

hospital admission. Adjusted risk ratios were calculated using Poisson regression.

Results 42 620 patients were attended to between April 2010 and September 2013. Overall, 6778 patients were included in the study. 52 patients died and 628 patients were admitted to hospital. The adjusted mortality risk ratio given a response time of ≥ 8 minutes was 0.635 (95% CI: 0.346–1.166; $p = 0.143$). The adjusted hospital admission risk ratio given a response time of ≥ 8 minutes was 1.165 (95% CI: 0.985–1.379; $p = 0.075$).

Conclusions A response time of ≥ 8 minutes was not associated with a difference in all cause mortality or hospital admission for paediatric patients suffering from a traumatic injury.

160 EPIDEMIOLOGY OF INJURIES LEADING TO VOLUNTARY WITHDRAWAL FROM US HIGH SCHOOL SPORTS, 2005/06–2014/15

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Background Over 7 million US high school athletes played sports in 2013/14. Participation elevates injury risk, which sometimes results in athletes' voluntarily withdrawing from sports. Understanding what prompts athletes to withdraw, despite no medical disqualification, is important to inform injury prevention and management to reduce dropout rates.

Methods We utilised the High School Reporting Information Online database. Athlete exposure (AE) and injury incidence data were collected from a large national sample of US high schools for 22 sports from 2005/06–2014/15. Injuries motivating voluntary withdrawal from sports participation, despite no medical disqualification, were analysed.

Results Overall, 794 injuries resulting in voluntary withdrawal (representing 1.2% of all injuries reported) occurred during 35,454,673 AEs (rate = 2.24/100,000 AEs). Boys' wrestling had the highest rate (6.17) followed by football (5.15), girls' track and field (1.96) and girls' soccer (1.68). Concussions accounted for 24.6% of these injuries, ligament sprains for 22.5%, and muscle strains for 12.2%. In gender-comparable sports, there were no differences in the proportion (# of withdrawals/# all injuries) of boys' withdrawals compared to girls' (Injury Proportion Ratio = 1.19; 95% CI: = 0.92–1.53). Most injuries were new (77.8%) and few required surgery (6.5%). Trends over time in overall rates of athletes choosing to withdraw were stable, but the rate of withdrawal due to concussion increased significantly (0.12 in 2005/06; 1.01 in 2014/15; $p < 0.05$).

Conclusions Rates of athletes' voluntary withdrawal, despite no medical disqualification, differed by sport. Concussions were the primary diagnosis; rates of withdrawal due to concussion increased over time. This may reflect increased concussion awareness driving parent or athlete prompted reluctance to return to play. Sport and diagnosis specific targeted injury prevention efforts are needed to reduce voluntary athlete withdrawal from sports.

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161 AN EVALUATION OF CDC'S WEB-BASED INJURY STATISTICS QUERY AND REPORTING SYSTEM (WISQARS)

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Background WISQARS is an interactive, web-based data query system (WBDQS) that is accessible from the internet. It includes modules for fatal and non-fatal injuries, a separate module on violent deaths, and injury costs and maps. Data come from a variety of trusted sources, including national health surveys and health data repositories. CDC created WISQARS in 1999 to meet the data needs of injury practitioners in the United States. Since that time, the audience has expanded to include researchers, policy makers, media, and the general public.

Objective The purpose of this evaluation was to assess the focus, quality, usefulness, impact, and outcomes of WISQARS; and to identify gaps and areas for improvement. Data were collected through peer-reviewed and grey literature searches, google searches, an environmental scan of internal and external WBDQS, and a series of stakeholder interviews.

Results WISQARS is used as a data source by NGOs, academic institutions, other U.S. federal agencies, and social media websites. Stakeholders most frequently used the fatal and non-fatal modules. The most frequently accessed data were on suicides, poisonings, homicides, motor vehicle crashes, and falls. WISQARS is most often used to respond to data requests, educate decision makers, conduct basic analyses, and teach and plan. Areas for improvement included building more capacity for data visualisations and for users to export both data and graphics, allowing for full mobile responsiveness when accessing, expanding by incrementally including additional data, and developing better support information and guidance on use.

Conclusions While WISQARS has been largely a success in expanding access to U.S. injury and violence surveillance data, there are several opportunities to enhance the functionality of the system for the end user. CDC is planning to use innovations in data science to enhance WISQARS's capacity.

162 IMPLEMENTATION OF A MORTUARY-BASED FATAL INJURY SURVEILLANCE(FIS) SYSTEM IN RURAL AND URBAN HOSPITALS IN TANZANIA (2010–2015)

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Background Tanzanian law states that all injury deaths should undergo a postmortem medical examination. In absence of effective vital registration (VR) systems, mortuaries provide an alternative source of cause of death information to support injury prevention policies and programs. In 2010, a mortuary-based fatal injury surveillance system was established at selected mortuaries and a pilot study commenced with financial and technical support from WHO.

Methods A data collection form was developed using the WHO/Monash Fatal Injury Surveillance in Mortuaries and Hospitals Manual and was implemented in 4 mortuaries (3 urban, 1 rural). Training for project staff, ongoing technical support and monitoring was provided by WHO. The project was led by Forensic Pathologists. Data collection started in 2010, with initial piloting (2010–2011) and implementation after the publication of the manual (2013–present). In 2015, an evaluation was conducted comparing data from the mortuary with data from traffic police, hospital mortality records and with national VR registry.

Results In the initial pilot phase (2010–2011) a total of 112 cases were recorded in the 4 mortuaries. Based on the result of the piloting, the system was revised. Formal implementation started in 2013. By June 2015, a total of 2666 cases were recorded. About two-thirds were from unintentional causes, majority being due to road traffic injuries (RTI). Of the remaining, 6% were due to suicide, 15% from assault. Most of the RTI victims were passengers, motorcyclists and pedestrians. Males were over represented in all causes. Most of the deceased were 18–29 years old. Suffocation/hanging was the main mechanism of injury for suicide cases. While guns and blunt objects were the weapons involved for majority of the homicide deaths. There is a high under reporting of RTI deaths in police and VR systems. With recognition of its limitations, the FIS data from the mortuary is being used to support local injury prevention efforts.

Conclusions Compared to other sources, such as police and VR systems, mortuaries are a better surveillance data source for injury deaths, particularly for RTI deaths. In low-mid income countries, it is feasible to implement a standardised fatal injury data collection process at both rural and urban mortuaries. Local ownership of the system is key for sustainability.

163 VALIDATING WISQARS ESTIMATES OF THE INCIDENCE AND COST OF US INJURIES: A TALE OF TWO DATASETS

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Background Both the US Centres for Disease Control and Prevention's WISQARS system and the Healthcare Cost and Utilisation Program (HCUP) provide sample-based national estimates of injury survivors treated in hospital emergency departments and released (ED cases) or admitted. The WISQARS sample is much smaller but also more quickly available and more fully cause-coded than the HCUP data. For admissions, HCUP weights are quite accurate, computed from a near-census. We compared estimated medical and work loss costs from the two systems.

Methods We applied an updated version of essentially the same published injury cost model to both datasets. The HCUP model combined HCUP data on hospital payments per case with estimates by International Classification of Diseases, 9th Edition-Clinical Modification diagnosis of associated professional fees and lifetime medical costs post-discharge. Work loss costs were estimated from length of stay if admitted and data by diagnosis group on mean days of work loss and the probability of permanent work-related disability. We used 2010 HCUP incidence data to collapse the HCUP costs into WISQARS diagnosis codes.

Results Both data sets estimated 27 million ED cases annually in 2012/13, with annual costs estimated at \$165 billion using HCUP data and \$167 billion using WISQARS data. For admitted injuries, WISQARS estimates of 3 million cases costing \$290

billion exceeded HCUP "gold standard" estimates of 2.7 million (11.5% fewer) and \$245 billion (19% less). WISQARS reported admitted injury trends by cause that HCUP suggested were spurious.

Conclusions WISQARS provides adequate injury incidence and cost estimates for surveillance. Its sample is too thin to support trend analyses by cause or for admissions and its admissions estimates should be replaced or reweighted with HCUP data as they become available. For admitted injuries, the sample of 66 hospitals underlying the WISQARS estimates warrants expansion.

164 ASSESSING VIOLENCE AND INJURY SURVEILLANCE IN THE CARIBBEAN

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Background The Caribbean Region experiences high levels of violence and injury. Limited research is available on the status of existing violence and injury prevention (VIP) efforts and surveillance systems.

Methods The Caribbean Public Health Agency undertook a survey to gather evidence of VIP in 24 member countries. The questionnaire on VIP was developed using available literature on injury surveillance systems. The survey was administered to national epidemiologists and non-communicable disease focal points in October 2015 using an online tool, "Survey Monkey". Questions were asked about the availability in each country of VIP representative surveys, policies, action plans, laws, victim support services, and surveillance systems.

Results Nineteen (79%) countries completed the VIP survey. Only three (16%) countries confirmed having undertaken a nationally representative survey. Twelve (63%) had not developed a national policy and 14 (74%) had not implemented an action plan on VIP. Each country reported the existence of VIP laws and offered victim support services, though average enforcement ranged from 40–79%. Nine (47%) countries indicated using an injury registry and 15 (79%) reported collecting injury data with in-patient records, mainly from public hospitals. All 19 countries confirmed that records of reported violent incidents were maintained by the police. Unique identifiers were generally lacking in registries and police systems. Only four (44%) countries with registries, ten (67%) countries with in-patient injury data, and 12 (63%) countries with police records indicated sharing data with other organisations.

Conclusions Each country reported some level of injury surveillance system; however, such systems should be harmonised to produce more complete baseline data. The use of unique identifiers is required to reduce duplication and effectively link surveillance systems.

165 THE SWEDISH NATIONAL INFORMATION SYSTEM FOR TRAFFIC ACCIDENTS AND INJURIES; EXPERIENCES FROM THE IMPLEMENTATION PROCESS

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Background The process towards a new Swedish information system was launched in 1993 when the Swedish Road