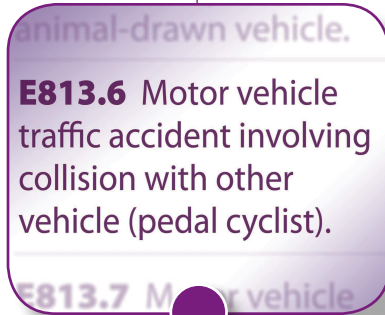
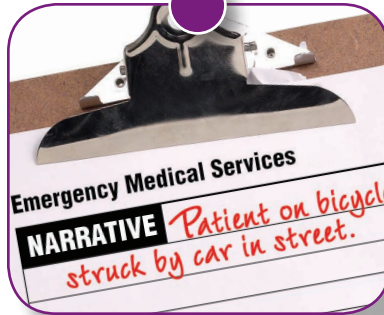
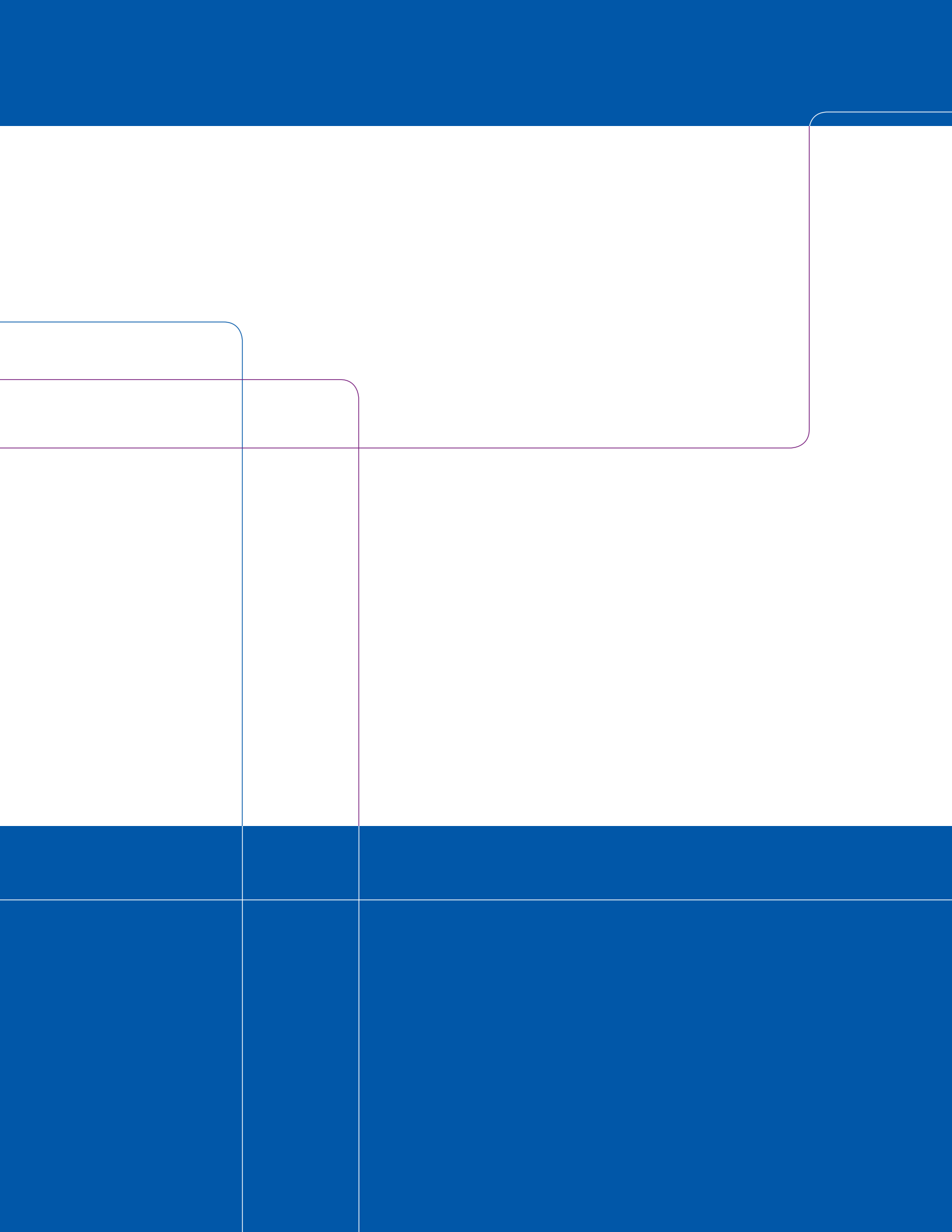


RECOMMENDED ACTIONS to Improve External-Cause-of-Injury Coding in State-Based Hospital Discharge and Emergency Department Data Systems



CENTERS FOR DISEASE CONTROL AND PREVENTION





**RECOMMENDED ACTIONS to Improve
External-Cause-of-Injury Coding in
State-Based Hospital Discharge
and Emergency Department
Data Systems**

Recommendations for Collaborative Efforts
by Participants of CDC's Partners Meeting to
Improve External-Cause-of-Injury Coding
on February 22-23, 2009

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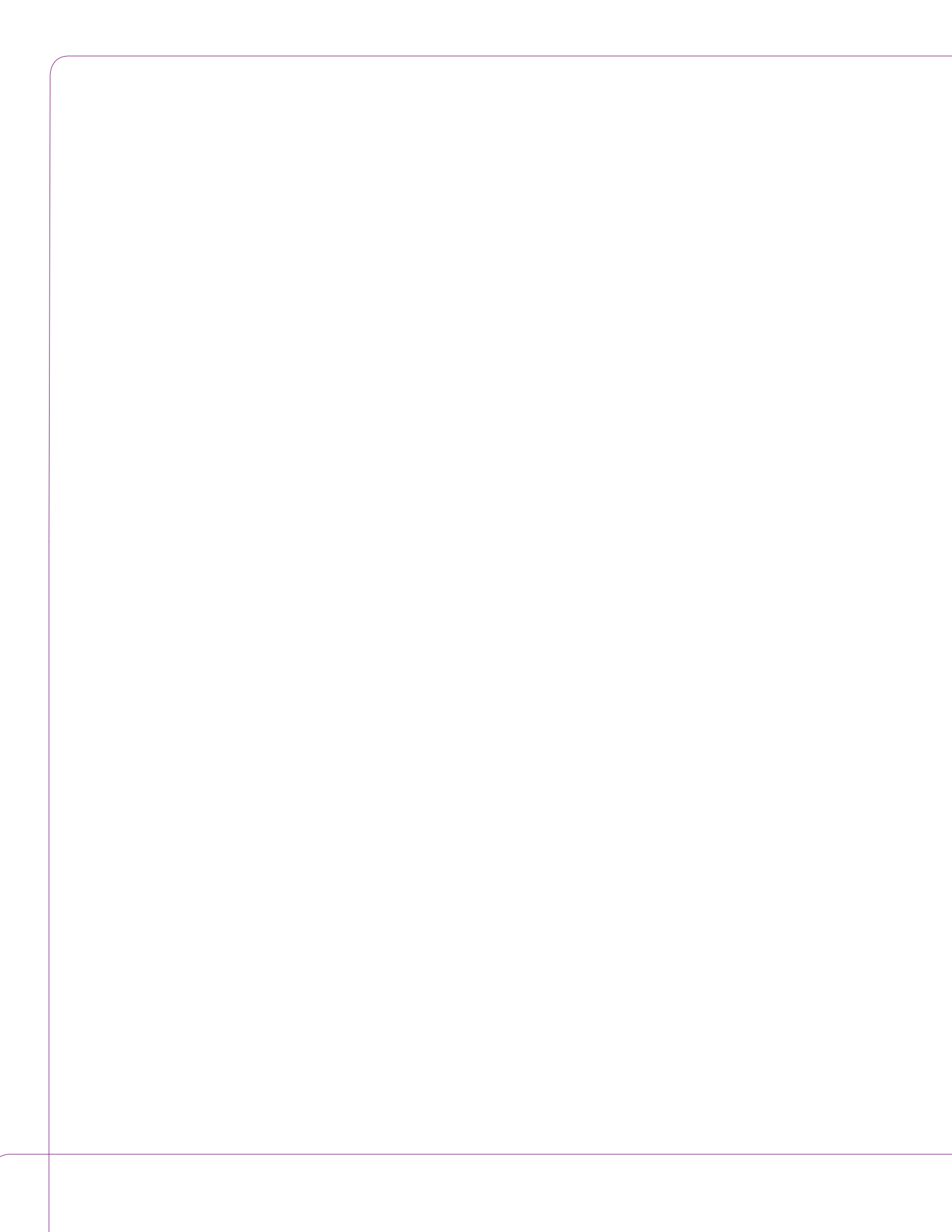
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A Introduction

The Centers for Disease Control and Prevention's (CDC) National Center for Injury Prevention and Control (NCIPC) and National Center for Health Statistics (NCHS) are collaborating to provide national leadership to improve external-cause-of-injury-coded (E-coded) data collected in state administrative data systems. These data are used at the national, state, and local levels to identify high-risk populations, set priorities, and plan and evaluate injury prevention programs and policies, and are potentially useful for evaluating emergency medical services (EMS) and trauma care systems.

The initial steps in this effort have been to develop strategies and action plans based on recommendations from public and private partners in the field of injury prevention and control. In the summer of 2007, CDC assembled an expert workgroup to prepare a *Morbidity and Mortality Weekly Report (MMWR)* Recommendations and Reports that identified strategies for improving E-coding in state morbidity data systems. This *MMWR* report, published in March 2008 (<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5701a1.htm>), summarized: (1) the status of E-coding in state data systems; (2) the need to improve E-coding in state data systems; (3) the uses of these data for prevention efforts; and (4) key strategies recommended as next steps. In August 2008, CDC brought together 30 representatives from 21 federal agencies that rely on E-coded data for program planning and evaluation. These federal partners expressed their support and willingness to work together to improve E-coding in state morbidity data systems as well as in their federal agency's data systems. On February 22-23, 2009, CDC held the E-coding Improvement Partners Meeting in Maryland, with a broader range of stakeholders to seek recommendations for action plans to address the strategies published in the *MMWR* report. Meeting participants included representatives from federal and state agencies, medical and public health professional organizations, non-profit injury prevention and health/safety promotion organizations, and health insurance plan organizations. This report summarizes potential collaborative action steps for CDC and its partners to improve E-coding in state morbidity data systems, with implications for improving federal morbidity data systems, based on recommendations by participants of that February 2009 meeting. A list of participants and their organizations represented at the meeting is provided in Appendix A. A list of acronyms used in this report is given in Appendix B.

B Background

Each year, one in six Americans seeks medical attention for an injury. Health care data from encounters with the emergency department (ED) or hospital are generally captured in state morbidity data systems (e.g., detailed data on health care quality, services, and charges on hospital discharges and ED visits are transmitted from acute care hospitals to a centralized state database). State health departments, hospitals, and hospital associations traditionally have used these data primarily for administrative purposes, such as gaining reimbursement for hospitals and tracking utilization, costs, and quality of health care. State health departments also use de-identified

data from these administrative databases for surveillance purposes, such as understanding the leading causes of hospitalizations or ED visits or to identify high-risk subpopulations and trends over time. These ED and hospital discharge data systems provide the opportunity to capture information on the circumstances of the injury using E-codes. E-codes are used to classify injury events by intent (e.g., unintentional, homicide/assault, suicide/self-harm, undetermined) and mechanism (e.g., motor vehicle, fall, struck by/against, firearm, poisoning). E-codes provide the basis for analyzing and reporting state injury data useful for: (1) monitoring temporal changes and patterns in causes of unintentional injuries, assaults, and self-harm injuries; (2) identifying high-risk populations; (3) priority setting; and (4) planning, implementing and evaluating injury prevention and trauma care programs and policies. However, the completeness, accuracy, and specificity of E-coding vary substantially from state to state making the usefulness of these data limited in some states. Injury statistics from national surveys that rely on E-codes from state hospital discharge and ED data systems also are affected.

Why Improving E-coding in State Morbidity Data Systems is Important

- Accurate information on the mechanism of injury is critical for informing prevention programs. Trends and patterns of injury differ from state to state. State health department-based injury prevention programs and others involved in injury prevention activities need state-specific data to understand and effectively respond to leading injury problems and high-risk populations in their jurisdictions, as well as more localized injury prevention problems and initiatives (e.g., ATV-related and farming-related injuries in rural areas; falls among older adults in the community). Additionally, states participating in the National Highway Traffic Safety Administration's (NHTSA) Crash Outcome Data Evaluation System (CODES, <http://www.nhtsa.dot.gov/people/ncsa/codes/index.html>), which links data on the characteristics of the crash incident, the vehicles involved, and the people injured to specific medical and financial outcomes, are also in need of high-quality E-code data to identify motor vehicle injury prevention factors.
- State data systems potentially provide the best available data sources on external cause of injury for measuring the impact of nonfatal injury on society. For example, state and national estimates show that falls are the leading cause of injury morbidity among older Americans. As the U.S. population continues to age, states will benefit from monitoring fall-related morbidity among older Americans to assess changes in health care utilization and cost, and to determine the effectiveness of fall prevention strategies.
- Collection and ready access to complete and reliable E-coded injury data are important for data-driven decision making on public health policy and priority setting at the federal, state, and local levels. High-quality injury morbidity data on health care utilization and costs associated with specific external causes of injury are critical to accurately estimate the impact of targeted, cause-specific prevention efforts on the health care system and society. For example, many of the Healthy People 2010 Injury and Violence Prevention objectives rely on E-codes to document the injury burden in the United States (<http://www.healthypeople.gov/Document/tableofcontents.htm#volume1>).
- Improving the availability of and access to high-quality E-coded data can also benefit auto insurance companies, disability insurers, health insurance plans, public payers, healthcare purchasers, employers, businesses, labor unions, schools, and other entities interested in injury prevention and safety issues. E-codes can help identify major causes of injuries that require medical attention for workers in the workplace and their families outside the workplace that could be addressed by implementing safety measures and policies, which potentially could result in improved financial security and quality of life for employees and their families, and productivity gains and cost savings to companies.

RECOMMENDED STRATEGIES FROM THE *MMWR* REPORT FOR IMPROVING E-CODING

Many strategies published in the *MMWR* report provided the basis for developing action items at the E-coding Improvement Partners Meeting in February 2009. Following is information concerning the strategies in three major areas.

1. Improving Communication among Stakeholders about E-codes

- CDC should facilitate a meeting of state and federal injury surveillance and prevention professionals with representatives from health care, public health, health insurance, public and private purchasers, non-profit advocacy groups, employers, and labor communities. These representatives should discuss: (1) how E-coding and injury surveillance can drive injury prevention efforts in health care settings both at work and at home, and how preventing injuries can reduce health care system demands and costs of care; (2) how to demonstrate a potential business case for E-coding, from a health care provider and purchaser perspective, such as using E-coded data to assess health care systems demands and costs of care associated with specific causes of injury (e.g., falls among older adults in nursing homes); and (3) methods to facilitate incorporating external cause of injury documentation and coding as required data elements in electronic health and patient record systems and associated forms and software.
- CDC, in collaboration with Centers for Medicare and Medicaid Services (CMS), should consider using E-codes in uniform billing procedures used for reimbursement in government programs. CDC and CMS should include a review of relevant E-codes in their evaluation of the Hospital-Acquired Conditions and Present on Admission Indicator program evaluation (<http://www.cms.hhs.gov/hospitalacqcond/>).
- CDC, in collaboration with the State and Territorial Injury Prevention Directors Association (STIPDA), the Society for the Advancement of Violence and Injury Research (SAVIR), American Public Health Association's (APHA) Injury Control and Emergency Health Services Section (APHA-ICEHS), the Council of State and Territorial Epidemiologists (CSTE), Department of Defense (DoD), and Veterans Administration (VA), should examine several issues. These issues are: (1) the cost-effectiveness of the existing E-coding mandates in 26 states and the District of Columbia, and the potential use of financial incentives to improve the completeness and specificity of E-coding; (2) the role of quality improvement initiatives aimed at electronic data processing and coding practices; and (3) methods of tracking improvements in the completeness, accuracy, and specificity of E-codes in hospital discharge data systems and ED data systems among states and territories.

2. Improving Collection of E-codes

- CDC should collaborate with STIPDA, CSTE, SAVIR, APHA-ICEHS, American College of Emergency Physicians (ACEP), American College of Surgeons Committee on Trauma (ACS-COT), Association of American Physicians and Surgeons (AAPS), American Academy of Pediatrics (AAP), American Health Information Management Association (AHIMA), National Association of Health Data Organizations (NAHDO), Association of Schools of Public Health (ASPH), DoD, VA, and other partners to address several issues. This collaboration should: (1) develop uniform methods to improve E-coding through cost-effective quality improvement activities and best practices with ongoing evaluation; (2) develop training curricula; and (3) work with professional organizations of clinicians, nurses, health information specialists, medical epidemiologists, and hospital administrators to develop incentives, policies, and approaches to train their members on their roles in collecting high-quality external cause of injury data (e.g., documenting circumstances of the injury incident and E-coding in the medical record).
- State health departments, in collaboration with regional Injury Control Research Centers (ICRCs), ACEP, and other partners, should provide feedback to data providers (e.g., administrators, physicians, nurses, health information specialists, hospitals and other health care facilities, and EMS providers) regarding the quality of E-coded data (e.g., reports on the completeness, specificity, and accuracy of E-coded data) and uses of E-coded data in tracking injuries and providing the basis for data-driven decision making about injury prevention and trauma care programs and policies.

3. Improve the Usefulness of E-coded data for Injury Prevention Efforts

- CDC should engage in activities with state epidemiologists and state injury prevention directors to educate health care workers in EMS and hospital settings; health insurance plans; auto, disability, life and worker's compensation insurers; public payers; businesses and labor unions; school administrators and teachers, and others about the uses of E-coded data for prevention and trauma care efforts.
- State health departments should work with local health departments, using local nonfatal injury data, to develop and implement approaches to highlight injury as a public health concern and to emphasize the importance of injury prevention and trauma care in their community, especially for high-risk populations.
- State health departments should develop and implement methods for timely and easy access to E-coded data by policy makers, program planners, researchers, and the public through their Web sites (e.g., access to injury-related reports, slide sets, fact sheets, and Web-based data query systems).

C Recommended Actions to Address Key Strategies Identified by Participants at the E-coding Improvement Partners Meeting

At the E-coding Improvement Partners Meeting, participants were asked to review the strategies presented in the *MMWR* report and provide their recommendations to CDC regarding actions that could be taken in partnership with their organizations. Using breakout groups, participants discussed their recommendations in four strategic areas.

- Improve communication and collaboration among stakeholders on E-coded data needs and uses for injury prevention efforts in health care settings, at work, in schools, and at home;
- Demonstrate a business case for high-quality E-coding in state morbidity data systems;
- Improve the collection of high-quality E-coded data in state hospital discharge and ED data systems; and
- Improve and promote the utility of high-quality E-coded data from state morbidity data systems in designing, developing, and evaluating injury prevention and regional trauma care programs and policies at the state and local levels.

RECOMMENDED ACTIONS TO ADDRESS STRATEGIES

The following subsections summarize the major recommended actions (practical tasks, methods, and approaches) discussed in each of these areas. These actions are not listed in priority order. Following this section, some potential challenges associated with implementing these recommended actions are presented.

1. Actions for Improving Communication and Collaboration among Stakeholders

1.1: Create a central repository to share information about E-coding.

ACTION ITEM

A central repository of E-coding information and activities should be accessible through a Web site housed and maintained at a federal agency or a federally-funded site. This repository should provide a marketing tool kit (e.g., fact sheets, case examples showing the cost and benefit of having E-coded data, answers to common questions about E-codes, and slides for presentations to different audiences about the importance of having high-quality E-coded data). Also, information should be provided on the current status of E-coding in state morbidity data systems and the results of any evaluation studies that assess the quality of the data, along with information on best practices. CDC should work with the Agency for Healthcare Research and Quality (AHRQ) to conduct these evaluation studies using state hospital discharge and ED data submitted annually by participating states to the Healthcare Cost and Utilization Project (HCUP) data sets. The central repository Web site should also contain a bulletin board with current information on

THE CYCLE OF

CAPTURING INJURY INCIDENT INFORMATION IN THE HEALTH CARE SETTING



Scene of the Incident

EMS personnel are often at the scene where they can observe first hand the circumstances of the incident. This information can be captured as a brief narrative or by using pre-defined fields in the EMS report.



EMS Transport

EMS personnel sometimes have the opportunity to question the patient, or by accompanying adult, about the injury incident during transport to a hospital emergency department. Information obtained regarding the patient can be recorded in the EMS report. A copy of the EMS report can then be given to the hospital personnel upon arrival so that it can become part of the patient's medical record.



Emergency Department

When the patient arrives at the ED, attending physicians and nurses often have an opportunity to question the patient, or an accompanying adult, about the specifics of the injury incident (who, what, when, where and how?). This information can be recorded in the doctor's and nurse's notes which become part of the ED record.

The health care setting—from the scene of the incident to discharge from the hospital—

provides an excellent venue to capture information about the circumstances of the injury incident. Health care providers (e.g., emergency medical services [EMS] personnel, clinicians, and nurses) and health information specialists have an important role in determining the quality (i.e., completeness, accuracy and specificity) of external-cause-of-injury codes (E-codes) in state hospital discharge and emergency department (ED) administrative databases. High quality E-codes can play an important role in assessing trauma care quality and in developing and evaluating the effectiveness of injury prevention programs. The graphic timeline below follows a common path of capturing a hospitalized patient’s information about the injury incident, assigning E-codes, and making those E-codes available in these administrative databases.



Hospital Admission

When the patient is injured severely enough to require a hospital stay, a hospital record is generated. Through interactions with the patient, physicians and nurses providing care can obtain and record additional information about injury circumstances that may not have been captured in the ED record.

Medical Records Coding Department

At the end of the hospital stay of an injured patient, a health information specialist assigns ICD-9-CM¹ diagnosis codes, procedure codes and E-codes using information that is recorded in the complete medical record. The completeness, accuracy and specificity of E-codes assigned depend on the availability of detailed injury circumstance information recorded in the medical record.

Hospital Records and Billing Department

After ICD-9-CM codes are assigned, medical records become part of a hospital administrative database used for managing patient records and for billing purposes. In some states, these data from individual hospitals become part of a centralized state hospital discharge database. This centralized database provides useful de-identified records (to protect confidentiality and non-disclosure) which can be aggregated for analysis of injury diagnosis and E-coded data for use in injury surveillance and prevention activities and in trauma care quality assessment.

¹ ICD-9-CM, or International Classification of Diseases, Clinical Modification, is the classification used in assigning codes to diagnoses associated with inpatient, outpatient, and physician office utilization in the United States (<http://www.cdc.gov/nchs/icd.htm>).

E-coding improvement activities, links to organization sites (e.g., STIPDA, CSTE, American College of Surgeons [ACS] National Trauma Data Bank [NTDB]), and links to federal and state E-coding and injury-surveillance guidelines. The central repository Web site also should contain links to the following federal and state injury-related data Web sites:

- NCIPC's WISQARS (<http://www.cdc.gov/injury/wisqars>),
- NCHS' Injury Data and Resources (<http://www.cdc.gov/nchs/injury.htm>),
- NIOSH's Work-RISQS (<http://www2a.cdc.gov/risqs/>)
- CDC's WONDER (<http://wonder.cdc.gov/>),
- AHRQ's HCUP data documentation (<http://hcupnet.ahrq.gov/>),
- NHTSA/HRSA/CDC's NEMESIS (<http://www.nemesis.org>),
- Armed Forces Health Surveillance Center (<http://www.afhsc.army.mil>)
- California's EPIC system (<http://www.applications.dhs.ca.gov/epicdata/>),
- Wisconsin's WISH system (<http://dhfs.wisconsin.gov/wish/index.htm>),
- Colorado's Health Information Dataset (<http://www.cdphe.state.co.us/cohid/>),
- Minnesota's MIDAS (<http://www.health.state.mn.us/injury/midas/>),
- Oklahoma's OK2SHARE (<http://www.health.ok.gov/ok2share/>), and
- Other state systems (<http://www.injurycontrol.com/icrin/stats.htm>).

1.2: Develop a coordinated and proactive marketing plan to promote the collection and use of high-quality E-coded data.

ACTION ITEM

CDC and its partners should develop a comprehensive marketing plan. This plan should include best practice marketing and communication opportunities in professional journals, conferences, and newsletters. It should also include a description of audiences and perceived challenges and benefits to collecting and using E-coded data. Information should be prepared that provides clear examples of how E-coded data have been used in efforts to reduce the burden of injuries and violence. Simple marketing messages aimed at specific target audiences should be developed to show how E-coded data have identified potential injury problems and resulted in prevention programs and policies that saved lives and reduced hospitalizations and ED visits.

CDC should work with the APHA-ICEHS, ACEP and ACS-COT to update the “E Codes – The Missing Link in Injury Prevention” brochure. This brochure should include a section showing the utility of E-coded data for injury prevention activities and for assessing quality of health care. The brochure should provide links and Web addresses to policy statements from many public health-related organizations (e.g., CSTE, STIPDA, SAVIR, APHA-ICEHS, ACEP, Association of State and Territorial Health Organizations [ASTHO], NAHDO, AAP, National Safety Council [NSC], and U.S. Army Center for Health Promotion and Preventive Medicine [USACHPPM]) that support efforts to improve E-coding.

Examples of the use of E-codes for identifying, characterizing, and examining trends in nonfatal injuries by mechanism and intent of injury should be incorporated into the Community Guide for Preventive Services (<http://www.thecommunityguide.org/index.html>).

A definition of E-coding and a description of uses of E-coded data should be developed for entry into Wikipedia.

1.3: Integrate E-coding into national public health objectives and federal data standards.

ACTION ITEM

Efforts should be made to encourage stakeholders to voice the need for E-coding to be included in federal public-health objectives, in data standards for health care quality, and as a basis for national reporting, such as: (1) Healthy People 2020 objectives that rely on E-coding from state hospital discharge and ED data systems; (2) Healthy People 2020 objectives that measure the status of E-coding in state hospital discharge and ED data systems; (3) the National Healthcare Quality Report and the National Healthcare Disparities Report (<http://www.ahrq.gov/qual/grdr08.htm>) published by AHRQ annually; and (4) definitions of standard external-cause-of-injury data elements for Electronic Health Records (EHRs) as part of the Public Health Information Network (PHIN).

CDC should encourage other public health agencies, such as AHRQ, CMS, Health Resources and Services Administration (HRSA), National Institutes of Health (NIH), Administration for Children and Families (ACF), Indian Health Service (IHS), and other federal agencies (e.g., military, transportation, fire administration, labor, criminal justice), to require reporting of high-quality E-codes from injury- and violence-related morbidity data systems in grants and contracts, where appropriate. For example, CDC and CMS should be addressing E-code use as it relates to identification of Hospital-Acquired Conditions in their program evaluations.

ACTION ITEM

1.4: Facilitate associations between injury prevention/advocacy groups and health data organizations.

Efforts should be made to encourage communication and working relationships regarding E-coding between injury prevention/advocacy groups (e.g., Home Safety Council [HSC], Suicide Prevention Action Network USA [SPAN USA], NSC, Safe Kids Worldwide [SKW]) and state health data organizations. These relationships can be facilitated through collaboration with the STIPDA, CSTE, AHRQ, and CDC. These relationships should emphasize the need for access to high-quality E-coded data from state morbidity data systems for injury prevention efforts by advocacy groups at the state and community levels. NSC is currently engaged in these efforts regarding their data needs for injuries that occur at work, at home, and elsewhere.

2. Actions to demonstrate a business case for high-quality E-coding

ACTION ITEM

2.1: Make the case that high-quality E-coding is needed for injury-related performance measures of health care quality improvement.

2.1.a. Collaborate with the national health care quality measure developers.

CDC should work with recognized measure developers such as the National Committee on Quality Assurance (NCQA), the American Medical Association's (AMA) Physician Consortium for Performance Improvement (PCPI), and the medical specialty societies to: (1) define potential injury-related quality-of-care measures that require high-quality E-coded data; (2) develop a business case to show how E-codes in the specifications might improve the measure and are feasible to collect (e.g., capturing fall-related injury cases in medical care settings to help identify older persons at risk of future falls, <http://www.ama-assn.org/ama1/pub/upload/mm/370/geriatrics.pdf>); and (3) develop a pathway for broad adoption by key stakeholders. With an understanding that quality measures must be evidence based and have the potential for improving structures, processes, and outcomes, many possible quality-of-care measures exist that would benefit from E-codes. Some of those measures are:

- Proportion of fall patients who receive a vision screen, gait screen, bone density scan, and review of prescription drugs;
- Proportion of patients attempting suicide who are referred for follow-up psychological evaluation or other care;

- Proportion of patients with a prescription drug poisoning who had a suicide assessment;
- Proportion of patients with an assessment of home safety for children;
- Proportion of patients with an assessment of the medication management system for the elderly; and
- Proportion of patients with specific causes of injuries (e.g., accidental alcohol poisoning, E860.0) who received an alcohol abuse screening in the ED.

Potential injury-related quality-of-care measures should be evaluated through clinical research as part of CDC's injury research agenda to assess their effectiveness as measures of health care quality in ED and hospital settings, especially in state and regional trauma care systems. Injury-related standardized quality-of-care measures, if adopted, could lead to higher-quality E-coding as a routine practice in health care delivery systems across the United States.

2.1.b. Collaborate with the National Quality Forum (NQF).

CDC should participate in activities of the National Quality Forum (NQF, www.qualityforum.org). NQF is a not-for-profit membership organization created to develop and implement a national strategy for health care quality measurement and reporting. NQF is a public-private partnership with broad participation from all parts of the health care system, including national, state, regional, and local groups and represents consumers, health care purchasers, health care professionals, health plans, accrediting bodies, labor unions, industry, and others. Recently, NQF published a consensus report on Safe Practices for Better Healthcare 2009 (http://www.qualityforum.org/publications/reports/safe_practices_2009.asp). One of the strategies in this consensus report is to take action to prevent patient falls and to reduce fall-related injuries by implementing evidence-based intervention practices in ambulatory care settings, outpatient and inpatient hospital settings, skilled nursing facilities, and home health care services. CDC's participation in the NQF could provide a voice for the applicability of high-quality E-coded data to support performance measures that have been established or that are under consideration by the NQF. Other consensus-based quality organizations include the Ambulatory Care Quality Alliance (AQA, www.aqaalliance.org), the Hospital Quality Alliance (HQA, www.hqaalliance.org), and the Pharmacy Quality Alliance (PQA, www.pqaalliance.org).

2.1.c. Collaborate with the Joint Commission.

CDC should work with the Joint Commission (JC) to assess how high-quality E-coding of injury-related ED visits and hospitalizations could help document compliance with JC accreditation components that address screening for suicide attempts, domestic violence, elder abuse, and child abuse.

2.1.d. Collaborate with the American College of Surgeons.

CDC should encourage the American College of Surgeons (ACS) to include collection of high-quality E-codes as a standard for ACS trauma center verification. Currently, E-coding is included as an essential data element in data standards for trauma center hospitals that contribute to ACS's National Trauma Data Bank (NTDB). CDC has worked with ACS to develop a nationally representative sample of trauma centers, most of which contribute trauma registry data annually to the NTDB. CDC should also work with ACS to demonstrate the usefulness of E-coded data from NTDB and its national sample for injury prevention activities. Improving E-coded data in hospital trauma registries could potentially help improve E-coding in administrative data sets.

CDC should also work with ACS and American Trauma Society (ATS) to explore the value of high-quality E-coding in regional and state trauma care systems inclusive of both trauma center and non-trauma center hospitals. E-coded data could help identify and characterize all injured patients treated in an inclusive trauma care system, such as a regional system with trauma center and non-trauma center hospitals, for use in needs assessment and tracking of external-cause-specific admissions and ED visits.

2.1.e. Collaborate with the Centers for Medicare and Medicaid Services.

CDC should work with Centers for Medicare and Medicaid Services (CMS) to assess the role of high-quality E-coding in quality and patient safety initiatives and uniform billing procedures for Medicare and Medicaid claim data associated with injuries. Present-On-Admission (POA) codes are used to determine if health conditions or injuries occurred before or after hospital admission; CMS does not pay hospitals the additional costs associated with treating the selected conditions (e.g., fall-related hip fractures) when they occur after admission if the selected condition is the only complication or comorbidity present. E-codes could be helpful to characterize the circumstances leading to the injury (e.g., E884.3 – fall from wheelchair; E884.4 – fall from bed). There may be other quality initiatives associated with injury-related claims (e.g., motor vehicle crash-related injuries) that could help CMS make payment decisions and help provide an incentive for hospitals to collect high-quality E-coded data. Also, E-codes are used to code information on adverse effects of therapeutic use of drugs and of medical/surgical care (http://www.qualityindicators.ahrq.gov/downloads/psi/psi_guide_v31.pdf). Accurate E-coded data on adverse effects could be helpful for assessing quality initiatives and patient safety.

2.1.f Collaborate with the Departments of Defense and Veterans Affairs.

CDC should work with the Departments of Defense (DoD) and Veterans Affairs (VA) to ensure their public health organizations (i.e., USACHPPM) are involved with improving E-coding and other injury-data issues (i.e., coding of traumatic brain injury) pertaining to the health of military service members at home and abroad. DoD and VA personnel who operate military and veteran's health systems have experience with national electronic health recording and health care delivery that can be leveraged to help provide national leadership in improving E-coding in state morbidity data systems.

2.2: Assess the inclusion of E-coding in data standards for the EHR Systems.**ACTION ITEM**

CDC should explore how existing information technology standards can accommodate documentation of a narrative for injury circumstances. An advantage of having the electronic collection of E-codes directly from the EHR is that the data could be collected and made available in a very timely manner. A hierarchical external-cause-of-injury pick list could help facilitate E-coding. However, best practices related to E-coding and EHRs need to be identified. Tools to document injury circumstances must be simple and efficient for use by clinicians or other health care practitioners who complete the EHRs. The documentation also needs to be captured in a manner that facilitates assignment of specific E-codes by health information specialists.

CDC should work with the ACEP, ACS, ATS, National Association of EMS Physicians (NAEMSP), National Association of State EMS Officials (NASEMSO), and others to endorse the development and implementation of external-cause-of-injury documentation tools for EHRs. Efforts to develop these data standards and software tools for coding need to conceptually consider the transition from ICD-9-CM to ICD-10-CM by October 1, 2013 (<http://www.cdc.gov/nchs/about/otheract/icd9/abticd10.htm>).

CDC should establish an expert work group to define data standards for EHR software used to capture and report information on external causes of injury so that all vendors are working with the same requirements for both pre-hospital and hospital settings. The technology to capture and extract E-code information needs to be included as a requirement for the EHR system architecture. This work group should define the data elements and the minimum acceptable level of information on external causes of injury; this information may be different for patients transported by EMS, patients treated and released from an ED, and hospitalized patients. They should document both the business case and the use case (i.e., how to use the system to get injury-related information) to support including E-codes in EHRs. E-coding standards established by this work group should also be included in the Certification Commission for Healthcare Information Technology's (CCHIT) EHR certification criteria. The information captured should be relevant to the health care provider and useful for health care quality assessment, clinical referrals for follow-up care, and injury prevention efforts.

2.3: Facilitate and support research on the role of high-quality E-coding in developing and assessing both evidence-based interventions that can improve clinical outcomes and the effectiveness of injury prevention programs and policies.**ACTION ITEM**

CDC should work with AHRQ to fund research on the role of E-codes in defining measures of quality of care to assess evidence-based interventions in health care settings that result in improvements in clinical outcomes and quality of life. Research could be facilitated through SAVIR, Society for Academic Emergency Medicine (SAEM), ACEP, ACS-COT, the American Association for the Surgery of Trauma (AAST), NAEMSP, APHA, American Hospital Association, American Trauma Society (ATS), Society of Trauma Nurses (STN), and other organizations.

CDC should fund projects to: (1) identify and understand the obstacles to high-quality E-coding of state administrative data systems; (2) examine solutions to improve E-coded EMS, ED, and hospitalization data; and (3) assess the cost and benefits of high-quality E-coding in state administrative data systems. Such studies could demonstrate how collecting high-quality E-coded data in state hospital discharge and ED data systems can make a difference in preventing injuries in targeted populations. Evidence should be gathered to show that improving the completeness, accuracy and specificity of E-codes can facilitate improved prevention programs to reduce injuries.

3. Actions for improving the collection of high-quality E-coded data.

ACTION ITEM

3.1: Develop guidelines and training material to instruct health care providers in injury documentation in the medical record.

CDC should work with the ACEP, ACS, ATS, NAEMSP, AMA, Emergency Nurses Association (ENA), Society for Trauma Nurses (STN), AHA, AHIMA, NASEMSO, DoD, and VA to develop and implement guidelines and training curriculum for injury documentation by health care providers (e.g., emergency medical technicians [EMTs], physicians, and nurses). These guidelines should provide instructions on how to document injury circumstances (who, what, when, where, and how) in the medical record. Instructions should include examples of how health information specialists assign E-codes and demonstrate the importance of detailed documentation to facilitate assignment of accurate and specific E-codes. Training guidelines and materials should be suitable for adding to online training modules, short courses, and lecture series for EMT/medical/nursing school curriculum and continuing education courses. These training efforts should be coordinated with technical modifications to the EHR to accommodate user-friendly documentation and coding of external cause of injury.

CDC should work with ATS and with the state trauma program managers to add injury-documentation training to courses for trauma staff. Injury documentation training could be added to the Advanced Trauma Care for Nurses (ATCN), Trauma Nurses Core Curriculum (TNCC), and Advanced Trauma Life Support (ATLS) courses.

ACTION ITEM

3.2: Modify the guidelines to allow use of all documentation in the medical record to assign E-codes.

CDC should work with other members of the Cooperating Parties (CMS, American Hospital Association [AHA], and AHIMA) to consider changing the E-coding guidelines so that all documentation in the medical record (e.g., EMS report, doctors' notes, nurses' notes) can be used by health information specialists to assign specific E-codes for ED visits and hospital admissions. Current ICD-9-CM guidelines instruct health information specialists to primarily assign ICD-9-CM codes, including E-codes, based on injury documentation in the medical record provided by the physician or other qualified health care practitioner who is legally responsible for establishing and documenting the patient's diagnosis (<http://www.cdc.gov/nchs/data/icd9/icdguide.pdf>). Modifying the guidelines to include additional data on injury circumstances

and E-codes recorded in other documentation in the medical chart could help improve the specificity and completeness of E-coding. Changes in the ICD-9-CM coding guidelines will need to transition to the ICD-10-CM coding guidelines by October 1, 2013 (<http://www.cdc.gov/nchs/about/otheract/icd9/abticd10.htm>).

3.3: Establish guidelines and standards for E-coding data quality for state hospital discharge and ED data systems.

ACTION ITEM

CDC should work with AHRQ to recommend guidelines and standards of data quality to facilitate the completeness, accuracy, and specificity of E-coded data. Guidelines should include examples of good injury documentation by health care providers; measures of completeness, accuracy, and specificity of E-codes; measures of inter-coder reliability for health information specialist; potential incentives for reporting high-quality data; and timely feedback mechanisms to inform hospital administrators, health care providers, and health information specialist on data quality, fidelity, and utility.

Standards for analysis of E-coded data quality should be developed, including criteria for edit checks and computer programs to conduct routine edits of the data. CDC should include requirements (with standard specifications and templates) for core state injury-program funding. Funded states should be required to assess and report on E-coding quality of injury-related hospital discharge and ED data. These standards should be made available to all states for their use in improving the quality of injury-related data.

AHRQ currently conducts a fairly extensive set of data edits on state hospital discharge and ED data submitted to HCUP. Edits specific to E-coding could be used as a starting point for developing standard edit checks and computer programs. AHRQ could also provide these guidelines and standards to the more than 40 states that contribute administrative data to HCUP; these states can use these guidelines and standards to assess the quality of their E-coded ED and hospital discharge records before they submit the data to HCUP.

4. Actions to improve and promote the usefulness of E-coded data for state injury prevention efforts.

4.1: Develop a user-friendly, Web-based query system for state hospital discharge and ED data.

ACTION ITEM

CDC should work with AHRQ to develop a user-friendly, Web-based query system that provides access to state injury morbidity data by mechanism and intent of injury. This query system could be based on E-coded data from state HCUP data sets. For instance, a new state HCUP data query module could be added to WISQARS (<http://www.cdc.gov/injury/WISQARS>).

CDC should also work with AHRQ to develop an annual report that summarizes the E-coding status of state HCUP data sets and present summary tables by mechanism and intent of injury for each participating state. The annual report could be made available through the Web-based query system and at the repository Web site described in Action Item 1.1.

Developing these centralized data query systems and keeping them updated with the most current data available would help provide ready access to, and analysis of, state morbidity data for use in injury surveillance and prevention activities at the national, state, and community levels.

ACTION ITEM

4.2: Develop a tool kit on using E-codes to set priorities and to develop and evaluate injury prevention and trauma care programs at the state and community levels.

CDC should work with STIPDA, CSTE, APHA-ICEHS, ATS, ACEP's Public Health and Injury Prevention Committee, ACS-COT, SAVIR, and other injury prevention organizations to compile an inventory of examples of using state and local E-coded data to help develop and evaluate injury prevention program and policy planning and improve trauma care efforts. A slide set should be prepared to show the uses of E-coded data for data-driven decisions in setting priorities for injury prevention and trauma care programs, and for evaluating their effectiveness. Efforts are needed to explore ways to make information more geographically relevant for injury prevention and trauma care programs attempting to use it to evaluate program effectiveness.

This tool kit should also include marketing tools for demonstrating the value of high-quality E-coded data in developing and evaluating injury prevention programs aimed at specific target audiences (e.g., health care providers, medical specialty societies, policy makers, state data organizations, hospitals, health plans, consensus-based quality organizations, accrediting bodies, state epidemiologists, injury prevention/advocacy groups, employers, schools, and community leaders). This tool kit could be made available at the central repository that is described in Action Item 1.1.

D Challenges Associated with Implementing these Recommended Actions

Collecting and using high-quality E-coded data from state administrative data systems can provide a cost-effective tool for data-driven decisions about injury prevention. However, a major challenge will be to achieve consistency in E-coding quality (completeness, accuracy, and specificity) among all state hospital discharge and ED data systems. Implementing these recommended actions will help to meet this challenge by raising stakeholders' awareness of the important role of high-quality E-codes in designing, developing, and evaluating injury prevention programs and policies, and subsequently addressing health care cost issues. For the public, examples are needed to demonstrate how knowledge of injury circumstances based on high-quality E-coded data has helped save lives, reduce injuries, and improve worker/employee productivity in a cost-efficient manner.

Several of the recommendations involve creating tools for documenting injury circumstances and for coding external causes in EHR systems. As previously mentioned, efforts are needed to develop data standards and software tools for external cause coding that conceptually consider transition from ICD-9-CM to ICD-10-CM by October 1, 2013.

Some stakeholders may be skeptical about the need to improve E-coding in state morbidity data systems because they do not see how the data are affecting outcomes or how the data may benefit them. Because E-codes are not currently integral to billing or reimbursement, health care providers, hospital administrators, purchasers, and other stakeholders may see capturing these data as an additional burden and expense. Special efforts will be needed to educate them about uses of E-codes for measures of community health, health care quality, and improved safety of the populations they serve. If injury indicators based on high-quality E-coded data are seen as a useful tool to identify major sources of health care costs (e.g., falls among older adults), to assess the effectiveness of injury prevention and trauma care efforts, and to measure health care quality, they may be more likely to support further efforts to improve E-coding in state morbidity data systems.

Ongoing collaborative efforts among CDC, STIPDA, CSTE, AHA, ACEP, ACS-COT, AHIMA, and other stakeholders will be essential to bring health care providers and public health officials together to determine best practices for collecting and using high-quality E-coded data to help address the public health concerns.

E Next Steps

Implementing recommended actions in this report will require a coordinated effort among CDC and its partners. CDC is committed to continue providing national leadership on improving E-coding in state morbidity data systems; however, success in implementing recommended action plans in this report will require coordination and commitment of time and resources from CDC, other federal, state, and non-government partners and stakeholders.

CDC will collaborate with other partners to set priorities and establish workgroups to develop practical steps to address recommended actions. These collaborative efforts hopefully will result in better training and awareness of the need for high-quality E-coded data; improved documentation on injury circumstances in emergency medical services records, hospital medical charts, and electronic health records; more complete, accurate, and specific E-codes; and improved usefulness of the E-coded data for health care quality assessment, injury surveillance, and injury prevention activities.

Appendix A.

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Appendix B. List of Acronyms Used in this Report

AAP	American Academy of Pediatrics	HQA	Hospital Quality Alliance
AAPS	Association of American Physicians and Surgeons	HSC	Home Safety Council
AAST	American Association for the Surgery of Trauma	ICRC	Injury Control Research Center
ACEP	American College of Emergency Physicians	IHS	Indian Health Service
ACF	Administration for Children and Families	MIDAS	Minnesota Injury Data Access System
ACS	American College of Surgeons	MMWR	Morbidity and Mortality Weekly Report
ACS-COT	American College of Surgeons Committee on Trauma	NAHDO	National Association of Health Data Organizations
AHA	American Hospital Association	NAEMSP	National Association of EMS Physicians
AHIMA	American Health Information Management Association	NAEMSO	National Association of State EMS Officials
AHRQ	Agency for Healthcare Research and Quality	NCHS	National Center for Health Statistics
AMA	American Medical Association	NCIPC	National Center for Injury Prevention and Control
APHA	American Public Health Association	NCQA	National Committee for Quality Assurance
APHA-ICEHS	Injury Control and Emergency Health Services Section, APHA	NEMSIS	National EMS Information System
ASPH	Association of Schools of Public Health	NHTSA	National Highway Traffic Safety Administration
ASTHO	Association of State and Territorial Health Organizations	NIH	National Institutes of Health
ATCN	Advanced Trauma Care for Nurses	NIOSH	National Institute of Occupational Safety and Health
ATLS	Advanced Trauma Life Support	NQF	National Quality Forum
ATS	American Trauma Society	NSC	National Safety Council
AQA	Ambulatory Care Quality Alliance	NTDB	National Trauma Data Bank
CCHIT	Certification Commission for Healthcare Information Technology	PCPI	Physician Consortium for Performance Improvement
CDC	Centers for Disease Control and Prevention	PHIN	Public Health Information Network
CDHP	Consumer Directed Health Plan	POA	Present on Admission
CMS	Centers for Medicare and Medicaid Services	PQA	Pharmacy Quality Alliance
CODES	Crash Outcome Data Evaluation System	SAVIR	Society for the Advancement of Violence and Injury Research
CSTE	Council of State and Territorial Epidemiologists	SKW	Safe Kids Worldwide
DoD	Department of Defense	SPAN USA	Suicide Prevention Action Network, USA
EHR	Electronic Health Record	STIPDA	State and Territorial Injury Prevention Directors Association
EMS	Emergency Medical Services	STN	Society of Trauma Nurses
EMT	Emergency Medical Technician	TNCC	Trauma Nurses Core Curriculum
ENA	Emergency Nurses Association	USACHPPM	US Army Center for Health Promotion and Preventive Medicine
EPIC	Epidemiology and Prevention for Injury Control	WISH	Wisconsin Interactive Statistics on Health
HCUP	Healthcare Cost and Utilization Project	WISQARS	Web-based Injury Statistics Query and Reporting System
HRSA	Health Resources and Services Administration	Work-RISQ	Work-related Injury Statistics Query System
		VA	Department of Veterans Affairs

