

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.

Conclusion The rising national rate of TBI-related deaths due to falls highlights an emerging priority area for prevention. Targeted interventions to reduce incidence of this health event, especially among older adults and those living in non-metropolitan counties is needed.

Spreading the word: health communication and education

133 USING CONTENT ANALYSIS AND EYE-TRACKING TO UNDERSTAND INJURY PREVENTION CONTENT DISSEMINATION ON SOCIAL MEDIA

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Purpose We will provide information on two study branches: content analysis, showing the frequency and content of injury prevention social posts from key disseminators, and eye tracking experiment, examining the textual and pictorial factors of social posts that influence visual attention and correct safety behavior among parents of young children.

Methods First, we conducted a quantitative content analysis (May 2018-April 2019) of Instagram posts from 22 key pediatric injury disseminators. Next, parents (n=150) of young children (<7 years) completed an eye-tracking experiment, where they were exposed to six posts, three with imagery that matched the textual information explaining the recommended safety information (concordant) and three with imagery that did not (discordant). We examined the proportion of dwell time spent on textual and pictorial areas. We applied generalized estimating equation regressions to examine the relationship between concordant imagery and visual attention, accounting for frequency of social use and health literacy (Newest Vital Sign).

Results A total of 4,598 posts were analyzed, of which 754 had a pediatric injury focus. Pediatric injury content was posted in more than half (54%) of posts from pediatric injury organizations. More posts had images than videos, but videos were more likely to show safety recommendations. Participants spent an average of 5.3 seconds on the concordant image posts compared to 3.3 seconds on the discordant image posts ($p < 0.001$). Each second of viewing time on concordant posts was associated with a 2.8% increase in safety information knowledge ($p < 0.001$).

Conclusion Visual attention to posts with the recommended safety behaviors attracted significantly higher visual attention and resulted in an increased recognition/identification of the optimal safety actions.

Significance Identifying the gaps in social media messaging and understanding how parents view these messages allows us to provide recommendations for injury prevention organizations to more effectively design and disseminate child injury prevention messages.

Opioids: epidemiology and interventions

134 DEVELOPMENT OF AN EVIDENCE-BASED SAFER OPIOID PRESCRIBING TOOLKIT FOR CLINICAL CARE

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Statement-of-Purpose Despite a 30% reduction nationwide in new opioid prescriptions since 2012, prescription opioid overprescribing, as well as opioid misuse and overdose remain significant U.S. public health issues. To address a deficit in educational resources/tools for clinical providers and their patients, the Injury Prevention Center (UM-IPC), in partnership with the Department of Health and Human Services (MDHHS), created the Michigan Safer Opioid Prescribing Toolkit – a comprehensive, evidence-based, on-line resource.

Methods/Approach A needs assessment was conducted, identifying knowledge/skills gaps among primary care providers across the state. Utilizing results, a comprehensive review of publicly available opioid prescribing resources and systematic literature review to identify up-to-date recommendations was conducted in key areas. Provider- and patient-focused educational content and resources were identified/curated from existing sources or newly developed for the toolkit. Resources were reviewed by expert researchers/clinicians for accuracy and by practicing primary care clinicians for usability and applicability/relevance.

Results Toolkit resources were developed across seven domains, including background resources on pain and pain management (managing acute/chronic pain, reducing stigma), management strategies for chronic opioid use and opioid use disorders (screening tools, naloxone, medication-assisted treatment), non-opioid/non-pharmacological pain management, opioid pain management (prescribing/tapering guidelines), prescribing laws (PDMPs, legal resources), just-in-time resources (clinical decision flowcharts, assessment tools, safe storage/safe disposal), and special populations (adolescents, LGBTQ, pregnant women, veterans, etc.). In the first two weeks since the November 2019 launch (michmed.org/optoolkit), website reach has included 1,846 unique visitors, suggesting high engagement with toolkit content.

Conclusions Development/dissemination of a just-in-time toolkit to guide evidence-based primary care pain management (i. e., safer opioid prescribing), harm reduction, and opioid use disorder treatment/linkage to care has potential for broad public health and clinical impact in addressing the opioid epidemic.

Significance/Contributions to Injury/Violence Prevention This toolkit is one of the first fully online, comprehensive, evidence-based clinical resources to address the opioid epidemic.