accidents (RTA) and pedestrian road injuries are a devastating burden for Georgia, annually, about 600 people are killed and 9,000 are injured. This study investigates the incidence and causal factors of fatal and non-fatal pedestrian's crashes and provides recommendation for prevention.

**Methods:** A retrospective review of medical records of injured pedestrian from RTA for 2016 was done in several hospitals in three cities of Georgia, Tbilisi, Batumi and Rustavi to provide a cross-sectional profile of the non-fatal injury burden. The medical records were collected, by the following ICD-10-AM codes: S00–T98 & V01 to V89 and information was obtained using a questionnaire. The statistical analyze was done in Epi-info7.

**Results:** A total of 374 cases of the hospitalized injured pedestrians was observed, 54% of them were  $\leq 40$  of age. The case fatality rate was 4.8%. Risky behavior of pedestrians and drivers were revealed in 32% and 30% respectively. Children  $\leq 7$  of age are the most likely to be a risky maneuver (PRR=3.1 95%CI=2.4-3.9), than other age categories. The risk of fatal outcome is higher among hospitalized pedestrians who injured in due to excessive speed of the vehicle, compared to other injured pedestrians (PRR=3.7 95%CI=1.5-9.2).

**Conclusions:** This study identified some key factors associated with pedestrian collisions. There is overwhelming evidence that speed and some behavioral risk factors (risky maneuver, drunk) of pedestrians and drivers have a great impact on pedestrian safety and play a role in injury severity. In order to decrease of road traffic accident related risk behavior it is necessary to implement the extensive information campaigns aimed at raising awareness of public and specific target groups.

**Keywords:** road traffic accident, injury, pedestrian, speed



## Strengthening road safety legislation in Republic of North Macedonia

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**Introduction:** There is a strong evidence that laws addressing the key risk factors of speeding, drink-driving, helmets, seat-belts and child restraints can reduce road traffic deaths and injuries. Main objective is to analyze the road safety legislation on key behavioral risk factors in Republic of North Macedonia.

**Methods:** Standard criteria were used for desk review and analysis of comprehensive legislation for key behavioral risk factors: speed, drink-driving, motorcycle helmets, seat belts, child restraints.

**Results:** There is a national law for road safety which defines a national maximum urban speed limit of 50 km/h and 30 km/h in residential areas where vulnerable road users mix with cars; for motor ways 130 km/h, 110 km/h for roads for motor vehicles and 90km/h for other roads out of urban area. Speed limits are lower for busses and heavy vehicles and for novice drivers are for 30km/h lower from those for the roads out of urban area. Drink-driving limit for blood alcohol concentration (BAC) is  $\leq 0.05$  g/dl for drivers and BAC of 0 g/dl for novice and professional drivers. The national law stipulates compulsory helmet use for drivers and passengers on bicycles and motorcycles all engine types referring to a particular helmet standard. Seat-belt use is compulsory for all private car occupants on front and rear seats. Use of child restraints is compulsory for children younger of 5 years based on age, height or weight of a child for rear seat, while front seat use is forbidden for a child below 12 years. Use of lights is compulsory for day and night driving.

**Conclusions:** Republic of Macedonia has a National strategy for road traffic safety 2015-2020 and a national law for road safety which is very comprehensive and addresses all five behavioral risk factors, but still their enforcement should be strengthened to enhance road safety.

**Keywords:** road safety, legislation, enforcement

## On the crossroad of the road safety legislation, risk factors knowledge, safety culture and road users' behaviour

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Medicine, Georgia*

**Introduction:** Road traffic injuries are one of the major problems of Public Health all over the world. Every year approximately 1,25 million people die globally on the world's roads (WHO, 2014). Road traffic death and injuries are predictable. Effective injury prevention largely depends on behavior and safety culture of road users. Legislation is one of the most effective mechanisms to influence road user's behavior. In Georgia, the control on safety belt use has been introduced and Amendments to the Code of Administrative Offenses of Georgia has been in force since 2010. The aim of the study is to explore the attitudes of the population regarding road traffic safety policy and risk factors and driving behavior.

**Methods:** A total of 250 randomly selected respondents were interviewed in Tbilisi (capital of Georgia) using a survey designed for this study. Univariate and bivariate distributions were examined to describe participant responses.

**Results:** Majority of the respondents were female (55.10%) and 25-34 years old (55.20%). Most of the respondents (88.60%) had a standard license to operate a passenger vehicle. Over half of the respondents (54.10%) reported that they always use safety belts while driving and 72.4% of the respondents reported never driving under the influence of alcohol. All respondents from the ages of 55-64 reported that they always use their seat belt while driving. To handle fatigue, 57.3% of the respondents always open the window/turn on conditioning, 59.4% respondent talk on the phone, and 57.80% ask a passenger to drive the car. Experiencing a road crash was common, with 12.8% respondents reporting at least one crash in the past three years, of which 4% reported two crashes and 2.4% reported three or more. Although 46.4% respondents identified drunk driving as the most dangerous risk factor, most (74.2%) also reported that drunk driving would not be dangerous to them personally if they drive carefully. Ten percent of respondents said they do not put on the restraint if the driving distance is small.

**Conclusions:** The results of the survey show that most of respondents follow the rules and use seat belts while driving and do not drive under influence of alcohol. Respondents lacked knowledge about distracted driving and did not fully recognize the risks of violating driving policies. Although experience with traffic crashes was common, respondents did not recognize the serious potential outcomes. Efforts to enforce existing legislation, enact new safety legislation, and to enhance the public perception and safety culture could improve road safety.

**Keywords:** road traffic, injury, risks, legislation, attitude, culture

## Effect of preventive measures in mortality for road injuries in Brazil

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**Introduction:** There were 1,342,284 deaths due to road injuries in the world, which corresponds to a mortality rate of 18.3 deaths per 100,000 inhabitants, in 2016. Analyzing the trend and characteristics of the victims, are essential for the monitoring and evaluation of road safety policies and interventions. The objective of this study is to analyze the trend of mortality due to road injuries, according to the conditions of the victims, in Brazil, from 2000 to 2016.

**Methods:** Time series ecological study on the magnitude and trend of mortality due to road injuries in Brazil. Data obtained from the Mortality Information System, according to the International Statistical Classification of Diseases and Related Health Problems - tenth revision (ICD-10), under the following codes: V01 to V89. The non-specific basic causes of death were redistributed to the specific causes of road injuries and mortality rates were standardized by the direct method. The joinpoint regression method was used. After the identification of the models, a residue analysis was performed. The Durbin-Watson test was used to verify the correlation of the data.

**Results:** In the period 485,015 specific deaths due to road injuries occurred, 202,025 non-specific deaths were added to the analysis. In Brazil, in 2016, 37,345 deaths were registered for this cause. There was a reduction in the mortality rate due to road injuries of 1.7%, from 19.2 to 18.8 per 100,000 inhabitants, the lowest rate since 2000. In 2012 observed a change in the trend. In the period prior to the greater rigidity of the “Dry Law”, created with the aim of inhibiting drunk driving, from 2000 to 2012, the trend was increasing, average annual change of 1.8% ( $p < 0.05$ ). On the other hand, the second period was reduction of -5.6% ( $p < 0.05$ ). The highest risk of death was among motorcyclists in the clusters of the states with the lowest family income. In age-specific mortality, the elderly (pedestrians and car occupants) and motorcyclists (20 to 59 years old) presented a higher risk of death.

**Conclusions:** Despite the decreasing trend in road injuries mortality, possibly due to the greater rigor of the Dry Law (2012), together with the economic crisis (2014) and the implementation of a monitoring program and action to reduce traffic accidents (Life in the Traffic Project), it is necessary to increase efforts in policies aimed at reducing road injuries in Brazil, especially in relation to the most vulnerable, motorcyclists and pedestrians.

**Keywords:** road safety, road injuries, time series studies, mortality

# NOTES

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# Break out session 9:

Injury Surveillance &  
Research - part 2

## Alcohol related emergency department treatments in the Netherlands: alcohol intoxications and alcohol related injuries

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**Introduction:** Alcohol intoxications are a serious health risk, especially for adolescents. In addition to intoxications, alcohol can be an important factor in the occurrence of accidents that lead to injuries. Monitoring alcohol intoxications and alcohol related injuries is crucial for policy making in prevention. In the Netherlands, the Dutch Injury Surveillance System (DISS) monitors Emergency Department (ED) treatments for accidents and injuries. Since 2007, DISS is analysed for ED-treatments on alcohol intoxications and accidents/injuries involving alcohol, resulting in annual reports for the Dutch Ministry of Health. The current study has two objectives: a) To establish prevalence rates of alcohol intoxications and alcohol related accidents, and b) To improve and validate registration of alcohol related ED treatments in The Netherlands.

**Methods:** All patients treated for injury in 14 DISS Emergency Departments in the Netherlands are included. From this representative sample of ED's, extrapolation to national estimates of ED-treatments is possible. Alcohol intoxications, defined as "alcohol use being the only cause of the ED visit", are registered in a reliable manner. Until recently, alcohol related injuries were only coded as "injury involving alcohol" if the use of alcohol was obvious or perceived as medically relevant by medical staff. This lead to an underestimation of

accidents involving alcohol. In order to improve reliability of alcohol registration, physicians at DISS Emergency Departments are currently requested to explicitly register involvement of alcohol, based on their expert clinical judgement ("Is this visit to the ED (also) caused by the use of alcohol?"). A study was conducted to validate this clinical judgement, by interviewing patients during their ED-visit on alcohol use, and compare these data with registered judgement from physicians.

**Results:** In 2016 according to DISS estimations there were 6.000 patients treated at an ED for alcohol intoxication only; and 17.800 additional patients treated for alcohol related injuries. ED-treatments for both alcohol intoxications and accidents involving alcohol increased during the period 2008-2017. Trends and figures for different age groups, and different types of accidents, will be presented and discussed. Validation of physician's judgement for alcohol use prior to the accident revealed that clinical judgement on alcohol use did not significantly differ from patients self-reports.

**Conclusions:** The prevalence rates of ED-treatments for alcohol intoxications and injuries involving alcohol consumption are increasing in The Netherlands. Registration, crucial for policy making in alcohol and injury prevention, appears to be reliable when based on clinical judgement of the treating physician.

**Keywords:** injury surveillance and injury prevention research, prevention of intoxications, alcohol related injuries

## Risk factors associated with unintentional injury. Results from the European Health Examination and Interview Surveys in Luxembourg

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**Introduction:** Mortality and morbidity data show that injuries are a major public health problem inflicting a considerable societal burden. The analysis of causes, circumstances and risk factors of injuries are the first step towards successful prevention. The risk of injuries is known to be associated with socio-demographic factors, risk behaviours, etc. but for some risk factors reported results are not consistent across countries. We aim to identify risk factors associated with unintentional injury in Luxembourg.

**Methods:** We analyzed data from two representative surveys: the European Health Examination Survey (EHES) collected in 2013-2014 on 1529 randomly selected residents aged 25-64, and the European Health Interview Survey (EHIS) 2014 on 4004 residents aged ≥15 years. In both surveys, information was collected via questionnaires on any road traffic, work or home and leisure related accidents during the last 12 months. Risk behaviours (smoking, alcohol consumption, cannabis/other illicit drug use), socio-demographic and health condition variables (age, sex, country of birth, education, residence area, physical limitation in every day activities) were also assessed. Univariable and multivariable logistic regression were used to analyze the combined effect of risk factors. Only variables associated with outcome on univariable analysis ( $p < 0.1$ ) were included in the multivariable analysis using a forward fitting approach.

**Results:** Analysis of EHES data showed that age and moderate-severe depression were associated with higher risk of injury. The risk was higher among people aged 25-34 and 35-44 years compared to those aged 45-54 years. Analysis of EHIS data confirmed the results about depression and age with a higher risk among those aged 15-24 years, an age group not included in the EHES survey. Surveys didn't detect a higher risk of injury among ≥55 years old. Cannabis use and physical limitation were also associated with a higher risk of injury in the EHIS survey.

**Discussion:** A higher risk of injury was only detected among the 15-24 years old which is consistent with data from hospital's Emergency Department (ED). However ED-surveillance data showed a higher risk of injuries among older people that was not detected by any of these two cross-sectional surveys probably because of selection and memory bias. Other than age, the risk of injury in Luxembourg is higher among cannabis users, people with a physical limitation, or with moderate-severe depressive symptoms. The association between physical limitation and injury could be due to reverse causality. Better information on injury risk is provided by combining data from many sources.

**Keywords:** injuries risk, survey, physical limitation, risk behaviours, home and leisure injuries



## Poisoning injuries takes to many lives – mapping and prevention need to be developed and increased in Sweden

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**Introduction:** After falls, poisoning is the second leading cause of unintentional injury-related deaths. Poisoning injuries have increased significantly between 1997 and 2013. The most commonly used substances are medicines, narcotics, and alcohol. 80% of poisoning deaths are registered among men. The risk of poisoning is higher among the 20-69 years old. This study investigates the distribution of mortality and morbidity of poisoning injuries at home and in other settings.

**Methods:** We used the Swedish Cause of Death Register, the Patient Register (hospitalization) and the Injury Data Base (IDB) (A&Es) for the years 2010-2013. We included unintentional events described as poisoning, including cases involving bites from insect or from venomous snakes, self-harm/suicide and poisoning with unclear intention. We matched these data with the national register of housing conditions. A descriptive study is combined with a case analysis.

**Results:** Poisoning-related mortality in 2013 included 437 unintentional poisoning, 281 suicides and 248 poisonings with unclear intention (Swedish population 9 644 864). Each year about 2000 poisoning victims are hospitalized while more than 4000 males and 3000 females, mainly adolescents, younger adults and small children, are treated at the A&Es for this same cause. About 3.9 poisoning events per 1000 inhabitants/year impact people living in high density housing areas, while 0.9 poisoning events involve people living in lower density areas with single-family housing predominating. This difference is significant. An analysis of the free text in IDB found that more poisoning events are connected to outdoor activities in gardens and natural areas for people living in single-family housing areas, including bites and stings from insects. In both living high density and lower density housing areas, the leading cause of poisoning events were due to alcohol and medications. These causes of poisoning were, however, proportionally more likely to occur in high density housing areas.

**Conclusion and prevention:** Poisoning injuries form a substantial public health problem, impacting high risk groups including adolescents, younger adults and small children. People living in high density housing areas have higher risks for poisoning injury. The Swedish Poisoning Information Centre responds to calls about acute poisoning events both for the public and the professionals. A strategy for prevention could be: Information and education of the public and the professionals, supervision and improvement of the home environment and increased awareness of different types of products that can cause poisonings.

**Keywords:** housing density, poisoning, product safety

## A new method for estimation of occupational injuries and diseases economic burden in five European Union countries

Emile Tompa<sup>1</sup>, Amirabbas Mofidi<sup>1</sup>, Young Jung<sup>1</sup>, Thijmen van Bree<sup>2</sup>, Swenneke van den Heuvel<sup>2</sup>, Frithjof Michaelsen<sup>3</sup>, Lukas Porsch<sup>3</sup>, Martijn van Emmerik<sup>2</sup>

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**Introduction:** The objective of this study was to estimate the economic burden of occupational injuries and diseases in five European Union countries for the reference year 2015. The burdens identified reflect the amount that would be realized by each country if they had no injuries or diseases in the reference year.

**Methods:** We use a “bottom up” approach to estimate the economic burden from a societal perspective for Finland, Germany, Italy, The Netherlands, and Poland. Three broad cost categories are considered—direct health care, indirect productivity, and intangible health-related quality of life costs. The methods start with data on newly diagnosed occupational injuries and diseases from calendar year 2015. We consider lifetime costs for cases across all cost categories using human capital approach. Sensitivity analysis is undertaken to address to assess the impact of key parameters.

**Results:** Indirect costs represent the largest proportion of total costs (the exception is Poland), ranging from 66% for The Netherlands to 43% for Poland. Intangible costs are the second highest, ranging from 49% for Poland to 21% for Finland and The Netherlands. Direct costs range from 16% for Finland to 8% for Poland.

Average per case costing is highest for The Netherlands (€75,342), followed by Italy (€58,411), Germany (€44,919), Finland (€43,069) and Poland (€38,918). Total costs as a percentage of GDP are highest for Poland (10.4%), followed by Italy (6.7%), The Netherlands (3.6%), Germany (3.3%) and Finland (2.7%). In terms of costs per working population, the value is highest for Italy (€4,956), The Netherlands (€2,930), Poland (€2,793), Germany (€2,527) and Finland (€2,331).

**Conclusions:** The economic burden of occupational injuries and diseases in the countries considered are substantial, despite efforts to reduce adverse workplace exposure. Our case costs and total economic burden estimates provide a basis for undertaking economic evaluations of prevention efforts and can serve as a template for monitoring and evaluation at the country level. We advance the methods on several fronts.

## Feasibility of standardized reporting schemes on home and leisure injury risks and relevant safety measures for EU countries

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<sup>1</sup>Eurosafe – European Association for Injury Prevention and Safety Promotion, Austria; <sup>2</sup>KFV – Austrian Road Safety Board, Austria

**Introduction:** Internationally comparable reporting systems are standard in almost all policy areas in the EU and certainly help to compare the performance of national policies and their outcome. A comprehensive EU reporting scheme on risks and safety measures exists e.g. for road traffic accidents, but not for home and leisure injuries, although they account for more than 50% of all injuries. Exchanging core indicators on the health burden and sharing experiences on strategies and actions could help to enhance home and leisure safety in Europe.

### Methods:

- › Identify meaningful risk indicators, which realistically can be provided by all member states;
- › Identify promising policy actions regarding home and leisure safety, which realistically can be expected from member states;
- › Draft a comprehensive and internationally comparable reporting scheme on risks and actions for home and leisure safety, which can be completed by national experts without noteworthy burden; and to
- › Test this scheme by completing it for Austria and the entire EU-28 by publicly available data.

**Results:** There are models for comprehensive statistics reports, which are based on mortality data, data from emergency departments using the IDB methodology, and data from household surveys using the EHIS methodology. Based on these models an internationally comparable reporting scheme for the risks of home and leisure accidents can be developed, but not all countries can deliver sufficiently reliable data for completing the scheme.

Regarding reporting safety policies and measures, there are a few examples for national reporting schemes (e.g. those developed by WHO 2010 and European Child Safety Alliance 2012). However, the number of potential actions is almost uncountable. For almost every home and leisure activity several specific precautions can be taken. For many of these actions the effectiveness of implementation cannot be assessed. The data from the WHO- and European Child Safety Alliance-projects are outdated and would require a completely renewed survey initiative.

**Conclusions:** It is feasible to establish a comprehensive and internationally comparable reporting scheme on home and leisure injuries risks, however for defining core safety measures a new and quite ambitious initiative would be required in collaboration with the respective responsible national agencies. The Network of National Focal Persons on Violence and Injury Prevention of the WHO-Office for the European Region might offer the proper platform for such an endeavour.

**Acknowledgment:** This study has been co-financed by the Austrian Road Safety Board

**Keywords:** safety promotion policies and action plans, good practices in injury surveillance, translating research into practice and policy



# Break out session 10:

Road Traffic Safety - part 2

## Traffic safety culture and interactions between motorists and cyclists

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**Introduction:** Unsafe interactions between motorists and vulnerable road users can result in fatalities and serious injuries. To achieve a vision of zero traffic fatalities and serious injuries with our communities, we must grow a positive safety culture in which all road users willingly and intentionally behave in ways that ensure the safety of everyone they interact with on the roadway – regardless of mode. This study examines the traffic safety cultures of motorists and cyclists that affect the ways they interact together in rural American communities.

**Methods:** N = 2,400 randomly selected households in Rural United States (Bozeman, Montana and Fargo, North Dakota) were sent a survey to assess the traffic safety culture of drivers regarding their safe interactions with cyclists. The survey examined seven behaviors that drivers could engage in that would be protective of cyclists: driving with extra care around cyclists; paying special attention for cyclists when making turns; using mirrors and checking blind spots looking for cyclists when changing lanes; slowing down when approaching or passing a cyclist; moving over and providing ample space when passing a cyclist; when turning right, waiting until the bicycle has cleared the intersection and then turning after them; and being patient with cyclists when the edge of the road is unsafe or in poor condition. The survey also assessed beliefs predictive of these behaviors including intention, willingness, attitude, behavioral beliefs, perceived injunctive and descriptive norms, and control beliefs.

**Results:** Most drivers reported engaging in these protective behaviors frequently. Various beliefs were strongly correlated with those protective behaviors. Linear regression models showed that willingness and intention to engage these behaviors were predicted ( $R^2=0.42$ ) by attitude (standardized beta= 0.31), perceived injunctive norms (standardized beta= 0.23); and perceived control (standardized beta= 0.22). Various beliefs and assumptions were significantly correlated with attitudes, intention, willingness, and behaviors.

**Conclusions:** An instrument was developed to measure driver traffic safety culture related to interactions with cyclists. It was implemented with a random sample of households in two rural communities. The results inform various kinds of beliefs that may influence driving behaviors that would protect cyclists. Various strategies including educational campaigns, interventions, and driver's education could be used to grow these beliefs and thereby potentially decrease crashes between vehicles and bicylists.

**Keywords:** road safety, safe communities

## Effective ways of engaging parents/caregivers in their children's road safety education

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**Introduction:** Road safety education targeting parents/caregivers has been found to have a positive impact on both parent and child knowledge and behaviour. Parents/caregivers have the most opportunity to practice road safety with their children. However, parents/caregivers are an underutilised resource in children's road safety education. There has been limited work investigating how to effectively engage with parents/caregivers about their children's road safety, especially parents/caregivers from deprived backgrounds who are especially vulnerable on the roads.

**Methods:** A study was carried out to identify and evaluate three promising examples of road safety education involving parents/caregivers of children under 11 years-old in the UK. The three initiatives included were: 1) 4 day road safety course for children with special educational needs; 2) parent-child road safety walks for 4-5 year-olds; 3) parent-child play sessions from birth to 5 years-old. These initiatives are being quantitatively and qualitatively evaluated. Interviews were held with managers, course instructors and parents/caregivers regarding engaging parents/caregivers. A thematic analysis was carried out to explore key themes across interviews. Further, follow-ups with parents/caregivers six months after they have completed the course are being carried out to explore whether they have continued to teach their children about road safety.

**Results:** Identifying effective parent road safety education was a challenge as there were very few initiatives being carried out across the UK that directly involved parents/caregivers. Analysis of the initiatives included in this project identified some effective ways to engage with parents/caregivers: involving parents/caregivers in a more indirect way via children, involving siblings, and building rapport with parents/caregivers beforehand. Some barriers to parent involvement were also identified, such as: work commitments, limited knowledge of the course, and approach of staff.

**Conclusions:** Parents/caregivers are a valuable resource in teaching children about road safety and the majority of those who have attended road safety education feel it is beneficial. However, there is limited evaluation being carried out into how to effectively engage parents/caregivers. Greater efforts need to be made to understand how to reach parents/caregivers effectively.

**Keywords:** road safety, child and adolescent safety



## Deprivation and road traffic injury comparisons for 4-10 and 11-15 year-olds

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**Introduction:** It has been consistently found that children living in disadvantaged communities are at an increased risk of being killed or seriously injured (KSI) on the roads. Despite this finding, limited attention has been directed towards understanding patterns of road traffic injury across childhood. Research has failed to consider different developmental stages of childhood, the modes of travel children are using, and their exposure to the road environment. The present research therefore compared the number of 4–10 year-olds and 11–15 year-olds KSI on the roads during 2016 in England across deprivation quintiles and mode of travel to gain a greater understanding of road traffic injury risk across childhood.

**Methods:** Data from three datasets was used to identify the rates of children KSI across age groups, gender, deprivation levels, and mode of transport, taking into account population size and exposure to the roads. The number of children KSI in England in 2016 as pedestrians, cyclists and car occupants was obtained from police reported data (STATS19). Population estimates were obtained from the Office for National Statistics Deaths and Population by Sex, Age, and IMD Decile Dataset for England and Wales. Estimates of how far children were traveling were obtained from the National Travel Survey.

**Results:** Children 4–10 years-old and 11–15 years-old residing in the most deprived areas were nearly three times more likely to be KSI as pedestrians than their peers in the least deprived areas. Males were more likely to be KSI on the roads than females across both age groups. This gender inequality was greatest in the most deprived areas. The inequality in injury risk as cyclists and car occupant's increased for males as they progressed towards adolescence. These relationships remained even when exposure to the roads was taken into account.

**Conclusions:** The inequality in road traffic injury remains. Differential patterns of risk are apparent across childhood as well as gender, deprivation, and transport mode. Children living in the most deprived areas face the greatest risk of being KSI on the roads, especially as pedestrians.

**Keywords:** road safety, child and adolescent safety



## Road traffic injuries in children in Serbia-possibility for more action

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**Introduction:** Although in recent years Serbia has made a significant progress in improvement of road safety, road traffic injuries still represent a great burden at all ages. The objective of this study was to analyze the road traffic injuries of children aged 0-14 in Serbia and to propose the implementation of adequate and effective, evidence based preventive activities.

**Methods:** The data from The integrated database of characteristics of traffic safety in Republic of Serbia, Annual statistical reports of The National Road Traffic Safety Agency, and national data from the WHO Global Status Reports on Road Safety were analyzed.

**Results:** In the period 2008-2017, 180 children were killed, and 16,152 injured on the Serbian roads. The highest number of both fatal and non fatal injuries was recorded in 2008 (36 deaths and 1,973 injuries) with decreasing trend interrupted in 2015 and 2017, with the increase in the number of killed, and in 2016, with the increased number of injured. The highest percentage of children was injured in vehicles as passengers (49% of killed and 38% of injured), followed by pedestrians (37.5% of killed and 35% of injured), with overall predominance of male gender and collision or vehicle impact as the main accident mechanism. An important indicator of child safety, the usage of child restraints and other safety equipment, is constantly increasing since 2013 (every sixth child restrained properly), but is still inadequate. In 2017, the use of this equipment was detected only in every third child passenger younger than 12 years.

**Conclusions:** Despite of all efforts, the number of children injured in traffic in Serbia still remains high, and more should be done in achieving the National road safety strategy target of 0 children killed in traffic in 2020. In addition to the appropriate implementation of the new amendments to the Road Traffic Safety Law and the more severe application of repressive measures, it is necessary to introduce the education of all traffic participants on psychophysical characteristics of children which make them particularly vulnerable, as well as to widen the education of parents, caregivers and professional public on the necessity of using child safety equipment in vehicles through sustainable educational programs coordinated by institutes of public health as institutions competent for implementation of preventive activities.

**Keywords:** road traffic injuries, child safety

## Scenario generation for testing Automated Driving using crash databases

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**Introduction:** Automated Driving is expected to play a core role in the automotive industry in the coming years. Many companies like Tesla, BMW, Audi, Toyota, and Nissan are aiming to introduce Highly Automated Vehicles to the market by 2025. Additionally, the European Commission (EC) has ruled, that all vehicles leaving the assembly line by 2021 must be equipped at least eleven Advanced Driver Assistance Systems (ADAS). Advanced Driver Assistance Systems aim to support the driver during the driving task to reduce road fatalities and to decrease injuries when a crash takes place. Many researchers see ADAS as an enabler for the incremental deployment and adoption of AD. Automated Driving and Advanced Driver Assistance Systems, contributed to making our roads safer. Nevertheless, while fatalities in vehicle-to-vehicle accidents are decreasing steadily, fatalities involving vulnerable road users (VRU) are increasing. Hence, the European Commission decided that among the eleven ADAS, a series is picked to protect VRU. However, the reliability of these systems, when operating continuously is not the level expected as witnessed from the recent Auto Pilot crash of Tesla. There is an urgent need for pre-crash scenarios to test the reliability and robustness of ADAS and AD. The characteristics to derive test scenarios are not well understood according to the findings of the European Commission. With this in mind, in this study, we provide a method to derive test scenarios to test AD and ADAS systems for VRU.

**Methods:** To understand accident circumstances, the EC brought the project SAFER WHEELS into life. In this project, an in-depth accident database has been generated for different European countries. In order to reveal hidden accident circumstances, Cluster Analysis has been applied to this dataset. Furthermore, the results from the in-depth accident dataset have been combined with a macroscopic accident dataset, the STATS 19. Using this British accident dataset, in combination with SAFER WHEELS, enabled us to derive statistical representative scenarios. Which is not possible using only the in-depth database, due to the small number of accident recordings.

**Results:** By applying CA to both datasets we identified unique and novel clusters, describing accident pattern for VRU. For instance, we revealed scenarios, where almost in all cases the roads were wet, whereby it was not raining in all the cases. This knowledge is very important when it comes to assess sensor performance for VRU detection. One key cluster has been derived to describe the most representative accident pattern in SAFER WHEELS. All derived scenarios will be presented at the conference.

**Conclusions:** Using our novel framework, by combining macroscopic data with microscopic data, we showed, how the advantages of both datasets can be used to derive concrete scenarios for AD and ADAS testing. State-of-the-art methods are not well suited to derive proper clusters, containing many parameters like weather conditions, road type, road conditions, manoeuvres and so on, compared to the method proposed in this study.

**Keywords:** road safety, pre-crash scenarios, automated driving, vulnerable road users

# Plenary Session 3:

## Innovation in injury prevention and safety promotion

### PS3.1

#### New Technologies: challenges and opportunities for enhancing safety

Klaus Robatsch

*KFV – Austrian Road Safety Board, Austria*

#### The impact of accidents in the EU

The impact of accidents is important both for younger and older people. On the one hand, accidents and injuries may trigger a fatal deterioration in the health of older people: currently, more than three fifths (64 %) of the 160 thousand deaths per year from accidents in the EU-28 are among people aged 65 years or over. On the other hand, a relatively high proportion of young people die from accidents: Deaths from transport accidents accounted for nearly one quarter (24 %) of all deaths among people aged 15-19 years.

#### Population and injury trends – older and safer

The share of the elderly (65 years +) in the total population of the EU-28 is projected to increase from 19 % (or 98 million elderly persons) at the start of 2016 to 29 % (or 151 million) by 2080. Population projections suggest there will be 66 million people aged 80 years and over in the EU by 2080. Even if the accident risk for both fatal and non-fatal injuries will be further decreasing for all age groups, for the elderly this would still mean a substantial increase in absolute accident numbers and their share from all accidents.

#### Digital transformation

Whereas the Ageing Society is one of the main challenges for injury prevention in the near future, Digital Technologies might be the most promising opportunity to face this challenge – and also to revolutionize injury prevention in other areas of our daily lives, e.g. mobility. Two exemplar classes of technology with a high potential for accident and injury prevention illustrate this

- > technologies for driving assistance and autonomous driving
- > technologies to promote safe aging at home

#### Technologies for driving assistance and autonomous driving

have arrived rapidly on the market and their future deployment is expected to accelerate. However, a majority of road users is still sceptical about the automation of vehicles and a number of safety issues still have to be solved, also for “non-automated road users” such as pedestrians and cyclists. There are six levels of driving automation (SAE Levels). From a safety point of view, SAE Level 3 is most critical: the driver can transfer driving tasks to the system but must be able to take them over again if the system requires it. Such tasks should only be conducted in approved testing environments. At the production stage, they should enter the market only as fully automated systems, where a transfer between driver and machine is no longer necessary.

#### Technologies to promote safe aging at home

tend to be driven top-down by government priorities and entail complex ensembles of technologies and support services. Advanced telecare-packages already comprise a variety of safety related sensors and alarms: Personal Alarms, Activity Monitors, Bed or chair occupancy sensor, Fall Detectors, Fire or smoke alarms, Temperature extremes, Blood Pressure Monitor or Smart Shoes. However, there is limited evidence of widespread and sustained use – and of associated positive impacts on injury prevention in real life. While it's relatively easy to design and build a new technology, it's extremely difficult to design and build a good technology that fits into everyday social practices and contexts of use. (A recent survey on the use and acceptance of Smart Home technologies in Austria will be presented.)

Therefore, KFV currently has a focus on the evaluation and promotion of digital injury prevention tools in real life settings and with real added value. The main subject is fall prevention: preventing falls themselves (primary prevention through automatic lighting etc.) and early detection of falls for mitigating the consequences (secondary prevention through fall detectors).

Most promising technical solutions are considered those that are user-independent. Three such use cases have already been designed

- > Automatic Lighting and Voice Control
- > Window Monitoring
- > Automatic stove shutdown

Two other use cases will be tested in the area of

- > Remote assistance for the elderly through Augmented Reality (AR) eyewear regarding safety at home (Identification of pitfalls, adaptation of the living space to changed life situations in the elderly)
- > User-independent fall detection technologies

Digital technology – be it for autonomous driving or for smart homes – has the potential to promote better safety in a sustainable way, only if we can learn how to better gain a more holistic understanding of the context, values and social relationships of its users.

### **The big data and information technology revolution in injury prevention; are we lagging behind?**

Dr Birgitte M. Blatter

*Consumer Safety Institute, Netherlands*

For prevention of injuries, quantitative epidemiological research is necessary. Until now, frequency statistics are mostly derived from hospital admission or discharge data. Research on risk factors and effectiveness of interventions is primarily done by interview or questionnaire studies and data are mostly analyzed by means of conventional statistical packages such as SPSS or SAS.

Developments in innovative data collection such as the use of mobile phones and wearable devices, and developments in data processing and statistics such as machine learning, the big data revolution, evidence based and data driven research, provide opportunities for advanced risk analyses and predictive modeling. Expectations of those developments are high: they may provide opportunities to collect more and more detailed data, resulting in more (unexpected) statistical and causal relationships. Also, investments to achieve these results may even be lower than with current methods. Finally, they may facilitate research of the effectiveness of interventions. But are we already taking advantage from those developments? Which developments have led to successes or are promising, which are difficult to implement in epidemiological research in general and injury prevention research in particular?

In my presentation I will discuss several aspects of recent and upcoming novelties for our day-to-day injury prevention research. Regarding innovative data collection, topics such as continuous extraction of data from hospital information systems, wearable devices and the use of online questionnaires (on responsive websites) instead of paper questionnaires will pass by. With regard to data processing and statistics, the use of automatic text recognition software, analyzing open text fields, innovative data processing techniques, data science and modeling skills, statistical tools and interactive -dashboard- reporting tools will be discussed.

### How a smart home can be a safer home?

Martyn Allen

*Electrical Safety First, UK*

In 1923 the Swiss-born architect, Le Corbusier, described a house as: "a machine for living in." Now that metaphor has become a reality. Our home environment is changing in a period of technological and cultural change with the emergence of a 'smart home' where home appliances and devices are connected and remotely controlled.

Many of us already live in homes with a degree of 'smartness' in the sense that you can remotely control some of the home appliances (e.g. a thermostat that switches on and off gas central heating or smoke alarm to alert you to a potential fire). A smart home has taken this concept further by introducing centralised control and remote user interaction of a broad range of devices. It has a communications network that connects the electrical home appliances and services, and allows them to be remotely controlled, monitored or accessed by your smart phone or tablet – with all devices connected to the Internet of Things (IOT).

With so many electrical devices becoming 'smart' and having the capability to connect, if set-up and used properly, smart connected devices can really make a difference to improving our lives in the home environment as well as providing many safety benefits.

For example, sensors around the home and smart devices are able to detect higher than normal air temperatures, smoke, carbon monoxide or water leaks and automatically adjust settings or isolate a product to remove the hazard. Manufacturers could send an alert direct to your device, provide an over the air safety update or even disconnect the product to make it safe – supporting product registration and recall effectiveness. You can also check to see if an appliance is left on, which can be a fire hazard, and switch it off remotely.

For the elderly or disabled, a smart home can make a huge difference to their quality of life – and the peace of mind of their care-giver. Individuals with dementia, for example, could have their home fitted with automated sensors that check if a cooker has been left on, or a bath is overflowing. Their homes could be fitted with lighting activated by motion sensors, so that when they get up in the night they won't stumble around in the dark. Voice controlled smart devices could allow easier access and control over household appliances to those who are restricted from movement within their homes.

Of course, as with all things in life there has to be a negative and for the smart home it relates to ensuring devices are not just safe but are also secure from data hackers. Buying from reputable retailers and good password housekeeping are key factors to ensuring that your smart home is safe and secure. This short presentation will explore the tangible benefits of the smart home and how to mitigate the risks.



