

Injury surveillance systems are used to describe the burden of injuries, to document specific patterns of injuries, to identify emerging hazards, and to evaluate the effectiveness of prevention strategies. Pediatric emergency medicine practitioners use and participate in injury surveillance systems. The purpose of this article is to review the principles of injury surveillance as applied to pediatric emergency medicine, to highlight the roles and responsibilities of practitioners in injury surveillance, and to provide opportunities for readers to explore current data and injury surveillance systems using online resources and examples from the literature.

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Injury Surveillance and the Emergency Physician

By Lynne Warda, MD
WINNIPEG, MANITOBA, CANADA

THE DAILY TIMES REPORTER FROM Hazardtown, USA has contacted you about a possible epidemic of Tiny Toy injuries. This toy is being distributed nationally by a fast food chain. Parents in Hazardtown have complained to the Daily Times that their children are choking on the Tiny Toys in their meals. One parent reported that her tiny tot turned blue and was rushed to the hospital. You are asked to comment on this product. Have any children in your emergency department (ED) been treated or hospitalized for Tiny Toy aspiration? Have any died? Can you verify an increasing trend? Have cases been reported elsewhere in the state? Other states? Is there evidence for a recall or consumer warning? You turn to local, state, and national surveillance systems to prepare for the interview.

Local, regional, and national injury surveillance systems contribute to our knowledge and understanding of the burden of injuries, the specific pattern of particular injuries, emerging hazards, and the effectiveness of prevention strategies. Pediatric emergency medicine (PEM) practitioners are both consumers of and participants in injury surveillance systems. The purpose of this article is to review the principles of injury surveillance as applied to PEM, to highlight the roles and responsibilities of PEM practitioners in injury surveillance, and to provide opportunities for readers to explore current data and injury surveillance systems using online resources and examples from the literature.

Injury Surveillance ABCs

Important Definitions

What is surveillance? As defined by the World Health Organization, surveillance is “the ongoing and systematic collection,

From the Department of Emergency Medicine, Children's Hospital of Winnipeg, Winnipeg, Manitoba, Canada.

Address reprint requests to Lynne Warda, MD, Medical Director, IMPACT, NA335-700 McDermot Avenue, Winnipeg, Manitoba, Canada R3E 0T2. E-mail: lwarda@escape.ca

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analysis, and interpretation of health data essential to the planning, implementation, and evaluation of health practice. It is closely integrated with the timely dissemination of these data to those who need to know. The final link of the surveillance chain is in the application of these data to prevention and control. A surveillance system includes a functional capacity for data collection, analysis and dissemination linked to public health programs.”¹ Injury surveillance systems are guided by these epidemiological principles, and are closely linked to prevention programs and strategies, as their ultimate goal is action to reduce injuries.²⁻⁵

Surveillance by definition is a prospective activity. Actual collection of data within a surveillance system, however, may be continuous or periodic. Surveillance systems can be very complex or surprisingly simple in design, applicable to settings where resources are scarce. Their scope may be international, national, regional, or local. They may include all injuries and all injured persons, or may limit surveillance to a specific type of injury, such as child abuse, or a specific population, such as injuries among seniors.^{1,4,5}

What is the difference between a survey and surveillance? While surveys are conducted typically as single events, surveillance is an ongoing activity. Surveys cannot be used to monitor trends, identify emerging hazards, or evaluate interventions.¹

What is the difference between active and passive surveillance? In active surveillance, injured persons or injury events are actively sought and investigated using interviews, case file review, and other methods. Data about a case can be integrated from multiple data sources. In passive surveillance, data collection is integrated into routine tasks such as the coding of death certificates or hospital discharge data. Passive surveillance is more frequently used, as it is less resource intensive. Some surveillance systems may combine active and passive methods, such as using active methods to seek cases missed by passive surveillance, or in-depth investigation of a subset of cases identified through passive surveillance.¹ For example, the US Consumer Product Safety Commission (CPSC) actively seeks product-related deaths by searching the media for cases potentially missed by death certificate data.

Rationale for Injury Surveillance

Why perform surveillance? Injury surveillance data are used to describe the injury problem: evaluating the magnitude of the burden of illness and its

financial impact, identifying and describing populations at risk, identifying risk and protective factors, and monitoring trends in specific injuries over time and in different populations. Injury surveillance data are also used for injury control: designing, implementing, monitoring, and evaluating interventions, and identifying emerging hazards. Surveillance provides a basis for public health strategies to reduce injuries, including policy and programming.^{1,2,4}

Who needs injury surveillance data? Those who are mandated to identify injury patterns in the community, those who treat injured patients, those who pay for the consequences of injuries, those who conduct research to understand and prevent injuries, those who advocate for injury prevention, and those who manage prevention programs. “More detailed data on the who, when, where, and how of injuries can be used to target injury control measures to relevant circumstances and populations and increase cost-effectiveness of resource allocation.”⁵ Consumers of injury surveillance data include public health professionals, hospitals, practitioners, insurers, researchers, programmers, the media, and the public.^{2,3,6}

Injury Data ABCs

In order to analyze injury events and identify potential prevention strategies, one requires data not only about the injury itself (what) but also about the injured person (who) and the injury event (when, where, why, and how). Standard data sources used for injury surveillance include death certificates, ED records, and hospitalization records. These sources code and classify injuries and injured persons in a standardized fashion but are very limited in terms of relevant *event* information. In response to these limitations, specially designed surveillance systems have been designed to collect in-depth information regarding specific types of injuries, such as motor vehicle-related injuries, spinal cord injuries, or significant trauma. The strength of these systems is that detailed event-related information is collected in addition to relevant injury-related information such as patient disposition, treatments and procedures, and follow-up care.^{2,3,5}

Classifying and coding injuries in a standardized manner is essential for any surveillance system. The International Classification of Disease (ICD) is the system used by most countries, including the US, to code mortality data for statistical purposes. For injuries, this system provides a code for the diagnosis, including the type of injury and body

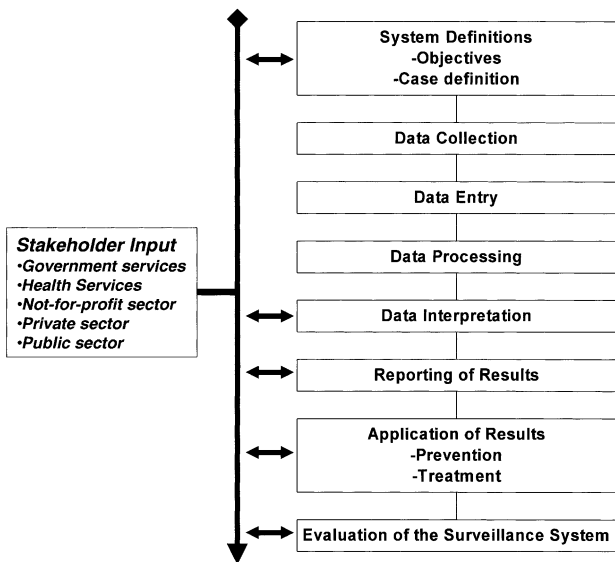


Figure 1. Steps in building a surveillance system. Adapted from Holder et al.¹

part affected (eg, skull fracture), and a code for the external cause of injury (eg, fall from playground equipment). Injuries can be coded for intent (eg, unintentional) as well as mechanism of injury (eg, fall), and for certain types of injuries, for place of occurrence and activity of the victim.^{2,3,7,8} A standardized framework has been proposed for presenting injury mortality data coded using ICD-9.* This matrix was developed to allow comparisons at the local, state, national, and international levels. A similar framework is being developed for ICD-10 and for injury morbidity data.⁷

Designing an Injury Surveillance System

Building an injury surveillance system is a process that begins with a group of stakeholders, often a mix of government agencies and departments (eg, health, transportation), not-for-profit organizations, health care practitioners representing the spectrum from emergency medical services to acute care and rehabilitation, insurers, injury prevention experts, and community members (Fig 1). The first step is to define the objectives and scope of the system and to define a “case.” The system may

*In the Ninth Revision (ICD-9), diagnosis codes are known as N-codes and external cause codes as E-codes, while in the Tenth Revision (ICD-10) the diagnosis codes begin with S and T, and external cause codes begin with V, W, X, and Y. Substantive changes will be seen with ICD-10, which was implemented in the US for mortality data for the data year 1999.⁸

TABLE 1. Identifying Data Needs:
Useful Data Elements

Types of variables	Examples of variables
Patient	Age, gender, race/ethnicity, place of residence, occupation
Circumstances of injury	Time: date, time Place: address, type of location (playground, road, home) Cause: E code, activity at time of injury, intentionality Other: alcohol/drug involvement, product involvement
Injury	Injury description: nature of injury, anatomic location, severity of injury Medical care: EMS, ED, hospital admission, intensive care Outcome: disposition, length of stay, death, disability

Abbreviations: ED, emergency department; EMS, emergency medical services.

count injured persons (who may have more than one injury), injuries (eg, all injuries, deaths, spinal cord injuries), or injury events (eg, traffic collisions). Most systems count only the first presentation for treatment, but this does not allow for assessment of the entire economic burden related to the injury. Certain systems may restrict data collection to a certain age group or other sub-population.^{1,2,4}

The next step is to identify data needs and data sources. Useful data elements include items related to the patient, items related to the circumstances of injury, and items related to the injury itself (Table 1). Core data have been identified for surveillance systems collecting data on all types of injuries (Fig 2). The “minimum data set” includes age, gender, intent, activity when the injury occurred, place of occurrence, nature of injury, mechanism or cause of injury (eg, traffic injury, drowning), and a unique identifier (usually a number). A core “optional data set” consists of additional variables that are useful for analysis of all types of injuries. For systems collecting data on specific types of injury (eg, traffic, assaults) there are additional data sets that are required, called supplementary data sets. Again,

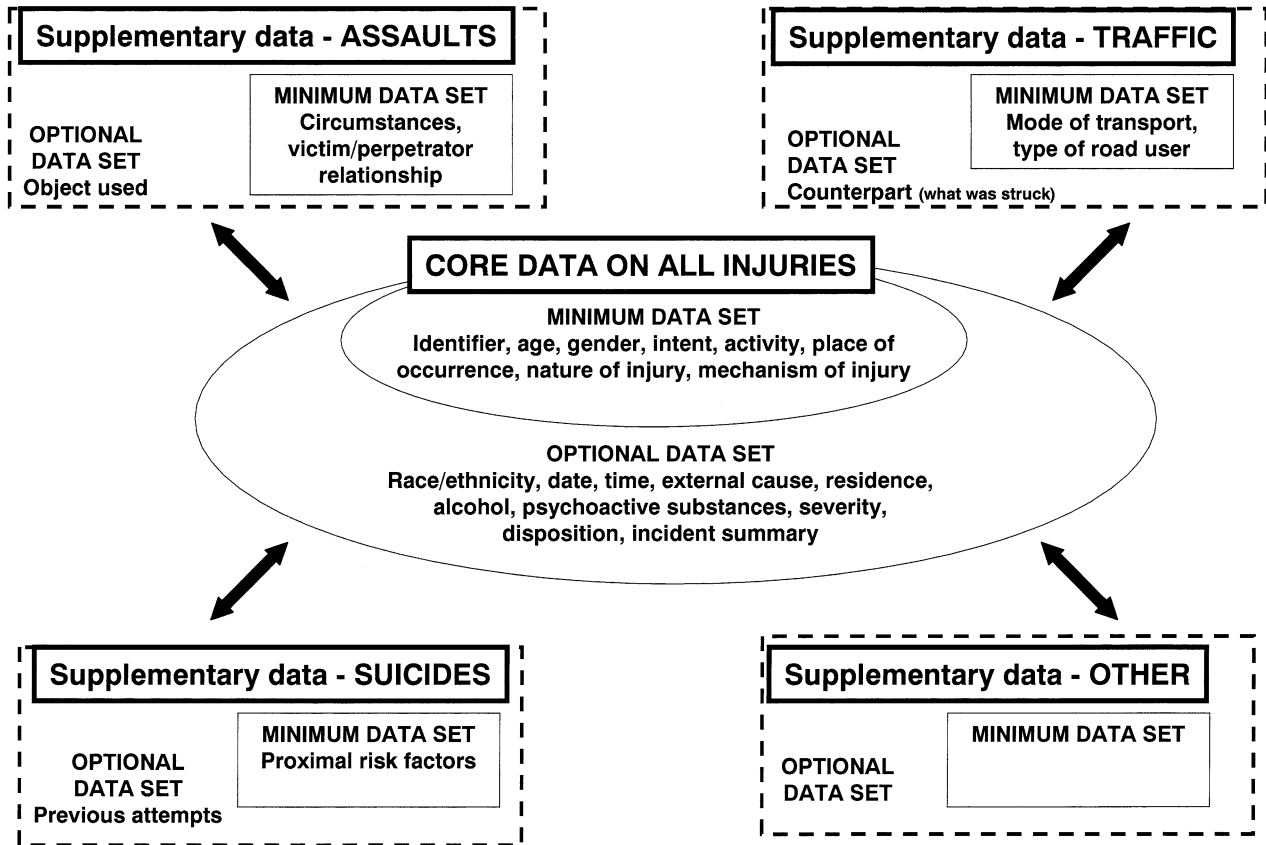


Figure 2. Data sets for an injury surveillance system. Adapted from Holder et al.¹

there are minimum data sets and optional data sets for each type of injury. These are generally defined by the objectives of the surveillance system and are limited only by resources.¹

One of the key decisions to be made in the planning stages is what outcome of injury will be counted, as this determines the data source and location of data collection. If mortality is the outcome of interest, death certificates are the primary data source. For non-fatal injuries, hospital records and ED data are the primary data sources. For hospital-based surveillance, coded discharge data or trauma registry data are frequently used. For ED-based surveillance, data collection can be integrated with routine registration or charting, or may be conducted in a parallel process such as completing specialized report forms. Data collection forms can be designed to be completed by the patient and family, clerical, nursing, and/or medical staff, or a combination thereof. Many surveillance systems use sentinel sites for data collection, using a subset of hospitals or EDs rather than attempting to collect data from all sites.^{1-3,5,9}

Subsequent steps in the development of a surveillance system include the actual data collection,

data entry, coding, processing, and periodic interpretation and reporting of results. At this stage stakeholder involvement becomes essential to facilitate the design of prevention strategies targeting issues identified through careful data analysis. The dissemination of surveillance data to stakeholders is a critical step, and should both inform and motivate.^{1,2,4}

Periodic formal evaluation of the system should include analyses of processes, data quality, and system products and services, and should lead to improvements and revisions in the system. Attributes of a surveillance system that can be evaluated include its simplicity, flexibility, acceptability, sensitivity, positive predictive value, representativeness, and timeliness (Table 2).^{1,4,10}

Examples of Injury Surveillance Systems

There are numerous examples of injury surveillance systems at the national, regional, and local levels.^{2,3,5,8} An inventory of federal data systems that provide national data on injuries reports 31 different systems, of which 17 are continuous, on-

TABLE 2. Criteria for Evaluating the Quality of a Surveillance System*

Quality criteria	Sample questions
Simplicity	How easy is it to identify a case? How easy are forms to understand and complete? Is software user-friendly? Is data collection kept to a minimum? Are system procedures easy to understand?
Flexibility	Can the system adjust to address new questions? Can the system adapt to new diagnoses? New classification schemes? New case definitions?
Acceptability	Is the system and its processes acceptable to its participants, including patients and their families, clerical and medical staff, coders, analysts, users, and stakeholders?
Sensitivity	To what extent does the system accurately identify all events/persons in the target population? To what extent can the system identify epidemics?
Positive predictive value	To what extent do the cases meet the case definition? What is the misclassification rate?
Representativeness	To what extent do events detected by the system represent the condition of interest in the target population? Over time?
Relevance	How useful are the data to end-users and stakeholders? Have the data been used to inform prevention activities? To evaluate the effectiveness of prevention activities?
Timeliness	How timely is data collection, processing, and reporting?

*Adapted from references 1, 4, 5, and 10.

going surveillance systems¹¹ (Table 3). The following are a few selected systems of interest to the PEM practitioner. Additional systems will be reviewed in the exercises below.

- **The CPSC National Electronic Injury Surveillance System (NEISS).** This is a surveillance sys-

tem that collects data from 100 hospital EDs and conducts follow-up studies to identify injuries related to consumer products. These data are used to calculate national estimates of the number of injuries associated with specific consumer products. These data have been used by the CPSC as evidence supporting product recalls, public awareness campaigns, and product standards. For more information go to <http://www.cpsc.gov>. A recent study demonstrated that expansion of NEISS to include all injuries could provide national estimates of emergency department-treated nonfatal injuries by all types and external causes.¹²

- **Fatality Analysis Reporting System (FARS).** This is a database maintained by the National Highway Traffic Safety Administration of motor vehicle-related crashes that occur on a public road and result in at least one fatality within 30 days of the crash. Data sources include police reports, motor vehicle licensing agencies, hospitals, and coroners. Variables collected include approximately 100 driver/passenger factors, vehicle factors, and crash factors. For more information go to <http://www-fars.nhtsa.dot.gov>. Summary reports can be downloaded, or data queries can be conducted online.
- **The National Hospital Ambulatory Medical Care Survey (NHAMCS).** The NHAMCS, which began annual data collection in 1992, is directed by the Centers for Disease Control and Prevention. It is a national probability sample of 600 hospitals and is designed to collect data from hospital emergency and outpatient departments. For more information go to <http://www.cdc.gov/nchs>. Online data searches can be conducted using the Emergency Department Interactive Query Module (EDIQS). Recent examples of injury surveillance research using these data include studies of sports injuries¹³ and nonfatal injuries in infancy.¹⁴

The Role of the Pediatric Emergency Physician in Injury Surveillance

ED-based surveillance of injuries and other health issues is likely to increase as medical record technology improves and data sets become standardized.¹⁵ Support for a national ED-based surveillance strategy is strong.^{2,6,15} A convincing case can be made for injury data collection in the ED, because of the volume of patients treated and the spectrum of severity represented. The quality of these data directly relate to the quality of historical and diagnostic information provided by clinicians.

TABLE 3. Examples of Federal Data Systems in the United States: Types of Injury Data Collected*

Data System	Agency	Violence-Related Data			Unintentional Injury Data		
		Mortality	Morbidity	Risk*	Mortality	Morbidity	Risk*
NVSSS	National Vital Statistics System-Current Mortality Sample	Centers for Disease Control and Prevention	✓			✓	
NHDS	National Hospital Discharge Survey	Centers for Disease Control and Prevention	✓	✓		✓	✓
NAMCS	National Ambulatory Medical Care Survey	Centers for Disease Control and Prevention		✓			✓
NHIS	National Health Interview Survey	Centers for Disease Control and Prevention		✓			✓
YRBSS	Youth Risk Behavioral Surveillance System	Centers for Disease Control and Prevention			✓		✓
NEISS	National Electronic Injury Surveillance System	Consumer Product Safety Commission		✓			✓
FARS	Fatal Accident Reporting System	National Highway Traffic Safety Administration				✓	✓
NOPUS	National Occupant Protection Use Survey	National Highway Traffic Safety Administration					✓
NFIRS	National Fire Incident Reporting System	Fire Administration				✓	✓
NIS	National Incidence Study of Child Abuse and Neglect	National Center for Child Abuse and Neglect	✓	✓	✓		
NCVS	National Crime Victimization Survey	Bureau of Justice Statistics		✓	✓		
CFOI	Census of Fatal Occupational Injuries	Bureau of Labor Statistics	✓		✓	✓	✓

*Risk refers to behaviors and practices.

Adapted from Annest et al.¹¹

The American Academy of Pediatrics has issued a position statement regarding proper record-keeping of ED visits and hospitalizations of injured children. "To be of greatest use, hospital records should indicate the 'who, what, when, where, why, and how' of the injury occurrence and whether protective equipment (eg, a seat belt) was used. The pediatrician has two important roles in this area: to document fully the injury event and to advocate for the use of standardized external cause-of-injury codes, which allow such data to be compiled and analyzed."¹⁶ The PEM practitioner can improve data quality by charting sufficient detail for systems that

abstract data, and by carefully completing forms for manual systems. Finally, PEM experts can play a role in injury surveillance system development and evaluation (Table 4).

Working With Injury Surveillance Data: Examples and Exercises

Describing an Injury Issue

Impressive Charts and Graphs. You are seeking funds to start a statewide trauma registry, and

TABLE 4. Getting Involved in Injury Surveillance: Tips for the PEM Clinician

Surveillance system phase	What you can do	Examples
System definitions	Recommend that topics of clinical relevance are being coded and captured in a useful manner	Suggest that tap water scalds should be captured as distinct from other scalds due to water; request that street address be recorded for pedestrian injuries to identify high-risk locations.
Data collection	Improve data quality	Teach trainees to chart circumstances of injury. Document protective equipment use and nonuse. Participate in voluntary reporting systems.
Data interpretation	Request custom analyses	How does the pattern of snowboard-related injury differ by age group? Have baby walker injuries decreased since the introduction of the new ASTM standard?
Reporting of results	Recommend that reports are distributed to you and your colleagues	Ask for a copy of the latest report. Review the data at your next staff meeting. Are there opportunities for prevention? Teaching? Research?
Application of results	Use surveillance data for prevention	Use the data to inform parents of the risk of injury and effective prevention measures related to a product or activity.
	Use surveillance data for teaching	Use the data to teach how to predict pattern of injury.
	Use surveillance data for research	Surveillance data can be used to describe injuries, identify hazardous products or activities, or evaluate prevention strategies.

are meeting with potential funders. You need to convince them that injury is an important health issue, using state-specific data.

Exercise: To conduct an online data query and create impressive charts and tables for your presentation, visit the Web-based Injury Statistics Query and Reporting System (WISQARS) website at <http://www.cdc.gov/ncipc/wisqars/>. WISQARS is an interactive system that provides customized reports of injury data. Try the *Leading Causes of Death* and *Potential Years of Life Lost* options and customize for your state. Charts and tables can be printed or the data downloaded to a spreadsheet.

Identifying Risk Factors for Injury

Crash Analysis Request. Your state multidisciplinary road safety committee is holding a strategic planning workshop to identify opportunities for the prevention of fatal traffic collisions. The committee will be reviewing a recent summary of fatal crashes and their circumstances, in order to identify risk factors. Although your committee has access to

hospital discharge data for motor vehicle-related injuries, you do not have any detailed circumstances data.

Exercise: To prepare a state summary of fatal motor vehicle crashes and their circumstances, visit the website of the Fatality Analysis Reporting System (FARS) at <http://www-fars.nhtsa.dot.gov/>. Choose the *Create a Query* link to conduct a customized report online. Try some of the exercises first: *Univariate Tabulation Exercises*, *Cross Tabulation Exercises*, and *Case Listing Exercises*. Then create a customized report for your state. An alternative way to find this web page is to visit <http://www.nhtsa.gov> and select *Crash Statistics* or *Crash Information* or search for FARS.

Understanding Patterns of Injury

Safe Sleep Savvy. As a consultant to the hospital's public education committee you are asked to review a new pamphlet and poster about safe sleeping practices for infants. The committee wants more information about suffocation hazards such

as cribs, beds, bedding, and co-sleeping. What are the most common mechanisms implicated in suffocation-related deaths? What are the age groups at risk? What specific prevention messages should be included?

Exercise: To answer these questions, review the electronic publication “Infant Mechanical Suffocation Deaths in the United States, 1980-1997,” which can be found at <http://www.pediatrics.org>. The authors analyzed data from the USCPSC’s death certificate file to document patterns and products associated with mechanical suffocation deaths of children younger than 13 months. This is one of the data sources that the CPSC uses to conduct product-related injury surveillance.

Risky Business. While shopping at the local mall you provide first aid for a drowsy, vomiting toddler who just fell out of a shopping cart and struck his head. You note that the cart does not have a seatbelt, and decide to make a formal complaint. In drafting your letter you do a quick search for data describing typical shopping cart injuries.

Exercise: To learn about the patterns of injury associated with shopping carts, go to the website of the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) at <http://www.he-sc.gc.ca/pphb-dgspsp/injury-bles/chirpp/injrep-ables/index.html>. Or search the main Health Canada website at <http://www.he-sc.gc.ca>. CHIRPP is an example of a surveillance system using sentinel hospitals for reporting. Data are collected from emergency rooms of ten pediatric and five general hospitals in Canada. CHIRPP is a program of the Injury Section of the Health Surveillance and Epidemiology Division of the Centre for Healthy Human Development, Health Canada.⁹

Identifying Emerging Hazards

New Wheels. While shopping for a baby shower gift you come across what appears to be a new style of baby walker. The clerk states that the older style of wheeled walker has not been sold recently. You wonder if the newer model is safer.

Exercise: The CPSC collects data on product-related injuries using a number of different types of data sources, including death certificates, hospital records, consumer claims, and newspaper reports. Search the CPSC website at <http://www.epsc.gov> for the phrase “baby walkers.” You will find a number of documents summarizing CPSC baby walker injury data. A good example of the variety and depth of detail of the data sources used by the CPSC is seen in the Freedom of Information Act (FOIA) document “Termination of Baby Walker Rulemak-

ing Proceeding” (in the FOIA library). This document outlines the emergence of the new style of baby walker and its associated injuries, and provides an assessment of whether this newer design is safer.

Summary

Injury surveillance is a vital tool for the prevention and control of pediatric injuries. PEM practitioners have a unique opportunity to participate in injury surveillance systems, as a data providers, data consumers, and system consultants and supporters.

To prepare for your interview with the Hazardtown Daily Times reporter you request Tiny Toy aspiration data from your local injury surveillance system. This ED-based system has a free-text field to identify specific products. You confirm that there have been 12 documented cases linked to Tiny Toys in the past month, including 10 hospitalizations, but no deaths. The statewide injury surveillance system reports a recent increase in hospitalizations for foreign body aspiration in the toddler age group, but this system relies on ICD coding and cannot identify the specific products involved. The national surveillance system, which uses sentinel hospital surveillance and voluntary coroner, physician, and consumer reporting, has confirmed 3 Tiny Toy-related deaths in the past 6 weeks. Your communication with product safety authorities reveals that they are preparing a news release regarding an urgent recall of all Tiny Toys distributed by the fast food chain. You provide the Daily Times reporter with the breaking news and local data demonstrating the impact on the children of Hazardtown.

Useful Resources

The National Injury Prevention Centre (<http://www.cdc.gov/nipc/>) provides online access to current data, national and state injury control resources, publications, and an extensive set of injury control links.

The World Health Organization (http://www.who.int/violence_injury_prevention/index.html) is worthwhile to visit to download the “Injury Surveillance Guidelines.” This document begins with a succinct summary of injury prevention theory and concepts and injury surveillance theory, and is a practical guide to developing an injury surveillance

system. Sample data collection forms and report templates are appended.

Links to a comprehensive set of online injury databases can be found at <http://www.injurycontrol.com>, including searchable mortality, hospitalization, and ED data systems, as well as mapping resources. Topic-specific links include transportation, occupational, crime, demographic, and administrative databases.

References

1. Holder Y, Peden M, Krug E: Injury Surveillance Guidelines. Geneva, Switzerland, World Health Organization, 2001.
2. Institute of Medicine: Reducing the Burden of Injury. Washington, DC, National Academy Press, 1999.
3. Christoffel T, Gallagher SS: Injury Prevention and Public Health: Practical Knowledge, Skills, and Strategies. Gaithersburg, MD, Aspen, 1999.
4. Laflamme L, Svanstrom L, Schelp L: Safety Promotion Research. Stockholm, Sweden, National Institute of Public Health, 1999.
5. Robertson LS: Injury Epidemiology: Research and Control Strategies. New York, NY, Oxford University Press, 1998.
6. Garrison HG, Runyan CW, Tintinalli JE: Emergency department surveillance: An examination of issues and a proposal for a national strategy. *Ann Emerg Med* 4:849-856, 1994.
7. Centers for Disease Control and Prevention: Recommended framework for presenting injury mortality data. *MMWR Morb Mortal Wkly Rep* 46:1-33, 1997.
8. Rivara RP, Koepsell PCTD, Grossman DC: Injury Control: A Guide to Research and Program Evaluation. New York, NY, Cambridge University Press, 2001.
9. Mackenzie SG, Pless IB: CHIRPP: Canada's principal injury surveillance program. Canadian Hospitals Injury Reporting and Prevention Program. *Inj Prevent* 5:208-213, 1999.
10. Klauke D, Buehler J, Thacker S: Guidelines for evaluating surveillance systems. *MMWR Morb Mortal Wkly Rep* 37:51-55, 1988.
11. Annett JL, Conn JM, James SP: Inventory of Federal Data Systems in the United States for Injury Surveillance, Research and Prevention Activities. Atlanta, GA, National Center for Injury Prevention and Control, 1996.
12. Quinlan K, Thompson M, Annett J: Expanding the National Electronic Injury Surveillance System to monitor all nonfatal injuries treated in US hospital EDs. *Ann Emerg Med* 34:637-645, 1999.
13. Burt C, Overpeck M: Emergency visits for sports-related injuries. *Ann Emerg Med* 37:301-308, 2001.
14. Powell EC, Tanz RR: Adjusting our view of injury risk: The burden of nonfatal injuries in infancy. *Pediatrics* 110:792-796, 2002.
15. Hirshon JM: The rationale for developing public health surveillance systems based on emergency department data. *Acad Emerg Med* 7:1428-1432, 2000.
16. American Academy of Pediatrics Committee on Injury and Poison Prevention: The Hospital Record of the injured child and the need for external cause-of-injury codes. *Pediatrics* 103:524-526, 1999.