

Significance/Contribution to Injury and Violence Prevention Science Our findings are the first to examine concussion prevention in MS sports, and highlight the need to further explore strategies to disseminate and implement concussion education.

Policy efforts in substance use and abuse

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INFORMING POLICY CHANGE: REACHING POLICYMAKERS WITH IOWA'S OPIOID OVERDOSE CONCERNS

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Purpose The opioid overdose epidemic continues to devastate the United States through dangerous variations and combinations of drugs. In Iowa's population of over 3 million people, there were 137 overdose deaths involving opioids in 2018. While Iowa's opioid related overdose deaths remain lower than the national average, there is concern that the rurality of Iowa could contribute to increases in opioid involved deaths. In August 2019, the University of Iowa Injury Prevention Research Center (UI IPRC) began collaborative efforts with Iowa stakeholders to identify policy priorities to address rural opioid concerns and identify ways to reach policymakers with these priorities.

Methods In September 2019, the UI IPRC convened over 30 stakeholders across Iowa representing more than a dozen fields including groups with rural and farming interests. We reviewed evidenced-based strategies, identified what Iowa was doing to address rural overdose issues, proposed policy and program changes, and identified priorities. An online survey was sent to participants to vote on their top five priorities.

Results The five stakeholder priorities included developing holistic treatment and recovery resources, improving communication strategies between stakeholders, considering polysubstance drug use during surveillance and prevention efforts, improving naloxone access and distribution, and combating stigma. The UI IPRC will disseminate a report describing the unique characteristics of Iowa's rural drug issues, including the rise in polysubstance overdose deaths, and the five stakeholder priorities to Iowa policy makers beginning in the 2020 legislative cycle. In addition, the UI IPRC will also publish an op-ed highlighting the priorities.

Conclusions/Significance Upon identifying the priorities, it is clear there are still gaps in surveillance, prevention, and treatment efforts with regards to licit and illicit drugs in Iowa. In order to prevent further drug related mortality in Iowa, it is crucial to continually identify policy priorities and actively disseminate recommendations to Iowa policy makers.

Violence prevention policy and advocacy

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PUBLIC EDUCATION FUNDING AND FIREARM MORTALITY IN THE UNITED STATES

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Purpose We sought to assess the association between public education funding and county-level firearm mortality in the United States.

Approach Spatial analyses were conducted to assess the associations between a 5-year aggregated (2013–2017) county-level firearm mortality rate and public education funding. Public education funding was calculated by school district-level per-pupil spending and adjusted by the Cost Wage Index to account for geographic variation in wages and costs.^{1,2} Funding data from 2003 and 2010 were used to account for a lag effect and to evaluate effects of the nadir in state-level funding after the Great Recession.^{3–5} Spatial autocorrelation, hot-spot, and geographically weighted regression analyses were performed.

Results Geographic hot spots were primarily identified in central, rural counties of the U.S. In the regression model, education funding from 2003 exhibited a small effect size ($b=0.08$, $se=0.03$, $p=0.002$) on firearm mortality. Statistically-significant covariates included county-level proportions of Black residents ($b=0.04$, $se=0.02$, $p=0.038$), residents <18 years old ($b=0.06$, $se=0.02$, $p=0.012$), and residents living in urban areas ($b=-0.05$, $se=0.02$, $p=0.013$). 2010 data yielded similar trends.

Conclusions Unexpectedly, higher school funding was associated with higher firearm mortality. Given the broad nature of per-pupil rate measures for education funding, future studies should explore the extent (e.g. proportion) and in what capacities (e.g., programming) funding streams are allocated specifically to address gun violence as well as community and individual-level risk factors.

Significance School-related factors like truancy and poor school performance are linked to gun violence victimization among youth^{6,7}, implicating schools as a critical platform to address individual and structural causes and consequences of the gun violence epidemic in the U.S.^{8,9} The extent to which adequate public education funding informs firearm mortality remains poorly understood.

Epidemiology of TBI

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SCHOOL-LEVEL DETERMINANTS OF VARIABILITY IN OBSERVED CONCUSSION INCIDENCE: A CARE CONSORTIUM STUDY

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Statement of Purpose To investigate variability in observed concussion incidence between NCAA colleges participating in a multisite prospective study of concussion, and to quantify the effect of selected school-level factors on concussion risk.

Methods/Approach Data on sport-related concussion (SRC) were provided by the CARE Consortium, a multisite study of 30 collegiate institutions. School-level factors included NCAA Division (DI, DII, DIII) and school type (military or civilian)

and a 3-level Sport Risk Index (Low, Medium, High). Random intercepts G-side log-binomial regression was used to model between- and within-school variability in concussion risk in NCAA athletes. Three concussion outcomes were modeled: all SRCs, competition SRCs only, and practice SRCs only.

Results School-Level Risk Factors: In fully adjusted models with all SRCs as the outcome, Sport Risk Index was the strongest predictor (risk ratio (RR) of 6.0; 95%CI: 4.4, 8.1, for the High vs. Low categories of the Index). Concussion risk was higher in Division I schools than in Division 2 (RR=1.6, 95%CI: 0.6, 4.2) and Division 3 schools (RR=1.8, 95%CI: 0.9, 3.6) schools. Military academies had an elevated risk of SRC (RR=1.5; 95%CI: 0.7, 3.3; analysis limited to NCAA athletes). School-Level Variability: Most of the variability in SRC risk was at the level of the athlete, not at the school. For all three outcomes, the within-school (athlete-level) variance was over five times the between-school variance. Adjusting for our three school-level risk factors (Division, Mil/Civ, and Sport Risk Index) removed 40% of the variation between schools for competition SRC, and 25% for overall SRCs and practice SRCs.

Conclusions Sport-level factors predict concussion risk, and a substantial portion of variability in concussion risk between schools is readily explainable.

Significance and Contributions to Injury and Violence Prevention Science Understanding school-level determinants and variability in concussion risk may identify opportunities for interventions to reduce SRC incidence.

Spreading the word: health communication and education

129 PUBLIC PERCEPTIONS OF SYRINGE SERVICES PROGRAMS AND SUPERVISED USE SITES IN PREVENTING OVERDOSE DEATHS

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Statement of Purpose Syringe Services Programs (SSPs) provide sterile needles, health services, overdose prevention education, and naloxone to people who inject drugs, with the aim of preventing death and transmission of disease. As part of a larger needs assessment for SSPs in Colorado, we sent a survey to a sample of registered voters about perceptions of SSPs and overdose prevention.

Methods We randomly selected 250 registered voters from each of the eight counties in Colorado with SSPs. We mailed a machine-scannable paper survey with postage-paid return envelopes along with instructions to complete the survey online if preferred. We sent three reminders to complete the one-page survey that addressed topics such as familiarity with SSPs and naloxone, and perception of effectiveness of SSPs for overdose prevention. The project was IRB approved.

Results Of those eligible, 690 participants (52% female, mean age=53 years) completed the survey (response rate = 41%). Of respondents, 41.5% thought it was likely/very likely that a SSP would lead to fewer overdose deaths. When asked about

supervised use sites (SUSs) where individuals can inject drugs under supervision, 62.0% thought it was likely/very likely a SUS would reduce overdose deaths. Of respondents, 74.6% had heard of naloxone. Knowledge of where one can get naloxone varied; 50% responded at the emergency department, 25.3% at the doctor's, 18.3% at the county health department, 12.8% at a SSP, and 12.1% answered at the drugstore (not mutually exclusive). More registered Democrats (90.0%) than Republicans (61.1%) endorsed positive statements on consequences of a SSP program.

Conclusion Perceptions of effectiveness for overdose prevention were higher for SUSs than existing SSPs. Most respondents were aware of naloxone but respondents' knowledge on where to obtain naloxone varied.

Significance Persuasive public messaging is needed about how harm reduction services such as SSPs can prevent or reduce overdose deaths.

Epidemiology of TBI

130 EPIDEMIOLOGY OF FALL-RELATED TRAUMATIC BRAIN INJURY MORTALITY IN THE UNITED STATES, 2008–2017

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Introduction During 2014, unintentional falls was one of the most common mechanisms of injury contributing to a traumatic brain injury (TBI)-related death and accounted for 29% of all TBI-related deaths in the U.S. Current information on national and state trends and decedent characteristics for this type of health event is lacking.

Methods The national incidence of TBI-related deaths attributable to falls was determined by analyzing the multiple-cause-of-death files within the National Vital Statistics System. A death was determined to be TBI-related if any of the multiple-cause-of-death codes listed in the death record indicated a TBI-related diagnosis. TBI-related deaths attributed to unintentional falls were identified based on the single underlying-cause-of-death, specifically ICD-10 codes W00-W19, listed in each death record. Annual incidence rates were calculated per 100,000 population and age-adjusted to the U.S. year 2000 standard age distribution. Data years 2008–2017 were selected to produce 10-year age-adjusted national and state-specific trends that were modeled using the National Cancer Institute Joinpoint Regression Program. Estimated rate trends are reported in the form of average annual percentage changes accompanied by 95% confidence intervals. National rate trends of TBI-related deaths attributed to falls were analyzed by sex, age group, ethnicity/race, and level of urbanization.

Results During 2017, there were 17,408 TBI-related deaths attributed to unintentional falls in the U.S. From 2008 to 2017, there was a 17% increase in the national rate of TBI-related deaths due to falls. Analysis of decedent characteristics revealed the fastest-growing rates of this specific health event were among older adults aged ≥ 75 years and persons living in non-core, non-metropolitan counties. At the state level, rates of TBI-related deaths due to falls increased significantly for 29 states from 2008–2017.