

## **A summary of evidence-based and best practices to prevent violence and injury of children and youth in King County, Washington**

### *Background and Context*

In King County, Washington and nationwide, children, youth and young adults are disproportionately impacted by violence and injury compared to adults. Unintentional injury and violent injury are the leading cause of death for people 1 to 25 in King County, leading to more deaths than medical illnesses like cancer and communicable diseases like influenza. Despite their lower prevalence, the latter receive broad attention in the media, research, and the health care system, while far fewer resources and structural supports are dedicated to preventing deaths from unintentional injury and violence.

The financial cost of violence and injury is well-documented, with estimates of medical and lost productivity costs available from the CDC.<sup>1</sup> Lowered life expectancy in communities where fatal childhood injuries are most prevalent shows us one dimension of the cost to public health. None of this, however, includes the financial and emotional costs to family members and the community when a child is seriously injured or dies. Nonfatal injuries can lead to lifelong disability and contribute to the host of health problems linked to emotional trauma, not all reflected in cost calculations.

Many types of injuries result in death and hospitalization, and how a child or youth is likely to get hurt appears to be influenced by brain and social development and where they spend their time. For instance, research shows that most infants and toddler injuries happen at home or in child care settings; many adolescents are injured because of risky choices influenced by life history and peer relationships; recreational injury rates increase and violent injury rates plummet in middle childhood, when children are somewhat insulated from risks at home and not yet making high-risk choices of their own.

From 2002 to 2014, 1500 children, youth and young adults died and 31,522 were hospitalized due to unintentional or violent injury in King County. Investment in evidence-informed prevention likely could have made a difference: Choices made by young people or their caregivers can be informed by education, support services, and other interventions. Changes in the home environment or public space, such as installation of safety mechanisms and changes in traffic patterns, can make children and youth safer in their homes and communities. Enhancement and enforcement of policies and regulations give supports for infants, toddlers, children and youth to stay safe. Upstream prevention can prevent traumatic experiences before they occur and give youth the skills and resources to navigate adversity and make safer choices as they mature.

There may not be consensus on the role of local government in creating and supporting these opportunities and systems. However, at a minimum we must recognize that these largely preventable losses of life and life-altering injuries are unacceptable, and that the disproportionate impact of injury and violence on young people is an equity concern. King County's government, including Public Health, can take an active role in preventing future injuries and losses by establishing an equity-based framework for prevention.

This report examines some of the most common fatal and nonfatal injuries among children and youth in King County. It sums up some known risk and protective factors and best practices in prevention. This information and the accompanying data brief will give community providers the tools to choose effective practices and connect with county agencies to put them in place.

## UNINTENTIONAL INJURY

Unintentional injuries are commonly referred to as accidents – a term the violence and injury prevention field avoids because it minimizes the importance and potential of strategically planned prevention. Some of the most common unintentional injuries leading to hospitalization and death are infant sleep injuries, falls, traffic-related injuries, burns, unintentional poisoning (including drug overdoses), and drowning. Unintentional injuries have a strong relationship to poverty, unsafe housing and public spaces, and substance abuse, with many specific risk factors for specific types of injury. In many cases, particularly for young children, adult supervision is a key part of prevention.

For many types of injury, there are many more Emergency Medical Services (EMS) responses than hospitalizations, showing the high prevalence of less serious injuries. More research is needed to understand the relationship between these injuries and more serious future harm.

### **Drowning**

Drowning causes a number of deaths of young people in settings like King County, where there are abundant bodies of water and recreation such as boating and swimming is popular. Infants and toddlers are at more risk of drowning in settings closer to home like bathtubs and pools, while older children and youth are more likely to drown in open water. 90 children and youth died by drowning in King County from 2002 to 2014. There were twice as many drownings among adolescents and young adults as among children under 10, and a large majority of adolescents who drowned were 15 and older. Both locally and nationally, children and youth who die by drowning are disproportionately male.

#### *In the home*

Nationally, 78% of infant drownings take place in the home, often in bathtubs or buckets.<sup>2</sup> Public education about the importance of home drowning prevention and close supervision of infants in the home are known prevention strategies. Infants should never be left alone, even for a moment, in or near a bathtub or bucket with liquid in it.

#### *Around pools*

Nationally, children between ages 1 and 4 have the greatest risk of drowning in swimming pools.<sup>3</sup> Pool fencing has been studied as a drowning prevention strategy for this age group. Evidence shows that the most effective pool fencing is four-sided fencing at least 4 feet high, with no hand or foot holds and no opening greater than four inches between the bottom of the fence and the ground or between bars. Gates should be self-closing and self-latching and open out from the pool. The Consumer Product Safety

Commission has issued detailed guidelines for safety design in residential pools, outlining these standards in more detail.<sup>4</sup> These guidelines are not mandatory for home residential pools, but King County has incorporated them into enforceable building codes for public and semi-public pools and spas.<sup>5</sup> Drowning is far less prevalent in this age group in King County due to this focused local work.

Most young children who drown in a home pool are under parental supervision at the time, and most were out of an adult's sight for less than five minutes. Supervision, in addition to safe fencing, is key. There is some evidence that taking part in formal swimming lessons reduces drowning risk among children 1 to 4 years old,<sup>6</sup> however, swimming skill is not a substitute for supervision and other safety measures for people of any age.

*Parents, social workers and medical personnel are generally further agreed that pre-school-age children, in particular, should be supervised constantly to minimize the risk of injury – with any unsupervised period lasting no longer than five minutes.<sup>1</sup>*  
- World Health Organization, *World Report on child injury prevention*

#### *Around natural water sources*

Nationally and locally, children 5 and older are most likely to drown in natural bodies of water while swimming, playing in or near, and/or boating in open water. These drownings most often take place in fresh water, such as rivers and lakes.<sup>7</sup> In King County, very cold water temperature is a contributor to drowning; rivers and lakes swell with water from melting snow in the mountains in early summer, remaining cold even when the air temperature is warm. Swimming in water this cold creates a hazard even for the most experienced swimmers, a risk most people - particularly those who come from places with warmer swimming water - are not aware of.

For children and youth of all ages, supervision from trained lifeguards is a widely implemented drowning prevention strategy. The presence of a lifeguard appears to decrease drowning risk, and lifeguarding organizations are pursuing evidence-based practices to improve their work.<sup>8</sup> However, even at swimming areas with resources for lifeguard staffing, lifeguards are generally not present after dark. Further, the weather in recent years has been growing warm enough for swimming before lifeguards begin working for the summer, raising experts' concerns about increased drowning risks among children, youth and adults.

Resources for lifeguard supervision at open-water swimming areas decreased in King when state budget cuts led to the removal of lifeguards at two state parks, leaving these popular swimming beaches unguarded. During the years with no lifeguards there were drownings and nonfatal drowning injuries of children, youth and adults at these beaches; there were no drownings at these beaches during the 2008-10 biennium, when funding was briefly restored and lifeguards reinstated at these parks.

Wearing personal flotation devices (PFDs), such as life jackets, in open water is an evidence-based practice to prevent drowning. Although federal law requires that all children under 13 wear PFDs on recreational boats, almost a third of King County 8<sup>th</sup> graders who reported that they ever go boating reported wearing a life jacket half the time or less, and self-reported life jacket use among high school students was even lower.<sup>9</sup>

The majority of drowning cases reviewed by the King County Child Death Review from July 2012 to December 2015 were young people 15 to 17 years old. 88% of cases involved swimming in open water without a life jacket and 63% involved swimming without a lifeguard present; nearly all drowning cases involved multiple modifiable risk factors.<sup>10</sup>

### *Secondary prevention*

Cardiopulmonary resuscitation (CPR) is an evidence-based secondary prevention practice that improves outcomes for drowning victims. CPR for drowning is most effective when the person is rescued within five minutes of submersion and CPR is initiated within ten minutes of submersion, although trained bystanders should always attempt CPR.<sup>11 12</sup> The American Academy of Pediatrics recommends that all parents and caregivers be trained in infant and child CPR. The American Red Cross offers classes tailored to health care providers, lifeguards, child care providers and the general public,<sup>13</sup> and the American Heart Association offers a more advanced training on pediatric life support tailored to the needs of health care providers who respond to child and infant emergencies.<sup>14</sup>

## **Sudden Unexpected Infant Death: Infant sleep injuries, suffocation and SIDS**

### *Data summary and background information*

Sudden unexpected infant death (SUID) refers to several reasons a previously healthy child less than 1 year old might suddenly and unexpectedly die. SUID includes Sudden Infant Death Syndrome (SIDS), where a cause is not able to be determined after a thorough investigation. SIDS has been the third leading cause of death for children under 1 in King County since 2012.

Most infants who died from unintentional injury in King County from 2002 to 2014 suffocated; there were 15 infant deaths from suffocation over these years, 7 deaths from other unintentional injuries and another 5 deaths from injuries of undetermined intent. Deaths by SIDS were much more common but are not included in injury data. Infants who die by SIDS have not suffocated; SIDS is considered a natural cause of death, while suffocation is considered an unintentional injury.

While research on deaths from SUID and SIDS is still delving into specific causes, unsafe sleep environments are a factor in a large proportion of infant deaths (most clearly excluding homicides and unintentional injuries unrelated to sleep). Characteristics of an unsafe sleep environment include a soft surface, loose bedding, the presence of pillows or soft toys, a warm environment (because babies are not able to regulate body temperature), secondhand smoke, being placed to sleep on the stomach, parental substance abuse, and sharing a bed with adults or others.

In infant death cases reviewed by the King County Child Death Review from July 2012 to December 2015, bedsharing was a factor in 60% of cases and almost 80% of cases involved multiple risk factors. Major risk factors for sleep injuries and fatalities include poverty and inadequate housing, which limit families' ability to create safe sleep environments because of factors like overcrowding, poor air quality, inconsistent temperature and lack of space.

Infant mortality overall has a disproportionate impact in communities of color and communities with low socioeconomic status. Infant and child death is one of the drivers of lower overall life expectancy (length of years lived) in many marginalized communities. Infants of color disproportionately lose their lives to sleep injuries in King County.

### *Prevention of sleep injuries*

Several prevention strategies are known to improve sleep safety for infants. These include eliminating tobacco use during pregnancy as well as in the infant's home and other environments, placing babies to sleep on their backs, ensuring the sleep environment is not too warm, and removing toys, blankets, pillows and other objects from the sleep environment. Experts recommend parents share a room but not a bed with babies to prevent SIDS and sleep injuries.<sup>15</sup> There are a number of options for safe sleeping that allow room sharing without the risk of bed sharing.

One evidence-based program for preventing infant sleep injuries is the National Institutes of Health's Safe to Sleep public education campaign, whose materials are used in Washington.<sup>16</sup> Improving the safety of the sleep environment by removing risk factors has a significant impact on reducing infant mortality.

## **Falls**

### *Data summary and background information*

Falls are a significant cause of nonfatal injury in King County and statewide and relatively rarely result in death. 33 children and youth died and over 4400 were hospitalized due to fall injuries from 2002 to 2014. Falls were the top reason for injury hospitalization for children under 14 and in the top 3 reasons for injury hospitalization for older adolescents and young adults. There were 26,615 EMS responses for injuries related to falls for people under 25 in King County from 2002 to 2014; 69% of these resulted in transport to a hospital or other medical facility, although the percentage of falls needing medical facility transport rather than treatment on the scene increased with age.

The reasons for falls and injuries resulting from them vary across this age range. In King County from 2005 to 2014, no children under 1 died from falls. Older children and young adults who died by falls fell from or out of buildings (often windows), from trees, from scaffolding, into water, and for a variety of reasons fell from one height level to another or on the same level. Many falls result in broken bones or sprains, and traumatic brain injury (TBI) is one of the most serious resulting injuries. According to the Washington State Department of Health, from 2009 to 2013 a very small number of brain injuries from falls among children and youth were fatal statewide, but 28% of falls resulting in hospitalization involved a traumatic brain injury – more than 1600 altogether.<sup>17</sup>

For infants in the United States and other industrialized countries, falls often occur by rolling off furniture, such as changing tables, sofas and beds, or falling down stairs, or from being dropped by caregivers. Many caregivers underestimate how much infants can move on their own or are surprised by sudden development of rolling skills, not always realizing the danger of leaving an infant on an elevated

surface. Infant walkers create risk of serious injury from falling down stairs. Other risk factors for infant falls include poverty, unsafe housing and lack of supervision. At least two studies have found that fall fatalities for infants are twice as likely at home as in daycare facilities, highlighting the importance of home safety promotion.<sup>18</sup> As in many other kinds of injury, vigilant supervision by caregivers and proper use of safety devices protect against both fatal and nonfatal injuries.

For children older than infancy, poor-quality housing contributes heavily to fall fatalities, particularly in the case of falls from high windows and fire escapes, roofs and balconies. Deaths by falling are more common for children during the summer, when windows are often open and housing with inadequate play space leads children to play on fire escapes, balconies and roofs.<sup>19</sup> Falls also account for 75% of playground injuries nationally.<sup>20</sup>

### *Preventing fall injuries*

Nonfatal falls for older children and youth can happen when playing on a playground, climbing a tree, hiking, climbing stairs, participating in sports and other physical activity, using skateboards or roller skates, slipping on ice, working in an elevated location or even simply walking or running on a flat surface. Reducing substance abuse, installing safety devices like hand railings and fences, and improving recreational and occupational safety are useful in preventing falls. Occupational fall prevention – particularly important in the construction industry - is regulated by the federal Office of Safety and Health Administration and in Washington under implementation of the Washington Industrial Safety and Health Act by the Department of Labor and Industries' Division of Occupational Safety and Health, and through various other state and local policies.

## **Burns**

### *Data summary and background information*

In King County, injuries from burns are the third most common form of unintentional injury for infants and the second most common for 1 to 4 year olds. Over the time period included in this report, 5% of injury-related deaths for 1-to 4-year-olds and 16% of injury-related deaths for 5- to 9-year-olds were from burns. There were 19 deaths from burn injuries in ages 0 to 24 from 2002 to 2014.

Nonfatal burn injuries were much more common. There almost 1100 hospitalizations of children and youth for burns over this time period, the highest number in the 1- to 4-year-old age group. EMS responded to 1395 calls for burn-related injury from 2002 to 2014, 71% of which required transport to the hospital or other medical facility; 1-year-olds had a far higher number of burn injuries than children and youth of any other age, possibly due to newfound mobility and curiosity combined with difficulty understanding and following directions.

### *Preventing burn injuries*

For infants in developed countries, most burn injuries are from scalding. One of the most common sources of scalding injury for infants is hot prepackaged instant soup.<sup>21</sup> Infants are also at risk for burns

on their hands, often from grabbing or pulling themselves up on heaters, hot-water pipes and other hot objects.<sup>22</sup> Prevention of scalding injuries is generally simple: hot liquids must be kept out of reach of young children by turning handles inward on the stove, limiting access to stoves and microwaves, placing hot liquids far from the edge of any surface with the hot liquid and any table covering out of children's reach, and protective coverings installed over hot water pipes and heaters to prevent touching. Quality of housing can create a problem with burn prevention, as parents and caregivers who do not own their home may not be in control of whether protective devices are installed or be prohibited from installing them. Scald injuries can be prevented through policy and public education; in Washington State, a change in laws combined with a public education program caused 84% of homes to reduce the temperature of tap hot water from 140 to 120 degrees and reduced tap water burns.<sup>23</sup>

For older children, most burn injuries are from exposure to fire. Children whose parents smoke in bed are more likely to experience burn injuries than their peers whose parents are non-smokers.<sup>24</sup> Home fires disproportionately affect low-income people living in substandard housing.

One of the best evidence-based approaches to reducing the risk of death from a fire at home is the use of properly installed smoke detectors with regularly replaced batteries, which significantly reduce fire fatalities.<sup>25</sup> As with many other public health interventions, public education and promotion of smoke detector use is not enough to make a difference; programs providing and installing smoke detectors had some effectiveness but were most effective when combined with legislation requiring them.<sup>26</sup>

One study found lower rates of hospitalization for burn injuries among young children (but not among school-age children) in places where injury prevention programs were working on burn prevention. Notably, though, this study found a greater effect in communities with middle and high socioeconomic status.<sup>27</sup> In fact, poverty is a strong predictor of injury and death from burns in childhood. Studies in Sweden and the UK demonstrated that the poorest children were at highly elevated risk of burn injuries as compared to children of higher socioeconomic status. Considering the impact of substandard housing on burn injuries and the higher prevalence of smoking in low-income communities, this pattern is likely true in King County as well.<sup>28</sup>

## **Traffic-related injuries**

### *Data summary and background information*

Traffic-related fatalities in King County from 2002 to 2014 took the lives of 389 children, youth and young adults and resulted in 3027 hospitalizations. The vast majority of both in people this age group were among youth age 15 and older. Traffic-related injuries – most prominently motor vehicle injuries but also including pedestrian/vehicle collisions and motorcycle and bicycle injuries – were among the top three reasons for injury-related King County EMS responses from 2002 to 2014 in every age group and were the top reason for injury-related EMS response in youth and young adults ages 15 to 24.

### *Preventing traffic-related injuries: proper restraints*

Washington's seat belt law became a primary law, allowing law enforcement to issue tickets for violation, in 2002. (Before that change, tickets for non-use could only be issued under a different primary violation, such as DUI or speeding.) King County has one of the highest seatbelt usage rates in the country and adolescents' self-reported seat belt use has remained high over time, but deaths and injuries from motor vehicle crashes are still a serious problem for children and youth. Preventing traffic-related injuries in children, youth and young adults requires sustained work including a combination of community education, proper use of appropriate restraint devices, reducing impaired and distracted driving, and enforcing policy interventions.

Appropriate child restraints are critical to reducing death and injury in automobile crashes. The National Highway Traffic Safety Administration's recommendations for safe car seats specify that babies and toddlers should be in rear-facing car seats, which protect the child's neck and spinal cord in case of a crash, until their height and weight exceed the safety standards for the device. Older children should still use a forward-facing car seat with a harness until they exceed the manufacturer's height and weight specifications, and children who are too small for a seat belt to fit properly should continue to use a booster seat that allows the seatbelt to fit properly. In Washington, children under 13 are required to ride in the back seat when practical to do so. The complexities of the law can be confusing and should be regularly explained to caregivers.

### *Preventing traffic-related injuries: driver behavior*

Speed limit laws show evidence of reducing harm from motor vehicle crashes. Studies of traffic-related injuries after changes in speed limits have consistently shown that fatalities and serious injuries decrease with speed limit decreases and increase when the speed limit is raised.<sup>29</sup> The City of Seattle is currently moving to lower residential area speed limits in response to local advocacy.<sup>30</sup>

Of course, keeping motor vehicle crashes from occurring at all is the most effective prevention of injury. Impaired driving (driving under the influence of drugs or alcohol) contributed to 46% of fatal car crashes in King County from 2008 to 2015, and distracted driver-involved crashes accounted for at least 26%.<sup>31</sup> Laws establishing lower blood alcohol concentrations as impaired driving and establishing zero-tolerance laws for even lower blood alcohol concentrations for young and inexperienced drivers are recommended to prevent impaired driving by young people; these laws are more effective when paired with public information and awareness.<sup>32</sup> Graduated driver licensing also shows evidence of reducing crashes involving youth drivers. Washington's youth driver licensing format leads young people through a series of steps to become fully licensed, including taking an approved driver training course before obtaining an instruction permit, completing a significant number of hours of driving practice with a driver who has been licensed for at least five years, passing a test and then remaining under an intermediate license, with restrictions on driving with passengers, night time driving and distracted driving. The intermediate license was established by legislation that took effect on July 1, 2001.<sup>33</sup> The law still needs to be brought into compliance with evidence-based best practices, and advocacy around this is ongoing.



Traffic-related injuries include people who are struck by motor vehicles while riding a bicycle or motorcycle or walking. Research shows that helmets are highly effective for reducing head injuries in bicycle and motorcycle crashes, decreasing head injuries by up to 85%.<sup>34</sup> Legislation increases helmet use, most effectively when combined with public education and helmet distribution programs sustained over a long period of time.<sup>35</sup>

## Poisoning and unintentional overdose

### *Data summary and background information*

A small number of youth and young adult suicides and a very small number of homicides are by poisoning, but most poisoning injuries in King County and nationally are unintentional. In King County, unintentional poisoning is responsible for 5% of infant hospitalizations, 10% of hospitalizations in ages 1 to 4 and 3% of hospitalizations in ages 5 to 9. In 2014, 56% of calls to the Washington State Poison Control Hotline concerned children under six and 9 out of 10 were resolved without hospital contact. For children under 13, the most common exposures for which people called the hotline were cosmetics and personal care products (notably diaper rash treatments), analgesic pain killers and household cleaning products. Poisoning prevention for young children focuses on keeping household chemicals, cosmetics and medications out of children's reach.

Fatal unintentional poisoning becomes an issue at the age when young people begin using substances recreationally or because of addiction; while the percentages of nonfatal injury hospitalizations that are for unintentional poisoning remain relatively low among adolescents, unintentional poisoning accounts for more than 1 in 12 injury-related deaths in early adolescence, 1 in 10 in late adolescence and nearly 1 in 5 among young adults in their early 20s. This change is directly related to unintentional overdoses of commonly used recreational and addictive substances, including alcohol, cocaine, MDMA, methamphetamine and opioids like heroin and oxycodone.

EMS calls for alcohol and drug exposure over 2002 to 2014 – the closest to the unintentional poisoning category in death and injury data - varied greatly by age, and among youth they follow the pattern of greater risk with older age. From 2002 to 2014, EMS calls related to substance use for people under 25 peaked at age 21.

For teens 13 to 18, calls to the Poison Control Hotline were most commonly related to pharmaceuticals (including analgesic pain killers and psychiatric medications) and alcohol. While exposure to cannabis products is not among the top ten reasons for calls, the Poison Center has noted an increase in cannabis-related calls. In this age group, hotline calls begin to reflect concerns about overexposure to psychiatric medications and substances used recreationally.

The increased rate of death from poisoning among adolescents and young adults is driven in part by abuse of prescription opioid medication. Opioid abuse continues to be a problem in King County and is becoming more common in some communities. The strongest personal risk factors for unintentional drug overdose include a combination of substance abuse disorder and mental illness.

### *Prevention of unintentional poisoning*

Prevention of poisoning in children generally involves proper childproofing, keeping medications, cosmetics and household chemicals out of reach of young children. For older youth, poisoning prevention comes more in the form of prevention of drug and alcohol misuse. A very wide variety of evidence-based practices for youth substance abuse prevention exist; the Substance Abuse and Mental Health Services Administration's registry of evidence-based programs and practices lists 130 programs and interventions that have been evaluated for evidence of effectiveness<sup>36</sup> in a searchable database with the option of specific filtering for populations, outcomes and types of intervention. In Washington, the Division of Behavioral Health and Recovery (DBHR)'s Athena Forum website provides an online resource for substance abuse prevention professionals. This includes the searchable Excellence in Prevention Strategy List, a searchable directory of effective programs including those on SAMHSA's list.<sup>37</sup>

The National Institute of Drug Abuse provides a helpful brief on key principles of effective prevention programs for children and youth, including understanding the spectrum of risk and protective factors, addressing the range of substance abuse, tailoring programs to community needs and designing and delivering specific family, school and community prevention programs.<sup>38</sup> The National Institute on Drug Abuse has published research-based guides for violence prevention work in early childhood<sup>39</sup> and in adolescence<sup>40</sup>

As in the case of drowning, more than prevention programming is necessary; some people will reach the point of overdose and need immediate intervention to prevent death. The drug Naloxone is effective in reversing opioid overdose, and a 2015 bill in Washington allowed doctors to write prescriptions for Naloxone to first responders and friends and families of people at risk of overdose.<sup>41</sup> Wider distribution of Naloxone can reduce overdose risk for all users of opioid medication.

## **INTENTIONAL INJURY**

Intentional injuries include injuries from assault and homicide as well as suicide attempts and deaths. Homicide and nonfatal assault rates are highest among infants and older adolescents/young adults, although homicide plays out very differently in these age groups. Self-inflicted injury and death are not considered related to suicide until ages 10 to 12 and are of most concern among older youth.

Suicidal behavior and involvement in violence in adolescence and young adulthood share a number of the same risk and protective factors, many traced back to early in childhood. Shared risk factors include poverty, low neighborhood attachment, adverse childhood experiences like violence and substance abuse in the home. Shared protective factors include community connectedness, opportunities for prosocial involvement in the community, connections to caring and supportive adults, family supports, and personal skills including emotional self-regulation and decision making. Building these skills and supports starting in early childhood can prevent a host of problems later.

## Assault and homicide

### *Data summary and background information*

270 people under 25 died by homicide in King County from 2002 to 2014. Over the same time period, 1995 children and youth were hospitalized for injuries from assault, and EMS responded to nearly 19,000 calls for interpersonal violence (including the categories of assault, child abuse or domestic violence) involving people under 25. Rates of hospitalization for injuries from assault and death by homicide both peak in infancy and again in late adolescence and young adulthood, and EMS calls for assault and domestic violence both increase sharply in adolescence and young adulthood.

### *Child abuse*

Among children and youth in King County, the rates of both homicide and hospitalization for injuries from assault for infants under age 1 are higher than for any age group except young adults in their 20s. Relatively few EMS responses are coded as child abuse or domestic violence, but a large number of responses are for children injured by assault. (From 2002 to 2014, there were 51 EMS responses for child abuse and 53 for domestic violence for children under 10, while there were 535 EMS responses for assault against children under 10.)

Washington state law is clear on what is reportable as child abuse and who must report. According to the Washington State Department of Social and Health Services (DSHS), "[RCW 26-44-020](#) defines abuse and neglect as injury, sexual abuse, sexual exploitation, negligent treatment or maltreatment of a child by any person under circumstances which indicate that the child's health, welfare, and safety is harmed. Abuse and neglect does NOT include the physical discipline of a child as defined in [RCW 9A.16.100](#)." People in a number of professions, including education, health care, law enforcement and social services, are required by law to report reasonable suspicion of child abuse or maltreatment by calling Child Protective Services at 1-866-363-4276. The DSHS website offers many resources on child abuse prevention and reporting, including a toolkit for mandatory reporters and a video exploring racial disproportionality in the child welfare system, where children of color are overrepresented despite child maltreatment occurring in all racial and ethnic groups.

Intergenerational trauma is a risk factor for perpetration of child abuse; parents who were themselves maltreated as children are at higher risk. Parents who are socially isolated and struggling (for example, young parents, families living in poverty, parents with low education, families experiencing domestic violence and families with negative parent-child relationships) are at elevated risk of child abuse.

### *Child abuse prevention*

The most researched protective factor against child abuse for families, even those that are struggling, is a supportive family environment connected to social networks, which allows for parent support and connection. Programs with evidence of effectiveness are long-term and begin before birth, and they offer concrete supports around high-priority concerns like finances and physical and behavioral health care.

The most promising evidence-based approach to reducing child maltreatment is home visiting, in which trained professionals (most notably public health nurses) visit low-income mothers at their homes during late pregnancy, infancy and early childhood to provide supports around personal development, family issues, parenting, child development and safety. There are many approaches to home visiting, some with nurses as home visitors and others using other professionals or peer supports, and proven outcomes include lower likelihood of child maltreatment.<sup>42</sup> The US Department of Health and Human Services rates nineteen home visiting program models evidence based, seven of which have evaluation data showing success in reducing child maltreatment.<sup>43</sup>

### *Violence among older youth*

Violence has a heavy impact among older adolescents and among young adults in their 20s, who have the highest rates of homicide (particularly by firearm) and of assault of any age group under 25. Older adolescents and young adults also have very high numbers of EMS contacts for assault-related injury. Violence affecting adolescents and young adults includes (but certainly is not limited to) interpersonal violence related to gang membership and relationship abuse.

Nonfatal assaults by firearm and firearm homicides rise sharply in adolescence, illuminating serious policy and public health problems around violence and access to firearms.<sup>44</sup> Recent research conducted in King County paints a concerning picture of the future life course for people hospitalized for firearm injuries, disproportionately young men of color, finding them more likely to be hospitalized for firearm-related injuries, killed with a firearm, arrested for firearm or other violence or for nonviolent firearm-related causes, and hospitalized for injuries from assault in the future.<sup>45</sup> The Annals of Internal Medicine published a call to action<sup>46</sup> alongside this article, calling for physicians, researchers and policymakers to implement actions to reduce the burden of firearm injury.

In Washington, people under 18 are permitted to buy rifles and shotguns from a private seller and to possess both these guns and handguns under certain circumstances. At age 18, Washingtonians are able to purchase rifles, shotguns and handguns from private sellers and to purchase rifles and shotguns from licensed dealers. While people between ages 18 and 21 are able to possess guns unless otherwise prohibited (for example, because of mental illness or domestic violence), concealed weapon permits cannot be given until age 21. There is no age limit on the purchase of ammunition under Washington law. Further, unsecured storage of firearms at home gives minors access to family guns, and trafficking in stolen and illegally purchased guns thrives in many communities in King County; of 13 cases of homicide and suicide by firearm reviewed in the King County Child Death Review from 2012-2015, most involved an unsecured family gun or a gun that was stolen.

Leaders in public health and county government have repeatedly expressed concern about the impact of firearm injuries and deaths on youth and young adults in King County, and the county is taking action to better understand risk and protective factors for firearm deaths and injuries.

## *Preventing youth and young adult violence*

Why young people get involved in violence has been a subject of decades of research, identifying family, community and individual risk factors.<sup>47</sup> Much of the research on youth violence has focused on risk factors, and researchers and program developers are paying increasing attention to protective factors and to buffering protective factors, which mitigate the effects of risk and adversity for youth.

In late 2016, the National Center for Injury Prevention and Control issued *A Comprehensive Technical Package for the Prevention of Youth Violence and Associated Risk Behaviors*, which outlines a set of evidence-based strategies for achieving and sustaining reductions in youth violence.<sup>48</sup> Strategies, approaches and supporting evidence are presented in detail, with a recommendation that the outlined strategies are meant to be implemented together. Many of the listed strategies, such as promoting healthy family environments and protective community environments, have proven outcomes in preventing other health problems and risk behaviors.

A very comprehensive literature review published in the *American Journal of Preventive Medicine* in 2012<sup>49</sup> focused on protective factors against youth violence. The article summarizes individual protective factors related to intelligence, planning and executive function; attitudes about family, school, self-concept and the perceived risk of crime; aspects of temperament such as irritability, impulsivity and mood; and biological factors involving brain chemistry, hormones and heart rate. Family protective factors included are related to a positive and secure parent-child relationship; parenting behavior including firm and non-physical discipline, acceptance and engagement of the child in the family and the parent in the child's education; and other family factors including parental stress and coping skills and socioeconomic status.

Outside the family, peer group, school and community protective factors are implicated in violence prevention. School achievement and connectedness are important, including aspects of the school environment such as clear rules and teacher support and supervision. As the peer group becomes increasingly important in adolescence, close relationships with nonviolent peers and peer group disapproval of violence are protective factors, as well as involvement in religious activities; unlike in other health issues, social isolation can function as a protective factor, although it may also drive youth toward marginalized peer groups that endorse violence. The relationship of the community to violence is complex and differs among groups of youth; neighborhood poverty, for example, can create a risk environment but can also promote neighborhood cohesion and support that buffers the risk, while living in a more advantaged neighborhood creates a protective effect for some groups of youth while leading to risk-increasing social rejection for others.

Research on shared risk and protective factors shows that many of these are also risk or protective factors for other social and behavioral health issues, including substance abuse, low academic achievement, depression, anxiety and suicide risk.

Violence within relationships is also a concern among older youth. On the 2014 Healthy Youth Survey, many high school students in King County said that someone had made them engage in kissing, sexual touch or intercourse when they did not want to, and nearly as many reported emotional abuse or

physical abuse by a dating partner. Sexual violence prevention is a field with a currently small evidence base; many programs have been developed by community-based organizations without the funds and capacity to engage in scientific research about program outcomes. After a rigorous evaluation of youth sexual violence prevention programs,<sup>50</sup> the CDC found only three with evidence of effectiveness and identified four more as promising programs based on design and research. These programs focus on preventing perpetration of sexual violence by teaching consent, respectful and assertive communication and healthy relationship skills, or teaching bystanders to intervene in problematic behavior. They are described in detail with links to research on the programs on the CDC's website.

The CDC's Task Force on Community Preventive Services recommends universal school-based programs as the best-supported evidence-based approach to violence reduction among children and youth. Universal programs reach all students, not a targeted group, and are sometimes known as Tier 1 interventions. The Task Force examined fifty-three studies about the effectiveness of school-based violence prevention programs published by December 2004. For a more tailored intervention, the Task Force recommends therapeutic foster care as an evidence-based support for children who cannot continue to live at home because of chronic delinquency.

More than 330 children and youth under 25 died from firearm injuries from 2002 to 2014 in King County. Notably, while the Task Force on Community Preventive Services reviewed a large number of law and policy interventions designed to reduce violence by limiting firearm access, it found that there was insufficient evidence of their effectiveness. Restrictions on funding for firearm research have made it difficult to do rigorous research examining these interventions' outcomes, a policy concern frequently raised in the violence prevention field.

## **Suicide**

### *Data summary and background information*

Washington has the 21<sup>st</sup> highest rate of suicide and 25<sup>th</sup> highest rate of suicide by young people 15 to 24 in the country.<sup>51</sup> King County has the lowest suicide rate but highest number of lives lost to suicide among the counties in the state.<sup>52</sup> 327 people ages 10 to 24 died by suicide in King County from 2002 to 2014, and almost 2700 youth and young adults were hospitalized for self-inflicted injuries. The most common means of suicide among young people in King County from 2002 to 2014 were firearms (39% of deaths) and suffocation, including hanging (35% of deaths). 78% of nonfatal self-inflicted injuries resulting in hospitalization were poisoning.

The state of Washington has a rich policy environment around suicide prevention, with leaders in the state government having passed a number of bills establishing and funding suicide prevention work since the mid-1990s.<sup>53</sup> Because many of the bills that establish suicide prevention work in education, health care and other settings are relatively new, evaluation data are not yet available.

Known risk factors for suicide among young people are complex and varied, although two of the strongest predictors at any age are mental illness and substance abuse disorders.<sup>54</sup> Increasing attention is being paid to the role of early trauma and loss in suicide risk and the importance of population-level

prevention strategies in addition to the existing work training professionals, peers and community members to identify and refer a person at risk. The Washington State Suicide Prevention Plan, published in January 2016, addresses risk and protective factors in detail and presents recommendations for preventing suicide across the lifespan, including among children and youth.<sup>55</sup> Risk and protective factors listed in the plan are below:

**Protective Factors for the General Population<sup>5</sup>**

Individual	Relationship	Community	Societal
<ul style="list-style-type: none"> <li>• Skills in problem solving, conflict resolution and nonviolent handling of disputes</li> </ul>	<ul style="list-style-type: none"> <li>• Strong connections to family and community support</li> <li>• Support through ongoing medical and mental healthcare relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Effective clinical care for mental, physical and substance use disorders</li> <li>• Easy access to a variety of clinical interventions and support for help-seeking</li> </ul>	<ul style="list-style-type: none"> <li>• Restricted access to highly lethal means of suicide</li> <li>• Cultural and religious beliefs that discourage suicide and support self-preservation</li> </ul>

**Risk Factors for Suicide**

Individual	Relationship	Community	Societal
<ul style="list-style-type: none"> <li>• Previous attempt(s)</li> <li>• History of mental disorders, particularly clinical depression</li> <li>• History of alcohol and substance abuse</li> <li>• Feelings of hopelessness</li> <li>• Impulsive or aggressive tendencies</li> <li>• Loss (relational, social, work or financial)</li> <li>• Illness and disability, including loss of physical or mental functioning</li> </ul>	<ul style="list-style-type: none"> <li>• Family history of suicide</li> <li>• Family history of child maltreatment</li> <li>• Isolation, a feeling of being cut off from other people</li> </ul>	<ul style="list-style-type: none"> <li>• Local epidemics of suicide</li> <li>• Barriers to accessing mental health treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Easy access to lethal methods</li> <li>• Cultural and religious beliefs (e.g., belief that suicide is a noble resolution of a personal dilemma, or belief that older people have little value to the community)</li> <li>• Unwillingness to seek help because of the stigma attached to mental health and substance abuse disorders or to suicidal thoughts</li> </ul>

*Preventing youth and young adult suicide*

In early 2017, the National Center for Injury Prevention and Control released *Preventing Suicide: A Technical Package of Policy, Programs, and Practices*, which outlines a set of evidence-based strategies for achieving and sustaining reductions in suicide.<sup>56</sup> Many of the approaches the document identifies are also effective in reducing other types of violence.

SAMHSA’s National Registry of Evidence-Based Programs and Practices (NREPP) lists evidence-based interventions for suicide prevention, including those tailored to preventing youth and young adult suicide.<sup>57</sup> The Suicide Prevention Resource Center presents a broader list of resources, programs and practices for suicide prevention, including programs that were on its now-defunct registry of best practice-adherent work. A large number of programs and interventions on both lists are being implemented in King County, some supported by county funding.

## CONCLUSION

As funding for public health work continues to erode, the Washington State Department of Health and its partners are honing in on the services considered Foundational Public Health Services – those that must be present in every community in order to efficiently and effectively protect all people in Washington. Government public health has a role in provision and assurance of these services. Prevention of injury and violence and work focusing on children’s health and safety are central to the foundational work of public health.<sup>58</sup>

Children, youth and the youngest adults are disproportionately affected by unintentional injury, suicide and violence. Among our county’s children and young people are stark health disparities reflecting inequities based on location, race and ethnicity, family income and other dimensions of identity and experience. It is the responsibility of government public health to face the challenge of resolving these disparities as part of improving community health.

Current county initiatives offer opportunities to do just this. These include the Best Starts for Kids levy’s ambitious plans to support physical and behavioral health and academic and social development starting in early childhood. Initiatives like this establish a foundation of funding and support for the prevention of child and youth violence and injury, from upstream prevention to direct intervention with those in need of acute care and timely help. By approaching these opportunities with mindfulness of the lifelong impact of childhood violence and injury, we can improve health not only among children but also across the population for generations to come.

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