

Missouri State Strategic Injury Prevention Plan

2010 to 2015

Missouri Department of Health and Senior Services

Strategic Planning Committee 2009

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(Prepared by the Office of Human Resources)

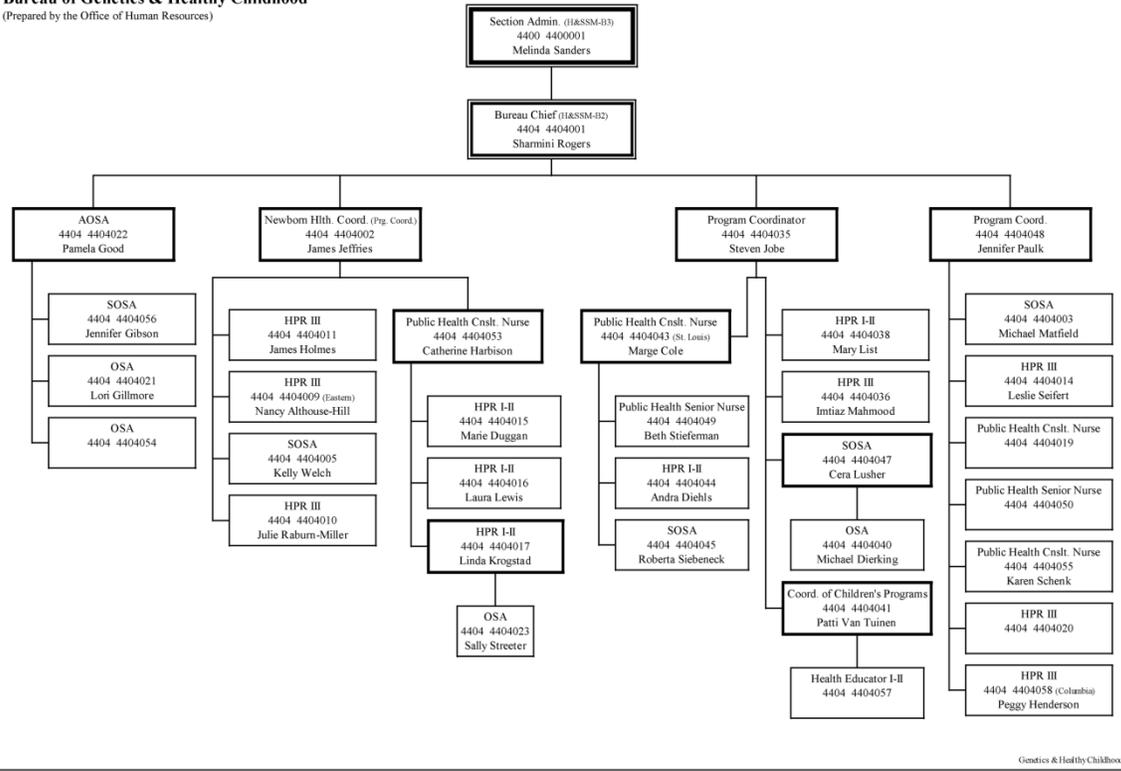


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Chapter 1: Introduction

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In the past decade we have made great strides in the prevention of injuries that affect all members of society. We have honed our educational approaches, innovated engineering modifications, and enacted community, local and national policies to prevent injury events from occurring and to mitigate the effects of injuries when they do occur. The field of injury prevention has become increasingly trans-disciplinary, and has reached out to established and non-traditional partners to meet the enormous injury prevention challenge.

Injury prevention has also embraced the realm of violence prevention. Issues of child maltreatment, intimate partner violence, sexual violence, suicide and youth violence have become increasingly classed as public health problems. This plan sets forth a guiding framework for moving violence and injury prevention forward in the state of Missouri. In several cases, the state plan is built on the work of agencies and coalitions that have worked to create a plan driven by empirical evidence with the goal of improving the well-being of Missouri's residents. This plan recognizes that the work of injury prevention must not only be grounded in the best possible evidence but also the grass roots buy in of the many persons that will work to see its goals and objectives achieved.

The plan highlights the goals, the resources and the challenges our state faces in decreasing the individual, social and economic costs associated with injury in our state. It serves as a reference point for policy makers, agencies and citizens who will come together to reduce the unintentional and intentional injury rates in Missouri.

The History of Injury Prevention in Missouri

The Injury and Violence Prevention Program (IVPP) within the Department of Health and Senior Services (DHSS) has a 20-year history, dating from its establishment in 1989 (with a planning/capacity building grant from the Centers for Disease Control) of the Office of Injury Control within the then Center for Health Statistics. Major foundational work occurring through the mid-1990s included the development of an initial document defining the problem of injury as it affects the citizens of Missouri, the formation of an injury prevention advisory group (currently MIVPAC), and the creation of an organizational framework for a data system that has served as a model for many states and territories. A great deal of work was accomplished during the 1990s, and the program had strong internal support and good visibility because of several federal grants that were received for injury prevention activities and a foundation in data-directed activity.

Starting in 1996, the department initiated a series of moves for the injury prevention program that shuffled it through several different offices and sections of the department, resulting in reduced program visibility and viability. That trend began to reverse somewhat in 2003 when, during reorganization within the department, the violence-related activities in the department (which were strongly victim services focused) were combined with the unintentional injury prevention activities to create a focal point for injury and violence prevention in the department. Additionally during that year the document *Injuries in Missouri: A Call to Action* was released, which had helped increase the profile of injury and violence as public health issues in the state and stimulate local interest in injury and violence prevention. The department underwent another reorganization, which placed the Missouri Injury and Violence Prevention Program within the Genetics and Healthy Childhood Unit of the Healthy Families and Youth Section.

The vision of the IVPP, "A Safer, Healthier and Violence-Free Missouri," is complemented by the program's mission to "improve the health of Missourians by preventing and reducing intentional and unintentional injuries." This mission will be accomplished as the program:

1. Develops public policy;

2. Takes a leadership role in DHSS in coordinating injury prevention interventions across programs within the Department;
3. Collaborates with external agencies to coordinate programs addressing injuries;
4. Supports the collection, analysis and interpretation of injury data; and
5. Conducts quality improvement and program evaluation activities.

In September 2005, the Injury and Violence Prevention Program hosted a review by the State and Territorial Assessment Team (STAT). STAT is sponsored by the State and Territorial Injury Prevention Directors Association (STIPDA). During the assessment, the team conducted interviews with program staff, department staff, staff from other state departments and other partners. At the conclusion a document was presented outlining strengths and recommendations for the program.

The report presented recommendations related to data collection and analysis, interventions, training and technical support, and public policy. The overarching recommendations made that will impact the program's ability to implement the recommendations are those related to the program's infrastructure.

The STAT observed evidence of multiple partnerships and collaborative efforts addressing both unintentional injury and violence prevention. There is clear evidence that partnerships are bi-directional; IVPP staff members serve on a variety of councils, committees and sub-committees of multiple organizations and groups, just as representatives from across the state serve on the MIVPAC and other agency planning and advisory committees. Needs assessments have been conducted in selected program areas (for example, violence against women and suicide prevention planning) at the state level in Missouri, and are encouraged at the local level, with the results intended to guide programmatic decisions and resource allocation. Program priorities, for the most part, have largely depended upon available funding rather than a prioritized statewide plan.

In the past DHSS had designated staff with expertise in suicide prevention and community coalition building to continue to serve as the agency liaison in the state partnership for suicide prevention. The Missouri Department of Mental Health currently serves as the lead agency for suicide prevention initiative. Unintentional injury prevention in Missouri is addressed through committed partnerships with and leadership from the Missouri Safety Council, the Missouri Coalition for Roadway Safety, the Highway Safety Division of the Missouri Department of Transportation, the University of Missouri-Columbia Medical School, and the nine Safe Kids coalitions across the state. The Missouri Coalition for Roadway Safety is the legislative and lobbying arm of multiple groups in Missouri committed to reducing injury and death associated with motor vehicle crashes. ThinkFirst Missouri sits organizationally with the University of Missouri-Columbia Medical School.

The IVPP is the lead agency for Safe Kids of Missouri, principally funded through the MCH Block Grant. Missouri has nine local Safe Kids coalitions throughout the state funded by the IVPP. Not all counties are served by a coalition, resulting in rural gaps in coverage. Safe Kids programs in Missouri focus prevention efforts on providing car seats and bicycle helmets with concomitant training in correct use. State staff members support Safe Kids coalitions, along with the work of local public health and other prevention practitioners by distributing fact sheets on water safety, ATV safety, violence prevention, bicycling, child passenger safety and motorcycle safety. The IVPP also consisted of the Rape Prevention and Education program as well as the Rape Victim Services Program. The programs contracted with providers to provide the respective services. Both these programs were transferred to the Office on Women's Health within the Division of Community and Public Health in FY 2009. In FFY 2010, the DHSS has discontinued the contract with ThinkFirst Missouri.

In August of 2009, the Brown Center for Violence and Injury Prevention (CVIP) became one of the newest CDC funded Injury Control Research Centers, the first ever housed in a school of social work, and a new resource for Missouri efforts in injury control. In 2010, the CVIP joined the efforts of MIVPAC and was instrumental in pulling together the efforts of agencies and subcommittees that provide the backbone of the current plan.

Missouri Injury and Violence Prevention Advisory Committee (MIVPAC)

The MIVPAC, comprised of representatives from the program's key partners, exists to "provide advice, expertise and guidance to the IVPP and to establish injury and violence prevention as a state priority."¹ While the MIVPAC is charged with addressing unintentional and intentional injuries, the membership has traditionally focused on prevention of motor vehicle-related injuries. In the near future MIVPAC plans to collaborate with the Bureau of EMS to encourage trauma centers and EMS providers to recognize their unique capacity to partner in prevention activities in their catchment areas, encourage outreach to under-served and culturally diverse populations, and invite the trauma nurse coordinators and trauma prevention educators to be represented and to participate in appropriate subcommittees. The following served as chairs for the MIVPAC since inception: Dale Findlay, Jane Knapp, Jerry Duty, Susan Vaughn, Leanna Depue, Michelle Gibler, and Pam Holt (current as of August 2009). Phyllis Larimore, the current co-chair assumed responsibility of the chair in January 2010. Also chief among this effort was the support of Dr. Nancy Weaver of the Saint Louis University School of Public Health. Dr. Weaver would become a key stakeholder in the CVIP and ultimately the bridge between the work of the committee and the present report.

The first chair of the MIVPAC (Dale Findlay) was instrumental in helping to establish Missouri as a leader in E-coding of injury events in the nation. In the recent past IVPP worked closely with two programs that were responsible for injury data surveillance: the Center for Health Information Management and Evaluation (CHIME) and the Office of Surveillance, Evaluation, Planning, and Health Information (OSEPHI). Three additional data sets have been accessed, assessed, and analyzed (Behavioral Risk Factor Surveillance System, Youth Risk Behavior Surveillance System, and Child Death Review). Emergency department data, Uniform Crime Reporting System data, and Fatality Analysis Reporting System data are also used.

The Committee's responsibilities include assisting the Injury and Violence Prevention Program in its mission to reduce the morbidity and mortality to Missouri residents by:

- Recommending priorities and objectives for state injury prevention initiatives.
- Recommending actions and strategies to address priorities and accomplish objectives in the state plan.
- Identifying and mobilizing state, regional, and community resources and networks (e.g., public and private sector organizations, coalitions, funding sources, elected officials) needed to support and implement state injury prevention initiatives.
- Providing ongoing leadership, consultation, and guidance in the promotion and implementation of a state plan for injury prevention initiatives.

Because injury is a multi-determined outcome, prevention is necessarily built upon multiple disciplines, professions and agencies. MIVPAC respects the work of the state agencies and agency coalitions that have put countless hours into developing strategic plans. For the current plan, these efforts are supported by the state Center for Violence and Injury Prevention at Washington University that will help coordinate research and training efforts with the policy and program efforts set forth in this plan. This overall plan therefore includes work of many persons from different agencies, socio-political perspectives and disciplines all joining together to make Missouri a model for collaborative, responsive injury prevention efforts.

Missouri Demographic, Economic and Social Profile

Missouri is a Midwestern state, covering 69,709 square miles with a population of 5,911,605 people in 2008, an increase from 5,595,211 in 2000. The state is largely rural with high-density populations in the state's two largest cities, St. Louis and Kansas City, which make up 71 percent of Missouri's population. The city of St. Louis contains the largest person-per-square-mile population at 5,731.²

Gender and Age

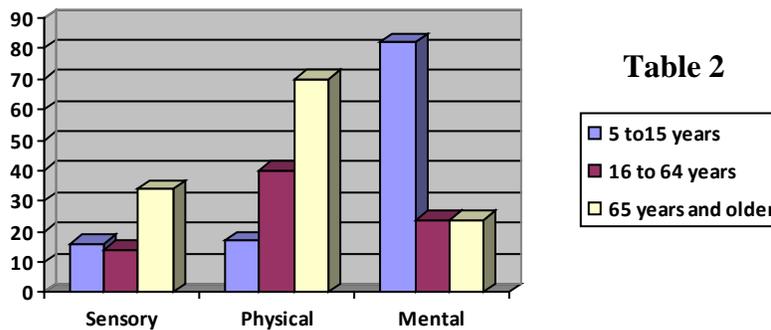
Missouri’s gender distribution is 51.2 percent female and 48.7 percent male. The gender ratio is 95.2 males for every 100 females.² There is a lack of data on transgender, intersex or transsexual populations.

Race

The majority of Missouri residents are classified as White and make up 85 percent of the population. African Americans represent 11.5 percent of the population, Latinos represent 3.2 percent, Asians 1.5 percent and Native Americans 0.4 percent. Only 0.2 percent identify as more than one race. The percentage of white individuals in Missouri is 11 percent higher than the national average. The Latino population in Missouri is well below the national average as demonstrated by a 12.8 percent difference between Missouri’s Latino population and the nation’s Latino population.²

Disability

The U.S. Census Bureau reports that 19 percent of Missourians aged five years and older have a disability. Table 2 demonstrates the distribution of identified disability by age. Sensory disabilities involve sight or hearing impairments. Physical disability involves conditions that limit basic physical activities, such as walking, climbing stairs, reaching, lifting or carrying. Mental disabilities include conditions that cause difficulty with cognitive tasks such as learning, remembering and concentrating.²



In addition, 378,583 Missourians reported a status of employment disabled. Fourteen percent of disability status Missourians aged 18 to 34 are enrolled in college or graduate school and 6.8 percent hold a bachelor’s degree or higher. A little more than half of Missourians aged 21 to 64 years with a disability are employed, which is significantly less than the 80 percent of non-disabled persons in the Missouri labor force.²

Income

Seventy-nine percent of Missourians between the ages of 20 and 65 are in the labor force. In 2008, 3,231,256 of Missourians reported receiving income earnings during the year. The average income was \$48,409. Men were making an average of \$55,889 while women were making significantly less at \$38,561. Missouri households are making an average of \$61,347.² Thirteen percent of Missouri’s population is living at or below the federal poverty level, which closely mirrors the national average of 13.2 percent. (The federal poverty level is \$10,830 for an individual and \$22,080 for a family of four.) A larger percentage of women in Missouri (14.7 percent) live in poverty than men (11.9 percent). A large disparity also exists between Missouri’s white population and minorities with 11 percent of whites, 14 percent of Asians, 23 percent of Latinos, 24 percent of Native Americans and 28 percent of African Americans living at or below the poverty level.

The Burden of Injuries in Missouri

Injuries are the most frequent cause of visits to the emergency department (ED), are responsible for the second highest total for inpatient charges, and are the fourth most frequent cause of death. Falls are the most frequent mechanism of injury according to hospital and health data, 50 percent

more frequent than the second leading cause. Assaults and self-injuries together account for five percent of injury ED visits, compared to 94 percent for unintentional injuries. Males have slightly higher injury rates than females, and Blacks have moderately higher rates than Whites. For assaults and legal intervention or war, Blacks have much higher rates than Whites. Injury rates are highest in 15-24-year olds.

The burden of intentional and unintentional injury is underestimated if we restrict counts to emergency room data. For example, pediatric injury includes child abuse and neglect which is a high cost public health concern and a major cause of cognitive, physical and emotional harm. While some maltreatment is captured in emergency room statistics, most is not. Each year over 70,000 children are reported for alleged abuse and neglect in Missouri.³ Lifetime prevalence of maltreatment in low income areas has been estimated as high as 30-40% of children.⁴ Immediate and long-term costs of maltreatment range in the billions of dollars annually.

Assaults are captured through crime reports and through hospital data. There were 36,943 domestic violence incidents reported by Missouri law enforcement in 2009⁵ – a rate of about 635 per 100,000 in the adult population. Over 1600 incidents of forcible rape were reported in 2009.⁵ Examination of intentions in hospital data by sex and race reveal that males have higher rates of assault injuries overall than females, but that females have higher rates of abuse and rape injuries. Females have higher rates of self-inflicted injuries and account for 63 percent of the poisons and overdoses, the most frequent mechanism of self-injury. Blacks have 5.5 times the assault injury rate as Whites and 38 times the firearm assault rate. Many studies suggest that intimate partner violence and sexual violence is under-reported in official agency statistics. Compared to the US, Missouri has lower rates of ED visits for three major intentional injuries. However, Missouri ranks in the highest levels for child fatality due to child maltreatment and suicide rates.

US injury rates are particularly high for firearm assaults and for self-inflicted injuries. When unintentional injuries for specific age groups are examined, children and adolescents in Missouri tend to have somewhat higher rates than the US for the top five mechanisms. Missouri elderly have lower rates of the top five mechanisms except for motor vehicle injuries, where their rate is 54 percent higher. The leading causes of death for these three age groups – motor vehicle among children and adolescents, and falls among the elderly – were higher in Missouri than for the US overall.

For all ages combined, Missouri death rates exceed US rates for unintentional injuries, suicides, falls and motor vehicle injuries. Missouri has substantially lower homicide rates. Motor vehicle injuries have decreased since 2000, while fall injuries, self-inflicted injuries and Black firearm assault injuries have increased. The trend in death rates for unintentional injuries has increased slightly since 1991, while death rates for unintentional fall injuries have increased 73 percent. Homicides have decreased substantially over the same time period. Homicide rates and homicide rates from firearms have increased markedly among young Black males since 2002.

Tables 1-3 show that injuries account for a substantial amount of the healthcare burden in Missouri. Injuries (including poisonings) are the number one reason for visits to the emergency room (Table 1), with 84 percent more visits than for respiratory problems, the second-ranked cause.

| Diagnosis | Number | Rate |
|-------------------------------------|---------------|-------------|
| Injury and poisoning | 561,977 | 97.7 |
| Respiratory (throat and lung) | 305,643 | 53.2 |
| Symptoms and ill-defined conditions | 210,957 | 36.5 |
| Brain - spinal cord - eyes - ears | 190,455 | 33.3 |
| Digestive system | 150,623 | 26.1 |
| Bone- connective tissue- muscle | 135,004 | 23.2 |
| Kidneys - bladder - genitalia | 114,198 | 19.7 |
| Heart and circulation | 103,415 | 17.1 |

| | | |
|--|-----------|-------|
| Skin | 71,574 | 12.5 |
| Mental disorders | 60,527 | 10.5 |
| Infection | 45,116 | 7.9 |
| Pregnancy - childbirth - reproduction | 44,469 | 7.7 |
| Nutritional - metabolic - immunity | 25,133 | 4.2 |
| Other - unclassified | 22,478 | 3.8 |
| Blood and blood forming | 7,768 | 1.3 |
| Perinatal conditions | 3,447 | 0.6 |
| Neoplasms - malignant (cancer) | 1,952 | 0.3 |
| Neoplasms - other | 1,925 | 0.3 |
| Congenital anomalies | 569 | 0.1 |
| All diagnoses | 2,057,230 | 356.1 |
| Rates Per 1,000 Population, Age Adjustment Uses 2000 Standard Population | | |

Among hospitalizations (Table 2), injuries are the fifth-ranked cause, and among fatalities, they are the fourth-ranked cause when all other accidents and adverse effects are combined with motor vehicle accidents, suicide, homicide and other external causes. Over all three tables, injuries account for 22 percent of the total, while heart disease and cancer together account for fewer than 11 percent.* Injuries also account for a large portion of inpatient charges. They rank second, with nearly \$2 billion in charges in 2006.

| Table 2 Inpatient Hospitalization Discharge Statistics for the State of Missouri, 2006 | | |
|---|---------------|-------------|
| Diagnosis | Number | Rate |
| Heart and circulation | 146,140 | 231.1 |
| Pregnancy - childbirth - reproduction | 88,173 | 155.7 |
| Digestive system | 80,873 | 132.2 |
| Respiratory (throat and lung) | 77,296 | 124.9 |
| Injury and poisoning | 68,253 | 111.8 |
| Mental disorders | 63,929 | 109.9 |
| Bone- connective tissue- muscle | 44,025 | 70.8 |
| Kidneys - bladder - genitalia | 40,439 | 66.7 |
| Symptoms and ill-defined conditions | 28,904 | 46.8 |
| Nutritional - metabolic - immunity | 27,809 | 45.5 |
| Neoplasms - malignant (cancer) | 25,557 | 40.6 |
| Brain - spinal cord - eyes - ears | 18,483 | 30.8 |
| Infection | 15,950 | 25.7 |
| Skin | 15,032 | 25.0 |
| Neoplasms - other | 10,350 | 17.4 |
| Blood and blood forming | 8,140 | 13.4 |
| Perinatal conditions | 3,227 | 5.5 |
| Other - unclassified | 3,105 | 5.1 |
| Congenital anomalies | 2,889 | 5.0 |
| All diagnoses | 768,574 | 1,263.7 |
| Rates Per 10,000 Age Adjustment Uses 2000 Standard Population | | |

* Heart and circulatory in Table 3 are defined as heart disease, cerebrovascular disease, other major cardiovascular diseases, essential hypertension and atherosclerosis. (total for 3 tables=2,879,741, injury total=634,500; heart, circulatory and cancer total=307,992).

The Injury MICA is structured according to the Centers for Disease Control and Prevention's (CDC) recommendations for displaying E-coded (external-cause-of-injury) data according to intention and mechanism. According to these data, falls are the leading mechanism, being 50 percent more frequent than being struck by something or someone, and twice as frequent as visits for motor vehicle traffic injuries. Firearm injuries fall in the bottom group of mechanisms.

Table 3 compares males and females and Blacks and Whites across the five intentions. Blacks have higher rates than Whites, and except for self injury, males have higher rates than females. The largest disparities are for legal intervention and war, where males have a rate five times that of females, and the Blacks have a rate five times that of Whites. Assault injury rates are also substantially higher for Blacks than for Whites.

| Intentionality | Male | Female | White | Black | Total | |
|-----------------------|---------------|---------------|--------------|---------------|----------------|--------------|
| Unintentional | 9,499 | 8,151 | 8,649 | 9,114 | 508,894 | 8,854 |
| Assault | 489 | 320 | 301 | 1,022 | 22,998 | 404 |
| Legal I/War | 26 | 5 | 10 | 51 | 875 | 16 |
| Self Injury | 53 | 69 | 60 | 62 | 3,457 | 61 |
| Unknown | 76 | 66 | 67 | 87 | 4,065 | 71 |
| Total | 10,142 | 8,610 | 9,088 | 10,336 | 540,289 | 9,405 |

Rates are age-adjusted rates per 100,000 population
Significantly different according to 95 percent confidence interval method (Males vs. Females and Whites vs. Blacks)

ED rates for injuries are highest in adolescents and young adults (Table 4). Rates for 15-24 year olds are higher than those for all other age groups for each of the intentions except legal intervention and war. Somewhat surprisingly, adolescents tend to have high rates of self-inflicted injuries. Those aged 15-17 and 18-19 have the highest rates (200/100,000 population and 166/100,000 population, respectively – not shown in table). Sixty-two percent of these are from alcohol and drug overdoses. Not so surprisingly, adolescents aged 18-19 have the highest assault injury rate (1,187/100,000 population). Sixty-six percent of these are from being hit by someone.

| Intentionality | 0-14 Rate | 15-24 Rate | 25-44 Rate | 45-64 Rate | 65+ Rate | Total Number | Total Rate |
|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|---------------------|-------------------------|-----------------------|
| Unintentional | 11,361 | 12,461 | 8,788 | 5,662 | 6,533 | 508,894 | 8,854 |
| Assault | 173 | 1,041 | 591 | 197 | 25 | 22,998 | 404 |
| Legal I/War | 2 | 30 | 30 | 9 | 1 | 875 | 16 |
| Self Injury | 22 | 162 | 89 | 31 | 3 | 3,457 | 61 |
| Unknown | 56 | 123 | 89 | 46 | 40 | 4,065 | 71 |
| Total | 11,613 | 13,816 | 9,586 | 5,945 | 6,603 | 540,289 | 9,405 |

Rates are age-specific per 100,000 population

In Table 5, the leading causes of unintentional injuries for the age groups requested in the Pre-review Questionnaire (children, adolescents and elderly) are presented. The three age groups have four mechanisms in common: fall, struck by or against, cut or pierce and overexertion. Falls are either the leading or second most frequent mechanism in each age group. Motor vehicle traffic is third among adolescents and second among the elderly.

| Cause | Missouri | | United States | |
|--------------|--------------------------|-------------|----------------------|-------------|
| | Children Age 0-14 | | | |
| | Number | Rate | Number | Rate |
| Fall | 45,722 | 3,911 | 2,223,355 | 3,662 |

| | | | | |
|---|---------------|-------------|---------------|-------------|
| Struck by/against | 27,222 | 2,328 | 1,450,786 | 2,390 |
| Cut/Pierce | 9,331 | 798 | 347,475 | 572 |
| Weather/Wildlife | 8,875 | 759 | 2,656 | 4 |
| Overexertion | 7,950 | 680 | 447,121 | 736 |
| Adolescents Age 15-17 | | | | |
| Cause | Number | Rate | Number | Rate |
| Struck by/against | 8,780 | 3,432 | 408,435 | 3,153 |
| Fall | 6,238 | 2,439 | 300,161 | 2,317 |
| Motor Vehicle Traffic | 5,387 | 2,106 | 201,148 | 1,553 |
| Overexertion | 4,604 | 1,800 | 255,751 | 1,974 |
| Cut/Pierce | 2,875 | 1,124 | 120,227 | 928 |
| Elderly Age 64+ | | | | |
| Cause | Number | Rate | Number | Rate |
| Fall | 30,194 | 3,876 | 1,840,117 | 4,940 |
| Motor Vehicle Traffic | 3,040 | 390 | 175,219 | 470 |
| Cut/Pierce | 2985 | 383 | 118,967 | 319 |
| Struck by/against | 2970 | 381 | 225,785 | 606 |
| Overexertion | 2691 | 346 | 178,808 | 480 |
| Missouri Emergency room data contain fatalities, while WISQARS does not. Rates are per 100,000 population. | | | | |

Comparing Missouri and the US, rates for the 0-14 year-olds are fairly similar except for 'cut/pierce,' where Missouri has a 40 percent higher rate, and 'weather/wildlife,' where the rates are so different that it is likely the definitions are different. In the adolescent group, Missouri rates are generally higher. The biggest differences are for 'motor vehicle traffic,' where Missouri's rate is 36 percent higher, and 'cut/pierce,' where Missouri's rate is 21 percent higher. In the elderly group, Missouri's rates for 'cut/pierce' are nearly 21 percent higher again. US rates for the elderly are higher for the other four mechanisms, though, and the differences are substantial: rates are 60 percent higher for 'struck by/against,' 39 percent higher for 'overexertion,' 28 percent higher for 'fall/jump,' and 21 percent higher for 'motor vehicle traffic.'

Strategic Planning Process

The strategic planning process was conducted throughout 2008 and 2009 in the quarterly meetings of the MIVPAC. The advisory committee was organized by topic and representatives with expertise in each of the identified injury areas worked together to outline the components of the plan. The plan represents multi-system coordination and collaboration of the respective components within the state infrastructure.

The work of this committee generated the current structure of the plan and major target areas. In 2010, the work of various groups was coordinated into a single overarching plan that drew upon the strengths and resources of several individual plans specific to certain types of injuries. The final editing and preparation was done with support of the Brown Center for Violence and Injury Prevention with leadership from faculty affiliate Dr. Nancy Weaver and the center director Dr. Melissa Jonson-Reid. The final plan was respectfully submitted to the Department of Health and Senior Services for editing and final adoption.

The Organization of this Plan

After careful consideration of the injury burden in Missouri, six injury areas became the focus of our injury prevention work for the planning period of 2010-2015. These injury types are discussed in Chapters 2-7, which includes the epidemiology of the injury type, risk factors and known countermeasures and best practices. Each chapter concludes with an outline of the specific Missouri goals and objectives to reduce the burden of that injury type, and the action plan that will be

implemented to achieve these goals. While injury types are not easily classified, we have presented a strategic plan in the following chapters:

1. Child Abuse and neglect
2. Sexual violence against women
3. Falls in the elderly
4. Motor vehicle injuries
5. Traumatic Brain Injury
6. Suicide

The Planning committee considered six primary criteria when selecting the injuries to include:

- Current injury rates indicate a high burden, as evidenced by incidence, morbidity, mortality, quality of life, costs;
- Missouri is disproportionately or uniquely affected by this injury type, or the topic is of particular interest to Missouri Injury Prevention partners;
- There are evidence-based practices or countermeasures for reducing the burden of that injury type;
- Relevant behaviors, either of individuals, organizations or policy makers are amenable to change;
- MICA or other state level data available to guide efforts; and, lastly
- Resources or capacity exists to make progress in this area.

The final format of the plan provided a consistent outline, but the structure of the goals and objectives was retained from the original reports used for ease of later cross-referencing.

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CHAPTER 2: Child Abuse and Neglect

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Overview

Child abuse and neglect is a major public health problem that impacts millions of children across the country. Child abuse and neglect or child maltreatment (CM) includes violence against children by a parent or other care provider, generally characterized by labels of sexual abuse, physical abuse, neglect, and emotional abuse. While the numbers of known reports of maltreatment are impressive enough, various studies including the National Incidence Study indicate that many cases of abuse and neglect go unreported.^{1,2} Child maltreatment occurs across income and age levels, but research indicates it is higher among lower income populations^{2,3} and the majority of reported children are under age 12.⁴

While the rare and tragic outcome of child fatality related to maltreatment is perhaps the most visible aspect of harm, CM results in numerous other forms of developmental damage. These untoward outcomes represent significant costs to the individual children and society at large. Negative outcomes related to CM include immediate non-fatal physical injury, and longer term outcomes like developmental delay, educational deficits, poor health and mental health, violent criminality and heightened risk of victimization.^{5,6,7,8,9,10,11,12,13} Consistent empirical evidence across studies also finds that abuse and neglect in childhood is associated with: dating violence, serious delinquent behaviors, engaging in risky sex and substance use, physical and sexual revictimization as adult women, and maltreatment as parents.^{8,14,15}

Definition

Child maltreatment includes both child abuse and neglect. Child abuse can be broken down into three categories: physical, sexual and psychological (or emotional). Child abuse or acts of commission are defined as "words or overt actions that cause harm, potential harm, or threat of harm to a child. Acts of commission are deliberate and intentional; however, harm to a child may or may not be the intended consequence."¹⁶ Child neglect or acts of omission are defined as "the failure to provide for a child's basic physical, emotional, or educational needs or to protect a child from harm or potential harm."¹⁶ The Missouri Child Abuse Law, Section 210.110 RSMo defines:

- **Abuse** as any physical injury, sexual abuse, or emotional abuse inflicted on a child other than by accidental means by those responsible for the child's care, custody, and control, except that discipline including spanking, administered in a reasonable manner, shall not be construed to be abuse; and
- **Neglect** as failure to provide, by those responsible for the care, custody, and control of the child, the proper or necessary support, education as required by law, nutrition or medical, surgical, or any other care necessary for the child's well-being.
- **Care, custody and control** of the child, includes but is not limited to the parents or guardian of a child, other members of the child's household, or those exercising supervision over a child for any part of a twenty-four hour day. Those responsible for the care, custody and control shall also include any adult who, based on their relationship to the parents of the child, members of the child's household or the family, has access to the child.
- **Investigated or assessed cases** of maltreatment may be "substantiated" according to a legal standard of preponderance of evidence. These "substantiated" cases include the smaller subset that are adjudicated. Cases may also be deemed "unsubstantiated-preventive services needed", or "unsubstantiated-no services indicated." Unsubstantiated should not be confused with inappropriate or untrue allegations which are a very small proportion of all reports.¹⁷ While some researchers report only those classified as "victims" (substantiated), a considerable body

of work exists to suggest that both substantiated and unsubstantiated cases face similar risks of recurrence and other poor outcomes.^{18,19,20} Therefore reductions in both unsubstantiated and substantiated reports is a goal of the Missouri plan.

Exclusions

States differ in terms of what is legally deemed to be abuse and neglect. In Missouri, exposure to domestic violence and drug-exposure in utero are not considered abuse or neglect. Further, failure to provide resources that is solely attributed to poverty and amenable to change with financial assistance is not deemed child neglect.

Facts and Trends

In 2008, over 3 million reports of maltreatment involving about 6 million children were made nationwide.⁴ There is an indication that rates of sexual abuse and physical abuse are declining at the national level,²¹ however reports of neglect are not experiencing a similar decline. Each day approximately five children die from abuse and neglect in the United States with at least half of those killed having been previously brought to the attention of authorities.^{22,23} States with larger social safety nets, including child protection, education, health and social services, are found to have fewer deaths related to child abuse and neglect.²⁴

In CY-09, 52 percent of the calls received met statutory requirements for child abuse and neglect. Reports were relatively unchanged from CY-08 with 53 percent of the calls meeting the requirements. In Missouri, over 50,000 reports of abuse and neglect involving over 75,000 children were made in 2008.²⁵ Similar to national trends, the number of reports has declined from slightly over 56,000 in 2004. In 2008, there were about 55 per 100,000 children under the age of 15 with emergency room visits or inpatient hospital records for abuse or neglect. This is also down slightly from 59 per 100,000 in 2004. Thirty children were officially reported to Children's Division as fatalities due to maltreatment in 2008, down from 46 the prior year.²⁵ These fatalities include only those where the cause of death is officially verified by a coroner. Missouri ranks near the bottom nationally, with only seven other states reporting higher child abuse and neglect fatality rates.²⁴

Surveillance of risk that is not yet considered maltreatment

While only about half percent of the child abuse/neglect hotline calls received in Missouri met statutory requirements for child abuse and neglect reports, another 35,822 were considered non-child abuse and neglect. These calls still included significant concerns and are distributed through several avenues for follow up, such as through referrals to community resources by the hotline worker. Finally, during CY 2009, 2,765 calls were screened at the Child Abuse/Neglect hotline as a newborn crisis assessment compared to 2,805 in CY 2008; and 2,774 calls in CY 2007. These calls come in as requests for home assessment by a physician or other medical personnel when they have serious reservations about releasing an infant from the hospital and may be sent home to a potentially dangerous situation. There may also be other non-drug related situations in which a physician/health care provider is concerned about releasing a newborn infant from the hospital.

Disease Burden on Sub-Populations

National data on child maltreatment by demographic characteristics is limited to substantiated cases. Rates of substantiated maltreatment in 2008 were higher for African American/Black children and children under the age of six years.⁴ The rate of hospital care for abuse and neglect for children under the age of 15 in Missouri is over five times higher for African American/Black children compared to Whites. While data are not available on the income level of children reported or those receiving hospital care, a large body of literature exists that suggests children from low income families are at much higher risk of abuse or neglect.^{2,3,8}

Risk Factors

There are numerous risk factors for abuse and neglect, including poverty, low levels of caregiver education, child medical or developmental risk, caregiver substance abuse, caregiver mental health problems, lack of parenting skills, parental history of maltreatment, and lack of social supports. The Centers for Disease Control and Prevention (CDC) outlined several risk factors associated with child abuse.²⁶ These risk factors include:

- child disability or mental retardation
- social isolation of families
- parent lack of understanding of children's needs and development
- parent history of domestic abuse
- poverty, unemployment
- domestic violence
- substance abuse
- young parents
- lack of family cohesion
- negative family interactions
- parental distress including mental health problems and community violence

Economic Cost

The vast majority of costs of maltreatment are not associated with child fatalities, but rather with incidents of abuse and neglect. These costs include hospitalization, mental health care, the child welfare services system, and law enforcement. Longer term costs of child abuse and neglect relate to the increased risk of special education, juvenile delinquency, mental health and health care, the adult criminal justice system, and lost productivity to society.

These costs are not small. One study estimates the national cost of child abuse and neglect at \$103.8 billion. While this may sound high, it is based on cases from the 1993 National Incidence Study that were categorized under the criteria of "severe" maltreatment²⁷ and is almost certainly an underestimate. Children who are reported for maltreatment but do not meet such criteria for harm face nearly equal levels of risk of later untoward outcomes.²⁰ Given that Wang & Holton estimates are the most current available, a comparison is provided by adjusting national cost estimates based on the number of children with substantiated cases or services indicated in 2007 in Missouri. This estimate of system costs only including the more severe categories in our state, far exceed the savings achieved by the proposed cuts in services related to parenting and child abuse and neglect.

Wang & Holton Estimates of National Costs of Child Abuse and Neglect in 2007 with Similar Estimates for Missouri based on state level child maltreatment report data²⁷

| DIRECT COSTS | | |
|--|---|--|
| Category | Annual Total (National estimate) | Missouri Annual Total (based on 7,886 substantiated or unsubstantiated but services needed child cases in 2007) |
| Hospitalization | \$6,625,959,263 | \$92,763,429.68 |
| Mental Health Care System | \$1,080,706,049 | \$15,129,884.69 |
| Child Welfare Services System | \$25,361,329,051 | \$355,058,606.71 |
| Law Enforcement | \$33,307,770 | \$466,308.78 |
| INDIRECT COSTS | | |
| Category | | |
| Special Education | \$2,410,306,242 | \$33,744,287.39 |
| Juvenile Delinquency | \$7,174,814,134 | \$100,447,397.88 |
| Mental Health and Health Care | \$67,863,457 | \$950,088.40 |
| Adult Criminal Justice System | \$27,979,811,982 | \$391,717,367.75 |
| Lost Productivity to Society (wages...) | \$33,019,919,544 | \$462,278,873.62 |

| | | |
|--------------------|--|---------------------------|
| Grand Total | | \$1,452,556,244.89 |
|--------------------|--|---------------------------|

Best Practices – and Current Practices

- **Early Risk Detection: Pediatric screening**
 - American Academy of Pediatrics recommends that all pediatricians screen for maltreatment risk.²⁸ In 2010, the first board certification of pediatricians in child abuse and neglect occurred.
 - Currently physicians comprise only 1.3 percent of hotline reports of abuse and neglect; nurses comprise slightly under 5 percent, and remaining health professionals less than 1 percent.

- **Home Visiting**
 - Home visitation programs such as Healthy Start (which provides parents with “ideas on how to solve problems along with relevant information”) are more effective at reducing neglect when parents' thinking processes were examined and addressed (through “the facilitation of mothers' own problem-solving and information search”).²⁹
 - The findings regarding nurse home visitation and the prevention of child abuse are mixed.^{30,31,32} However, studies of mothers who are visited by RNs have reported less use of restriction or physical punishment,^{33,34,35,36} better interactions with their children,^{37,38,39} and fewer incidences of domestic violence.⁴⁰ Postnatal visits have been found to result in longer intervals between pregnancies,^{34,37,41,42,43,44,45} higher self confidence, lower perception of infant difficulty,⁴⁶ increased length of employment among mothers,^{34,37,41,45} increased return to or retention in school by mothers,^{37,41,47} less dependence on public assistance,^{40,42} decreased substance abuse, and decreased criminal activity.⁴⁸ Most of the work to date has focused on the Olds model which tends not to work with the highest risk population. A recent evaluation of the Nurses for Newborns model that does target higher risk families indicates promise in child abuse prevention.⁴⁹
 - Other home visitation program models have also shown promise, though the work is not rigorous enough to lend the term “evidence-based.”⁵⁰

- **Community Level Prevention**
 - Public awareness & Detection: Maltreatment and neglect are under-reported. School teachers, doctors, neighbors, friends, and other community members should be aware of indicators of maltreatment and take action if abuse or neglect is suspected. Public awareness should be increased in communities.⁵¹

- **Early Childhood Programming**
 - Quality child care can promote positive development and reduce child behavior problems.⁵²

- **Intervention to Prevent Recurrence**
 - Project SafeCare has been found to be effective in initial trials, though full scale implementation in usual care has not yet been achieved.⁵³
 - Evidence-based parenting programs targeting child behavior may have particular relevance to preventing maltreatment (see parenting below).
 - Connecting families served by child welfare to longer term home visiting approaches is being examined as a means to prevent recurrence.⁵⁴
 - Evidence is mixed regarding the effectiveness of usual care, in-home child welfare services.^{55,56}

- **Crisis/respice care**

- Quality crisis/respice care can provide a safe place for parents of young children who are facing short-term crises and cannot care for their children during that time. Evaluations of these programs have found decreased parental stress and improved parenting.⁵⁷
- **Parenting education**
 - Teach parents importance of early development, discipline techniques, conflict resolution, and socially appropriate modeling; as well as about hazards, cleanliness, use of latches and locks, and other safety measures. Teaching could occur at childbirth classes, information provided through obstetricians, or other medical settings visited for pre- or post-natal care.^{51,58}
 - Three parent training programs are consistently held up in the empirical literature as the gold standard in BPT: Triple P,⁵⁹ PCIT,⁶⁰ and Incredible Years.⁶¹ Furthermore, the California Evidence-Based Clearinghouse for Child Welfare, which is a resource to identify evidence based practices relevant to child welfare, gives each its highest ratings for scientific support of their effectiveness (see www.cebc4cw.org for additional information). Triple P is a continuum of parent support and training that was developed over thirty years ago in Australia by Matt Sanders and his colleagues.⁵⁹ It provides parent management training techniques at different levels of intensity ranging from universal prevention (level 1) to indicated treatment (level 5). Triple P is beneficial with multiple parent populations, including parents of children with early onset conduct disorder, parents at risk of child maltreatment, depressed mothers, and parents experiencing marital conflict.^{59,62,63}

PCIT, developed by Sheila Eyberg, uses a two-staged approach to intervene with parents and children together.⁶⁰ During both stages parents are observed and coached by a therapist as they play with their child. Stage 1, child directed intervention, is focused on building the emotional relationship between the parent and child. Stage 2, parent directed intervention, teaches parents to discipline children consistently and positively.

The Incredible Years was developed by Carolyn Webster-Stratton and is a video-based training series with programs for parents, teachers, and children. It is delivered in a group format. Incredible Years has demonstrated success at increasing nurturing parenting, decreasing harsh parenting, and reducing child conduct problems.^{64,65,66}
 - New ways of using technology to provide parenting advice are also showing promise. A review of promising practices highlights potential avenues for prevention using phone, computer, and other media.⁶⁷ Text messaging is now being tested as a way to enhance parenting programs to prevent maltreatment.⁶⁸ Computer assisted tailored communication, already an evidence-based practice for pediatric unintentional injury prevention, is now being tested to see if it can be used to promote positive parenting.⁶⁹
- **Parental Substance Abuse Services**
 - Parental substance abuse is consistently associated with heightened risk of maltreatment. Evidence suggests that among child welfare involved families, substance abuse treatment appears to help prevent out-of-home placements or improve reunification.^{70,71} However, evidence remains scant and mixed at best as to whether substance abuse treatment compliance is related to the prevention of maltreatment.⁷² This is not, however, an indication that substance abuse treatment is ill-advised but rather a signal of the fact that these programs are rarely linked to parenting intervention, so that success in one domain may not spill over into another without purposive action.

- **Economic/Housing Intervention**

- Living in dangerous neighborhood conditions leads to more severe consequences if children are neglected, as they are more likely to be in unsafe spaces. Evaluate housing structure and safety, and hold landlord accountable for repairs.⁷³
- Some evidence indicates that children with disabilities have higher risk of maltreatment.⁷⁴ Programs like lead screening and abatement can reduce the level of developmental delay among children living in older housing stock.

Barriers and Challenges

- **Lack of Integration of Data**

While the technology is now affordable and available, this continues to be an issue that impacts prevention and intervention.

- Lack of information coordination between state agencies. At the policy level, data are not easily accessible showing, for example, what the overlap is between clients served by child welfare, juvenile corrections, and mental health. “On the ground” Child welfare workers do not have easy access to cross system data, even within the state. For example, access to data on prior arrests would be helpful both in assessment and assuring worker safety.
- Lack of coordination of surveillance sentinels. For example, doctors in hospitals may have access to prior health records to help inform concerns about maltreatment, but data from community health clinics are not linked in so a child could be seen for injury in one setting without the next health professional being aware of the prior concern.
- Lack of coordination of data on services to support effective prevention plans. Many families have multiple needs that cannot be served in a single system. Knowing what a family is or has received is key to effective referrals and case coordination. Yet, few such linkages across services providers exist.
- Legal barriers to the sharing of information across systems.

- **Information to Support Screening**

- Lack of materials developed to support screening efforts so that if pediatricians or school personnel screen for maltreatment there is a clear set of next steps ranging from a hotline call to suggested preventive services.

- **Adequate Funds and Trained Staff**

- Lack of resources to fully fund preventive programs.
- Lack of evidence of effectiveness of certain approaches across populations.
- Lack of awareness and implementation of best practices in agencies providing frontline preventive and interventive services.

- **Lack of integrated planned approach to evaluate prevention efforts**

- Lack of connection of evaluative mechanisms tied to the level of resources and program in a given area to track results of prevention efforts.

Current Large Scale Missouri Prevention Programs

- The Missouri Children’s Division and Missouri KidsFirst are a statewide network of individuals, programs, and organizations committed to improving the response to child victims and stopping the cycle of child abuse through community efforts. They provide resources, training, support, and public awareness. The Missouri Prevention Partners extends this collaboration to other state and non-profit agencies and adopted a state plan in 2010.
- Children’s Division Services:

- Families entering the child welfare system due to reports of child abuse or neglect receive case management services referred to as Family-Centered Services (FCS). FCS may also be provided if the family requests preventive treatment services.
 - Intensive In-Home Services (IIS) is a short-term, intensive, home-based, crisis intervention program that offers families in crisis an alternative to out-of-home placement.
 - The CD is the lead agency for the federal Child Care and Development Fund and administers the state child care subsidy program for low income and protective services families served through both the CD and the FSD. Currently, child care subsidies help support approximately 44,000 low income children with about 3,000 children identified as protective services. Families qualify at 127% of Federal Poverty Level.
 - During the 2009-2010 academic year, the CD contracted with 42 school districts throughout the state for 61 workers. The primary goals of the school-based service worker agreement includes the prevention and early identification of children at risk of child abuse and neglect or other barriers which could limit full potential for success in the school setting, and early intervention and the provision of services to strengthen families.
- The Missouri Child Care Resource and Referral Network (MOCCRRN) provided child care referral services for approximately 24,978 families during SFY 09. This includes referral calls and on-line searches. Of the 24,978 families who were provided referral services, 17,147 families accessed services on-line.
 - Early Head Start (EHS). State funding currently provides one quarter of the total EHS slots available in the state. Federal funding provides the other three-quarters. Approximately one quarter of EHS families are teen parents. In SFY 09, ten Missouri EHS grantees served 1,691 children and continually provide 571 childcare slots for those eligible. MO EHS grantees partner with community child care providers to provide EHS services. In SFY 09, there were 777 non-EHS children impacted by the services of EHS professionals throughout the state.
 - Stay at Home Parent. In SFY 09, 16 competitive bid contractors served 11,013 children in 9,105 families. Eight Community Partnerships received this non-competitive funding and served 453 families with children between ages 0-3. These contractors are required to screen the children for developmental delays and social emotional health by using the Ages and Stages Questionnaire and the Ages and Stages Questionnaire Social Emotional. The parental stress levels must be screened by using the Parental Stress Index. Contractors are also required to track how much time parents spent reading to the children and to provide developmentally appropriate books to the families.
 - Strengthening families through early care and coordination. This program began pilot sites in 2007 and has funding through state, foundation and other sources. The pilot sites were chosen in FY 2007 along with a contractor to provide technical assistance in embedding the protective factors into their programs. The five protective factors: Parental Resilience, Social Connections, Knowledge of Parenting and Child Development, Concrete Support in Times of Need, and the Social and Emotional Competence of Children have been woven through or embedded within a variety of major initiatives and programs including; training for frontline child welfare staff, training for foster parents, the Parents as Teachers National curriculum, the Prevention module of basic child care orientation training for child care providers, the Children's Trust Fund discretionary grant program, the statewide strategic plan developed under the national MCFH Early Childhood Comprehensive Systems (ECCS) Plan grant that guides the work of the Early Childhood Coordinating Board appointed by the Governor, the state Quality

Rating System, and a variety of grants and initiatives of the various state agencies engaged in early childhood activities.

- Missouri Children's Trust Fund was created by Missouri's General Assembly in 1983 as a non-profit organization whose purpose is to prevent and/or alleviate child abuse and neglect. Prevention strategies include: planning and policy development, ensuring funding to evidence-based prevention programs, training programs, research, promoting public awareness and education, assisting in integration of statewide prevention efforts. CTF provides funding for prevention programs that include: parent education and support, mentoring, infant nurturing/infant massage, community education, grandparent support, staff training and development, home visitation, crisis intervention/respite care, safe crib programs, school-based education, fatherhood initiatives, and research.
- Child Advocacy Centers (CACs) are a safe and neutral place where children can go to ensure they receive specialized forensic, medical and therapeutic services necessary to treat the effects of physical, emotional and psychological trauma caused by abuse. CACs provide a safe place where law enforcement, prosecutors and Children's Division's investigators can work together to explore abuse allegations in a manner sensitive to the needs of young victims and their families. CACs in Missouri are regionally located and provide services to all of Missouri's counties. Missouri has fifteen regional advocacy centers with the main offices located in: St. Louis (two locations), Kansas City, St. Joseph, Springfield, Joplin, Sedalia, Trenton, Sullivan and Desoto, Wentzville, Cape Girardeau, Doniphan, Columbia, Parkville, Osage Beach, and Branson West. Satellite offices are also located in: Nevada, Pierce City, Poplar Bluff, Ellington, St. Robert, Farmington, and Hannibal. In total, CAC services are provided in 24 locations around the State.
- Missouri has two active models of nurse home visitation working from the prenatal period through age 2. The Nurse Family Partnership targets women in their first pregnancy and operates in 18 counties and Nurses for Newborns targets high risk women and/or mothers with infants with serious medical conditions in 20 counties.
- Missouri has a statewide Parents as Teachers program operated through school districts. Services include home visitation for higher risk families through age three and group and supportive school preparation services through age five.
- Missouri has a statewide substance abuse treatment program called C-STAR.
- Coordination with health. The MO HealthNet Managed Care Consumer Advisory Committee (CAC) was formed to advise the Director of MO HealthNet (MHD) on issues relating to enrollee participation in the MO HealthNet Program. The CAC meets quarterly to discuss MHD Managed Care issues and for the Managed Care health plans to provide updates in their areas. The committee is comprised of several consumers who present their concerns from their areas of the state. Representatives from the various managed care health plans attend these meetings, as well as representatives from MO HealthNet Division, Family Support Division, Children's Division, Legal Services of Eastern, Western and Southern Missouri, Medical Centers, Head Start, Missouri Primary Care Association or any other entity with a MHD interest. This committee opens the door for communication to occur so better service is provided to consumers in the state of Missouri.
- Coordination with Research and Evidence-based Practice. Brown Center for Violence and Injury Prevention at Washington University: Missouri has a network of researchers doing work related to primary prevention and intervention with child abuse and neglect. Researchers and

agencies throughout Missouri are affiliated with the Brown Center for Violence and Injury Prevention, Missouri's newly funded ICRC, which has maltreatment prevention as a primary foci.

Recommendations (Goals/Objectives)

Table 2.1 Goals and objectives addressing child abuse and neglect.

| GOAL 1: Reduce the incidence of abuse and neglect in Missouri. | | | |
|--|--|---|--|
| | By when? | By whom? | How evaluated? |
| Objective 1.1. Accomplish this by assessing the resources available throughout the state | Preliminary lists to be completed by the end of calendar 2011 | Existing lists and contacts held by Missouri Prevention Partners and CVIP shared and then expanded and geocoded by program staff at CVIP. | A final report will be created showing availability of services with geocoded locations. |
| Objective 1.2. Accomplish this by coordinating efforts to track identification of risk – This would include an integrated database of state funded prevention/intervention services. When a provider identified a particular risk of maltreatment, they would be able to access these data to note current family involvement with health, child welfare, mental health, criminal justice and income support systems. This information would allow the person noting the risk to create a plan which is fully informed. The plan would be entered into the system to allow for Objective 1.3 to occur | General agreement upon usage and user access to be achieved by 12/2012. Pilot databases, including structural elements, state data and and at least some non-state providers to be completed by 12/2012. Preliminary “on the ground” usage by select agencies during 2013. | Missouri Department of Health, Missouri Children's Division, Missouri Prevention Partners, CVIP. | Assess collaborative reporting process across Children's Division and DHSS early 2012 Produce pilot and preliminary integrated database capturing local agency work |
| Objective 1.3. Accomplish this by coordinating efforts to track response to risk This would similarly be supported by an integrated database that would begin with state and state-funded programs and expand to include approved providers | Due to need to allow cases to move forward, use of this system will not be possible prior to late 2012 | Missouri Children's Division, Missouri Prevention Partners, Selected outside agencies, CVIP | Assess tracking of pilot cases by late 2012. Assess non-state provider use of system by late 2013 |

| | | | |
|---|--|--|--|
| <p>Objective 1.4. Evaluate this by coordinating efforts to link response to risk to maltreatment rates</p> <p>In many cases data are not effectively linked to the areas and/or populations served making it difficult to track progress in prevention efforts – geospatial analysis (GIS) provides an ability to track maltreatment rates as a function of local preventative resources</p> | <p>Subsequent to completion of Objective 1.1</p> <p>Begin evaluative process in 2013</p> | <p>Missouri Department of Health, CVIP</p> | <p>Produced report showing geospatial relationship of maltreatment to resource availability</p> |
| <p>GOAL 2: Ensure that cases of abuse and neglect are appropriately identified and treated.</p> | | | |
| | <p>By when?</p> | <p>By whom?</p> | <p>How evaluated?</p> |
| <p>Objective 2.1. Accomplish this by raising public awareness of abuse and neglect</p> | <p>2012</p> | <p>Missouri Prevention Partners, Children's Division, CVIP</p> | <p>Web site for child abuse prevention extant and publicized</p> <p>Speakers Bureau Community toolkits – created and distributed</p> |
| <p>Objective 2.2. Accomplish this by increasing rates of screening for risk in hospital, pediatric care and education settings</p> <p>There are basically three major points at which widespread ability to assess risk and provide resources occur: In the hospital at the time of birth In pediatric settings for well-child care At key points in education such as kindergarten entry</p> <p>Promotion of screening needs to be accompanied by clear guidelines and materials to be used in the field so that professionals are comfortable that they know how to proceed with a family once screening occurs</p> | <p>Liaison with Missouri AAP to determine perceived strengths and weaknesses – Dec 2011</p> <p>Determine screening rates & practices 2012</p> <p>Disseminate guidelines and materials statewide –late 2012</p> | <p>CVIP & Department of Health</p> | <p>Speak to Missouri AAP</p> <p>Web-based survey of pediatricians</p> <p>Evaluate Number and percentage of maltreatment reports made by medical personnel annually using state CA/N administrative data.</p> |
| <p>Objective 2.3. Accomplish this by insuring</p> | <p>2015</p> | <p>Advocacy</p> | <p>Sponsored</p> |

| | | | |
|--|---|--|--|
| <p>adequate levels of funding for response systems</p> <p>This includes building on attempts to coordinate services and implement preventive models like Strengthening Families</p> | | <p>organizations throughout the state</p> | <p>legislation that supports prevention efforts that also has funding allocated.</p> <p>Tracking increase in donations to Children’s Trust Fund and other agencies</p> |
| <p>Objective 2.4. Accomplish this by insuring communication of evidence-informed practices that are most likely to yield reductions in recurrence and untoward longer term outcomes</p> <p>This includes materials to support screening as well as widespread professional development to help insure that those agencies offering prevention or treatment services are using the best possible approaches.</p> <p>Work needs to be done to follow-up on training to assess implementation and then evaluate outcomes.</p> | <p>2013, preliminary elements may possibly go online earlier, subsequent to information gained in prior objectives.</p> | <p>Missouri Department of Health, CVIP</p> | <p>Web-site links to evidence-based practices Regional forums to disseminate Web-based survey of organizations doing intervention work</p> |

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CHAPTER 3: SEXUAL VIOLENCE PREVENTION

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Background

Sexual violence is a significant public health problem. The National Violence against Women Survey found that 18 percent of American women experience rape or attempted rape at some point in their lifetimes¹. Police responded to over 1,600 calls about forcible rape in 2009². These forms of violence exact high costs for the victims, the agencies that respond to incidents, and on the broader society.

Prevention is about changing the social norms that allow and condone violence against women. Early work in the movement to end violence against women focused on social change through education about the dynamics of domestic and sexual violence, through legislative changes to hold violent men accountable, by finding and building resources to assist women, by making alliances with law enforcement and courts, and through increasing perpetrator accountability. Today, prevention generally falls into two categories: efforts that are designed to affect women's behavior and efforts to affect men's behavior. Helpful and appropriate strategies can empower women to gain confidence in their abilities, identify healthy relationship patterns, and/or develop social bonds in their communities. These strategies are generally called "risk reduction." Other violence prevention efforts have focused on changing men's behavior and the deeply ingrained social attitudes that contribute to an environment in which violence can occur. In Missouri, many advocates work in middle schools and high schools to teach adolescents about the importance of respect, consent, healthy relationships and non-violence. Some agencies include men in their outreach programs to educate boys about the issues of violence against women. Other efforts include advertising or social marketing campaigns that promote respectful attitudes toward women. Still others strive to organize their communities around violence prevention and work with a variety of audiences to communicate directly and indirectly that domestic and sexual violence are not acceptable.

Finally, the importance of victim and perpetrator services aimed at preventing recurrence and addressing the trauma associated with such events are critically important. Such services are provided through a variety of law enforcement, medical, social service and non-profit agency resources.

Definitions

Public health takes a four-step approach to violence against women. Step one is defining and measuring the issue. Sexual Violence (SV) is an overlapping construct with IPV characterized as completed rape, attempted rape, child sexual abuse, or any other kind of coerced, completed, or attempted sexual encounter³. In this chapter, sexual violence is limited to adults as child sexual abuse was included in the prior chapter.

Step two is identifying risk and protective factors, and developing interventions based on these factors. The following list is taken from the CDC on-line fact sheets:

Individual Risk Factors

- Alcohol and drug use
- Coercive sexual fantasies
- Impulsive and antisocial tendencies
- Preference for impersonal sex
- Anger and Hostility or Depression
- Hypermasculinity
- Childhood history of sexual and physical abuse or witnessing family violence

Relationship Factors

- Association with sexually aggressive and delinquent peers
- Family environment characterized by physical violence and few resources
- Emotionally unsupportive familial environment

Strong patriarchal relationship or familial environment

Community Factors

Lack of employment opportunities

Lack of institutional support from police and judicial system

General tolerance of sexual violence within the community

Weak community sanctions against sexual violence perpetrators

Societal Factors

Poverty

Societal norms that support sexual violence

Societal norms that support male superiority and sexual entitlement

Societal norms that maintain women's inferiority and sexual submissiveness

Weak laws and policies related to gender equity

High tolerance levels of crime and other forms of violence⁴

Step three is evaluating interventions to determine their impact. The Centers for Disease Control and Prevention uses the following definitions for the three levels of violence prevention:

- **Primary Prevention:** Activities that take place before violence has occurred to prevent initial perpetration or victimization. Such activities include educational efforts aimed at changing attitudes and conditions that can lead to intimate partner or sexual violence.
- **Secondary Prevention:** These are the immediate responses after violence has occurred to address the short-term consequences of violence. Such responses range from law enforcement, medical care or shelter services immediately after the incident.
- **Tertiary Prevention:** These are the long-term responses after violence has occurred to deal with the lasting consequences of violence such as longer term victim counseling or counseling for child witnesses of intimate partner violence. Tertiary prevention also includes the work of batterer intervention programs and sex offender treatment interventions⁵.

Step four is disseminating promising strategies to ensure the widespread adoption of these strategies by those working to prevent violence against women.

Facts and Trends

National-level Data

The National Violence Against Women Survey found that 18 percent of American women experience rape or attempted rape at some point in their lifetimes. Fifty-four percent of these women were younger than 18 years of age at the time of the incident, 32 percent were 12 to 18 years of age, and 22 percent were younger than 12. The Survey estimated that 17.7 million women in the U.S. have been raped at some point in their lives and that approximately 300,000 women are assaulted each year¹. The Bureau of Justice Statistics estimates the figure to be lower with 180,000 females older than 12 years being assaulted in 2008⁶. Currently, NCVS estimates roughly 200,000 cases of rape, attempted rape, or sexual assault yearly--about half the rate estimated a decade ago.⁷

Missouri Data

The 2005 Behavior Risk Factor Surveillance Study found that in Missouri 12.5 percent of women and 1.5 percent of men had experienced unwanted sex. Sixteen percent of women and four percent of men had experienced attempted unwanted sex⁸. The Youth Risk Behavior Study of Missouri youth in 2009 found that 12 percent of female high school students and 4.4 percent of male high school students had been physically forced to have sexual intercourse when they did not want to⁹. In 2009, there were 1,608 rapes reported to law enforcement agencies. This number includes forcible rape, sexual assault and attempted forcible rape as defined in Missouri laws¹⁰. There were 1,605 rapes reported to law enforcement in 2008¹¹.

Costs of Violence Against Women in the United States

According to a 2003 study by the Centers for Disease Control and Prevention, victims of intimate partner violence (including rape and sexual assault) lose a total of nearly 8 million days of paid work and nearly 5.6 million days of household productivity as a result of the violence. The cost of intimate partner rape, physical assault and stalking exceeds \$5.8 billion each year, nearly \$4.1 billion of which is for medical and mental health care services¹². Dating violence was associated with risk of suicide among female minority adolescents¹³.

Rape victims lose an estimated 1.1 million days of activity each year. Mean medical care costs for rape victims who receive treatment are \$2,084 per victimization. Mean mental health care costs per rape victims who receive treatment is \$978 per victimization. Post, Mezey, Maxwell & Wibert (2002) estimated that the tangible and intangible financial costs of sexual violence in Michigan in 1996 costs more than \$6.5 billion where most of which came in the form of intangible costs. Sex-offense homicide cost more than \$18 million, two thirds of which was intangible costs¹⁴.

Special Issues

Sexual Violence Against Women with Disabilities

Studies of sexual violence against women with disabilities are particularly difficult because of the different sample populations, methodologies and definitions. Additionally, women with disabilities are not a heterogeneous group. Not only are they diverse in age, class and sexuality, but also in the variety of conditions that are considered a disability. Persons with a disability had a rate of rape or sexual assault that was more than twice that of a person without a disability. Females with a disability had a higher victimization rate than males with a disability⁷. There is a need to increase understanding of healthy sexuality and behavior among individuals with disabilities. Additionally, it is important to improve the environments in which people with disabilities work, live and socialize. An increased attention to caretakers and family members is necessary to decrease the rates of perpetration against persons with disabilities.

Sexual Violence in Lesbian, Gay, Bisexual and Transgender Communities

Research on sexual violence in Lesbian, Gay, Bisexual and Transgender (LGBT) communities is limited. Most studies are community-based and cross-sectional, and cannot be generalized to Missouri. Given these limitations, recent studies of LGBT youth have found a prevalence of sexual violence from 14-33 percent¹⁵. The LGBT adults have a lifetime sexual violence prevalence that ranges from 12 percent to 48 percent¹⁶.

Best Practices – and Current Practices

To date, only one prevention program, Safe Dates, has been shown in a randomized controlled trial to prevent or interrupt sexual violence perpetration¹⁷. The CDC and other organizations, however, have been supporting research and developing lists of promising strategies including the following listing taken from a 2004 report by Morrison, Hardison, Mathew, & O'Neil¹⁸.

Overall:

- “skill-building through reproductive health promotions that include gender aspects and violence prevention;
- programs that work with families throughout child development;
- work at the community level with men to change concepts of masculinity;
- work in school environments promoting equitable gender relations.

College-based rape prevention programs commonly include components such as

- providing information on the prevalence of sexual assault;
- challenging rape myths and sex-role stereotypes;
- identifying risk-related behaviors;
- increasing empathy for rape survivors;
- providing information on the effects of rape on victims; and
- providing lists of victim resources.

Middle and high school programs commonly include components such as

- identifying, clarifying, and challenging societal portrayals of male and female roles;
- identifying and modulating intrapersonal and interpersonal stressors;
- promoting coping strategies that dissuade the use of alcohol and drugs;
- challenging the use of violence as a means of conflict resolution;
- recognizing the early warning signs of violence;
- correctly identifying and interpreting verbal, physical, and sexual aggression as such and not as love and developing strategies for disengagement from problematic relationships, including identifying and alerting a trusted adult and options for legal recourse.”

Missouri Resources. The Missouri Coalition Against Domestic and Sexual Violence (MCADSV) is the only organization in Missouri that collects data and information on all of the services that are provided by domestic and sexual violence programs. In 2009 MCADSV assessed the work of agencies statewide in order to support the development of a statewide prevention campaign. Fifty-two of the 58 programs (members of the coalition) completed the survey for an 88% response rate¹⁹.

Primary Prevention Work

82% of programs reported that they are doing teen dating violence prevention work.

84% of programs reported that they are doing domestic violence prevention work.

61% of programs reported that they are doing sexual violence prevention work.

When asked to describe their primary prevention work, fewer than half (46%) of all programs described awareness activities rather than primary prevention activities. 48% of programs' mission statements include a prevention component. 31% of programs reported using pre-tests and post-tests. 39% of programs reported they did not have a budget for prevention.

Barriers and Challenges

The political environment, problems with federal and state rules, regulations, program mandates that may not support best practices, funding streams, and other factors outside control of DHSS/OWH and MCADSV are challenges as we attempt to prevent sexual violence. In particular, agencies report being underfunded relative to primary prevention efforts.

Recommendations (Goals/Objectives)

After reviewing the state's needs and resources assessment and considering state context, the Sexual Violence Prevention Planning Committee created the following goals, objectives and strategies/activities to prevent sexual violence in Missouri:

Goal 1: Increase the capacity of agencies addressing the primary prevention of sexual violence.

Objectives:

- 1.1 RPE-funded programs will increase resources (financial, staff, volunteers) that support primary prevention of sexual violence by five percent by 2016.
- 1.2 RPE-funded programs will increase organizational capacity to plan, implement and evaluate primary prevention programs by 10 percent by 2016.

Strategies/Activities

1. Create a toolkit/resource website that provides curriculum ideas, best practices, evidence-supported strategies, emerging research, evaluation tools and online support from other prevention educators.
2. Sponsor training that focuses on framing and marketing in order to raise funds for primary prevention of sexual violence which includes experiences of RPE grantees and lessons learned from other disciplines.
3. Coordinate annual or bi-annual regional or statewide meetings of prevention staff from across the state.
4. Hold a multi-level training for prevention educators to address the spectrum of prevention from basic to advanced prevention work.

Goal 2: Promote and support the use of evidence-supported strategies and the evaluation of promising practices in community-based primary prevention programs.

Objectives:

- 2.1 The number of RPE-funded agencies implementing evidence-supported strategies will increase by 10 percent by 2016.
- 2.2 The number of RPE-funded agencies implementing best practice evaluation and program improvement methods will increase by 15 percent by 2016.

Strategies/Activities:

1. Create a toolkit/resource website that provides curriculum ideas, best practices, evidence-supported strategies, emerging research, evaluation tools and online support from other prevention educators.
2. Identify obstacles to rigorous evaluation and create tools and guidelines to enhance the use of best practices in program evaluation.
3. Create agency-specific evaluation plans.
4. Sponsor training on best practices in program evaluation.

Goal 3: Increase and/or strengthen active, interdisciplinary partnerships that generate and/or support primary prevention efforts.

Objectives (Within RPE grantee identified communities):

- 3.1 RPE-funded agencies will increase the number and quality of partnerships that support primary prevention by 25 percent by 2016.
- 3.2 RPE-funded agencies will increase the number and quality of partnerships with adolescent-serving organizations and marginalized communities by 25 percent by 2016.

Strategies/Activities:

1. To facilitate efforts of collaboration between agencies and community partners, local agencies will educate professionals such as teachers, school nurses and other community providers on primary prevention philosophies and strategies.
2. Create or enhance an existing communication network for agencies to share strategies and resources about their primary prevention practices with nontraditional partners.
3. Integrate sexual violence primary prevention education into programs which develop youth leadership and serve groups that include but are not limited to:
 - a. adolescents,
 - b. at-risk adolescents,
 - c. LGBT communities, and
 - d. individuals with disabilities.
4. Create a statewide task force to address and support primary prevention efforts in Missouri.

Goal 4: Identify, promote and implement policies and procedures to prevent sexual violence.

Objective:

- 4.1 The number of community partners who have implemented policies and procedures addressing the prevention of sexual violence will increase by 5 percent by 2016.

Strategies/Activities:

1. Mobilize communities to support policy changes addressing primary prevention.
2. Engage in community and state-level collaborative work with organizations to incorporate primary prevention into schools.
3. Educate public policy leaders on primary prevention.
4. Sponsor public policy training.

Goal 5: Support social change that creates norms which: promote healthy and respectful behaviors; and challenge and oppose sexual entitlement, sexual violence, and sexual control of others.

Objectives (Within RPE grantee identified communities):

- 5.1 Individuals' knowledge, positive attitudes, and skills regarding healthy relationships and sexual violence prevention will increase by 5 percent by 2016.
- 5.2 Individuals' perceptions of positive social norms regarding sexual violence will increase by 5 percent by 2016.
- 5.3 Individuals' perceptions of negative social norms regarding sexual violence will decrease by 5 percent by 2016.
- 5.4 The social climate regarding interpersonal and sexual violence will improve by 5 percent by 2016.

Strategies/Activities:

1. Develop a statewide social marketing campaign related to norms and culture change prioritizing adolescents in the state.
2. Work with adolescents to build skills around bystander intervention.
3. Identify activities and messaging specific to LGBT communities.
4. Identify activities and messaging specific to disability communities.
5. Work with local media outlets and advertisers to improve accurate reporting of sexual violence and greater engagement in prevention.
6. Engage men and boys in the movement to prevent sexual violence.

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Chapter 4: Falls in the Elderly

Adapted from the “Show Me Falls Free Missouri (SMFFM) Department of Health and Senior Services (DHSS) Plan with additional input and editing by Julia Bennett, Center for Violence and Injury Prevention.

Overview

Falls Among Older Adults: A National Public Health Crisis

Falls and fall-related injuries among older adults are common and present a serious public health crisis in the United States. Falls among older adults result in longstanding pain, functional impairment, disability, hospital morbidity, death and premature nursing home admissions.¹⁻³ Further, they represent a significant burden on individuals, families, society and the health care system, as evidenced through associated costs and decreased quality of life for our older adults and their families. Falls are not an inevitable part of the aging process, and are often highly preventable.

Definitions

Fall – An event which results in the person coming to rest inadvertently on the ground or other lower level, and other than as a consequence of the following: sustaining a violent blow, loss of consciousness, sudden onset of paralysis, or an epileptic seizure. (Kellogg International Workgroup Group. The prevention of falls in later life. *Danish Medical Bulletin* 1987;34(4):1-24.)

Older adult – Within this plan, older adult typically refers to individual aged 65+. However, this designation is primarily for ease and uniformity of data collection, analysis and dissemination. Certainly, strategies within the plan might be appropriate for individuals and communities considering the fall prevention needs of individuals less than 65 years of age.

Facts and Trends

More than one third of adults 65 and older living in the community fall each year in the United States.⁴ The rate increases to 40% among those over the age of 80 years.² Among older adults, in Missouri, as in the nation, falls are the leading cause of injury deaths.⁵ In 2005, 15,800 people 65 and older died from injuries related to unintentional falls.⁶ In 2006, 575 older Missourians died due to falls, and falls may have contributed to other deaths as well. The falls death rate for older Missourians in recent years has been more than three times the rate for the next-highest injury cause, which is motor vehicle accidents, and the rate is increasing. The death rate due to falls among Missourians aged 65 and older rose more than 60 percent between 1999 and 2006, from 45.8 per 100,000 to 73.8 per 100,000.⁷

Further, according to CDC, falls are the most common cause of nonfatal injuries and hospital admissions for trauma. In 2005, 1.8 million people 65 and older were treated in emergency departments for nonfatal injuries from falls, and more than 433,000 of these patients were hospitalized.⁶

Twenty percent to 30% of people who fall suffer moderate to severe injuries such as bruises, hip fractures, or head traumas.⁹⁻¹⁰ Most fractures among older adults are caused by falls.¹⁰ Falls are the most common cause of traumatic brain injuries among older adults.¹² In 2000, traumatic brain injury accounted for 46% of fatal falls among older adults.⁸ Many older adults never fully recover from falls, living with chronic pain, reduced functional abilities, often leading to reduced independence for seniors and even nursing home admissions.¹³ One study found that falls were the major reason for 40% of nursing home admissions.¹⁴ Many people who fall also have a chronic or acute disease and the functional impairment as a result of that disease either precipitates the fall or is further complicated by the fall.¹⁵ For example, individuals with arthritis may experience decreased mobility or decreased grip which may exacerbate a fall. Or individuals with osteoporosis may have bone deterioration thus do not routinely engage in exercises that might result in better balance and gait. Or individuals prone to depression may engage in physical activity less and may experience an exacerbation of their depressive illness due to pain or limited mobility following a fall injury. Many people who fall, even those who are not injured, develop a fear of falling. This fear may cause them to limit their activities, leading to reduced mobility and physical fitness, and increasing their actual risk of falling.¹⁶ The impact

of the older adult's fall-related injury upon the caregiver(s) in terms of decreased productivity, increased time away from work and family and stress-related issues are widely acknowledged, but not commonly discussed or quantified in the literature.

The Scope of Falls Among Missouri's Older Adults

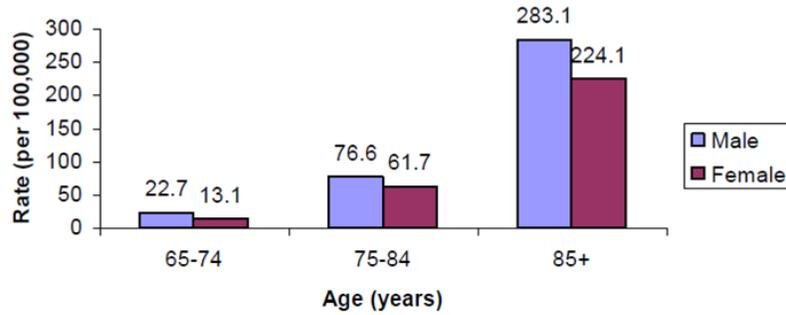
How big is the problem in Missouri? In Missouri, the fall death rate for older adults was more than thirty percent higher than the national death rate in 2005.⁵ Indeed, falls are the leading cause of unintentional injury deaths among Missouri's older adults, accounting for over 60% of all such deaths among Missouri's older adults in 2006.⁷ The death rate of falls increases with age, and jumps sharply for older adults. For Missouri in 2006, the rate of death due to falls in older adults was more than 16 times higher than for those 45-64 years of age (73.8 vs. 4.6 per 100,000). The rate of death due to falls increases steeply through the senior years. In 2006, it was 20.7/100,000 for Missourians ages 65-74, 81.9/100,000 for those 75-84 years old, and 239.0/100,000 for those aged 85 and older. Fall death rates among Missouri older adults are generally slightly higher in males than in females (Figure 1). However, females account for a larger number of falls deaths, because they are more likely to survive into the older age groups.⁷

The fall death rate in Missouri older adults has been rising over recent years. Indeed, the death rate due to falls among Missourians aged 65 and older rose more than 60% between 1999 and 2006, from 45.8 per 100,000 to 73.8 per 100,000. The fall death rate among white older adults is consistently higher than the rate among African-American older adults. In 2006, the rate for white older adults was 2.8 times the rate for African-American older adults (77.9 vs. 28.1/100,000).⁷ Falls are also the leading mechanism of unintentional injury-related hospitalizations and emergency room (ER) visits among older adults. In 2006, there were 43,150 (or 5,540 per 100,000 senior population) ER visits and hospitalizations due to unintentional falls among Missouri older adults, representing almost two thirds (64%) of all unintentional injury related ER visits and hospitalizations among Missouri older adults.²⁰

The rate of ER visits and hospitalizations due to unintentional fall injuries increases considerably with age in older adults. In 2006, the rate in Missouri seniors 85 years and over was more than four times higher than those at 65-74 years (13,934 vs. 3,047 per 100,000). Older adult women are almost twice as likely to be hospitalized or admitted to ER due to unintentional fall injuries than older adult males (6,837 vs. 3,720 per 100,000 in Missouri in 2006). Further, the rate of ER visits and hospitalizations due to unintentional fall injuries among Missouri older adults varies by county, from 958 in Clark County to 8,980 in Livingston County in 2005-2006.²⁰ (Rates in Clark County may be affected by its location on the border of Missouri, with some residents seeking care in another state that is not reported into our data.)

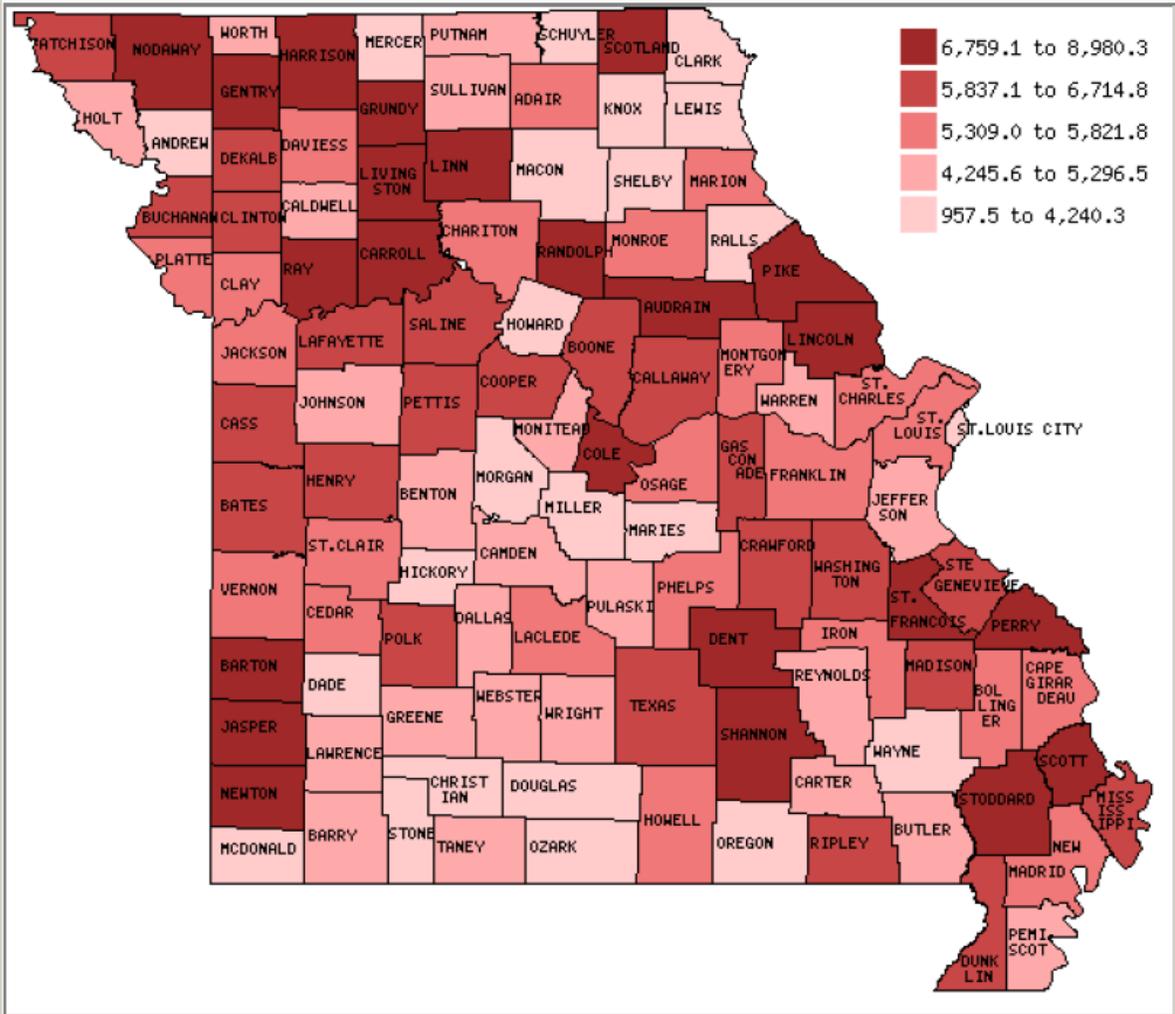
Where do fall-related injuries among older adults in Missouri typically occur? Information about the place of occurrence is important in developing fall prevention strategies. Nearly half of fall injury cases among Missouri older adults occur at home (48% in 2004) (Figure 3). It should be noted that older adults generally spend more time inside than outside their homes. Fall injuries in residential institutions accounted for 16% of fall hospitalizations and ER visits among Missouri older adults in 2004 (Figure 3).²⁰ Residential institutional older adults are generally more frail and older than those living in the community, and thus may be much more likely to have fall injuries.²¹

Figure 1. Fall death rate by age and sex, among seniors 65+ years of age, Missouri, 2003-2005



Source: DHSS, Death MICA (<http://www.dhss.mo.gov/DeathMICA/index.html>)

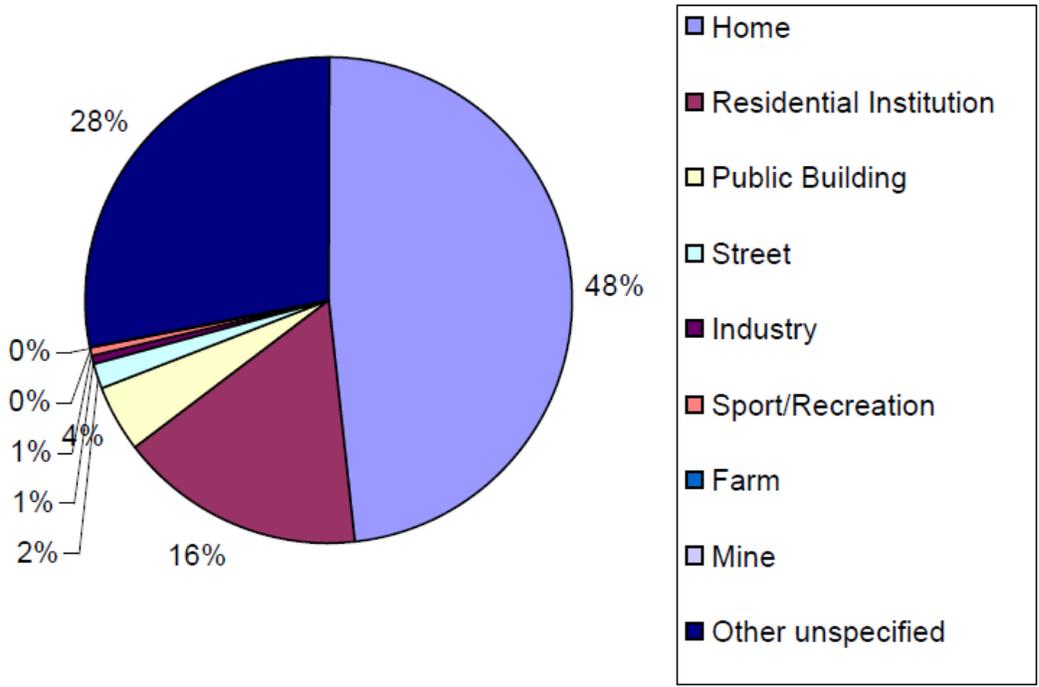
Figure 2. Rate (per 100,000) of E/R visits and hospitalizations due to unintentional fall injuries* among Missouri seniors 65+ years, by county, 2005-2006



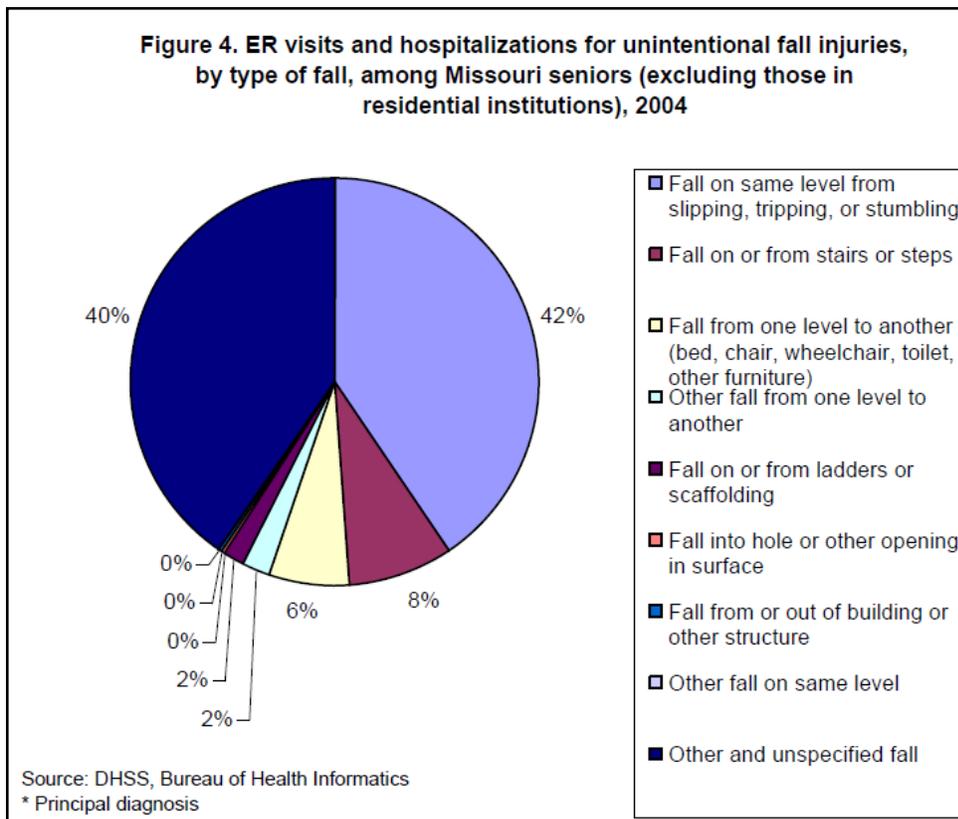
Source: DHSS, Injury MICA (<http://www.dhss.mo.gov/InjuryMICA/>)

* Principal diagnosis

Figure 3. ER visits and hospitalizations due to unintentional fall injuries among Missouri seniors 65 years and older, by place of occurrence, 2004



Source: DHSS, Bureau of Health Informatics
 * Principal diagnosis



Economic Cost

How costly are fall-related injuries among older adults? The total direct cost of all fall injuries for people 65 and older in 2000 was slightly more than \$19 billion.¹⁶ By 2020, the annual direct and indirect cost of fall injuries is expected to reach \$43.8 billion (in current dollars).¹⁸ One study of older adults aged 72+ found that the average health care cost of a fall injury was \$19,440 (including hospital, nursing home, emergency room, and home health care, but not doctors' services).¹⁹ The costs of fall injuries tend to increase with age and tend to be higher for women.¹⁷ Fractures were both the most common and most costly type of nonfatal injury. Just over one third of nonfatal injuries were fractures, but they made up 61% of costs or \$12 billion. In 2000, nearly two thirds of the costs of nonfatal fall injuries were for those needing hospitalization. One fifth of costs were for injuries treated in emergency rooms.¹⁷

How costly are fall-related injuries among older adults in Missouri? Hospital charges including inpatient and ER patient charges give us a measure of one important economic dimension of fall injuries for seniors. Estimated hospital charges for unintentional fall injuries among Missouri seniors were \$208 million in 2000, and reached \$308 million in 2004 (before adjusting for inflation), which accounted for 77% of hospital charges for all unintentional injuries among Missouri seniors in 2004. 86% of fall-related ERs and hospitalizations for Missouri older adults occurred for those in the community, costing \$248 million (81%) of hospital charges of fall injuries among Missouri older adults in 2004.²⁴

Hip fracture is a serious fall injury.²² Indeed, according to literature, approximately 95% of hip fractures are caused by falls.²³ In Missouri, hip fractures represented a substantial cost, accounting for nearly half (49%) of hospital charges for unintentional fall injuries among Missouri older adults in 2004. The median hospital charges were about \$1,500 for an unintentional fall injury, while extremely higher for a fall induced hip fracture (\$22,000) among Missouri older adults in 2004.²⁴ A recent study documented the cost of a hip fracture during the first year following the injury was \$16,300-\$18,700

(including direct medical care, formal nonmedical care, and informal care provided by family and friends).²² Only half of seniors hospitalized for hip fracture are able to return home or live independently after the injury.²³

It is important to note that hospital charges do not show the whole picture of economic costs of falls and fall-related injuries for Missouri's older adults. Other fall-induced costs also pose considerable financial burden to both the families and to society. These costs and fees may include nursing home care, physician and other professional services, rehabilitation, community-based services, the use of medical equipment, prescription drugs, rehabilitation, home modifications, insurance administration, and costs related to the long-term consequences of fall injuries, such as disability, decreased productivity, or reduced quality of life.¹⁷

Special Issues

What Risk Factors Contribute to Falls and Fall-Related Injuries Among Older Adults? A number of research studies have identified multiple risk factors for falling among the community-dwelling elderly population. While a few falls appear to have a single cause, the majority result from interactions among multiple factors.^{2,26} Furthermore, the risk of falling increases dramatically as the number of risk factors increases.^{3,23} Indeed, one cohort study showed the percentage of falling among community-dwelling older adults was only 8% for those with no risk factor, and increased to 78% for those with four or more risk factors.²³ Risk factors can be either intrinsic factors including both demographic and health factors (e.g., advanced age, chronic disease or disability), or extrinsic factors including the physical and socio-economic environment (e.g., four or more prescription medications, poor lighting, lack of bathroom safety equipment). There has been no consistent classification of fall risk factors. Frequently reported risk factors for falls in older adults include:

- Advanced age²⁷
- Female gender²⁸
- White²⁹
- History of previous fall²³
- Muscle weakness³⁰
- Gait or balance deficit^{2,31}
- Chronic illness/disability (e.g., Parkinson's disease, stroke, heart disease, depression, urinary incontinence, dementia, postural hypotension, eye diseases, osteoarthritis)^{21,12,23 32}
- Acute disease^{12,23}
- Poor vision³³
- Cognitive impairment²
- Taking more than four medications or using psychotropic medications (e.g., sedatives, hypnotics, antidepressants)^{21,30}
- Environmental hazards (e.g., poor lighting, loose carpets, lack of bathroom safety equipment, poor stair design, obstacles and tripping hazards, slippery or uneven surfaces)
- Use of assistive devices^{23,30}
- Routine activities such as walking on stairs²⁷

Several research studies have attempted to evaluate the importance of risk factors based on predefined criteria.^{34,35} One study found muscle weakness increased the risk of a fall by four to five times. History of falls, gait deficit, or balance deficit result in three times an increased risk of falling.^{30,35} Another review specifically focused on prospective studies of potentially modifiable risk factors of falls in older adults and determined the level of evidence of each risk factor from level 1 (best evidence) to level 6 (no evidence). For community-dwelling older adults, mental status and psychotropic drugs shows best evidence of level 1, and risk factors with level 2 of evidence include multiple drugs, environmental hazards, vision, lower extremity impairments, balance, gait and activities of daily living.³⁴

Best Practices

What are effective strategies to reduce fall-related injuries among older adults? What is occurring nationally and within other states to support falls prevention?

In general, fall prevention interventions can be categorized into three broad categories: 1) single intervention (e.g., exercise program or withdrawal of psychotropic drugs); 2) a multifactorial prevention strategy including application of several intervention practices simultaneously; and 3) individualized multifactorial risk assessment combined with targeted interventions to reduce these risks. The National Council on the Aging (NCOA) recognizes five primary intervention strategies that are effective according to the research:

- Comprehensive clinical assessment³⁰
- Exercise for balance and strength³⁶
- Medication management^{37,38}
- Vision correction²²
- Reducing home hazards^{39,40}

Most information related to what is considered effective practice recognizes these same five interventions according to the research. One author describes these interventions slightly differently and makes some notable additions:

- Regular strength and balance exercises
- Clinical management of chronic and acute illness
- Medication review and possible elimination or dose reduction
- Home hazard assessment and modification
- Educational programs about fall risks and prevention
- Use of assistive devices based on individual assessment¹⁴

The NCOA has partnered with the Home Safety Council, the Archstone Foundation, and the Center for Healthy Aging to establish and promote a national action plan entitled “Falls Free: Promoting a National Falls Prevention Action Plan”. Many national partners have joined in this work, including several entities present in Missouri at the state level. The Centers for Disease Control and Prevention (CDC) has published numerous resources including fact sheets and manuals summarizing best practices and developing community-based programs to prevent falls among older adults. These are only two examples at the national level of organizations which support falls prevention for older adults. Links to these resources, and others, are available in the Resources section of this document beginning on page 17. Likewise, many states have formed falls prevention coalitions (Figure 5) and/or published state and regional action plans designed to lead their work in falls prevention. Links to several of these state resources are also available in the Resources section of this document.

Barriers and Challenges

Barriers to prevention in this area have included lack of funding in general or lack of reimbursement for certain services as well as accessibility of existing services. Other challenges have been the lack of overall plan, and the lack of data to both obtain current baseline measures and to monitor outcomes.

Recommendations (Goals/Objectives)

Saint Louis University has provided a host site for SMFFM events and will continue to be actively involved in the implementation of goals and objectives.

Goal 1: Missouri older adults will have knowledge of the benefit, and access to fall risk assessment as appropriate to their individual needs. Strategy 1.1 and 1.2 have been implemented.

Strategy 1.1: Develop/adopt public educational materials for older adults, their caregiver(s) and healthcare provider(s) on the benefit of periodic fall risk assessment.

Strategy 1.2: Develop/adopt standardized fall risk assessment tools for various settings and providers, distributing and providing information relative to the tools as appropriate.

Strategy 1.3: Distribute information to healthcare providers related to the recently updated joint guidelines proposed by the American and British Geriatrics Societies (AGS, BGS) for fall risk assessment.

Action 1.3: Finalize and provide guidelines on SMFFM website

Strategy 1.4: Improve collection, analysis, and dissemination of data on the percent of older adults who receive fall risk assessments.

Action 1.4: By 2013, DHSS will include questions relevant to falls and injury prevention in the state BRFSS survey annually.

Goal 2: Missouri older adults living in the community will have knowledge of, and access to, effective programs and services that preserve or improve their physical mobility and lower the risk of falls.

Strategy 2.1: Develop/adopt public educational materials for older adults and their caregiver(s) to raise awareness of fall risk and protective factors related to physical conditioning, strength, gait and balance.

Action 2.1: Provide materials (or links) on SMFFM website.

Strategy 2.2: Design and implement a public awareness campaign using dissemination strategies customized to community-dwelling older adults to distribute identified public educational materials.

Action 2.2a: Identify funding to implement this strategy by the end of 2013.

Action 2.2b: Develop campaign in 2014

Action 2.2c: Implement campaign by July 2015

Strategy 2.3: Partner with key aligned programs and associations, at the state and community levels, to promote regular physical activity.

Action 2.3: Completed member list by must review list periodically for addition. Use member application to track partnerships.

Strategy 2.4: Promote the use of targeted home exercise programs by older adults to address identified risk factors.

Action 2.4a: Include in resource materials on SMFFM website

Action 2.4b: Develop community dissemination plan with partner agencies by 2013

Strategy 2.5: Promote state and community recreational, faith-based and senior-serving organizations to provide evidence-based physical activity programs customized to the older adult population, recognizing fall risk factors.

Action 2.5: Develop system to track number of local organizations implementing evidence-based programs as well as number of participants annually by 2014.

Strategy 2.6: Improve collection, analysis, and dissemination of data on the percent of older adults who have regular physical activity.

Action 2.6: Develop plan for web-based reporting and other means by 2014.

Goal 3: Missouri older adults, their caregiver(s) and healthcare provider(s) will be aware that falling is a common adverse effect of some prescription and nonprescription medications and have the tools/information to ameliorate the risk.

Strategy 3.1: Develop/adopt public educational materials for older adults, their caregiver(s) and healthcare provider(s) to raise awareness of fall risk factors related to prescription and nonprescription medication and the need for annual or periodic medication reviews, focusing on medication reduction or elimination when appropriate.

Action 3.1a: Develop materials and post on website

Action 3.1b: Explore other means of dissemination likely to reach older adults.

Strategy 3.2: Support healthcare provider (e.g., primary care physician and pharmacist) efforts in the implementation of periodic medication reviews and modifications prior to each new prescription that is written or filled for an older adult.

Action 3.2 Disseminate U.S. Preventative Task Force (USPTF) recommendations for Primary Care Fall Prevention Strategies, coalition (not the State) will advocate for appropriate/supportive legislation on local or national levels.

Strategy 3.3: Develop/adopt a systematic method for predicting how various combinations of medications interact with patient characteristics to increase risk of falls, and then add to MoHealthNet protocol for healthcare provider notification.

Action 3.3: Work with DHSS, DSS and researchers to develop method of linking medication use to falls. Pilot method by 2014

Strategy 3.4: Advocate with private insurance providers and Medicare the adoption or customization of methodology implemented in strategy 2.3, once efficacy of strategy is documented through MoHealthNet.

Action 3.4: Action is dependent on successful completion and funds to implement tracking in MoHealthNet system.

Strategy 3.5: Assure home health care and DHSS/DSDS home and community-based service provider staff has appropriate information to provide education and assistance to older adults and their caregiver(s) in discussing medication management.

Action 3.5: Action is dependent on successful completion and funds to implement tracking in MoHealthNet system.

Strategy 3.6: Improve collection, analysis, and dissemination of data on the percent of older adults who have periodic medication reviews.

Action 3.6: Establish best method for statewide surveillance with guidance of DHSS. Implementation timeline will be dependent on funds available.

Goal 4: Missouri older adults have access to home and community environments that lower the risk of falls, and facilitate full participation, mobility and independent functioning. For all strategies: Track SMFFM “events” using SLU host site. Includes speaking engagements, fairs, classes where information is disseminated. Ongoing throughout plan period.

Strategy 4.1: Develop/adopt public educational materials to improve older adults, their caregiver(s) and healthcare providers knowledge and access to home safety measures including home modifications, that reduce home hazards, improve independent functioning, and lower the risk of falls.

Strategy 4.2: Develop/adopt home safety assessment tool or process and distribute as appropriate.

Strategy 4.3: Partner with community developers, public safety, public transportation providers, etc. to promote better design and maintenance of public places and facilities with sensitivity to the needs of older adults and risk factors for falls.

Strategy 4.4: Provide educational and advocacy tools to older adults, their caregiver(s) and healthcare providers to empower them to make changes within their communities

Strategy 4.5: Identify funding sources and community-based resources to assist older adults in accessing home assessments and making appropriate modifications.

Strategy 4.6: Improve collection, analysis, and dissemination of data on the percent of older adults who have home safety assessments.

Goal 4 will depend on funding availability to devote staff/research time to develop materials and measures.

Goal 5: Missouri older adults will have knowledge of the benefit and access to the management of chronic and acute health conditions that place them at increased risk of falls and fall-related injuries. For all strategies: Track SMFFM “events” using SLU host site. Includes speaking engagements, fairs, classes where information is disseminated. Ongoing throughout plan period.

Strategy 5.1: Develop/adopt public educational materials to increase the older adult and their caregiver(s) knowledge of the interrelationship of acute and chronic health/mental health conditions, parallel functional limitations and the increased risk of falls, as well as how these resulting risks can be ameliorated.

Strategy 5.2: Partner with state/local public health chronic disease programs, healthcare providers and payors to promote education, screening and management of acute and chronic health/mental health conditions that increase older adults risk of falls or fall-related injury.

Strategy 5.3: Improve collection, analysis, and dissemination of data on the percent of older adults who receive screenings for acute and chronic health conditions that place them at risk of falls and fall-related injuries.

Goal 6: Missouri older adults will have knowledge of the benefit, and access to visual examination and corrective services to reduce the risk of falls and fall-related injuries. For all strategies: Track SMFFM “events” using SLU host site. Includes speaking engagements, fairs, classes where information is disseminated. Ongoing throughout plan period.

Strategy 6.1: Develop/adopt public educational materials to increase the older adult and caregiver(s) understanding of the role of uncorrected or inadequate vision as a risk factor in fall and fall-related injuries, including the need for adequate and uniform lighting in their home.

Strategy 6.2: Promote appropriate primary care screenings for visual problems resulting in referral to optometrist, ophthalmologist or other vision specialist as appropriate.

Strategy 6.3: Promote appropriate vision examination performed by optometrist, ophthalmologist or other vision specialist at recommended intervals.

Strategy 6.4: Identify community sources or other funding mechanisms, as necessary, to assure corrected vision measures occur, as a result of vision examination recommendations.

Strategy 6.5: Improve collection, analysis, and dissemination of data on the percent of older adults who receive vision examinations and recommended corrective measures. Include BRFS Vision module on years when falls is included if falls data is not included annually.

Goal 7: Missouri older adults benefit from intentional state and community infrastructure development to lower risk of falls and fall-related injuries.

Strategy 7.1: Identify key state-level partners to serve as core leadership team.

Strategy 7.2: Define the work of the leadership team and the role of each organization on the leadership team.

Strategy 7.3: Continue to identify and engage state-level partners to serve on Show Me Falls Free Coalition.

Strategy 7.4: Engage with one or more academic research partners to assist with data collection/analysis/redesign, as well as design and execution of outcome measures and studies.

Strategy 7.5: Develop and disseminate a written sustainability plan that identifies funding strategies for all or components of the Show Me Falls Free Missouri Action Plan.

Strategy 7.6: Establish or link to resource repository of evidence-based practices or promising practices as relates to falls and fall-related injury prevention, disseminating information in a manner(s) identified as most effective for community usage.

Strategy 7.7: Engage communities in strategic planning to implement evidence-based, multifactorial interventions within their community to lower the risk of falls and fall-related injuries. Increase number of local fall prevention coalitions established in Missouri by 2 annually.

Strategy 7.8: Engage communities and entities responsible for community planning components in actively planning for senior-friendly communities.

Strategy 7.9: Improve collection, analysis, and dissemination of data on the incidence of falls and fall-related injuries

Goal 8: Establish consistent and on-going evaluation of fall prevention efforts as performed by the Show Me Falls Free Missouri Coalition.

Strategy 8.1: Determine the best way to improve data collection, analysis and dissemination of factors impacting falls by January of 2012. This will be done by the SMFFM Coalition, DHSS, SLU (H. Lach) and be measured by the existence of an evaluation plan

Strategy 8.2: Monitor the use of on-line tools and guidelines established under the goals above as a measure of dissemination. This will be ongoing throughout the plan period. For all strategies: Track SMFFM “events” using SLU host site. Includes speaking engagements, fairs, classes where information is disseminated.

Strategy 8.3 Monitor advocacy efforts and legislation introduced and passed.

Goal 9: Educate legislators on fall prevention strategies and benefits.

Strategy 2.1: Establish Fall Prevention as a priority among the Silver Haired Legislature by Fall of 2010 through work by AAA and SMFFM.

Strategy 2.2: Communicate with local and state legislators on policy priorities of the National Falls Free Coalition. This work will be ongoing and coordinated by SMFFM. Products will include reporting on voting patterns, meetings and legislation introduced and passed.

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Chapter 5: Motor Vehicle & Traffic Injuries

Adopted from Missouri Department of Transportation State Plan & Missouri Coalition for Roadway Safety with additional input and editing by Julia Bennett, Center for Violence and Injury Prevention.

Overview

Motor vehicle crashes resulting in injury produce overwhelming levels of death and disability in Missouri and across the United States. Crashes involving motor vehicle occupants, motorcyclists, bicyclists, and pedestrians occur on public highways, roadways, parking areas, off road areas, and driveways causing more deaths in children than any other source of injury and a disproportionate number of injuries and fatalities for older adults and adolescents. Because injuries are significant to the population of cyclists, and pedestrians, this chapter has been expanded to include information on injury deaths and hospitalizations involving non-traffic incidents, such as collisions with motor vehicles off the highway in places like parking lots, driveways, or off-road activities, and other bicycle crashes in which bicyclists fall or hit objects. Prevention strategies for motor vehicle traffic and related non-traffic injuries are similar. Most data systems group these injury categories together for reporting purposes. Injury data for Missouri is available at: www.dhss.state.mo.us/MICA.

Facts and Trends: Motor Vehicle Traffic Injuries

Motor vehicle traffic-related injury is the leading cause of injury death for Missourians ages 1–34 years and the second leading cause for Missourians ages 35–84 years. Motor vehicle traffic incidents are the second leading cause of injury hospitalization in Missouri. In 2005, 1,257 Missourians were killed, and more than 1,841 were hospitalized for injuries sustained in motor vehicle traffic crashes and 66,392 were treated for injury, with a total 8,624 disabling injuries. From 1994 to 2005, the rate for motor vehicle traffic-related deaths in Missouri rose significantly from 160 per 100,000 population in 1994 to 302 per 100,000 population in 2005. Between 1994 and 2005, there was not a decrease in automobile related injury despite improvements in vehicle safety such as airbags and additional enforcement of occupant protection laws. There are a number of population-based risk factors for motor-vehicle traffic-related injuries, including age, gender, ethnic status, and place of residence. Injury from motor vehicle crashes spans all age groups of children.

Nearly 1 out of every 3 fatal unintentional injuries among children 12 years old and younger is the

Highest risk for motor vehicle traffic injuries are:

- Young adults ages 15–24 years
- Adults over age 75 years
- Males
- Hispanics and American Indians
- Riding unrestrained significantly increases the risk of death and injury for both drivers and passengers
- Rural counties' motor vehicle death and hospitalization rates are significantly higher than rates for urban and suburban counties
- Per vehicle mile traveled, young drivers, and older adults have the highest rates of motor-vehicle fatalities in the US⁵

result of a motor vehicle crash making it the leading cause of death for children ages 5 to 12¹. A 1997 National Safe Kids Campaign report describes an estimated 35 percent of children ride without restraint.³ Nearly 2,300 children died in 2000 in motor vehicle crashes², and as many as 60 percent of those children were unrestrained.² As of 1985, all 50 of the United States have enacted seat belt laws which include mandatory use of car seats for children from birth to 4 years of age.³ Children aged five to nine years old fall into a grey area where the laws are non-existent, inconsistent, or not clearly defined.³ Winston, Durbin, Kallan, & Moll (2000) investigated the injury risk for children ages two to five who were prematurely moved from an age appropriate safety seat to an adult seat belt. They found that these improperly restrained children were at a significantly higher risk for major injury (OR = 3.5, CI 2.4-5.2, $p < 0.05$) than children who were properly restrained.⁴ Both death and

hospitalization rates are highest for Missourians ages 15–24 years, and 75 and older. In persons over

age 15 years, death and hospitalization rates for motor vehicle traffic-related injuries are significantly higher for males than for females. The overall death rate for males is twice that for females (22.0 per 100,000 vs. 11.2 per 100,000, respectively). Using ten-year annual averages, the age-adjusted rate for death due to motor vehicle traffic crashes is significantly higher for Hispanics and American Indians than for Whites. Rates for Blacks and Asians do not differ significantly from the rate for Whites.

Injury Facts: Motorcyclists, Bicyclists, and Pedestrians

Motorcycle Injuries

- In 2006, 4,810 motorcyclists died and approximately 88,000 were injured in highway crashes in the United States. In Missouri, a total of 93 persons were killed and 685 had disabling injuries in motorcycle crashes.
- 83 percent of deaths and 88 percent of hospitalizations for injuries due to motorcycle crashes involve men. In particular, males ages 20–34 years have the highest rate of motorcycle deaths and hospitalizations in Missouri.
- According to the National Highway Traffic Safety Administration⁵, per mile traveled, a motorcyclist is approximately 32 times more likely to die in a crash than an automobile occupant.
- An unhelmeted motorcyclist is 40 percent more likely to suffer a fatal head injury and 15 percent more likely to suffer a nonfatal injury than a helmeted motorcyclist when involved in a crash.
- NHTSA estimates that motorcycle helmets reduce the likelihood of a crash fatality by 37 percent.⁵

Bicycle Injuries

- In the U.S., bicycle-related injuries account for approximately 900 deaths, 23,000 hospital admissions, 580,000 emergency department visits, and more than 1.2 million physician visits per year.
- Each year in Missouri, an average of 5.83 bicyclists are killed and 605 are hospitalized for injuries sustained in bicycle crashes.
- Children ages 5 to 14 years have the highest rates of bicycle-related hospitalization and death⁶, with 3 children per year under the age of 16 resulting in fatalities.

State Law

Missouri State Statutes require bicyclists to ride on the right-hand side of the road or shoulder with or adjacent to the flow of motorized traffic. Bicycles are classified as vehicles in Missouri, and their operators are subject to all the rules, rights, and responsibilities of other vehicle operators. Missouri Revised Statutes recommend that pedestrians walk on the left-hand side of the road, facing traffic. If a sidewalk is provided, pedestrians are required to use it and not the roadway. By state law, motorists are required to yield to all pedestrians in marked or unmarked crosswalks at intersections. To aid in the fulfillment of pedestrian education, there has been a full-time State Safe Routes to School Coordinator since 2006 with an expenditure of \$87,292.66 spent in the program's first year. This program started in 2005 with national funding, and Missouri has received approximately \$14 million since 2005.

Pedestrian Injuries

- In the US in 2008, 4,378 pedestrians were killed in traffic crashes in the United States, and another 69,000 pedestrians were injured.
- On average, 73 Missourians are killed and 1,380 are hospitalized each year for injuries sustained as pedestrians with an average of 290 disabling injuries.
- Pedestrian deaths are the third leading cause of unintentional injury death in Missouri. 8 per year were under 16 years of age, and 14 per year were 60 years or older.
- Age groups at highest risk of hospitalization for pedestrian-related injuries include adults ages 75 and older and children ages 5–9 years. Nearly a quarter of the hospitalizations for pedestrian-related injuries involve children ages 0–14 years.

Economic Costs of Motor Vehicle Injuries

In 2000, the cost of motor vehicle crashes in the United States totaled over \$230 billion. This represents approximately \$820 for every person in the nation, and 2.3 percent of the U.S. Gross Domestic Product. This figure includes medical, emergency services, and rehabilitation costs, as well as non-medical costs such as productivity losses, property damage, and legal, insurance, and workplace costs. Adjusting the costs for Missouri, the estimated state economic costs due to motor vehicle crashes in 2000 was over \$3.2 million representing \$762 per person and 2.3 percent of per capita personal income.⁶ Several studies have looked at the cost benefits of using safety devices that are known to be effective. Some examples of these cost savings include:

- From 1975 through 2006, seat belt use in the United States has saved about 226,567 lives, including 15,383 lives saved in 2006. This saves an estimated \$50 billion in medical care, lost productivity, and other injury-related costs. On the other hand, failure to wear seat belts result in about 9,200 avoidable deaths and 143,000 needless injuries, costing society \$26 billion.⁶
- From 1996-2002 emergency room data, there were 78,724 bicycle injuries and 23,144 pedestrian injuries in Missouri.⁷ These figures are below the national average not necessarily because Missourians are safer cyclists or pedestrians, but because they cycle and ride as much as 50 percent less than those in other states.⁷
- For United States children ages 0 to 4 years, every dollar spent on child safety seats saves \$33. This includes \$2 in medical costs, \$6 in future earnings, and \$25 by preventing pain, suffering, and lost quality of life.

Special Issues

Although many factors may contribute to motor vehicle injury incidents, the use of alcohol and the non-use of safety devices are major contributing factors. Young and older drivers also have special characteristics that increase their risk of being involved in motor vehicle-related injury incidents.

Alcohol Use

Of all 2006 Missouri traffic crashes, 4.9 percent involved a person drinking. A total of 288 people were killed in more than 7,900 alcohol-related traffic crashes in 2006 in Missouri.⁸ The percent of drivers involved in fatal motor vehicle crashes who had evidence of alcohol use varies by age, with the highest percentage in the 20 to 34 years age group. In the United States, alcohol was involved in 41 percent of fatal crashes in 2006. Alcohol involvement—for the driver, bicyclist, or pedestrian—was reported for 49 percent of all pedestrian fatalities and bicycle fatalities.⁹ 64 percent of passengers younger than age 15 years who were killed in drinking driver related crashes during 1985–1996 were riding in the vehicle with the drinking driver.¹⁰

Safety Devices

Research has shown that restraints such as lap/shoulder belts for adults, and car seats for children, reduce the rates of fatal and hospitalized injuries.⁵ Nationally, an estimated 226,567 adults and 5,085 children were saved by safety belts or child restraints from 1975 to 2006.⁵ In 2006, observational seatbelt surveys showed Missouri to be at between 73 and 77 percent seat belt use.¹¹ The national average for seatbelt use in 2006 was 81 percent.⁸ Females in Missouri are more likely than males to use seatbelts consistently. Two groups least likely to buckle up are teenagers and those driving pickup trucks.¹¹ In a survey of adults, 85 percent reported using a seatbelt or car seat for their children under age 16. Young children ages 0 to 4 years were much more likely to be reported to be restrained while riding in a car, for a total of 96 percent, than children ages 13 to 15, for a total of 73 percent. Children living in a household with an adult who always uses a seatbelt are 15.7 times more likely to always use car seats or seatbelts.¹² In addition to seatbelt use, helmets are known to be effective in reducing the risk of head injuries for motorcyclists and bicyclists. National figures

estimate that motorcycle helmet use is 48 percent in 2002 in states without strong helmet laws.¹³ Missouri has a mandatory helmet law.

Seatbelts, Child Restraints, and Helmets Save Lives¹

- Seat belts are 45–60 percent effective in preventing fatal injuries. Airbags, combined with lap/shoulder safety belts, offer the most effective safety protection for adults.
- Laws give guidelines for legal child transportation, but fail to take into consideration the safest way for a child to ride.² Through the use of anticipatory guidance, health care workers can provide information not only within a home setting, but also in the area of child passenger safety.³
- When correctly installed and used, child safety seats reduce the risk of death by up to 71 percent for infants and 54 percent for children ages 4 years and younger in passenger cars.
- Children in booster seats (recommended for ages 4–8 years) have 45 percent fewer major injuries compared to those children in crashes who use seat belts only. Missouri's booster seat law for children under 8 years of age or eighty pounds or 57 inches in height went into effect August 2006.
- A federal study showed that motorcycle helmets are 67 percent effective in preventing brain injuries.
- A bicycle helmet reduces the risk of serious head injury by as much as 85 percent, and the risk for brain injury by as much as 88 percent.
- In Missouri, seatbelt use in 2010 was reported to be 76 percent. A 2005 observational survey of motorcyclists reported that 99.3 percent of this population was wearing a helmet. This same survey reported that 26.2 percent of motorcyclists were wearing novelty, non-DOT compliant helmets.

Young Drivers

As shown in Figure 5, the 15 to 24 year-old age group has significantly higher fatality and hospitalized injury rates than all age groups except the older drivers. Inexperience with driving and risky behaviors such as non-seat belt use and speeding characterize this population, especially teenage drivers.¹² Missouri's graduated licensing law for 16 to 18 year olds went into effect June of 2006, and includes provisions for gaining driving experience with an adult and limiting night driving. Other state graduated licensing laws include stricter nighttime driving restrictions, increased fines for traffic violations, and limits on the number of passengers.¹³

Older Adults

Motor vehicle and pedestrian safety is an increasing concern as the national population ages. Older adults are at increased risk for injuries due to declining vision and physical and mental skills, and to physical impairments. In addition, the frailty of older adults contributes to their increased death and injury rates from motor vehicle crashes.^{14,15}

Best Practices: Preventing Motor-Vehicle Traffic Injuries

Motor vehicle prevention activities have a longer history than most other injury prevention efforts. For example, in the United States, seatbelt education started well before the first seatbelt laws were passed in 1984. Motor vehicle traffic injury prevention has successfully combined “the three Es” education, enforcement, and engineering. Recommendations for prevention strategies and best practices are described below.

Overall

Three national organizations - the Task Force on Community Preventive Services, the National Safety Council, and Mothers Against Drunk Driving - have developed recommendations for motor-vehicle prevention strategies based on their reviews of best practices across the nation. Their recommendations emphasize strengthening legislation and increasing enforcement, combined with focused education.

The Task Force on Community Preventive Services, an independent, non-federal public health group, completed an extensive review of evidence-based best practices.¹⁶ Their recommended

strategies for reducing injuries to motor-vehicle occupants all involve legislation and enforcement, sometimes combined with specialized education, such as car seat incentives and distribution, and alcohol server interventions. There was insufficient evidence to recommend car seat education-only programs. For the safety belt and alcohol impaired driving categories, the task force did not review the strategies of incentives, mass media, and education programs. Reviews of additional interventions will be published as they are completed.^{17,18}

The National Safety Council has recommended: enforcement, primary seatbelt laws, booster seat laws for children four to eight years old, strengthening of penalties and education programs only if proven effective.¹⁹ Mothers Against Drunk Driving (MADD) has developed an eight-point plan to revitalize the fight against drunk driving. Six components of the plan address increased enforcement and enactment of primary seat belt laws, tougher sanctions, and underage drinking provisions. The plan's two additional components call for increased public education.²⁰ Other research supports the approach of enhanced laws and strict enforcement, in combination with specific educational campaigns.^{21,22}

Legislation and Enforcement

Most effective prevention strategies include increased legislation and enforcement of traffic laws. Studies have shown the effectiveness of legislation in reducing alcohol related fatalities, young driver injuries, motorcycle and bicycle injuries, and increasing occupant restraint use.^{11, 23,24,25}

Interventions to Increase the Use of Child Safety Seats

| Intervention | Recommendation |
|--|-----------------------|
| Child safety seat laws | Strongly Recommended |
| Community-wide information + enhanced enforcement campaigns | Recommended |
| Distribution + education programs | Strongly Recommended |
| Incentive + education programs | Recommended |
| Education-only programs | Insufficient Evidence |
| Interventions to Increase the Use of Safety Belts | |
| Safety belt use laws | Strongly Recommended |
| Primary enforcement laws (versus secondary enforcement laws) | Strongly Recommended |
| Enhanced enforcement programs | Strongly Recommended |
| Interventions to Reduce Alcohol-Impaired Driving | |
| 0.08% blood alcohol concentration (BAC) laws | Strongly Recommended |
| Lower BAC laws for young or inexperienced drivers | Recommended |
| Minimum legal drinking age laws | Strongly Recommended |
| Sobriety checkpoints | Strongly Recommended |
| Server intervention programs | Recommended |

Results of Motor-Vehicle Legislation

- The implementation of a .08 BAC level state law has been associated with reductions in alcohol-related fatalities in at least 10 studies.²⁶
- The average seat belt use rate in primary enforcement state is 87.9 percent. In secondary enforcement states (like Missouri), the average use rate is only 80 percent.²⁷
- States with motorcycle helmet laws have a reduced incidence of motorcycle deaths and injuries.²⁸
- States with graduated licensing programs have reported 5 to 26 percent reduction in crashes in the teenage age group.²⁹

Behavior Change

Motor-vehicle prevention has been one of the first injury prevention fields to examine risk factors and to apply health behavioral change theories and social marketing strategies. Extensive work has been done in the motor-vehicle field to examine specific groups that are at high risk for motor-vehicle fatalities and injuries. Interventions and social marketing strategies can then provide specific messages for each target audience. Some examples are part-time seat belt users, teen drivers, older drivers, Hispanics, Blacks, and people in rural areas.^{23,24,25} Many of the health behavior change theories have been applied to developing and evaluating traffic programs.^{25,30,31}

Conclusion

Programs developed to reduce motor vehicle injuries should continue an integrative approach, incorporating all types of prevention strategies. Programs that center on education alone are generally not recommended. Effective traffic safety programs should have a strong component of effective legislation and enforcement. Engineering solutions to redesign vehicles and safety features, separate bicyclists and pedestrians from vehicles, and improve roadway and intersection designs are also necessary.

Health agencies and safety advocates can assist in prevention by participating in community coalitions that promote enforcement of existing laws, advocate for stronger traffic safety legislation, develop and implement effective educational strategies, and provide program evaluation. Education may include using social marketing techniques, segmenting the target audience with specific messages, applying health behavior change theories, and developing programs that build specific driving or traffic safety skills.

Best Practices: Prevention Strategies For Bicycle and Other Wheeled Sports Injuries

Bicycling and other wheeled sports, such as in-line skating, skateboarding and scooters, are popular recreational activities in the United States. Nearly 28 million children ages 5 to 14 ride bikes and the popularity of other wheeled sports is high.³² Wheeled recreational activities provide many health and recreational benefits, but also carry the risk of injury. Head injuries account for 22 to 47 percent of injuries to bicyclists, and are responsible for over 60 percent of all bicycle-related deaths.³³ These injuries can be reduced through the use of helmets. However, bicycle helmet use is still relatively low.

Many bicycle helmet, bicycle safety, and wheeled sports injury prevention programs and strategies have been developed. Few programs have been thoroughly evaluated to determine which strategies actually lead to increased helmet use. It is not enough to measure effectiveness by looking at changes in knowledge about brain injury or bicycle safety, helmet ownership, or self-reported helmet use. The generally accepted “gold standard” for evaluating helmet use is a well planned and executed observational survey.³⁴

In other states and countries, bicycle helmet laws have increased helmet use, especially if combined with educational efforts and the support of law enforcement agencies.^{35,34,36} A review of the literature of health behavior change shows that safety messages about the risk of injury are not sufficient to convince children or adults to wear helmets. Helmet use may be increased by promoting the social norm of helmet use by everyone, establishing family helmet rules, and addressing the barriers of cost, “coolness” factor, and comfort.³⁵

As with other injury prevention efforts, single interventions are unlikely to lead to an increase in bicycle helmet use. A successful bicycle safety community education campaign should include the following combination of strategies: formation of a community coalition; public awareness media campaign; coordination with other school and community groups; counseling by medical professionals to use bicycle helmets; school and community interventions; distribution of low-cost, discount or free helmets; policies requiring helmet use for schools, recreation facilities, and other programs; and evaluation of helmet use. A broad-based educational program that targets motorists as well as nonmotorized users would address the safety issue from both sides. Other prevention strategies may include: promoting bicycle helmet laws; encouraging development of separate bike trails, lanes, and

pedestrian paths; and collaborating with community groups that promote safe bicycling and walking for physical fitness.

Best Practices: Prevention Strategies for Pedestrian Injuries

The mainstay of pedestrian education is often seen as teaching children how to cross the street safely. However, community pedestrian safety should focus more broadly on solutions for all age groups and include enforcement and engineering strategies. For many reasons, reducing pedestrian injuries and deaths in children is not a simple job. First, street crossing is a difficult skill to master, with as many as 26 tasks needed to negotiate traffic safely.³⁷ Experts say that children under the age of 10 years are not ready to cross streets alone.³⁸ A successful child pedestrian safety program in New York City stressed teaching children the tools for being safe pedestrians, and emphasizing problem solving while recognizing children's cognitive limitations.³⁹ A review of community pedestrian safety programs showed that some programs can lead to increased knowledge, and a few programs have documented behavior change in street crossing skills. Education programs have been demonstrated to be more successful if multiple educational and skill building methods are used; parents are included as teachers; and engineering, regulations and enforcement strategies are included.^{31,37}

Pedestrian injuries in the elderly population generally result from limited vision and walking skills, combined with inattention by drivers. Communities will need to examine the transportation needs of older adults, as well as engineering solutions to create safe walking and street crossing routes, education of both pedestrians and drivers, and enforcement of existing traffic laws.¹⁵

A successful community pedestrian safety program would include education on safe driving behavior when pedestrians are present; identifying injury hot zones and targeting specific age groups; training programs to improve child pedestrian crossing skills that recognize children's cognitive limitations; increased enforcement of speed limit and other traffic laws; collaborative efforts with community traffic engineers and citizens to improve traffic devices, including traffic calming, improved signal timing and crosswalk markings; and the development of safe walking environments in the community.

Barriers and Challenges

Many data sources, including the Missouri State Highway Patrol, identify "motor vehicle traffic" crashes as incidents. Incidents consist of crashes occurring on public highways and roadways, and include injuries to motor vehicle occupants, motorcyclists and bicyclists or pedestrians involved in incidents with motor vehicles. Depending on the project, it may be important to look at only motor vehicle occupant data, or to include non-traffic motor-vehicle data and bicycle crashes that do not involve motor-vehicles.

Bicycle helmet safety programs should be combined with other wheeled sports. However, most medical record data do not contain specific information on scooter, skateboard, and in-line skating injuries. Public health agencies and coalitions have traditionally not been heavily involved with legislative and enforcement prevention strategies. Most motor vehicle injury prevention programs concentrate on children, especially car seat education and bicycle helmet promotion. There are few programs focused on other high-risk groups, including young drivers and older adults.

Recommendations

GOAL 1: Improve and maintain data collection and dissemination to focus injury prevention efforts.

- a. Develop data linkage between the electronic Highway Patrol Compendium <http://www.msdp.dps.mo.gov/MSHPWeb/SAC/Pubs/TrafficPub.html> and the Department of Health and Senior Services - nonmotorized injury statistics database <http://www.dhss.mo.gov/InjuryMICA/>.

- b. Encourage improvements in data collection systems for medical records and emergency medical services trip reports to provide more details on alcohol, drugs, restraint use, and other contributing factors for motor-vehicle traffic-related injuries.
- c. Improve the details on death certificates for motor-vehicle injuries regarding alcohol, drugs, restraint use, and other contributing factors.

GOAL 2: Establish guidelines and evaluation measures for injury prevention programs that are based on current evidence-based research and literature.

- a. Promote state and local motor vehicle injury prevention efforts that include a combination of: enforcement of existing laws; advocacy to strengthen traffic safety laws and public education activities that support enforcement efforts and address barriers to restraint use.
- b. Promote effective motor vehicle, bicycle, and pedestrian injury prevention programs that are multi-faceted, evidence-based, culturally competent, and include an evaluation component.
- c. Promote motor vehicle injury prevention programs that target the high-risk groups identified through data.

GOAL 3: Coordinate and link emergency medical services, trauma care, and public health agencies with other injury prevention programs at the state and local levels to increase collaboration and maximize the use of resources.

- a. Promote participation by all emergency medical services, trauma centers, and public health agencies in community-based traffic safety efforts.
- b. Promote the collaboration of traffic safety programs with community agencies to include physical activity promotion, safe school and community walking, and bicycling programs and older adult driving concerns.

GOAL 4: Develop leadership to identify and respond to injury prevention needs to initiate policy changes, provide technical assistance, training and support to injury prevention efforts at the state and local level.

- a. Expand the role of the Missouri Department of Transportation to collaborate with and help fund local, regional, and statewide programs.
- b. Establish the 2008 Injury Prevention Program as one of the statewide resources for program development, implementation, evaluation, and training on the issues of motor vehicle safety, bicycling, other wheeled sports, and pedestrian safety.

GOAL 5: Strengthen state and local legislation and policies that lead to the prevention of injuries.

- a. Advocate for the strengthening of Missouri's safety belt use law to a primary enforcement law for all seating positions and all ages.
- b. Advocate for the strengthening of Missouri's graduated licensing laws.
- c. Require high schools to teach driver education classes.
- d. Advocate for the passage of local and statewide helmet laws for bicycling and other wheel-related sports.
- e. Encourage increased enforcement of existing traffic laws by all law enforcement agencies.
- f. Support stronger state and local penalties for non-compliance with traffic laws.
- g. Encourage hospital policies to require appropriate child passenger safety restraint education and use for all children discharged from the hospital.
- h. Encourage policies for pre-hospital transport agencies to provide appropriate restraint systems for transporting all patients and passengers.
- i. Encourage mandatory employee seatbelt policies for all trauma centers, emergency medical services, and public health agencies.
- j. Encourage state and local agencies to examine requirements for license renewal and driving restrictions based on age, medical conditions, and other criteria.

Evaluation of Goals

The Missouri Coalition for Roadway Safety (MCRS) will monitor the implementation and success of Missouri's Blueprint to ARRIVE ALIVE. Ultimately, the key measure will be maintaining the recent deduction in fatal and disabling injuries at 850 until the new priorities are set in 2011. The Implementation and Strategic Planning Subcommittee and the Traffic Records Coordinating Subcommittee of the MCRS is responsible for providing annual reports on the progress and performance of the safety partners' collective efforts.

The following are a few selected items that will be monitored:

- Passage of a Primary Safety Belt Law
- Maintenance of the All-Rider Motorcycle Helmet Law
- Enhancement of existing safety laws (e.g., GDL, Impaired Driving, etc.)
- Increased number of roadway miles with shoulder, edgeline, and centerline rumble strips
- Increased installation of three-strand cable or equivalent
- Increased number of innovative engineering designs installed
- Increased amounts of roadway miles with new, expanded, or enhanced shoulders
- Increased number of curves receiving safety enhancements and evaluation of type of safety countermeasures installed
- Increased number of agencies conducting sobriety checkpoints and the number of checkpoints conducted
- Increased number of agencies participating in the "Click It or Ticket" and "You Drink & Drive. You Lose." mobilizations
- Increased number of agencies participating in the quarterly impaired driving and occupant protection initiatives
- Increased percentage of children properly restrained
- Percent of increase in the safety belt use rate
- Percent of increase in the teen safety belt use rate
- Increased number of breath alcohol ignition interlocks installed
- Increased percentage of agencies electronically submitting crash reports to the Missouri State Highway Patrol
- Status of the implementation of the strategies identified in the Impaired Driving Strategic Plan

The action items above are connected to the following outcome measures:

Aggressive Driving:

Goal #1: To decrease aggressive driving-related fatalities by 2 percent annually to:

- 419 by 2010
- 410 by 2011
- 402 by 2012
- 394 by 2013

Performance Measure:

- Number of aggressive driving-related fatalities

Benchmarks:

- 2009 aggressive driving-related fatalities = 376

Goal #2: To decrease speed-related fatalities by 2 percent annually to:

- 409 by 2010
- 401 by 2011
- 393 by 2012
- 385 by 2013

Performance Measure:

- Number of speed-related fatalities

Benchmarks:

- 2009 speed-related fatalities = 366

Goal #3: To increase speed-related arrests made during grant-funded enforcement activities and mobilizations by 2 percent annually to:

- 96,924 by 2010
- 98,863 by 2011
- 100,840 by 2012
- 102,856 by 2013

Performance Measure:

- Number of speeding citations issued during grant-funded enforcement activities and mobilizations

Benchmark:

- 2009 speeding citations issued during grant-funded enforcement activities and mobilizations = 98,453

Alcohol and other Drugs:

Goal #1: To decrease fatalities involving drivers with .08 BAC or greater by 2 percent annually to:

- 298 by 2010
- 292 by 2011
- 286 by 2012
- 280 by 2013

Performance Measure:

- Number of fatalities involving drivers of passenger vehicles and motorcycle operators with .08 BAC or greater

Benchmarks:

- 2008 fatalities involving drivers of passenger vehicles and motorcycle operators with .08 BAC or greater = 310

Goal #2: To increase impaired driving arrests made during grant-funded enforcement activities by 2 percent annually to:

- 7,711 by 2010
- 7,865 by 2011
- 8,022 by 2012
- 8,182 by 2013

Performance Measure:

- Number of impaired driving arrests made during grant-funded enforcement activities

Benchmark:

- 2009 impaired driving arrests made during grant-funded enforcement activities = 5,369 (DWI)

Goal #3: To decrease fatalities involving impaired drivers under the age of 21 years by 2 percent annually to:

- 37 by 2010
- 36 by 2011
- 35 by 2012
- 34 by 2013

Performance Measure:

- Number of fatalities involving impaired drivers under the age of 21 years

Benchmark:

- 2009 fatalities involving impaired drivers under the age of 21 years = 37

Occupant Restraints:

Goal #1: To increase statewide seat belt usage by 2 percent annually to:

- 80 percent by 2010
- 82 percent by 2011
- 84 percent by 2012
- 86 percent by 2013

Performance Measures:

- Statewide percent observed belt use for passenger vehicles (front seat outboard occupants)

Benchmarks:

- 2010 statewide seat belt usage rate = 76 percent

Goal #2: To reduce unrestrained passenger vehicle occupant fatalities by 2 percent annually to:

- 470 by 2010
- 460 by 2011
- 451 by 2012
- 442 by 2013

Performance Measures:

- Number of unrestrained passenger vehicle occupant fatalities

Benchmarks:

- 2009 unrestrained passenger vehicle occupant fatalities = 425

Goal #3: To increase seat belt citations by 2 percent annually to:

- 29,265 by 2010
- 29,850 by 2011
- 30,447 by 2012
- 31,056 by 2013

Performance Measures:

- Number of seat belt citations issued during grant-funded enforcement and mobilizations

Benchmarks:

- 2009 seat belt citations (grant-funded enforcement and mobilizations) = 29,034

Goal #4: To increase teen seat belt usage by 2 percent usage annually to:

- 66 percent by 2010
- 68 percent by 2011
- 70 percent by 2012
- 72 percent by 2013

Performance Measures:

- Percent observed belt use for teen front seat outboard occupants

Benchmarks:

- 2010 teen seat belt usage rate = 66 percent

Goal #5: To increase seat belt usage by commercial motor vehicle drivers by 2 percent annually to:

- 77 percent by 2010
- 79 percent by 2011
- 81 percent by 2012
- 83 percent by 2013

Performance Measures:

- Percent observed seat belt use for commercial motor vehicle (CMV) drivers

Benchmarks:

- 2008 CMV driver usage rate = 73 percent

Goal #6: To increase child safety seat usage by 2 percent annually to:

- 94 percent by 2010
- 96 percent by 2011
- 98 percent by 2012
- 100 percent by 2013

Performance Measures:

- Percent observed child safety seat use

Benchmarks:

- 2009 child safety seat usage rate = 91 percent

Goal #7: To maintain an adequate base of certified Child Passenger Safety Technicians throughout the state to fall within the following range:

- 800-1,000 with representation in each of the ten *Blueprint* regional coalitions

Performance Measures:

- Number of certified Child Passenger Safety Technicians in the statewide database maintained by the highway safety division

Benchmarks:

- Certified Technicians as of July 2010 = 925

Goal #8: To maintain an adequate base of certified Child Passenger Safety Instructors throughout the state to fall within the following range:

- 30-40 with representation in each of the ten *Blueprint* regional coalitions

Performance Measures:

- Number of certified Child Passenger Safety Instructors in the statewide database maintained by the highway safety division

Benchmarks:

- Certified Instructors as of July 2010 = 41

Goal #9: To maintain an adequate base of Missouri inspection stations (that are listed on the NHTSA website) throughout the state to fall within the following range:

- 125 – 200 with representation in each of the 10 blueprint regional coalitions

Performance Measures:

- Number of Missouri inspection stations in a statewide database maintained by the Highway Safety Division

Benchmarks:

- Inspection stations in Missouri as of August 2010 = 105

Young Drivers:

Goal #1: To decrease fatalities involving young drivers by 2 percent annually to:

- 182 by 2010
- 179 by 2011
- 175 by 2012
- 172 by 2013

Performance Measure:

- Number of drivers age 20 or younger involved in fatal crashes

Benchmarks:

- 2009 fatalities involving drivers age 20 or younger = 156

Goal #2: To decrease disabling injuries involving young drivers by 2 percent annually to:

- 1,710 by 2010
- 1,676 by 2011
- 1,643 by 2012
- 1,610 by 2013

Performance Measure:

- Number of drivers age 20 or younger involved in disabling injury crashes

Benchmarks:

- 2009 disabling injuries involving drivers age 20 or younger = 1,625

Older Drivers:

Goal #1: To decrease fatalities involving older drivers annually to:

- 153 by 2010
- 150 by 2011
- 147 by 2012
- 144 by 2013

Performance Measure:

- Number of fatalities occurring in crashes involving older drivers

Benchmarks:

- 2009 fatalities involving older drivers = 153

Goal #2: To decrease serious injuries involving older drivers by 2 percent annually to:

- 920 by 2010
- 902 by 2011
- 884 by 2012
- 866 by 2013

Performance Measure:

- Number of serious injuries occurring in crashes involving older drivers

Benchmarks:

- 2009 serious injuries involving older drivers = 962

Motorcycle Fatalities:

Goal #1: To decrease motorcyclist fatalities by 2 percent annually to:

- 103 by 2010
- 101 by 2011
- 99 by 2012
- 97 by 2013

Performance Measure:

- Number of motorcyclist fatalities

Benchmarks:

- Number of 2009 motorcyclist fatalities = 84

Goal #2: To decrease unhelmeted motorcyclist fatalities by one per year (does not include fatalities where helmet use was "unknown"):

- 11 by 2010
- 10 by 2011
- 9 by 2012
- 8 by 2013

Performance Measure:

- Number of unhelmeted motorcyclist fatalities (only those fatalities where helmet use was known)

Benchmarks:

- Number of 2009 unhelmeted motorcyclist fatalities = 16

Goal #3: To decrease fatalities involving motorcycle operators with .08 BAC or above by one fatality annually:

- 26 by 2010
- 25 by 2011
- 24 by 2012
- 23 by 2013

Performance Measure:

- Number of fatalities involving motorcycle operators with .08 BAC or above

Benchmark:

- 2008 fatalities involving motorcycle operators with .08 BAC or above = 28

School Buses:

Goal #1: To decrease by 2 percent the number of fatalities and disabling injuries resulting from crashes involving school buses in comparison to the previous 3-year period to:

- 85 for the period 2008-2010
- 83 for the period 2009-2011
- 81 for the period 2010-2012
- 80 for the period 2011-2013

Performance Measures

- Number of fatalities occurring in crashes involving school buses
- Number of disabling injuries occurring in crashes involving school buses

Benchmarks:

- 2007-2009 fatalities and disabling injuries occurring in crashes involving school buses = 94

Vulnerable Roadway Users:

Goal #1: To decrease one pedestrian fatality annually to:

- 64 by 2010
- 63 by 2011
- 62 by 2012
- 61 by 2013

Performance Measure:

- Number of pedestrian fatalities

Benchmarks:

- 2009 pedestrian fatalities = 71

Goal #2: To decrease the five year (2005-2009) bicyclist fatality average by one to:

- 4 by 2010
- 3 by 2011
- 2 by 2012
- 1 by 2013

Performance Measure:

- Number of bicyclist fatalities

Benchmarks:

- 2009 bicyclist fatalities = 2

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CHAPTER 6 Traumatic Brain Injury

This chapter is adapted from the “The Public Health Burden of Traumatic Brain Injuries in Missouri” and the Missouri Traumatic Brain Injury State Plan

Overview

Every year in Missouri, more than 1,300 people die and more than 12,000 people are treated at an emergency department or are hospitalized due to a traumatic brain injury (TBI). Many more people sustain a TBI but go undiagnosed and untreated. TBI is an injury to the brain that can result in multiple impairments and disabilities often leading to considerable loss of independence, productivity, and income potential.

The Missouri Head Injury Advisory Council was transferred from the Office of Administration to the Department of Health and Senior Services by Executive Order of the Governor on February 2, 2005. The vision of the Missouri Head Injury Advisory Council (MHIAC) is excellence in traumatic brain injury (TBI) prevention, public awareness, and the provision of services and supports across the lifespan of people with brain injuries and their families. To achieve this vision, the council’s mission is to lead in the development of a collaborative statewide system of prevention, public awareness, and provision of services and supports driven by the needs of individuals with brain injury and their families. The Missouri Traumatic Brain Injury State Action Plan was developed to serve as a guide to the MHIAC, keeping the council focused on the key priority goals and objectives. The council will determine specific activities as partnerships and resources are identified and opportunities arise. Just as collaboration with many key stakeholders was very important in the development of the State Action Plan, collaboration will be vital as the council moves ahead into implementation of the plan. The council will look to identify partnerships that can leverage outcomes consistent with those identified in the plan. The council does not have the resources to accomplish this alone, but rather identifies itself through its mission as the organization that must lead in the establishment of these collaborative partnerships. The implementation of this action plan brings the hopes of preventing TBI, increasing public awareness of TBI, and increasing services and supports for those who have survived a TBI and their families. While many TBI initiatives and programs have been established in Missouri during the past few decades, they form only a foundation. Missouri must continue to build upon that foundation to provide appropriate and accessible services to all persons who have been affected by a TBI. This action plan is a positive step forward in that direction.

Improvements in health care and technology are helping people with TBIs live longer, healthier lives, so the need for services to assist those with TBIs and their family members is growing. Educating the public about TBI is vital to improving the lives of TBI survivors. Because prevention is the only real cure for TBI, efforts to promote the use of seat belts, child safety seats, and helmets and to prevent child abuse, domestic violence, and other non-accidental injury are vital to reducing the number of people affected by TBI.

Definition

- TBI is defined as a blow or jolt to the head or a penetrating head injury that disrupts the function of the brain. Most TBIs are caused by falls, jumps, motor vehicle traffic crashes, being struck by a person or a blunt object, and assault. Blast injuries sustained in combat are a growing cause of TBI.

TBI can range from mild to severe, and the effects can be temporary or permanent. Many people who experience a TBI have long-term or lifelong disabilities as a result of impairments in a number of areas including:

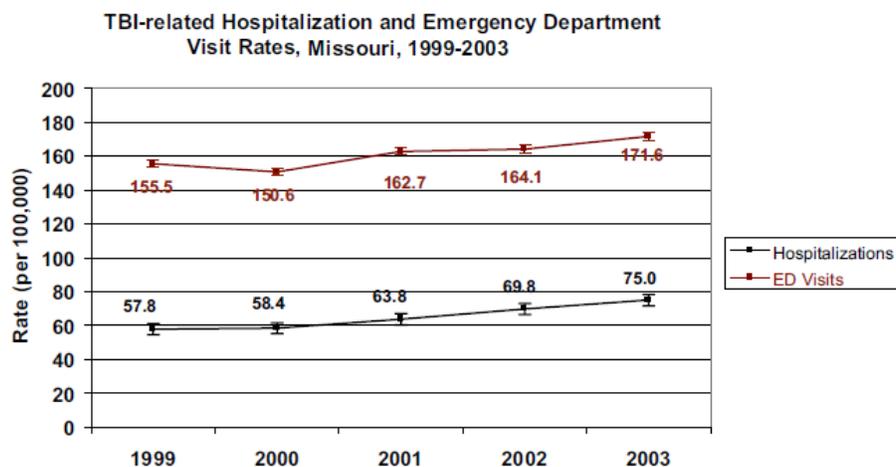
- Thinking and reasoning
- Understanding words
- Memory
- Attention
- Speech
- Problem solving
- Behavior
- Physical activities
- Seeing
- Hearing

These impairments can affect a person's physical, cognitive, behavioral, and emotional well-being, which subsequently impacts self-concept, family and social relations, education and learning performance. These secondary disabilities can cause significant long-term problems with independent living, community integration, employment and financial stability.

The Burden

A brain injury occurs every 23 seconds in the United States. Given the most recent data available from the TBI Registry and the national Centers for Disease Control and Prevention (CDC), and accounting for the numerous biases toward under-reporting, the best estimates suggest that between 18,000 and 25,000 Missourians will incur a brain injury each year. The condition is often called the silent epidemic because many people are unaware of the impact it has on those who are injured and their families. The short- and long-term consequences of a TBI create a significant public health burden across the country and in Missouri. Because TBIs affect different areas of the brain in different ways, no two brain injuries are alike. As a result, a range of services that can meet individual needs and change over time is necessary.

Missouri has seen a troubling increase of 15.6 percent in the annual combined emergency department (ED) visits and hospitalizations related to traumatic brain injury (TBI). The rate of combined ED visits and hospitalizations increased from 213.3 per 100,000 in 1999 to 246.6 per 100,000 in 2003. Although there is no estimate for the number of people that experience a TBI and receive some type of medical care other than visiting an ED or being admitted to a hospital or who receive no care at all, there were still more than 14,000 TBI events each year in Missouri between 1999 and 2003. These events resulted in an average 1,320 deaths, 3,660 hospitalizations, and 9,082 individuals treated and released from the ED.



The leading causes of TBI in Missouri are falls/jumps, motor vehicle traffic crashes, being struck by a blunt object or by a person, and motor vehicle non-traffic crashes occurring off major roadways. All four mechanisms experienced a statistically significant increase during 1999-2003: falls/jumps increased 22.7 percent; motor vehicle traffic crashes increased 12.9 percent; struck by or against an object or person increased 16.1 percent; and motor vehicle non-traffic crashes increased 26.1 percent. These four causes account for more than 90 percent of all TBI-related injuries in Missouri. Falls/jumps and motor vehicle traffic crashes each accounted for approximately 37 percent of all TBI-related hospitalizations. The majority of TBI-related ED visits were from falls/jumps, motor vehicle traffic crashes, and being struck by or against a person or object. Missouri is annually averaging a

greater combined percentage of ED visits and hospitalizations related to these mechanisms than the national annual average.

The populations at highest risk for TBI in Missouri were in the age groups of 0 to 4 years, 15 to 24 years, and 85 years and older. Males are more than 1.5 times as likely as females to sustain a TBI. African-American men are also more likely to experience TBI than females or white males. The overall age groups in Missouri demonstrating the highest combined ED visits and hospitalization rates for TBI from falls/jumps were those aged 0 to 4 and 85 and older. Motor vehicle traffic crashes related to TBI were highest among individuals 15 to 17 for females, 18 to 19 for males, followed by individuals 20 to 24. TBI emergency department visits and hospitalization combined rates for being struck by or against an object or person were highest among individuals aged 15 to 17. TBI related to being struck by or against an object or person showed a statistically significant increase of 35.4 percent between the years 1999-2003. The 10 to 14 age group is most likely to go to the ED or be hospitalized for a TBI caused by a motor vehicle non-traffic crash. In addition, the overall trend in ED visits and hospitalizations, separately and combined, related to TBI in Missouri is increasing.

There are several Missouri counties that demonstrated higher combined rates of TBI-related ED visits and hospitalizations compared to the state average (226.5 per 100,000) based on the county of residence of the person seeking care for TBI. The six Missouri counties identified with the highest reported annual TBI combined rates during 1999-2003 were: Harrison (565.7), Ray (475.1), Clinton (443.3), Clay (420.3), Daviess (349.2), and Jackson (343.4).

Economic cost

The economic burden from medical care, disability, and death related to TBI is considerable. The total annual direct medical cost of TBI in Missouri was an estimated \$67 million. Indirect costs such as lost productivity due to TBI related mortality were an estimated \$795 million annually in Missouri. The state's Medicaid program bears substantial costs related to TBI. For the four-year period, 1999-2002, Medicaid net payments in the fee-for-service portion of the program paid over \$22.5 million related to TBI. In 2004, an estimated 114,089 living Missourians had received medical treatment for TBI.

Special Issues

Traumatic brain injury among the troops

Traumatic brain injury has been identified as the "signature wound" of the Global War on Terror. It is estimated that among American troops 10 percent of all troops and 20 percent of infantry troops have sustained a TBI. Military Medical Centers have reported that 60 percent of all blast injuries resulted in a TBI, and for Marines with blast injuries, 83 percent had a TBI. Dr. Deborah Warden, national director of the Defense and Veteran Brain Injury Center, has reported that the true proportion is probably higher because some TBI cases are not properly diagnosed (David, 2007).

Best Practices

TBI creates a significant public health burden, both nationally and within the state of Missouri when the number of events, short- and long-term consequences, and costs are considered. Implementing evidence-based and promising strategies offers key opportunities for reducing TBI in Missouri. Interventions that are most likely to reduce the burden of TBI in Missouri include risk assessment and measures to reduce the risk of falls particularly in children and the elderly; use of safety equipment (e.g., child seats, seat belts, and helmets); reducing alcohol impaired driving; and behavioral interventions to reduce violence such as therapeutic foster care, early childhood home visitation programs, and limiting accessibility to firearms. Programs specific to traumatic brain injury in infants such as the *Period of Purple Crying* are also showing promise.

Challenges

In 2004, the Missouri Head Injury Advisory Council (MHIAC) contracted with the University of Missouri-Columbia to conduct a needs assessment for traumatic brain injury (TBI) issues in Missouri.

The TBI needs assessment addresses the breadth and depth of need among persons with TBI and their families throughout Missouri. The goals of the needs assessment were:

Goal 1: Estimate the incidence and prevalence of traumatic brain injury in Missouri

Goal 2: Interview individuals with brain injury, their families, and other key stakeholders

Goal 3: Identify brain injury service gaps in Missouri

Participants listed the following key barriers:

- Limited public knowledge of TBI
- Lack of coordinated state TBI policies
- Funding issues
- Lack of post-acute TBI services
- Lack of adequate family supports, transportation, and housing
- Substance abuse
- Reaching out to traditionally underserved populations

Challenges identified by collaborative partners were similar and included:

- Limited public knowledge
- Substance abuse
- Lack of coordinated state traumatic brain injury policies
- Lack of post acute traumatic brain injury services
- Lack of adequate family supports, transportation and housing

Resources

In addition to the Missouri Head Injury Advisory Council (MHIAC) and collaborative partners, the Missouri Department of Health and Senior Services was recently awarded a Traumatic Brain Injury (TBI) Implementation Partnership Grant from the U.S. Department of Health and Human Services. The grant award is from April 1, 2009 through March 31, 2013. The overall goal of the grant is “to provide individuals with TBI and their families with improved access to comprehensive, multidisciplinary, coordinated, and easily accessible systems of care.” A volunteer ombudsman has been appointed to be a voice for survivors and family members relative to grant activities. The ombudsman reports regularly to the MO Head Injury Advisory Council.

Successful prevention of TBI is clearly interrelated to efforts in other areas. Prevention activities related to child abuse are detailed in Chapter 2, falls among older adults in Chapter 4 and motor vehicle and bicycle injury in the prior chapter.

Recommendations:

The Missouri recommendations were based on the latest research, Missouri data, and the needs assessment.

Goal 1: Reduce preventable brain injuries

- Strategy 1: Increase public awareness of preventing brain injuries
 - Collaborate with appropriate partners with a prevention focus
 - Build and promote a resource library
 - Promote Brain Injury Awareness Month
- Strategy 2: Support unintentional injury prevention policy
 - Collaborate with appropriate partners
 - Reduce substance abuse in general public
 - Assist in promotion of prevention legislation
 - Encourage environmental improvements
- Strategy 3: Reduce child abuse, domestic violence, and non-accidental injury
 - Collaborate with appropriate partners such as Children’s Division, Missouri Prevention Partners and the Missouri Coalition Against Domestic and Sexual Violence
 - Promote current campaigns and programs
 - Encourage education of mandated reporters
 - Promote support programs

Goal 2: Increase the awareness and knowledge of brain injuries in our communities

- Strategy 1: Develop a marketing plan to educate targeted populations about brain injuries
Identify and prioritize target populations (see *Missouri Greenbook* as a recent example)
 - Develop messages based on target populations
 - Identify potential partners for collaborative efforts
 - Implement and evaluate the delivery of messages to targeted populations

Goal 3: Ensure quality, accessibility, and timeliness of services and supports across the lifespan

- Strategy 1: Identify current service and policy gaps
 - Review the current definition of traumatic brain injury in Missouri statute
 - Identify partners for collaborative service and support delivery
- Strategy 2: Increase brain injury service funding
 - Develop partnerships to maximize funding
 - Actively identify and pursue grant opportunities for the council and partners
 - Maximize opportunities for federal funding for current and potential programs and services
 - Promote and maintain the importance of the Head Injury Fund
 - Identify and review other successful state funding systems

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CHAPTER 7 Suicide

Content adopted from Missouri State Department of Mental Health Suicide Prevention Plan with additional material by Wei Chern Ng, Brown Center for Violence and Injury Prevention

Overview

Suicide has stolen lives around the world and across the centuries. Suicide exacts an enormous toll from the American people. Suicide claims more than 29,500 American lives each year.¹ Suicide is the eleventh leading cause of death for adults and the third leading cause for kids. There are many more suicides in Missouri than homicides. Every day two people die by suicide in Missouri. Meanings attributed to suicide and notions of what to do about it have varied with time and place, but suicide has continued to exact a relentless toll. Only recently have the knowledge and tools become available to approach suicide as a preventable problem with realistic opportunities to save many lives.”² Compounding the tragedy of loss of life, suicide evokes complicated and uncomfortable reactions in most of us. Too often, we blame the victim and stigmatize the surviving family members and friends. These reactions add to the survivors’ burden of hurt, intensify their isolation, and shroud suicide in secrecy.

Definition

- The term suicide refers to death where there is evidence that a self-inflicted act led to the person's death.
- The term suicidal behavior refers to a variety of activities related to thoughts and behaviors that include suicidal thinking, suicide attempts, and completed suicide.

Facts and Trends³

Suicide is ranked the 11th cause of death in the U.S. The rate of suicide is 10.8 per 100,000 equaling 1.3 percent of all deaths. On average, 1 person every 17.2 minutes kills themselves. For each completed suicide, as many as 25 people will make a non-lethal attempt (source of data of the last 3 sentences not available from document). Suicide is a growing concern among active duty military persons.⁴

Youth and the elderly have the highest rate of suicide:

- Suicide is the 3rd leading cause of death for youth age 15 to 24
- 19 percent of students have ‘seriously considered’ attempting suicide⁵
- 8 percent have made a suicide attempt
- Elderly account for 18.1 percent of completed suicides
- Over the age of 65, there is 1 suicide for every 4 attempts
- 75 percent have seen a primary care physician within a month of their suicide

More Missourians die by suicide than by DWI, homicide, or AIDS.

- Missouri’s rate of suicide (12.9 / 100,000) is the highest in Region VII (*Kansas, Iowa, Nebraska and Missouri*)
- Suicide is the 11th leading cause of death in Missouri⁶
- Average 707 Missourians die by suicide annually⁷
- Leading methods of suicide: firearms, suffocation, and poisoning
- Men account for 78 percent of completed suicides; women 22 percent
- 93 percent White non-Hispanics; 6 percent Black/African-American of completed suicides

Economic Cost

The economic burden of suicide is significant.

A suicide death in Canada was estimated to cost at least \$850,000; a suicide attempt cost between \$33,000 and \$308,000.⁸ In 2007, 395,320 people were treated in emergency departments for self-inflicted injuries.⁹

- Average medical cost per completed suicide exceeds \$2,000¹⁰
- Average work-lost cost per case exceeds \$800,000
- Each day, as many as 10 suicide attempters are hospitalized and medical cost per attempt averages \$7,500

Special Issues

Risk factors are a combination of stressful events, situations, and/or conditions that may increase the likelihood of suicide, especially when several coincide at any given time.

Risk factors for suicide include but are not limited to:¹⁰

Biopsychosocial Risk Factors

- Mental disorders, particularly mood disorders, schizophrenia, anxiety disorders, and certain personality disorders
- Alcohol and other substance use disorders
- Hopelessness
- Impulsive and/or aggressive tendencies
- History of trauma or abuse (bullying, violence and assault)
- Some major physical illnesses
- Previous suicide attempt
- Family history of suicide

Environmental Risk Factors

- Job or financial loss
- Relational or social loss (divorce, incarceration, legal problems)
- Easy access to lethal means
- Local clusters of suicide that have a contagious influence

Sociocultural Risk Factors

- Lack of social support and sense of isolation
- Stigma associated with help-seeking behavior
- Barriers to accessing health care, especially mental health and substance abuse treatment
- Certain cultural and religious beliefs (for instance, the belief that suicide is a noble resolution of a personal dilemma)
- Exposure to suicidal behavior of others, including through media coverage and influence of others who have died by suicide

Best Practices

Since 2003, the American Foundation for Suicide Prevention has been collaborating with the Suicide Prevention Resource Center to develop and maintain an online registry of best practices for suicide prevention. There are currently eight educational programs, four treatment programs and two education/screening programs listed as “evidence-based.” Most communities have some type of hotline resource to connect them to crisis resources.¹¹

Resources

In Missouri, the Department of Mental Health has taken the lead on suicide prevention efforts. The Missouri Suicide Prevention Project is the official program charged with prevention activities including an annual state conference that brings together experts and professionals.¹² Like most

states, Missouri has hotline capacity to link those in crisis to regional resources. There is a cadre of researchers focused on suicide prevention and intervention that also serve as a resource in the state.

Recommendations (Goals/Objectives)

The overall goal of a state plan for suicide prevention is to reduce suicide and suicidal behaviors in all populations. Missouri has followed the AIM framework (Awareness, Intervention, Methodology) as stated in the Surgeon General's Call to Action with recommendations for initiatives in each of the three areas, awareness, interventions, and methodology.

Goal 1 - Awareness

In Missouri, the suicide prevention messages will be consistent among all those engaged with awareness efforts. That message should include information regarding:

- Risk and protective factors,
- Reduce stigma by increasing the acceptability of asking for help around mental health issues,
- The importance of screening and early interventions,
- Effective treatments are available for mental illness and substance abuse disorders, and
- Where to go for help.

Strategy 1: Develop a statewide public awareness initiative designed to change attitudes toward accessing care, the acceptability of seeking help, and the availability of treatment.

Action 1.1: Develop public service announcements, brochures, resource guides; billboards, videos, Internet Web sites, and a speaker's bureau. Ongoing

Action 1.2: Identify Community partnerships and collaborations to distribute information to be completed by 2012.

Action 1.3: Identify funds and resources to assist in local implementation of awareness efforts. Ongoing

Action 1.4: Promote the use of national and state suicide prevention hotline numbers. Ongoing

Action 1.5: Develop strategies to target specific groups to receive information from the public awareness initiative. These groups will include but not be limited to the following:

- Journalists, including print and broadcast media
- School boards, administrators, staff, and students
- Social services, health, mental health, and criminal justice professionals
- Public officials, libraries, and clergy
- Consumers, Survivors and families
- Employer associations, unions, and safety councils.

Action 1.6: Promote inclusion of suicide prevention as part of conferences and training that pertain to high risk populations.

Strategy 2: Promote activities to further investigate and implement ways to influence positive attitudes and behaviors (to seek help and to access appropriate treatment). The Department of Mental Health, collaborative partners, and researchers in suicide prevention will create applied projects to further understanding of screening and connection to care. This work will be ongoing and communication facilitated with the assistance of the Center for Violence and Injury Prevention.

Strategy 3: Develop training and education opportunities for providers of services to high-risk populations; including but not limited to:

- Education professionals
- Case managers
- Criminal justice professionals

- Seniors program providers
- Child and adolescent program providers
- Social services, health and mental health professionals
- Employee assistance programs
- Suicide prevention training experience should be included in
- Basic professional development courses
- Continuing education courses and workshops
- Conferences and training sessions
- Existing community based forums attended by the above groups.

Action 3.1: In addition to annual conferences sponsored by the Missouri Suicide Prevention Project, professional development and educational opportunities will be augmented by programs offered in collaboration with the Center for Violence and Injury Prevention as well as collaboration with the Veterans Administration. Annual conferences are ongoing and the 2011 plan is now on-line. The CVIP will offer a professional development series focused on suicide prevention during the 2011-2012 academic year.

Strategy 4: Ensure that the suicide prevention message is consistent across agencies and that the prevention strategies and information about the risk and protective factors are integrated into suicide-related materials of all groups and agencies.

Action 4.1: Monitor the development of suicide prevention messages and assure that they are guided by the state plan.

Action 4.2: Develop an advisory committee on suicide prevention that will keep the message consistent and complete through an identified staff to shepherd this effort in DMH.

Goal 2 - Interventions Improve access and availability of services that encourage early detection, promote intervention, and eliminate stigma associated with suicidal ideation/behavior

Strategy 1: Endorse, recommend, and/or develop appropriate screening tools

Action 1.1: Assessment of coping and problem solving skills and help seeking behaviors

Action 1.2: Promote informal mental health screenings (anxiety, depression, stress, etc)

Action 1.3: Encourage inclusion of formal mental health screenings to the medical community

Action 1.4: Assure use of age appropriate tools for early identification of suicidal ideation across the lifespan

Strategy 2: Promote the development of prevention and intervention training within communities for all citizens

Action 2.1: Develop community education opportunities. Ongoing

Action 2.2: Recommend gatekeeper training curricula by 2012

Action 2.3: Include suicide prevention and intervention training for those working in elementary and secondary education and institutions of higher learning. Develop plan for implementation statewide by 2013

Action 2.4: Identify key members of the community, both professional and lay persons by 2013

Action 2.5: Target providers of services to high-risk populations; including but not limited to

- Education
- Case Managers
- Criminal justice professionals
- Seniors program providers
- Child & adolescent program providers
- Social services, health, and mental health professionals
- Employee assistance programs
- Suicide prevention training component(s) should be included in

- Professional curricula development
- Continuing education and refresher opportunities
- Conferences and related enrichment
- Community based forums

Strategy 3: Publicize community, state, and national crisis telephone hotlines. Ongoing

Goal 3 - Methodology

Strategy 1: Establish an advisory committee to monitor and oversee the effective implementation of the goals and activities set forth in this plan. The committee will be established by December 2011.

Strategy 2: Develop a plan to evaluate the progress made by collaborative partners on the three prior goals. Completed by January 2012.

Action 2.1: Identify and access availability of data sources to inform use of information resources, suicide attempts, trainings provided. Completed by December 2012

Action 2.2: Identify a lead agency or coalition to compile evaluation data

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Conclusion

The state of Missouri looks forward to impacting the intentional and unintentional injury areas included in this plan. We thank all the persons who contributed their time and expertise to develop the chapters included. In addition, we wish to recognize the work of members who forwarded additional background information and preliminary recommendations for intimate partner violence, poisoning, and burns. Committee members and agency officials recognize the importance of these issues for our state and look forward to continuing to build the infrastructure to be able to add these areas to our next plan.

We recognize that in order to successfully implement this plan it takes adequate resources and collaboration at the local levels as well as between local, regional, and state organizations. The Violence and Injury Prevention Program within the Missouri Department of Health and Senior Services and members of the Missouri Injury and Violence Prevention Advisory Committee are committed to moving forward to address the data, infrastructure, training, and policy needs that are common to many of the issues outlined in this plan. The personal and socioeconomic costs to Missouri's citizens are too great to do otherwise.