Core Components of a State Injury Prevention Program

A second reason for focusing on these five core components is that they evolved during several years of experience with STIPDA's State Technical Assessment Team (STAT) process. STAT brings together a team of injury prevention professionals who provide a point-in-time assessment of the capacity and status of a state injury prevention program, and detailed recommendations for improvement. The assessment focuses on the five core components presented in this document. As state injury programs have matured, the STAT review process has helped state injury prevention program staff share their successes, and in turn, translate trial-and-error experiences into specific program components, standards, and indicators that can benefit many programs at once.

Third, each of the core components includes collaboration and coordination. Since injury has many different causes and multi-faceted solutions, collaboration and coordination are essential to every aspect of an injury prevention program.

These core components, as a group, represent what is currently known and understood about creating and sustaining effective state injury prevention programs.

It is also important to note that the core components work together to create effective state injury prevention programs. Each piece is critical; when all five components are in place and functioning well, the state injury prevention program is most likely to fulfill its potential to reduce injuries.

To show how the core components work together, the following sections highlight how each component contributed to one example of a successful, real-word injury prevention program in action: promoting smoke alarm use to prevent fire- and smoke-related injuries.

This symbol shows examples of the core components and how they worked together in a real-world example.
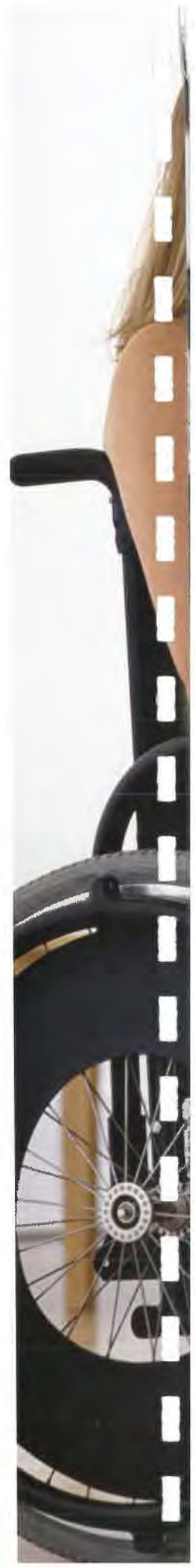
Collecting and Analyzing Injury Data

The first step in tackling any health problem is to investigate it, and injury is no exception. Answers to questions like "How serious is the problem?" "Who has the problem?" and "What are the circumstances under which it occurs?" help determine the answers to other important questions, such as "What causes it?" and "What can we do about it?"

Like the rest of the public health field, injury prevention programs need accurate, consistent data to track both old and new health problems. For example, without injury surveillance,[3] we wouldn't know the following facts:

◇ Drowning is the second leading cause of injury-related death for children (1-14 years of age), accounting for 940 deaths in 1998. In 1998, males comprised 81% of people who drowned in the United States.[4]

◇ Youth suicide rates have tripled since the 1950s, making suicide the third leading cause of death among youth 15-24 years of age.[5]

◇ In 1996, husbands, ex-husbands, or boyfriends perpetrated 30% of all female murders. Three percent of all male murder victims were killed by wives, ex-wives, or girlfriends.[6]

◇ In 1997, an estimated 567,000 Americans sustained a bicycle-related injury that required emergency department care. Approximately two-thirds of these cyclists were children or adolescents.[7]

◇ 9,600 people over the age of 65 died from fall-related injuries in 1998, making falls the leading cause of injury-related death among this age group.[8]

◇ Of the 42,556 traffic fatalities in 2001, 41% (or 17,448) were alcohol-related. In fact, 35% of all traffic fatalities during 2001 occurred in crashes in which at least one driver or nonoccupant – such as a pedestrian or bicyclist – had an elevated blood alcohol concentration of 0.08 grams per deciliter (g/dl) or greater.[9]

---

[3] The term surveillance is used to describe systems that are designed to collect different types of public health data. Injury surveillance is the ongoing capacity for tracking and monitoring the incidence, causes, and circumstances of fatal and nonfatal injuries and the timely dissemination of this information to those who need to know for the planning and the implementation of measures to control, reduce, or eliminate injuries and to improve health outcomes. Epidemiology is the science of analyzing these data and drawing conclusions about what they mean.

[4] National Center for Health Statistics (NCHS). National Mortality Data, 1998. Hyattsville (MD): NCHS 2000.

[5] Centers for Disease Control and Prevention (CDC). *Injury Fact Book 2001-2002.*

[6] Gazmararian JA, Lazorick S, Spitz AM, et al. Prevalence of violence against pregnant women. *JAMA* 1996;275:1915-1920.

[7] U.S. Consumer Product Safety Commission. National Electronic Injury Surveillance System (NEISS). Washington, DC: Consumer Product Safety Commission; 1997.

[8] Hoyert DL, Kochanek KD, Murphy SL. *Deaths: Final Data for 1997.* National Vital Statistics Reports; vol. 47 no. 19. Hyattsville, Maryland: National Center for Health Statistics, 1999.

[9] National Highway Traffic Safety Administration (NHTSA). *Traffic Safety Facts 2001: Alcohol.* Washington, DC: NHTSA; 2002.
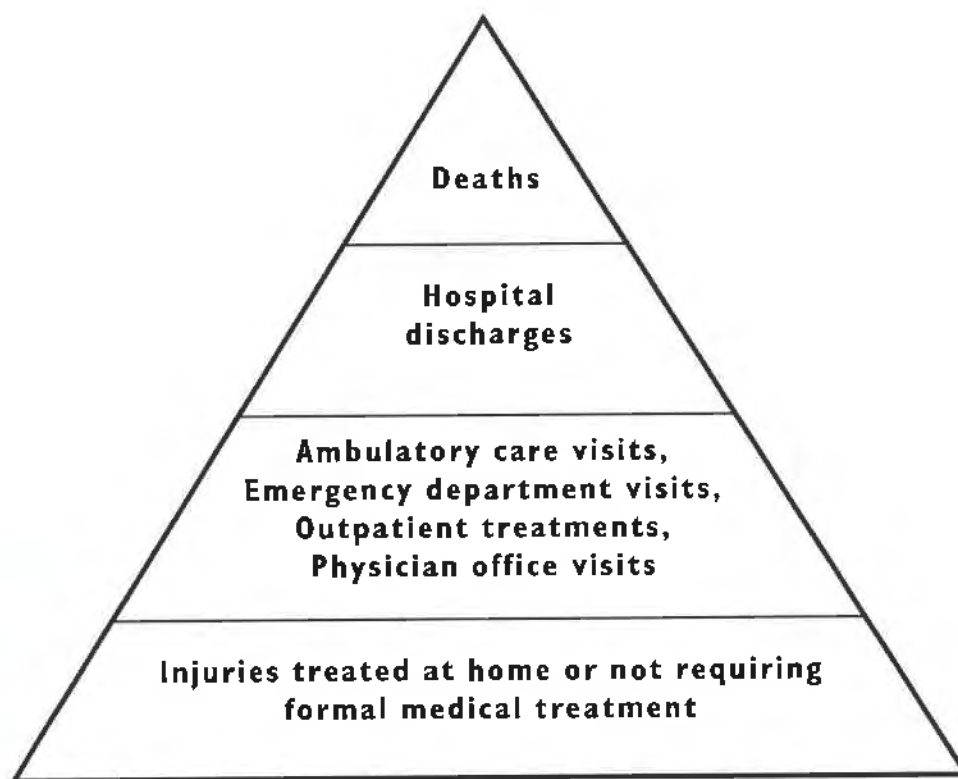
Sources of Injury Data

Injury covers a wide range of events and settings – including (but not limited to) car crashes, drownings, falls, fires, homicides, and suicides. Some of these lead to deaths and serious injuries, while others go untreated and/or unreported, as depicted in the injury pyramid (Figure 3).

Figure 3 shows that even though injuries are a significant cause of death, deaths are truly the proverbial "tip of the iceberg." Nonfatal hospitalizations, emergency room visits, doctor's office visits, and unreported injuries far outnumber fatal injuries. These nonfatal injuries, in turn, cause both temporary and permanent disability.

Figure 3: The Injury Pyramid

Deaths

Hospital discharges

Ambulatory care visits, Emergency department visits, Outpatient treatments, Physician office visits

Injuries treated at home or not requiring formal medical treatment

Collecting and Analyzing Injury Data

The wide range of circumstances under which injuries occur means that there are many different types of injuries, risk factors and degrees of severity. Consequently, there are many possible ways to collect information about each injury – from hospital emergency departments, vital records (death statistics), hospital discharge, crime reports, and special systems, such as spinal cord and traumatic brain injury registries.

Some injury data systems involve counting actual events (deaths, nonfatal injuries), or aspects of the injury (causes, location, severity). Other data collection efforts seek information on what factors might put someone at risk for an injury.

At the level of individual behavior, these "risk factors" might include whether or not someone wears a safety belt, uses child safety seats or booster seats for young children, wears a helmet and other protective gear, abuses alcohol or drugs, expresses suicide ideation, is a member of a gang, or has a history of juvenile justice involvement.

Individual behaviors, of course, are influenced by broader social norms as well as the environment – including regulations and their enforcement. This means that another set of risk factors could include attributes of one's immediate environment (such as a safe neighborhood) or state policies and laws (such as approaches to intervening in intimate partner violence).

Another informative type of data comes from qualitative research, including focus groups and interviews that help researchers understand causal factors and possible interventions.

The bottom line is that no single data source can do it all. This means that states – like their counterparts at the local and federal levels – must collaborate closely with others and share information. To make this complex task easier and more consistent across the country, STIPDA convened a workgroup of state, federal, and academic injury prevention partners in 1998 to identify 11 core data sets and 14 injury conditions that should be analyzed. (These are described in detail in *Consensus Recommendations for Injury Surveillance in State Health Departments*[10] and are summarized in Table 2.) The Injury Surveillance Working Group also identified consistent ways for states to count and report injuries so that multiple data systems could be integrated and the data would be more useful to different state, local, and federal audiences.

Table 2. Sources of Quantitative Injury Data

❱ Vital records; death certificates
❱ Medical examiner/coroner systems
❱ Fatality Analysis Reporting System (FARS)
❱ Child death review data
❱ Hospital discharge data
❱ Emergency department data
❱ Emergency medical services (EMS) data
❱ Uniform Crime Reporting (UCR) System
❱ National Occupant Protection Use Survey (NOPUS)
❱ Behavioral Risk Factor Surveillance System (BRFSS)
❱ Youth Risk Behavior Surveillance System (YRBSS)

Source: State and Territorial Injury Prevention Directors Association.

Ideally, injury data should:

✧ Be defined and collected in consistent ways, so trends can be monitored over time and compared across time and place. Routine evaluations of data quality can help programs improve not only their own systems but also their contributions to larger national efforts.

✧ Capture information about entire populations, where feasible. (Alternatives to population-based data collection include risk factor surveys, sample studies, community or hospital data, or other more specific assessments.)

✧ Protect confidentiality, especially because many injury data systems and policies require sharing information with partners in multiple organizations and across levels of government.

---

[10] Planning Comprehensive Injury Surveillance in State Health Departments Working Group. *Consensus Recommendations for Injury Surveillance in State Health Departments.* Marietta (GA): State and Territorial Injury Prevention Directors Association; 1999.

Collecting and Analyzing Injury Data

Putting Injury Data to Use

Injury data, like other types of surveillance data, have many uses. Sometimes, these data confirm what we suspect – for example, that alcohol plays a role in many types of fatal and nonfatal injuries,[11] or that motor vehicle crashes are more common and severe among the youngest and oldest drivers.[12, 13]

In other situations, injury data tell us something new and important that we would not have discovered otherwise – for example, that suicide is the third leading cause of death among American young people 15-24 years of age. Another example is a recent analysis of data from the National Electronic Injury Surveillance System All Injury Program (NEISS-AIP), operated by the U.S. Consumer Product Safety Commission, which found that as many as 4.3 million sports- and recreation-related injuries are treated each year in U.S. emergency departments – accounting for more emergency department visits than injuries among occupants of motor vehicles. The authors note that although sports and recreational activities generally confer the many health benefits of physical activity, these results suggest that a combination of protective gear, better conditioning, and safer environments for sports and recreation could help reduce these types of injuries.[14]

Often, data spark a new line of inquiry as researchers and policy makers seek more information and solutions. For example, in 1995, a special analysis of data collected through NEISS examined BB and pellet gunshot wounds among children treated in hospital emergency departments. The study identified a group at highest risk (boys 10-14 years of age), the most common type of injury (nearly a third were of the eye, face, head, and neck), and circumstances when injuries were most likely to occur (unsupervised playing in or around the boys' homes).

---

[11] National Highway Traffic Safety Administration (NHTSA), op cit.

[12] Insurance Institute for Highway Safety. 1998 Fatality Facts: Teenagers. Arlington, VA. Sept. 1999. [Online at: www.iihs.org/safety_facts/fatality_facts/]

[13] Stevens JA, Hasbrouck L, Durant TM, Dellinger AM, Batabyal PK, Crosby AE, Valluru BR, Kresnow M, Guerrero JL. *Surveillance for Injuries and Violence Among Older Adults.* In: CDC Surveillance Summaries, December 17, 1999. *MMWR* 1999;48(No. SS-8):27-50.

[14] CDC. Nonfatal Sports- and Recreation-Related Injuries Treated in Emergency Departments--United States, July 2000-June 2001. *MMWR* 2002; 51: 736-40.

STIPDA

"Unintentional BB and pellet gun-related injuries that occur during unsupervised activities are preventable," the researchers concluded, suggesting parental supervision, education, protective eyewear, and locked storage of unloaded weapons.[15]

States are important providers *and* consumers of public health data. State health departmenrs collect information on injury and disease-related deaths from county health departments or local jurisdictions, clinics, and hospitals, and share this information with national agencies like the Centers for Disease Control and Prevenrion (CDC). For example, three states recently completed a pilot program to test the feasibility of incorporating data elements related to intimate partner violence into existing injury surveillance activities. When every state provides similar data in the same format, we can see a national portrait of injury and disease trends as well as the situation in individual states aud counties.

States and counties also use injury data to understand local trends, assess injury prevention needs at the community level, select proveu or promising interventions, and measure whether or not the interventions are effective. An important use of surveillance data is identifying groups at high risk – such as those at risk for home-fire fatalities in low-income neighborhoods, or elevated suicide rates among Native American youth.[16] These data can guide professionals in state injury prevention programs as they select proven or promising prevention strategies to target the groups that need them the most.

The Data Picture: Who Has the Problem, and Why?

In 1987, the Oklahoma State Department of Health launched surveillance of burn injuries by making burn injuries that resulted in hospitalization or death a reportable condition. After collecting and analyzing data from September 1987 through April 1990, the state was able to identify an area in south central Oklahoma City with the highest rate of residential fire injuries – 4.2 times higher than in the rest of Oklahoma City. Analysis of residential fire deaths and injuries also revealed a different pattern in the target area than in the rest of the city, with 47% of the fires caused by children playing with fire (compared to 8% in the rest of the city.) A survey by uniformed firefighters (of a sample of 1,615 homes in the target area, or 5%) revealed that 34% of the homes in the target area did not have smoke alarms.

---

[15] CDC. BB and Pellet Gun-Related Injuries – United States, June 1992-May 1994. *MMWR* 1995; 44: 909-13.

[16] Wallace LJD, Calhoun AD, Powell KE, O'Neil J, James, SP. Homicide and Suicide among Native Americans, 1979-1992. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 1996. Violence Surveillance Summary Series, No. 2.

Designing, Implementing, and Evaluating Interventions

Using data to discover a new or emerging problem is part of the public health response. Ultimately, the data must lead to action – to programs, policies, environmental change, and information that can prevent injuries before they occur.

Deciding which actions to take is a complex and critical task for state injury prevention programs. Factors including timing, acceptability, and political climate must be taken into consideration. Ideally, selected interventions should be based on evidence-based research that they work. Interventions must not only be well-designed and implemented, but also assessed prior to their implementation to determine whether they are applicable and meet the needs of the targeted community. This applied research also needs to be evaluated.

Designing and Implementing Interventions

Many factors affect a program's choice of interventions. The public health model suggests several criteria to consider:

◇ Whether an effective, **evidence-based** intervention is available. For example, researchers have tested the intervention in other places.

◇ Its effect on the **burden of injury.** If an intervention reduces the most severe and costly injuries – such as traumatic brain and spinal cord injuries – this might serve as a rationale for choosing it. On the other hand, some interventions affect more common and perhaps less severe injuries such as back injuries; these, too, would be worthwhile in many situations.

◇ The specific **population(s)** affected and/or at risk. Does the intervention prevent injuries among children or the elderly? Does it help reduce the disparities in health status that exist in our country, e.g., between white and minority populations, urban and rural, recent immigrant and more assimilated populations?

In some cases, the causes of injury may include the so-called "root causes" – that is, not just the immediate failure to wear a helmet or seat belt, but more fundamental risks like living in sub-standard housing or working in dangerous factories or industries. While these contributing factors can seem overwhelming to programs already facing resource constraints, they do offer opportunities to work with non-traditional partners, such as advocates of "smart growth"[17] and livable communities.

---

[17] Smart growth is defined by the American Planning Association as "the planning, design, and development of communities to promote a sense of place, the preservation of natural and cultural resources, and the equitable distribution of the costs and benefits of development. Smart growth enhances ecological integrity over the short and long term and improves quality of life by expanding the range of transportation, employment and housing choices in the region in a fiscally responsible manner."

Designing, Implementing, and Evaluating Interventions

It is also important for interventions (either individually or as a group) to blend different types of strategies – such as *educational* interventions that teach people how to cross streets safely, *environmental* interventions that improve the visibility at dangerous intersections, or *enactment and enforcement* of laws and ordinances (such as those that designate special school-zone crossings). Often, these strategies work together to motivate people to change behavior in different but complementary ways, supporting safer behaviors at many levels.

Although many injury trends rise and fall in tandem across the country, others are unique to certain areas or populations. As a result, each state and local community brings other factors to the complex task of choosing appropriate injury prevention interventions. These include:

✧ The availability of resources – not only to cover the initial costs of an intervention, but also to sustain and evaluate it over time to determine the difference it makes.

✧ Local interest and support, including political readiness and timing (e.g., a recent injury that raised community interest and desire to make a change), community input into intervention design and selection (e.g., from a needs assessment process) and whether or not interventions are culturally appropriate.

Designing and Implementing an Intervention: The Lifesavers Program

The absence of a functional smoke alarm is a major risk factor for residential fire fatalities. In 1990, at the time the Oklahoma City intervention was implemented, approximately 80% of residential fire deaths occurred in homes without working smoke alarms. Homes at the highest risk of fire and fire-related death and injuries are those least likely to have smoke alarms – homes in poorer neighborhoods. This was the case in Oklahoma City's target area, where median household income, property values, and housing quality were all below averages for the rest of the city.

To get smoke alarms into the Oklahoma City homes that lacked them, the team devised a giveaway and educational program for residents in the target area. The program, called the Lifesavers Residential Fire Injury Prevention Program, began with a test of four different distribution strategies: door-to-door canvassing, in which a fire truck drove slowly down the street announcing the availability of free smoke alarms, and three different distributions of flyers alerting residents to the availability of free smoke alarms and educating them about fire risks. The three flyer distribution methods were in public places only, by mail, and by leaving them in residents' doorways.

Designing, Implementing, and Evaluating Interventions

Collaborating with Partners

Just as collecting injury data relies on the cooperation of many different organizations, so does the process of designing, implementing, and evaluating interventions. Collaboration helps integrate injury prevention into the work of other departments and organizations and helps ensure that scarce resources are used wisely.

Injury prevention programs may be located in a variety of areas or sections within a state department of health, but having an injury prevention program designated as the lead for injury prevention issues is crucial. That lead injury prevention program must collaborate with the other offices or areas that have a stake in injury prevention, because no one program or agency will have enough resources and expertise to adequately prevent injuries by itself.

Potential partners include:

✧ Offices within the state health department, such as Maternal and Child Health, Occupational Health, Epidemiology, and Emergency Medical Systems

✧ Other state agencies (e.g. Justice, Law Enforcement, Education, and Transportation)

✧ Advocacy groups

✧ Hospitals

✧ Professional groups (e.g. EMS providers, emergency department nurses and physicians, and police officers)

✧ County health departments or local jurisdictions

✧ Community-based and statewide organizations

✧ Federal agencies and national organizations

✧ Coalitions representing different groups with common purpose

Lifesaving Partnerships

The Oklahoma City Lifesavers Program was the result of a partnership among a number of community agencies and volunteers, including the state and local health departments, the local chapter of the American Red Cross, and the Oklahoma City Fire Department.

The relationship between state injury prevention programs and their local counterparts at the county or local jurisdictions are particularly critical, as most interventions are implemeuted at the local level. Because their success depends on local participation, state injury prevention programs should specify local program roles in state injury prevention plans and have procedures in place for supporting and monitoring local intervenrions.

Evaluating Interventions

In theory, many interventions sound promising. However, between the drawing board and the more complex environment of practical application, much can happen. Evaluation – built in from the very beginning of every intervenrion – helps us understand how and why an intervention worked, or why it did not. For this reason, interventions that may initially seem like failures are not a waste, for rhey help researchers and injury prevention program staff to adjust interventions so that they will have greater chances of success in the future. As discussed below, evaluations are important at every stage of intervention design and implementation.

Evaluation is a skill. Because it is a constant need in any type of ptogram implementation, it is useful to cultivate this skill by building in-house capacity within state injury programs, or at least within the health department overall. However, if evaluation expertise is not available within a program, local evaluation consultants – based in universities, resource centers, or other settings – can help. Regardless of the source – within the program or not – every intervention deserves a solid evaluation design and resources to make sure the evaluation is conducted before, during, and after implementation.

Designing, Implementing, and Evaluating Interventions

Several different types of evaluation can tell program staff, funders, and policy makers what they need to know at different stages of implementation.

◇ **Formative** evaluations are typically used in the early developmental stages to give feedback – for example, during a pilot program, before broader implementation, so that programs can be improved as they are being developed.

◇ **Process** evaluations answer the questions, "What was done?" and "To whom, and how?" Process evaluations describe what happened and offer information such as the number of people served in different settings. These are particularly important for tracking variations or adaptations in different places or circumstances, so that program designers can learn whether these variations affected the program's goals or outcomes.

◇ **Impact** or **outcome** evaluations are the most ambitious because they ask, "So what?" and "What difference did the program make?" Sometimes, these changes are difficult to detect because they occur over long periods of time. In other cases, it is difficult to attribute an effect to a specific intervention alone, because other factors may have influenced behavior. (For example, media coverage of a snowboarding death may stimulate helmet use among teenagers, at least for a short time.)

All three types of evaluation yield insights for state injury prevention program staff and for those who turn to them for guidance and data. Evaluations of state and local programs contribute not only to knowledge about programs within the state, but also to national databases of what works that can be used or adapted by others.

Evaluating an Intervention: What Happened?

The Oklahoma City Lifesavers Program conducted all three types of evaluations. The team was able to choose a canvassing method as the most effective means of reaching the target population after conducting a formative evaluation comparing different methods. In addition, a process evaluation showed that the canvassing method was by far the most effective, reaching more homes in need of a smoke alarm than the other three methods combined. As a result, the team decided to canvass the entire target area, with a total of 10,100 smoke alarms distributed to 9,291 homes – reaching at least 80% of the homes in need of a smoke alarm.

The team also conducted two other types of evaluations: an impact evaluation at three intervals during the four years following the intervention to see whether the alarms were installed and maintained (half still were, four years later) and an outcome evaluation to see whether the intervention had affected residential fire injuries and deaths. Indeed, fire-related injury rates decreased 81% in the target population, but only 7% in the rest of Oklahoma City during the same period. During the six years of the program, at least 60 fire-related deaths and injuries were prevented in the target area.

Building a Solid Infrastructure for Injury Prevention

Just as traditional "bricks-and-mortar" infrastructure supports roads and bridges, state injury prevention programs rely on a strong foundation of core capacity, leadership, and coordination. A state injury prevention program with a solid infrastructure and core funding provides focus and direction for the many aspects of an effective program, and makes the best use of the limited resources currently available.

Many state and local injury prevention programs have accomplished a great deal with just a few dedicated individuals – and often a sole individual – passionately targeting a particular injury issue. These efforts are inspiring and can be effective, but in order to address the many causes of injury in a systematic way – and to coordinate efforts with the multiple partners involved in these efforts – a strong program infrastructure is needed. Injury prevention is an extraordinarily diverse, multi-disciplinary field, affecting all walks of life, many different professions, and almost any setting in which people live, work, or play. Coordinating these disparate agendas and finding common ground among different individuals and organizations are tasks best accomplished by a strong, stable, and comprehensive program.

A solid infrastructure benefits the state by helping to reduce the burden of injury, and also by supporting national efforts. A consistent injury prevention capacity across many states is an advantage for both state and national initiatives. Strong state programs can participate in national surveillance systems and pursue the nuances of injury problems, or hidden pockets of injury among hard-to-reach populations. These programs have more potential to implement and evaluate what has worked elsewhere – and to offer their own innovations to others, serving as a model for other states.

Building a Solid Infrastructure for Injury Prevention

Three distinct but complementary aspects of a state injury prevention program's infrastructure are:

✧ **Organizational strength.** This means that the program takes a leadership role in understanding and responding to the state's burden of injury, using national guidelines and standards and customizing approaches as needed to local issues. The state injury prevention program should develop an injury prevention plan with specific objectives, which can serve as the basis for meaningful collaboration with other state agencies, organizations across the state, local programs, and national initiatives.

✧ **Staffing.** Key positions – in leadership, data collection and analysis, program development, evaluation, and education – should be permanent positions. Soft funding or time limited funding causes problems of staff turnover. Staff should be trained and diverse, and, whenever possible, dedicated exclusively to their injury prevention responsibilities.

✧ **Funding.** Some state injury prevention programs already have crafted innovative funding strategies, such as redirecting fines (from safety belt or drunk driving violations) to injury prevention programs. Federal funds and these creative solutions, however, are no substitute for sustained, stable funding that comes from inclusion as a line item in state budgets. Without stable funding, it is difficult to plan for the future, sustain current programs, and recruit and sustain talented staff needed to fulfill the injury prevention potential that exists in every state. As part of their efforts to collaborate with others, state injury prevention program staff should participate in the funding and priority setting processes of other groups who share injury prevention goals.

A Strong Infrastructure Yields Results

The Oklahoma City Lifesavers Program would probably never have left the drawing board without a strong state injury prevention program supporting it. As the lead agency, the state health agency's injury prevention program led the effort to make burn and smoke inhalation injuries that result in hospitalization or death be reportable conditions. This, in turn, yielded the data that allowed epidemiologists to pinpoint the geographic area of Oklahoma City – south central Oklahoma City – with the greatest burden of residential fire injuries and deaths. Through a CDC research grant, experienced program staff designed, implemented, and evaluated an effective intervention, working closely and productively with partners in a wide-ranging coalition. Finally, the staff secured and maintained funding from a variety of state and federal sources to keep the intervention – and several years of evaluation – on target.

Providing Technical Support and Training

Trained and high-caliber staff are a key element of a state injury prevention program, contributing to the success of interventions as well as the progtam's overall strength and longevity. Since injury prevention is still a relatively new field, training is one way to enlarge the pool of skilled, competent staff. In turn, those who already have received training specific to the field can help meet the ongoing demand for technical assistance and support from colleagues at both state and local levels.

Within state injury prevention programs, staff need specific skill training in addition to the on-the-job training that is part of any profession. This includes skills in:

◇ Collecting, analyzing, and disseminating data from surveillance systems

◇ Using data to select appropriate proven or promising strategies for preventing specific injuries

◇ Evaluating programs and interventions over time

◇ Affecting public policy

◇ Providing training

◇ Providing leadership

◇ Planning strategically, and

◇ Building and sustaining coalitions and meaningful partnerships

Providing Technical Support and Training

In addition to building these capabilities within a program, state injury prevention staff often provide training to other state and local professionals, such as those in collaborating agencies (e.g. local health departments, EMS providers, hospitals, coalitions, highway safety, education), local professionals who deal with injury risk factors and consequences in their own work (e.g., emergency medical technicians, police, nurses, counselors, fire fighters, and school staff), and the general public.

In some cases, state injury prevention program staff act as consultants to others, providing technical assistance and support to collect or analyze data, or to design and evaluate programs.

Whether knowledge and skills are transferred through formal or informal training, or through specific technical assistance efforts, they help build capacity for injury prevention and draw talented professionals to this important and growing field.

Transferring Knowledge and Skills

Many different skills and talents contributed to making Oklahoma's Lifesavers Program a success: collecting and analyzing data, devising and evaluating strategies, working with coalition members to implement the most promising strategy and maintain momentum for many years, and evaluating the program at different junctures. At each step, these skills were not only used but shared with others who gained experience in each component of designing and implementing a successful injury prevention program. Presentations were made at national and international meetings and published in professional journals.

Affecting Public Policy

When an action affects many people at once by changing a standard procedure or way of operating, it moves into the realm of public policy. Policy can include legislation, regulation, guidelines, ordinances, and/or rules (established by governmental or non-governmental organizations). The role of the public health department is to protect and improve the public's health.

State injury prevention programs rely on many tools to reduce the burden of injury in each state and across the country, but policy changes – such as safety belt laws – are among the most powerful in terms of their impact. Once the scientific evidence suggests a course of action, it is much more efficient to mandate change across the board than to try to persuade people, one at a time, to change their behavior. Policy changes are a tremendously useful tool, but they are not to be used lightly. Typically, they represent the culmination of a long process of building a scientific evidence base, working with coalitions of stakeholders to determine the best policy solution to an injury problem, and convincing advocates and policy makers that the policy solution is appropriate and will save lives or reduce injuries.

Behaviors that place people at risk for injury are the result of complex and shifting mixes of personal values and beliefs, perceptions (or misperceptions) of risk, and reactions to rules and their enforcement. Even temporary influences like fatigue, alcohol, or anger can affect risk and behavior.

When injury prevention professionals consider the options for reducing the burden of injury, they have several from which to choose. First, they can try to persuade people to reduce their risk – by wearing helmets, buckling up, choosing a designated driver, and so on. For many segments of the population, this works some or most of the time. For others, a reminder can reinforce good intentions – such as a safety belt that deploys automatically when the driver or passenger is seated, or child safety seats or helmets distributed through a community program. In other cases, where people either absent-mindedly or willfully resist these measures, a stronger prompt may be needed, such as a safety belt law and, of course, its enforcement.

Affecting Public Policy

It should be noted that not all policy changes are punitive (like fines and license revocation), although these are indeed effective. In fact, many policy changes aim to create positive incentives for injury-reducing actions – such as insurance company rebates for schools with upgraded, safer playgrounds or insurance discounts for smoke alarms, fire sprinklers, and safe driving records.

Likewise, not all policies and regulations aim to change behavior with either carrots or sticks. Some aim to build in safer practices, making injury prevention automatic. For example, laws that set limits for the temperature of hot water can prevent scalding injuries regardless of how people behave or perceive their risk.

Most state injury prevention programs can affect public policy at three levels: the state government level, the local government level, and at the community level, often involving non-governmental organizations.

At the state government level, state injury prevention program staff can participare in several ways. For example, they can:

◇ Participate on boards and commissions

◇ Review or recommend proposed legislation

◇ Develop and/or provide oral or written testimony on issues relevant to injury prevention

◇ Propose legislation to be sponsored by the state's administration through the state health department's legislative process

◇ Provide information on the effectiveness of existing state policies (derived from state and/or national evaluations or literature reviews)

◇ Collaborate with groups representing diverse population segments within the state by providing information on the legislative process and state injury prevention priorities, or assisting with strategic planning and priority setting

◇ Offer findings from surveillance data to help identify priority injury problems within the state

◇ Track new initiatives or model legislation in other states that might be useful in their states

◇ Evaluate the effectiveness of policy changes

Policy Implications

The Oklahoma City Lifesavers Program and its evaluation showed that the problem of homes without smoke alarms can be addressed effectively with a strong, cost-effective intervention – one that saves lives as well as costs. Yet the distribution of smoke alarms to homes without them is only a piece of the solution. As the program's designers readily acknowledge, the distribution of smoke alarms should occur in tandem with other measures: education about fire prevention, legislation that requires smoke alarms in all existing residences (along with fire sprinkler installation where possible), enforcement of existing codes, and the development and distribution of new and improved smoke alarms – such as those with longer battery life and fewer nuisance alarms (e.g., from cooking-related smoke).

This portfolio of interventions offers the potential of eliminating house fire deaths, but requires actions beyond a community or even a health department. Quickly and inevitably, injury prevention enters the policy realm – where much more can be accomplished, on a far larger scale, than where the intervention began.

State injury prevention program staff can support similar efforts at the local level, depending on resource availability and levels of activity in different counties or communities. This may include providing or helping to develop information on effective local ordinances, providing information on state and national priorities, identifying model legislation or ordinances, and providing oral or written testimony upon request.

Not all policies are set by government. Nongovernmental organizations – insurance companies, chambers of commerce, professional associations, and others – also make decisions with positive effects in terms of injury prevention for their clients, constituents, or memberships. Often, the impact of nongovernmental policy changes is underestimated; nonprofit agencies and businesses can set internal policies that have significant external effects. For example, one of the benefits of business injury prevention policies can be to decrease absenteeism of workers if they practice injury prevention at home and work. Collaboration with these groups is important for influencing behavior change and advocating for programs and policies.

No matter how they are measured – in terms of deaths, temporary and permanent disability, years of life lost, or health care costs – injuries take a tremendous toll in our society. Each injury-related death and disability is even more tragic because so many are preventable with tools we have already. Unlike other fields that await new scientific and technical breakthroughs, injury prevention has proven strategies ready to be applied.

Why have we not reaped the potential of injury prevention tools and techniques? In part, it is a problem of lack of awareness. Despite the efforts of local, state, and national injury prevention groups, many people still do not appreciate how many actions they can take to prevent injury.

But lack of awareness is not the only explanation. At the state and local levels in particular, the potential of injury prevention is hampered by a lack of resources. As this document shows, state injury prevention programs – and their partners – can make significant contributions at every point on the injury prevention continuum. They can collect and interpret data, promote proven methods of injury prevention, develop effective community programs, train and educate people, and design legislation that supports both individual and community injury prevention. Unfortunately, state and local injury prevention programs often lack the resources and basic infrastructure to make these contributions.

Injury prevention programs cannot accomplish their tasks alone. To help your state's injury prevention program, the State and Territorial Injury Prevention Directors Association (STIPDA) invites you to join us in our efforts to prevent injuries across the country. For starters, contact your state injury prevention director to learn more about injury prevention in your state. (A complete list of state injury prevention directors is available through STIPDA's web site: www.stipda.org.)

Conclusion

Other actions include:

◇ Join a local injury prevention coalition that is tackling an issue important to you and your family, such as bicycle safety (If a local coalition does not exist, consider starting one!)

◇ Share this document and discuss it with others

◇ Find out more about injury statistics in your state and community

◇ Support efforts to strengthen your state's injury prevention infrastructure: organization, staffing, and funding

◇ Participate in training for injury prevention and promote safety at your workplace or volunteer organization and at home

◇ Invite state injury prevention professionals to speak to groups of which you are a member to share information on how to prevent injuries and violence

Regardless of the specific actions you may take in the future, the members of STIPDA hope that this document has helped you learn about the impact of injury in our country and – more importantly – about the many ways state injury prevention programs help each of us prevent injuries in our own homes and communities.

MEMBERS OF THE *SAFE STATES* WORKGROUP

Trisha Keller, Chair
Violence and Injury Prevention Program
Utah Department of Health

Victoria Vespe Ozonoff
Injury Surveillance Program
Massachusetts Department of Public Health

Linda Scarpetta
Injury Prevention Section
Michigan Department of Community Health

Susan Gallagher
Children's Safety Network
Education Development Center

Christine Miara
Children's Safety Network
Education Development Center

John Horan
Centers for Disease Control and Prevention

Ellen Schmidt
Children's Safety Network
Education Development Center

Susan Hardman
Bureau of Injury Prevention
New York State Department of Health

Alex Kelter
Epidemiology and Prevention for Injury Control
Branch
California Department of Health Services

Sue Mallonee
Injury Prevention Service
Oklahoma State Department of Health

Xan Young
Children's Safety Network
Education Development Center

David Zane
Injury Epidemiology and Surveillance Program
Texas Department of Health

Julie Sergeant
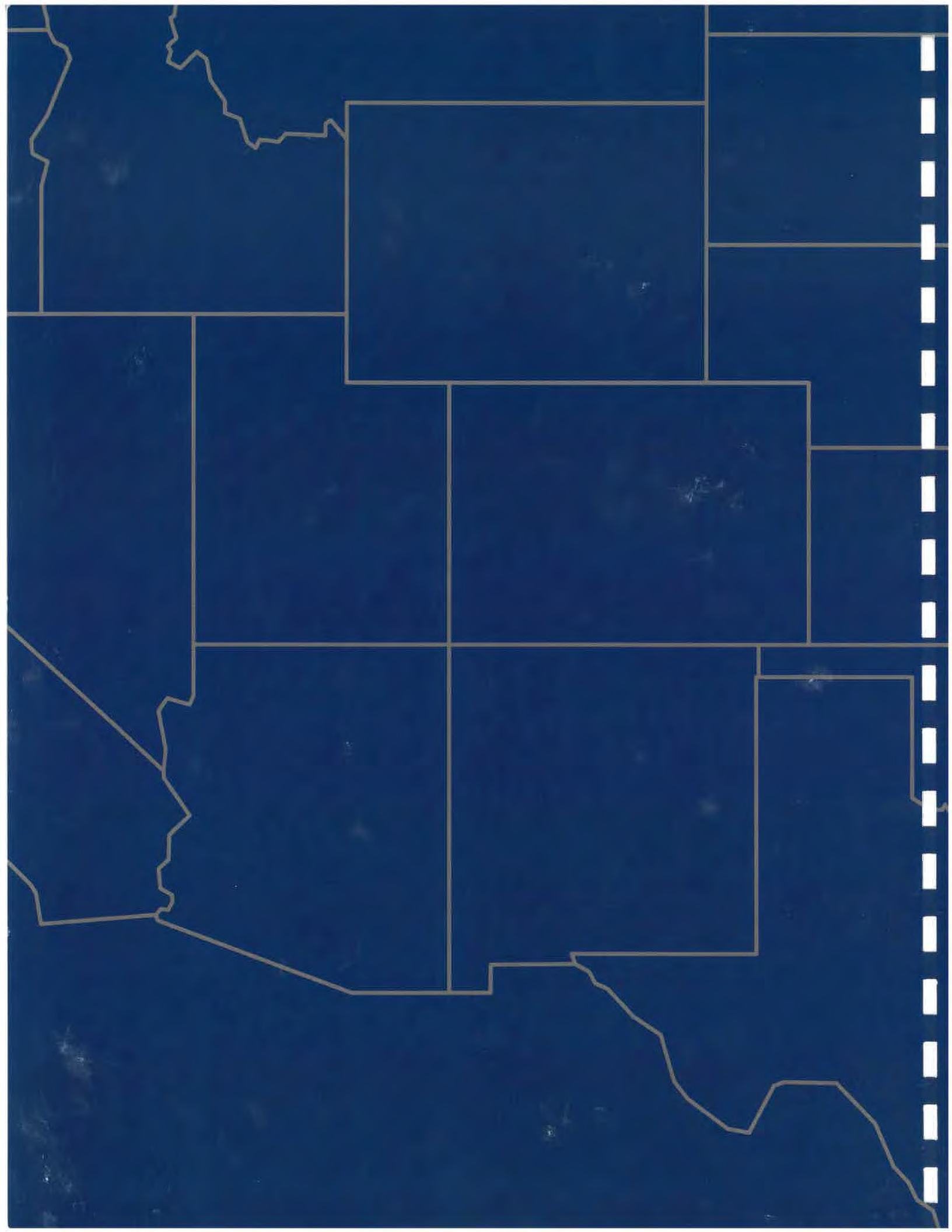Formerly with the Kansas Department of Health
and Environment

ACKNOWLEDGEMENTS

Evidence-Based Practices
in
Athletic Training and Primary Injury Prevention
SUGGESTED READING / REVIEW:

- **The Public Health Approach**, Adapted from Mercy, J.A., M.L. Rosenberg, K.E. Powell, C.V. Broome, and W.L. Roper. "Public Health Policy for Preventing Violence." *Health Affairs*, Winter 1993:7-29, and Jones, B.H., and J.J. Knapik. "Physical Training and Exercise-Related Injuries: Surveillance, Research and Injury Prevention in Miitary Populations." *Sports Medicine*, 27(2):111-125, 1999.

- **5 Components of a Model State Injury Prevention Program and 3 Phases of Program Development**, State & Territorial Injury Prevention Directors Association. 1997/2003.

- **Establishing Key Performance Measures, Benchmarks, and Best Practices.** Journal of Environmental Medicine, Goetzel, Ron, Guindon, Arlene, Turshen, I., Ozminkowski, R., Health and Productivity Management: 43(1), pp. 10 – 17, January 2001.

- **Epidemiology of Sports Injuries** by Dennis J. Caine, Caroline G. Caine, and Koenrad J. Lindner (Human Kinetics Publishers, Inc)

- **Injury Prevention and Public Health: Practical Knowledge, Skills, and Strategies** by Tom Christoffel, Susan Scavo Gallagher (Amazon.com) *Lead College Text*

- **Injury Epidemiology** by Leon Robertston (Oxford University Press) (Amazon.com)

- **Injury Control: Research and Program Evaluation** by Frederick P. Rivara (Amazon.com)

- **Injury Prevention: An International Perspective: Epidemiology, Surveillance, and Policy** by Peter Barrs (Amazon.com)

- **Reducing the Burden of Injury: Advancing Prevention and Treatment** by Richard J. Bonnie (Amazon .com)

- Emory University Course Syllabus / Injury Prevention and Control
http://www.sph.emory.edu/CIC/syllabus.html

- University of Pittsburgh Injury Epidemiology Lecture:
http://www.pitt.edu/AFShome/e/p/epi2670/public/html/lecture1/

- University of Alabama at Birmingham: ACL Injuries in Soccer Players (An evidence based approach) http://www.uab.edu/icrc/wilmcgriff.ppt Wil McGriff EPI 603

- Musculoskeletal Injury Prevention: United States Army Environmental Research Institute of Medicine: http://www.usariem.army.mil/mpd/muscskel.htm

- Naval Health Research Center: http://www.nhrc.navy.mil/
- Naval Health Research Center Labs: http://hq.nhrc.navy.mil/labs.html

Health and Productivity Management: Establishing Key Performance Measures, Benchmarks, and Best Practices

Ron Z. Goetzel, PhD
Arlene M. Guindon, MPH
I. Jeffrey Turshen, PhD
Ronald J. Ozminkowski, PhD

Major areas considered under the rubric of health and productivity management (HPM) in American business include absenteeism, employee turnover, and the use of medical, disability, and workers' compensation programs. Until recently, few normative data existed for most HPM areas. To meet the need for normative information in HPM, a series of Consortium Benchmarking Studies were conducted. In the most recent application of the study, 1998 HPM costs, incidence, duration, and other program data were collected from 43 employers on almost one million workers. The median HPM costs for these organizations were $9992 per employee, which were distributed among group health (47%), turnover (37%), unscheduled absence (8%), nonoccupational disability (5%), and workers' compensation programs (3%). Achieving "best-practice" levels of performance (operationally defined as the 25th percentile for program expenditures in each HPM area) would realize savings of $2562 per employee (a 26% reduction). The results indicate substantial opportunities for improvement through effective coordination and management of HPM programs. Examples of best-practice activities collated from on-site visits to "benchmark" organizations are also reviewed. (J Occup Environ Med. 2001;43:10–17)

The aggregate costs of providing health and productivity programs to workers have not been adequately assessed for American employers. Typically, employers examine their program costs one area at a time and are generally only able to report the organization's costs within any given benefit or program, such as group health, disability, or workers' compensation. Consequently, managers are generally unaware of the costs associated with other programs and are almost never able to estimate total health and related lost productivity costs for the organization.

Recently, several studies have emerged that highlight the relationship between employee health and well-being and consequent productivity gains or losses. For example, a study funded by the Health Enhancement Research Organization (HERO) showed that employees who are depressed and highly stressed cost employers significantly more in health care costs compared with those without these psychosocial risk factors.[1] Claxton et al[2] demonstrated that when workers are appropriately treated for depression, their rate of absenteeism drops. Cockburn et al[3] documented differences in workers' productive output when treated for allergies with different types of antihistamines. Burton et al[4] showed a direct relationship between modifiable health risk factors and work output for telephone call center operators at a bank. These and other studies have set a framework for future research that will more clearly

connect employee health, organizational performance, and work output (ie, productivity). Thus, there is a growing body of literature suggesting that worker health and productivity are related and that effective management of one will positively impact the other.

When considering productivity losses associated with health care, direct costs (eg, those associated with the provision of medical insurance benefits, disability payments, workers' compensation losses) most likely represent only a fraction of what employers spend to keep workers healthy and on the job.[5] We will show that when employers factor in indirect costs (such as those for replacement workers, overtime premiums, productivity losses related to unscheduled absences, and productivity losses of workers while on the job), the total health and productivity cost burden is increased significantly.

Recent labor shortages, attempts to consolidate corporate functions, and increased emphasis on expense management are some of the factors that have driven many organizations to organize diverse human resource and benefit functions in a more coordinated fashion. Many employers have introduced a new management approach that has been termed health and productivity management (HPM). HPM refers to the joint management of the many types of programs that employees may access when they are sick, injured, or balancing work/life issues. These include medical benefits, disability and workers' compensation programs, employee assistance programs (EAPs), paid sick leave, and occupational safety programs. HPM also refers to activities meant to enhance morale, reduce turnover, and increase on-the-job productivity.[6]

In this article, we describe the process for gathering key HPM measures from a diverse group of American employers who participated in our most recent benchmarking study. We detail how the data were collected, how the measures were developed, and

how "best-practice" targets were set. We also explain how quantitative data (from the survey phase of the study) were combined with qualitative information about HPM best practices (gathered through site visits at leading companies) to position the HPM model internally within organizations. The results reported suggest significant opportunities for other employers to better manage their health and productivity programs through collaborative efforts within their organizations. Just as important, the methods used to collect and evaluate HPM information presented within this report can be replicated at many other organizations, as a first step toward identifying opportunities for enhancing and coordinating the management of employee health and productivity.

Background

In the summer of 1996, representatives from a group of 17 Fortune 500 companies met in Chicago to discuss their individual and collective efforts in health and productivity management. The HPM benchmarking initiative grew out of an explicit need identified by this group of leading employers to identify comparative metrics and practices that would help them better understand the performance of their HPM programs. Subsequently, the first HPM Consortium Benchmarking Study was designed and implemented in April 1997.

The first study was a cooperative venture between The MEDSTAT Group (MEDSTAT) and The American Productivity & Quality Center (APQC). Most recently, the Institute for Health and Productivity Management was also included as a partner, as were three pharmaceutical companies, Pfizer, Pharmacia, and Schering-Plough. The HPM Consortium Benchmarking Study consisted of two phases.

Phase I: Quantitative Analysis

In this phase, a survey was administered to human resources or benefit staff at each participating organiza-

tion. The survey was designed to collect basic information about each organization's performance in the following HPM areas: health care benefits; EAPs; unscheduled absence; short- and long-term disability; workers' compensation; employee turnover; health, demand, and disease management programs; employee compensation; employee attitudes; and organizational productivity.

The focus of the survey was to gather specific performance data, including costs, incidence, and duration for each of these programs. Respondents supplied data about their actual experiences. Each participant's performance was then compared with norms and benchmarks that were internal (based on comparisons with other study participants) and external (obtained from public domain databases, reference documents, and other publications). Potential areas for improvement were identified, and dollar estimates of potential cost savings were calculated based on the difference between the organization's actual experience within each HPM area and the experience of organizations at the 25th percentile or better. The results of this study were reported to all participating organizations, individually and in aggregate, during a "knowledge transfer session" that culminated the study.

Phase II: Qualitative Analyses

This phase of the study focused on gathering qualitative information through site visits from organizations considered to use best practices in implementing HPM programs. Planning for site visits began with an organizing meeting in September 1997, at which the APQC/MEDSTAT study team and the participants agreed on the scope of the project. The study team developed specific discussion items to be addressed during site visits with best-practice organizations.

Planning for the September meeting began 1 month earlier with an

extensive review of secondary literature to identify organizations that have implemented innovative practices in HPM. The study team compiled the results of their investigations, which were used by participants to select best-practice organizations suitable for site visits.

The study team also developed a data collection tool and standard interview protocol to be used at site visits with innovative companies. The first set of visits was conducted in November and December 1977 and the second set during the same time period in 1998. The visits focused on three areas of inquiry: (1) factors that facilitated the implementation of an HPM agenda within an organization, (2) actual implementation processes, and (3) methods used to measure and evaluate program outcomes. Best-practice organizations selected for site visits in 1997 and 1998 were 3M Company, Applied Materials, Chevron Corporation, Coors Brewing Company, General Electric Company, Navistar International, Steelcase Inc, Texas Instruments Incorporated, and Union Pacific Railroad.

The overwhelming success of the earlier HPM benchmarking studies prompted MEDSTAT and APQC to improve and expand the study each year. In the third year of the study, the new study partners (Institute for Health and Productivity Management, Pfizer, Pharmacia, and Schering-Plough) became actively involved in the design and implementation of the project. After feedback from respondents, the quantitative survey was expanded to include new questions about related HPM program areas, including EAPs, on-site medical clinics, safety programs, disease management, clinical patterns, and work-life programs.

Described below are the methods used to develop key measures, the processes used to collect and compile data, and the results from the most recent study. For this application, 1998 data were collected and

analyzed. Results were reported to the 43 employer participants in March 2000. We supplemented the quantitative results with qualitative findings collected during site visits conducted with best-practice companies in 1998.

Study Objectives

The objectives of the HPM Consortium Benchmarking Study were to (1) provide sufficient quantitative information for an organization's management team to assess the relative magnitude of HPM expenditures across departments and functions within their organization; (2) compare program-specific results with norms and benchmarks so that opportunities for improvement could be quantified; (3) provide the foundation for building an internal business case for the HPM model and establishing broad priorities for key initiatives; and (4) serve as a catalyst for identifying information gaps that when filled, would allow organizations to better measure, monitor, and manage their HPM programs.

Data Source

A survey instrument was developed to collect key HPM metrics from participating organizations. The instrument was designed to capture basic core metrics so that results could be used to identify broad opportunities for action. Organizations were to provide data that would (or should) normally be available and accessible to top managers. The intent was to achieve the right balance of collecting enough meaningful information about each program while keeping the data collection requirements at a reasonable level. The survey instrument was designed for completion in no more than 2 days once it was distributed to the appropriate managers or departments within the organization.

For the 1999/2000 study, 1998 calendar year data were obtained for the active employee population. HPM areas queried included: group health; EAPs; non-occupational dis-

ability; workers' compensation; on-site medical clinics; safety; health promotion, demand management, disease management; work/life management; employee attitude; turnover; productivity; and medical/clinical of relevance to the organization. (An outline of the data elements collected, broad definitions for each data category, and a listing of possible data sources is available on request.)

Within each participating organization, a survey data coordinator was designated to collect and enter information about the organization's experience for each surveyed area. Data coordinators were encouraged to complete the survey using an Internet version of the instrument.

Once the data were submitted, they were subjected to validity checks and were then standardized across participants in the study. After this process was completed, each organization's data coordinator was sent a data quality report outlining questionable results found during the initial quality tests, and further clarification was requested.

A second series of tests focused on standardizing and displaying the calculated measures to be reported in the study. To standardize the database across participants, certain measures were created (eg, total group health plan payment per plan eligible employee, total turnover costs per active employee, EAP utilization rate, non-occupational disability days absent per eligible employee, workers' compensation incidence rate, and health promotion program utilization and costs per eligible employee). Each organization's metrics were then subjected to another series of validity tests that compared their experience with that of other respondents. An acceptability range was established for each measure. If a respondent's results were questionable, further investigations were conducted. A second data quality report card, which outlined questionable calculated metrics, was then sent to