Poisonings

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373 MANNER OF DEATH IN FATAL PRESCRIPTION DRUG POISONINGS

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Background In Finland, post-mortem toxicology is performed in 13% of all deceased as part of medico-legal cause-of-death investigation. Of all toxicology cases, approximately every 6th case is determined by a forensic pathologist to be a fatal poisoning. Medicinal and illegal drugs form the biggest group of intoxicants causing fatal poisonings.
Methods All fatal drug poisoning cases in 2013 were examined in terms of toxicological findings, background information and the manner of death. In these cases, comprehensive post-mortem toxicology had been performed by using chromatographic and mass spectrometric techniques in an accredited central laboratory serving the whole country.
Results There were 476 fatal poisonings by medicinal and illegal drugs in 2013. Buprenorphine, tramadol, pregabalin, codeine, oxycodone, amitriptyline, quetiapine, paracetamol, venlafaxine and insulin were the ten most prevalent major factors in the cause of death. The most common manner of death in all drug poisonings was suicide (41%, median age 49), followed by unintentional poisoning (40%, median age 37), and unknown manner of death (18%, median age 51). Unintentional poisoning was the most common manner of death in opioid poisonings, especially with the strong opioids possessing high abuse potential. In cases involving antipsychotics and antidepressants, such as quetiapine, amitriptyline and venlafaxine, as well as with insulin, the percentage of suicide was higher than that of unintentional poisoning.
Conclusions Information on fatal poisonings reveals trends in drug use, which can help monitor adverse effects of medicines as well as the emergence of new abused substances. The extensive post-mortem toxicology data collected in the cause-of-death investigations in Finland enable reliable statistical analysis and research on a population-based level.

374 RISK FACTORS OF POISONING: FINDINGS FROM THE NEW ZEALAND BLOOD DONORS' HEALTH STUDY

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Background Notwithstanding difficulties in ascertaining intent, aetiological studies on adult poisoning typically focus on intentional or unintentional events as distinct entities. This study investigated the predictors of hospital admissions or deaths for intentional and unintentional poisoning in adult New Zealanders.
Methods The 22,389 participants aged 16 and older comprised the New Zealand Blood Donors Health Study (NZBDHS) cohort who completed a baseline self-report questionnaire (including demographic, personal health, psychosocial and lifestyle information) at recruitment in 1998/1999. Outcome data on poisoning-related admissions and deaths up to 31 December 2014 were collected prospectively through electronic record linkage of participants' unique identifiers to national mortality and morbidity databases. Baseline characteristics associated with intentional and unintentional poisoning at follow-up were investigated using Cox proportional hazards analysis.
Results During the median follow-up period of 16.8 years (359,018 person-years), 437 poisoning events (315 intentional, 124 unintentional) were identified in 310 cases. Multivariable models revealed that both intentional and unintentional poisoning at follow-up were associated with depressive symptoms (intentional poisoning: adjusted HR = 2.05, 95% CI: 1.20–3.52; unintentional poisoning: adjusted HR = 1.58, 95% CI: 1.01–2.49) and suicidal ideation at recruitment (intentional poisoning: adjusted HR = 5.76, 95% CI: 3.32–9.97; unintentional poisoning: adjusted HR = 2.45, 95% CI: 1.53–3.94). Illegal drug use was a risk factor for future unintentional poisoning events.
Conclusions The findings of this large prospective injury cohort study suggest that interventions addressing mental health problems have the potential of reducing serious poisoning events irrespective of intent. Whether the findings also represent misclassification of intentional injuries as unintentional events is unclear.

375 SURVEILLANCE OF PLANT PROTECTION PESTICIDES-RELATED POISONINGS AND INJURIES

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Background Regulation 2009/1185/EU on sustainable use of pesticides requires reporting from European Member States on plant protection pesticide (PPP) poisonous exposures. These data can provide information to identify emerging problems and populations at risk, support the development of preventive and regulatory measures and evaluate their effectiveness. In Italy, a surveillance of acute PPP-related poisonings (SAPReP), based on Poison Control Centres data, has been implemented since 2001. In this contribution are presented the main characteristics of cases exposed in Italy in 2007–2012.
Methods series of cases identified by the National Poison Control Centre in Milan, reviewed and classified by the Italian National Institute of Health according to standard procedures.
Results In 2007–2012, SAPReP identified 2,108 cases of accidental PPP-related poisonings and injuries. Male patients were 1,442 (68%) while females were 442 (20%). Gender was unknown in 12% of cases (No. 224) Severity of poisoning was low in 84% of cases (No. 1,774), moderate in 14% (n. 305), high in 1% (n. 28). One case of death was identified. About 50% of poisonings occurred at work, in agricultural settings, and 36% at home. Some 70% of exposures occurred between May and September. Insecticides/acaricides were responsible in 42% of poisonings, fungicides/bactericides in 16%, herbicides in 15%, and soil sterilants in 13%. Five mass exposures were identified: two incidents were caused by off-site drift of metam sodium, a soil sterilant, and involved 86 and 103 by-standers, respectively; two incidents were caused by chlorpyrifos methyl, an organophosphate insecticide/acaricide (one occurred in a hospital, 10 cases; one occurred in agricultural setting, 20 agricultural workers); one incident was caused by phenthoate and involved 40 agricultural workers
Conclusions Surveillance based on data collected by Poison Control Centres provides an important tool to identify emerging

problems and associated risk factors. The observations available in Italy on PPP-related poisonings and injuries suggest that greater efforts are needed to prevent these types of incidents.

376 BE GAS SAFE PROGRAMME – REDUCING CARBON MONOXIDE POISONING

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Background The Chief Medical Officer of England has highlighted the need to tackle carbon monoxide (CO) poisoning with over 40 deaths and 4000 hospital attendances a year. The Be Gas Safe Programme, the first national programme to distribute CO alarms, was delivered by the Royal Society for the Prevention of Accidents (RoSPA) for the Gas Safe Charity between 2012 and 2014. The programme aimed to equip consumers to deal with dangers that lead to carbon monoxide poisoning.
Description The programme was delivered through Over 70 local partnerships across the UK who included local authorities, the NHS, fire services, housing agencies, children's and older people's charities and the police. They identified vulnerable households in their communities to receive CO alarms and safety information. Each partnership also received a briefing pack. A website was developed providing resources, links and useful information.
Results 13,000 CO alarms were distributed giving families protection for up to 7 years. At least 130,000 people benefitted from local education activities and media coverage reached over 3 million people. Evaluation included a survey and case studies of families whose lives have been saved either by being prompted to have their appliances serviced or because the CO alarm providing early warning. It showed a significant increase in awareness of the dangers and prevention measures.
Conclusions Carbon monoxide alarms are a last line of defence and are no substitute for regular servicing and good ventilation. However, research shows that combining provision of equipment with safety education is more effective than adopting one of these approaches alone. Providing practical protection for a limited number of families most at risk helped to maximise opportunities to educate a wider audience

377 THE PRESCRIPTION DRUG EPIDEMIC IN THE UNITED STATES – EFFORTS TO IMPROVE PRESCRIBING

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Background More than 145,000 people have died from overdoses involving prescription opioid pain relievers in the United States in the last decade and deaths have quadrupled since 1999. The quantity of opioids sold in the United States in 2011 was four times that sold in 1999. Providers wrote more than a quarter of a billion opioid prescriptions for Americans in 2012.
Description of the Problem While opioid pain relievers can and do play an important role in the management of some types of pain, the overprescribing of these powerful drugs for chronic, non-cancer pain outside of end-of- life care created and continues to fuel the epidemic. The U.S. Centres for Disease Control and Prevention (CDC) implemented a comprehensive suite of interventions to: (1) strengthen state efforts by scaling up effective, data-driven public health interventions; and (2) enhance patient safety by supplying health care providers with information, tools, and guidance for evidence-based decision making.
Results Beginning in September 2015, the CDC launched the *Prevention for States* program. A total of 16 states were funded to enhance and maximise state-based prescription drug monitoring programs, advance effective prevention efforts in hard hit communities, and improve health system and insurer practices to improve opioid prescribing. Early progress highlights the necessity of collaboration and that significant strides can be made when the barriers and silos within a state are eliminated. CDC also released guidelines to primary care providers for opioid prescribing for chronic pain outside of end-of-life care in January 2016. Broad dissemination is underway.
Conclusion With opioids among the most prescribed drugs in the United States, a substantial investment is needed to shift opioid prescribing to make it safer and to improve patient care. CDC's multifaceted and evidence-based interventions are making a difference. Highlights and lessons learned from CDC activities will be shared.

378 INTERNATIONAL COMPARISONS OF DRUG-RELATED DEATHS

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Background In the past decade, many countries have seen a significant increase in their drug-related mortality rates. In the United States (US), drug-related deaths now outnumber deaths from any other injury cause. To better understand international differences, this study compared drug-related deaths in the US, England/Wales, Scotland and Australia, examining trends, demographic characteristics and differences in the drugs involved.
Methods Drug-related deaths were identified using public access data and reports from each country's statistical office. Cases were selected based on ICD–10 underlying cause codes of F11–16, F18–F19 (Drug abuse), X40–X44 (Accidental poisoning), X60–X64 (Intentional self-poisoning), X85 (Assault by drugs) and Y10–14 (Drug poisoning of undetermined intent).
Results In 2013, the rate of drug-related deaths in the US (146 per million population) was 1.5 times the rate in Scotland, twice the rate in Australia and more than 3 times the rate in England/Wales. In all countries, rates were higher for males than for females, with the greatest gender difference seen in Scotland. For underlying cause, in all countries, the majority of the deaths were accidental, however in England/Wales a higher percent were intentional (33%), in Australia a higher percent had a mental/behavioural cause (15%) and in Scotland a higher percent were categorised as undetermined intent (17%). In all countries, opioids including morphine, heroin and methadone were implicated in a high percent of the deaths, although drug-specific comparisons were limited due to variation by country in the completeness of the information on specific drugs.
Conclusions While similar patterns in drug-related deaths were identified, differences were also seen. The extent to which these differences are true or due to variation in death investigation, reporting and coding is unclear. Further work is needed to enhance the international comparability of mortality data on drug-related deaths.