

and others (18%). Grouped by themes, mapping was the most frequently used method, with 74% of articles limited to this approach to investigate a spatial pattern of injuries. Cluster detection and ecological analysis methods were applied less commonly, being used in 26% and 3% of articles, respectively. The kernel density estimation for point data and local indicators of spatial autocorrelation for areal data were the most frequently used cluster detection methods.

**Conclusion** In the last two decades, many geospatial methods have been developed and applied in injury research, primarily to investigate road traffic injuries. The depth of investigations has been largely limited to basic mapping. Use of more advanced geospatial methods will help to better understand injury aetiology. Researchers should be encouraged to adopt these advanced methods in their future studies.

### 312 STATE VARIATIONS IN MORTALITY FROM UNSPECIFIED UNINTENTIONAL INJURY AMONG AMERICANS AGED 65 YEARS AND OLDER, 1999–2013

<sup>1</sup>Xunjie Cheng, <sup>2</sup>Jie Yao, <sup>3</sup>David C Schwebel, <sup>1#</sup>Guoqing Hu. <sup>1</sup>Department of Epidemiology and Health Statistics, School of Public Health, Central South University; <sup>2</sup>College of Basic Sciences and Humanities, Harbin Institute of Technology Shenzhen Graduate School; <sup>3</sup>Department of Psychology, University of Alabama at Birmingham

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**Background** Recent changes in unspecified unintentional injury mortality for the elderly by state remain unreported. This study aims to examine state variations in mortality from unspecified unintentional injury among Americans aged 65+, 1999–2013.

**Methods** Using mortality rates from CDC's Web-based Injury Statistics Query and Reporting System (WISQARS™), we examined unspecified unintentional injury mortality for elderly individuals aged 65+ from 1999 to 2013 by state. The proportion of unspecified unintentional injury was calculated to quantify the cause specificity of data. Linear regression examined the statistical significance of changes in proportion of unspecified unintentional injury from 1999 to 2013.

**Results** Of the 36 states with stable mortality rates, over 8-fold differences were observed for both the mortality rates and the proportions of unspecified unintentional injury for Americans aged 65+ during 1999–2013. 29 of the 36 states showed reductions in the proportion of unspecified unintentional injury, with Oklahoma (–89%), Massachusetts (–86%) and Oregon (–81%) displaying the largest changes. The decrease in unspecified unintentional injury mortality was negatively correlated with the change in mortality from falls in 26 states and poisoning in 3 states, and positively correlated with mortality from suffocation in 15 states, motor vehicle traffic crashes in 12 states, and fire/burn in 8 states.

**Conclusions** The cause specificity of elderly unintentional injury has improved for many states in the United States during 1999–2013. The improved cause specificity should be considered in trends analysis at the state level and comparisons between states for cause-specific injury mortality.

### 313 RISK OF VIOLENCE-RELATED INJURY AND BURDEN TO SOCIETY IN THE LATIN AMERICAN AND CARIBBEAN REGION

<sup>1</sup>Cheryl J Cherpitel, <sup>1</sup>Yu Ye, <sup>2</sup>Maristela Monteiro. <sup>1</sup>Alcohol Research Group, Emeryville, CA, USA; <sup>2</sup>Pan American Health Organisation, Washington DC, USA

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**Background** Violence-related injury has been an important harmful consequence of drinking in the Latin American and Caribbean (LAC) region, but the risk at which drinking places the individual for violence-related injury or the burden this places on the population is unknown.

**Methods** A probability sample of 969 emergency room (ER) patients reporting a violence-related injury and arriving within six hours was analysed from 12 ERs in 9 countries in the LAC region. Dose-response relative risk (RR) of violence-related injury based on volume of consumption prior to the event is examined using pair-matched case-crossover fractional polynomial analysis of mean volume and alcohol attributable fraction (AAF) calculated from the RR and prevalence of drinking prior to injury in each volume category.

**Results** A dose-response relationship was observed with a six-fold increase in risk (RR = 5.88) for less than two drinks prior to injury, increasing to a nine-fold increase (RR = 9.06) for those reporting more than 30 drinks. Risk was similar for males and females up to ten drinks, but higher for females over ten drinks. Risk was higher for those 30 and older compared to those younger at all volume levels, reaching a three-fold increase for 30 or more drinks (RR = 4.78 vs. 14.99). Among all injuries related to violence, 33.56% were attributable to alcohol (*population AAF*), and among those who reported drinking prior to injury, alcohol was an attributable factor in 87% (*exposed AAF*). AAF did not vary by age but was nearly three times larger for males (38.66%) than for females (13.52%), although exposed AAF did not differ.

**Conclusions** A dose-response relationship was found between the amount of alcohol consumed prior to the event and risk of violence-related injury, but risk was not uniform across gender or age. While females were at greater risk of injury than males at higher volume levels, lower prevalence of women drinking at higher levels contributed to overall lower AAF for women.

### 314 INJURY RECIDIVISTS IN A DEFINED POPULATION. OCCURRENCE AND CHARACTERISTICS

<sup>1</sup>Borge Ytterstad, <sup>2</sup>Thomas Gressnes. <sup>1</sup>University of Tromsø, Norway; <sup>2</sup>Harstad University College, Norway

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**Background** Studies on injury recidivism in Pubmed are mainly based solely on admissions to emergency departments for certain injury types. For tailoring prevention programs, such studies may aid identification of target groups for interventions. To our knowledge, population based studies on the full spectre of injury recidivism in a community have not been published so far.

**Methods** The Harstad Injury Prevention Studies have relied on data from a continuously recorded injury data base (IDB) since 1985. Coding was done in the Nordic system. From 2010 a unique identifier variable (ID = 11 digit person number) was added to the IDB after permission from the data inspectorate. The present work is based on injuries treated at Harstad Hospital (admitted and outpatient) containing this ID. Some person

numbers are punched retrospective from 2010. Information on alcohol and drugs was found in the free text variable. Definition of Recidivism: In some studies more than two injury episodes. The present study includes five or more. Aim of study is identification of target groups and tailoring community interventions.

**Results** Out of 27090 records on 18667 persons, we identified 360 treated for five or more injury episodes. These 360 were treated in 2321 different injury treatment episodes. The range of episodes was five to 41. Overrepresented groups were: 1) females age 19–29, treated for self-harm, alcohol/drugs/narcotics involved in most cases 2) males age group 19–29, treated for interpersonal violence, also with stories including alcohol and drugs 3) elderlies falling, 4) adolescent and young men in high energy activities.

**Conclusions** A continuous hospital based injury registry can identify characteristics and distribution of injury recidivists in a population.

### 315 RECENT TRENDS OF ROAD TRAFFIC FATALITIES IN CHINA: COMPARING NATIONAL AND SUBNATIONAL DATA SOURCES

Qingfeng Li, Huan He, Hailun Liang, David M Bishai, Adnan A Hyder. *Johns Hopkins International Injury Research Unit, Department of International Health, Johns Hopkins Bloomberg School of Public Health*

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**Background** This study aims to better understand public data sources and evaluate recent trends in road traffic fatalities (RTF) in China.

**Methods** We systematically reviewed and compared multiple national sources of RTF data. These included: population-based reports from the Ministry of Public Security (MPS), sample-based estimates from the vital registration system of Ministry of Health (MOH) and the Disease Surveillance Points System (DSP), as well as model-based estimates from the World Health Organisation (WHO) and the Global Burden of Disease Study (GBD). A comprehensive review of publications focused on subnational RTF was also conducted. We based our assessment of the recent trend of RTF on using fixed effects and random effects longitudinal models.

**Results** Despite the discrepancies in estimates, all national data sources indicated that RTF had been increasing prior to 2005. Since then, the MPS reports indicate a declining trend, DSP estimates showed a flat trajectory while estimates from MOH, GBD and WHO continue to show increases in RTF. Data from local death registration systems are largely consistent with MPS reports.

**Conclusions** Reflecting a non-representative sample, MOH data were used in generating model-based estimates by the WHO and GBD; consequently, the trends from these sources are open to.

MPS and local independent jurisdictional health data indicate that RTF have been declining since 2005. This may be consistent with recent interventions to reduce RTF. China's experience may be of great value for other developing countries though RTF still impose a tremendous health burden in the country.

### 316 THE ROLE OF SELEKTION BIAS IN A CASE-CROSSOVER STUDY ON OCCUPATIONAL INJURIES

<sup>1</sup>Anna H Oesterlund, <sup>2</sup>Flemming Lander, <sup>3</sup>Søren Rytter and <sup>1</sup>Jens M Lauritsen. <sup>1</sup>*Accident Analysis Group, Orthopaedic Department, Odense University Hospital and Institute of Clinical Medicine, University of Southern Denmark, Denmark;* <sup>2</sup>*Department of Occupational and Environmental Medicine, Odense University Hospital, Denmark;* <sup>3</sup>*Department of Orthopaedics, University Clinic for Hand, Hip, and Knee Surgery, Regional Hospital West Jutland, Denmark*

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**Background** The case-crossover studies in injury epidemiology research are gaining ground. The method compares transient exposure during intervals when an outcome occurs, to exposures during intervals without outcome for the same individual. Although non-responding is a concern in all interviewed based studies, previous studies have not involved and discussed the importance of selection as a source of bias that could influence the overall reliability of the risk outcomes. Due to the unique Danish identification number it is possible to examine data between responders and non-responders in our case-crossover study concerning injuries, industry, sex and age.

**Methods** The population base for the study was derived from two public Hospital Emergency Departments in Denmark. All contacts due to occupational injuries during 2013 were included. An occupational injury was based on asking the patient whether the injury occurred during paid work. All such injured patients were asked to participate. Those confirming participation (responders) were compared with those not responding or denying (non-responders).

**Results** Among all 4002 injured, 1693 were responders (42%). The overall tendency of sex, age and distribution of injury were the same between both responders and non-responders except for "other types of injuries". When dividing into minor and major injuries there were no difference between responders and non-responders. Further investigation of potential bias for subgroups or industries awaits further analysis.

**Conclusions** So far, our results indicate no serious selection bias in sex, age and injury distribution in spite of low participation rate, and thus, provide good possibility for broader generalisation of the risk outcomes. This indicates a strengthening of the overall reliability of the risk outcomes from our and previous case-crossover studies.

### 317 NON-FATAL INJURIES UNTREATED AT HOSPITALS IN HUNAN, CHINA: IMPLICATIONS FOR HOSPITAL-BASED SURVEILLANCE SYSTEMS

<sup>1</sup>Yue Wu, <sup>2</sup>Wei Zhang, <sup>2</sup>Lin Zhang, <sup>3</sup>David Schwebel, <sup>2</sup>Peishan Ning, <sup>2</sup>Xunjie Cheng, <sup>4</sup>Xin Deng, <sup>2</sup>Li Li, <sup>2</sup>Jing Deng, <sup>1</sup><sup>#</sup>Guoqing Hu. <sup>1</sup>*Department of Occupational and Environmental Health, School of Public Health, Central South University;* <sup>2</sup>*Department of Epidemiology and Health Statistics, School of Public Health, Central South University;* <sup>3</sup>*Department of Psychology, University of Alabama at Birmingham;* <sup>4</sup>*Xiangya Hospital, Central South University*

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**Background** Disability adjusted life year (DALY) is among the most commonly-used indicators of disease/injury burden. It relies on accurate data concerning non-fatal conditions, which may be collected through hospital-based surveillance or population-based