2011 Report from the Child Fatality Review Team

Understanding Child Injury Deaths

NYC

Michael R. Bloomberg
Mayor

Department of Health & Mental Hygiene

Thomas Farley, M.D., M.P.H.
Commissioner

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Mayor

Department of
Health & Mental
Hygiene
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Commissioner

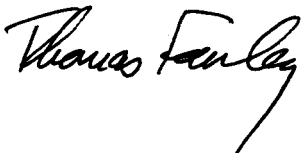
Dear Fellow New Yorker,

Childhood injury deaths are tragic events that prematurely end the lives of young people each year. Keeping children safe from injury is a basic responsibility of families and communities.

In 2006, to better understand unnatural deaths in children ages one to 12 years old and to identify strategies for injury prevention, New York City (NYC) established a multi-disciplinary Child Fatality Review Team (CFRT). This year's report of the CFRT presents an updated examination of trends in child injury deaths, integrating an overview of nonfatal child injuries, and a review of sleep-related injury deaths among infants younger than one year old.

This report presents multiple strategies to mitigate the circumstances that bring about fatal and serious injury among our City's children and infants. Recommendations for the enforcement of select safety regulations, as well as the formulation of new regulations, are presented with attention to leading causes of child injury in NYC. Further, health care providers, parents and caregivers are given targeted guidance for creating safer environments for children. We hope this report will advance comprehensive childhood injury prevention among NYC children.

Sincerely,



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Annual Report 2011

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Key Findings

1. **Between 2001 and 2009, the overall death rate for children aged one to 12 years old was 30% lower in New York City (NYC) than in the United States as a whole (between 2001 and 2007). Fewer injury deaths in NYC explain this difference.**
   - The injury-related death rate among children in NYC was less than half the national rate (4 deaths per 100,000 compared with 8.7 deaths per 100,000).
   - The injury death rate due to accidents (also called unintentional injury) was two and a half times higher nationally than in NYC (7.1 deaths per 100,000 compared with 2.7 deaths per 100,000). This is mostly due to the difference in transportation deaths: 3.6 deaths per 100,000 children nationally compared with 1.2 deaths per 100,000 children in NYC.

2. **Injury deaths accounted for 28% of the 1,681 child deaths in NYC between 2001 and 2009.**
   - There were 470 injury deaths among children. The annual number of injury deaths varied with an average of 52 deaths per year.
   - Unintentional injuries comprised 69% (n=324) of all child injury deaths. Of these, 41% (n=134) were transportation-related. Of 116 motor vehicle accidents, 76% (n=88) involved child pedestrians.
   - Intentional injuries comprised 24% (n=114) of all child injury deaths. Of these, 91% (n=104) were certified as homicides and 9% (n=10) as suicides.

3. **Between 2001 and 2009 higher injury death rates were found among younger children, boys and black, non-Hispanic children.**
   - Younger children had a higher injury death rate than older children (6.6 deaths per 100,000 children one to three years old vs. 3.3 deaths per 100,000 children 10 to 12 years old).
   - Boys had a higher injury death rate than girls (4.5 vs. 3.4 deaths per 100,000). While 76% (n=207) of fatal injuries among boys were due to unintentional injury compared with 59% (n=117) among girls, girls experienced a higher proportion of intentional injury deaths than boys (33%, n=64 vs. 18%, n=50)
   - The overall injury death rate among black, non-Hispanic children was about twice that of both white, non-Hispanic children and Hispanic children (6.2 per 100,000 vs. 3.3 per 100,000 white, non-Hispanic children and 3.1 per 100,000 Hispanic children). Black, non-Hispanic children and Hispanic children experienced a higher proportion of intentional injury deaths when compared with white, non-Hispanic children (30% and 29% vs. 6% of injury deaths, respectively).

4. **Although nonfatal injuries among children aged one to 12 years are more common than fatal injuries, the leading causes of nonfatal child injury hospitalization from 2001 to 2008 were similar to the leading causes of injury death.**
   - On average, there were 3,895 nonfatal unintentional injury hospitalizations each year. Leading contributors were falls (34%), burns (14%) and motor vehicle accidents (12%).
   - On average, there were 149 nonfatal intentional injury hospitalizations per year. Eighty-two percent (82%) of these injuries were assault-related with child abuse (29%) and physical force (27%) as the leading contributors; 18% were from self-inflicted injury, with poisoning (61%) and cutting/piercing (17%) as the leading contributors.

5. **Injury is also a leading cause of death among NYC infants (less than one year old); among injury deaths more than three quarters (78%) of infant injury deaths are sleep-related. A review of all 252 sleep-related infant deaths from 2004 to 2008 shows that:**
   - More than half (57%) were found in an unsafe sleep position in bed; infants were on their stomach or on their side rather than on their back.
   - Nearly two thirds (63%) were found bed-sharing with an adult or another child.
   - More than three quarters (76%) were found on an unsafe sleep surface (an environment other than a crib or bassinet); they were found in an adult bed, couch, stroller or car seat.
   - Excess bedding – defined as more bedding than a bed sheet and one blanket – was found in 64% of sleep-related deaths.

Glossary

Accident – Injury or poisoning that occurred without intent to harm or cause death, also called unintentional injury.

Asphyxia – A condition characterized by a lack of oxygen to the brain that results in loss of consciousness or unnatural death. Asphyxia can be the result of obstruction of airway (e.g., choking or drowning), compression of chest or neck, smothering, suffocation or inhalation of gas.

Assault – A type of bodily harm committed by another person with the intent to cause fear, harm or death.

Cause of death – The illness, disease or injury responsible for the death. Examples of natural causes include heart defects, asthma and cancer. Examples of injury-related causes include blunt impact, burns and drowning. Also known as mechanism.

Child Fatality Review Team (CFRT) – A group of individuals representing a variety of agencies, organizations and disciplines who investigate preventable child deaths and make recommendations for policy and prevention.

Death certificate – A legal document containing details of an individual's death. Cause and manner of death and key demographic information are provided.

Drowning – Death from asphyxia due to submersion in liquid, such as a large body of water, filled or partially filled pool, bathtub or household bucket.

External causes of death – Death that is due to environmental events, poisonings or other adverse effects. Also known as unnatural death. They include injury-related causes of death and death due to complications of medical and surgical care. In this report, all child deaths due to external causes are referred to as injury deaths.

Homicide – Death resulting from injuries committed by another person with the intent to cause fear, harm or death.

Intentional injury – Injury resulting from the intentional use of force or purposeful action against oneself or others. Intentional injuries include interpersonal acts of violence intended to cause harm, criminal negligence or neglect (e.g., homicide) and self-inflicted (e.g., suicide).

Manner of death – The circumstances of the death as determined by postmortem examination, death scene investigation, police reports, medical records or other reports. Manner of death categories include: natural, accident (unintentional), homicide (intentional), suicide (intentional), therapeutic complication and undetermined.

Natural death – Death due solely to illness or disease.

Non-transportation accident – A subcategory of unintentional injury that encompasses a variety of injuries not associated with any mode of transportation, such as falls, drownings and fires.

Office of Chief Medical Examiner (OCME) – The office that investigates cases of persons who die within New York City from violence or criminal neglect, by accident, by suicide, suddenly when in apparent good health, when unattended by a physician, in a correctional facility, in any suspicious or unusual manner or where an application is made for a permit to cremate the body of a person. The OCME is responsible for postmortem examination, death scene investigation and final determination of cause and manner of death.

Postmortem examination – External examination or autopsy used with other evidence to determine cause and manner of death.

Self-inflicted injury – Injury from an intentional act with the intent to cause harm or death to oneself.

Sleep-related death – A unique grouping of infant deaths caused by both injury (unintentional suffocation in bed and undetermined causes) and by sudden infant death syndrome (SIDS).

Sudden Infant Death Syndrome (SIDS) – The sudden death of an infant less than one year of age, which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of death scene and review of clinical history. SIDS is a natural cause of death and is not related to injury.

Suicide – Fatality from an intentional, self-inflicted act with the intent to cause harm or death to self.

Therapeutic complications – Death or injuries that result from causes associated with a medical or surgical intervention used to treat an illness or disease.

Thermal injury – Fire, flame or scald burns due to contact with fire, hot surfaces, hot liquids or steam.

Transportation accident – A subcategory of unintentional injuries in which the victim was a passenger in or injured by a motorized vehicle (e.g., car, plane or train).

Undetermined – The classification of a death when all available information is insufficient to point to any one manner of death. In some cases, both cause and manner of death may remain undetermined.

Unintentional injury – Injury that occurred without intent to harm or cause death; an injury not intended to happen. Also called an accident.

Introduction

In New York City (NYC), and throughout the United States, injuries pose a threat to children's health and well-being and are the leading cause of child deaths, despite the fact that many injuries are predictable and can be prevented through proven measures. Deaths from injuries are categorized as unintentional (such as deaths caused by a motor vehicle accident, accidental suffocation or drowning) or intentional (such as injuries from abuse and physical force). Through careful review of these child injury deaths we can identify specific opportunities to modify unsafe environments and prevent future deaths.

The NYC Child Fatality Review Team (CFRT) was established in 2006 by Local Law 115 in response to the need to better understand the unnatural or external causes of child deaths. The law mandates a review of external causes of death of NYC children one to 12 years old. The CFRT published its first annual report in 2007. The report included an aggregate review of child injury deaths and an in-depth case review of all child deaths related to motor vehicle accidents, the leading cause of injury deaths among children in NYC. The 2008 report focused on fire- and burn-related deaths, the second leading cause of child injury deaths in NYC. The 2009 report focused on setting and closely examined unintentional child injuries in the home environment. Finally, the 2010 report focused on individual- and neighborhood-level disparities in child injury deaths that reflect both social and economic inequalities. Viewed together, the first four CFRT reports provide a comprehensive picture of trends in fatal injuries and their contributing factors among NYC children aged one to 12.

For the 2011 CFRT report, we updated the statistics provided on child injury death with data from 2001 to 2009. In addition, CFRT members elected to expand the report to include information on injury deaths among infants less than one year old. This section includes a special focus on unsafe sleep-related deaths, as they contribute to more than three quarters (78%) of injury deaths among this age group. A brief description of nonfatal injuries among children and infants is also presented to provide a comprehensive picture of the total burden of severe injuries affecting NYC children under the age of thirteen. The final section of the report presents recommendations from the CFRT on preventing injuries among NYC children.

Background

The NYC CFRT is a multi-disciplinary review committee chaired by the Department of Health and Mental Hygiene (DOHMH) and comprised of experts in child welfare and pediatrics appointed by the Mayor, City Council Speaker and Public Advocate, as well as representatives from several NYC agencies including: Administration for Children's Services, Department of Education, DOHMH, Police Department and Office of Chief Medical Examiner (OCME).

The goals of the CFRT are to examine significant social, economic, cultural, safety and health-systems factors associated with external causes of death among children one to 12 years old to help identify modifiable risk factors and to develop injury prevention policy and program recommendations.

The CFRT meets quarterly to review aggregate data and identify trends and risk factors for injury-related deaths among NYC children aged one to 12 years. For this 2011 review, the CFRT invited representatives from the Consumer and Product Safety Commission, Department of Buildings, Department of Homeless Services, Department of Transportation and Housing Preservation and Development to participate in quarterly meetings.

Methods

Classification of Injury Deaths Among Children One to 12 Years Old

Injury-related deaths were identified from death certificates maintained by the DOHMH Office of Vital Statistics. Cases were included in analyses if the manner of death on the death certificate was listed as an accident, homicide, suicide, undetermined or therapeutic complication, and the cause of death listed an International Classification of Disease, 10th Revision (ICD-10) code that was consistent with an unnatural, external cause of death. Death certificate data were verified and supplemented with additional information from files maintained by the OCME. These files contain autopsy or external examination reports, police and other investigative reports, toxicology and other postmortem special studies. Data abstraction was conducted using a form adapted from the National Center for Child Death Review Case Report. OCME files were not reviewed in cases pending criminal investigation, prosecution or appeal.

The report utilizes conventional classification of injury deaths:

Unintentional injury–An injury that was not deliberate, and occurred without intent to harm or cause death; an injury not intended to happen. This type of injury is described as accidental and includes:

- **Transportation accident**–Fatal injury in which the victim was a passenger in or injured by a motorized vehicle (e.g., car, plane, train).
- **Non-transportation accident**–Fatal injury caused by external factors such as falls, fires or drownings, and are not associated with any mode of transportation.

Intentional injury–Injury resulting from intentional use of force or purposeful action against oneself or others. Types include:

- **Homicide**–Fatality resulting from injuries sustained through an act of criminal negligence or violence committed by another person to cause fear, harm or death.
- **Suicide**–Fatality from an intentional, self-inflicted act with the intent to cause harm or death to self.

Undetermined–The classification of a death when all available information is insufficient to point to any one manner of death. In some cases, both cause and manner of death may remain undetermined.

Therapeutic complication –Death or injury resulting from causes associated with a medical or surgical intervention (complication of medical and surgical care) used to treat an illness or disease. Though not the result of an injury, deaths from therapeutic complication are included in analyses because of their external nature.

World Trade Center-related deaths were excluded from the report. For a complete listing of inclusion criteria and ICD-10 injury codes, please see the Technical Appendix.

Classification of Nonfatal Injury Hospitalizations Among Children 0 to 12 Years Old

Injury hospitalization data for all acute-stay hospitals in the five boroughs of NYC were acquired from electronic administrative files of the New York Statewide Program and Research Cooperative System (SPARCS), which is operated by the New York State Health Department. Only records of live hospital discharges from 2001 through 2008 were included in analyses. Injury hospitalizations were defined using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) diagnostic codes and external cause of injury codes (E-Codes) according to a taxonomy similar to injury-related deaths.

Hospitalizations where the intent of injury was unintentional, intentional (assault-related and self-inflicted injuries) and undetermined were included in analyses; injuries that resulted from therapeutic complications and their late effects were excluded. Data presented in this report provide information on hospitalizations, not individuals. For a complete listing of ICD-9-CM classification codes, see the Technical Appendix.

Classification of Injury Deaths Among Infants Younger Than One Year Old

Information on injury deaths among infants younger than one year old was obtained and abstracted using the same methodology as that for children one to 12 years old. Sleep-related injury deaths were identified for special review and defined as having occurred when environmental factors pertaining to sleep (e.g., position, location, sleep arrangement, and presence, type and location of bedding materials) were suspected or confirmed in the death of an infant. The deaths were classified as:

- **Unintentional suffocation or asphyxia** if sufficient evidence was present (e.g., due to smothering or overlay).
- **Undetermined or unknown cause** if there were no findings from the autopsy or post-mortem studies that pointed to a cause of death, but the death scene investigation revealed an environment that may have caused an injury, like asphyxia or suffocation.

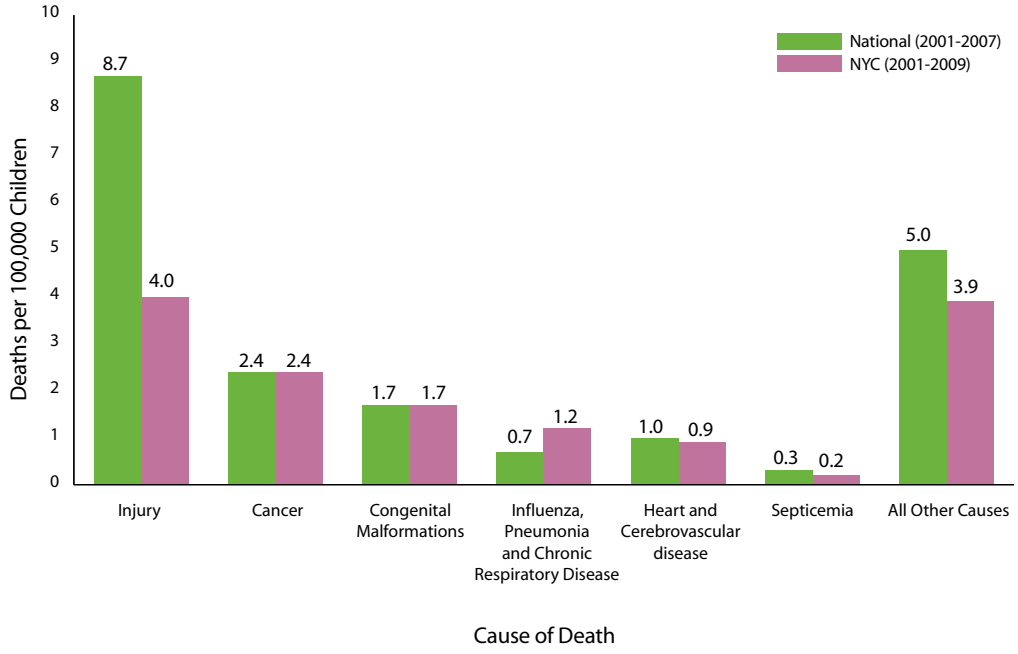
Based on these criteria, death resulting from unintentional threat to breathing (ICD-10 W75 and W84), and deaths of undetermined intent (Y33-Y34) were included as sleep-related death. Using a structured abstraction form, details such as infant's sleeping position and sleep surface were recorded from files maintained by the OCME for a five-year review from 2004 through 2008.

Results

Injury Deaths Among Children One to 12 Years Old

Compared with the national rate, NYC has approximately 30% fewer deaths from all causes among children aged one to 12 years old. Nationwide, approximately 20 per 100,000 children die each year, compared with approximately 14 per 100,000 in NYC. Most of this difference is due to fewer injury deaths in NYC (4 per 100,000 NYC children vs. 8.7 per 100,000 children nationally). Still, injury deaths are the most common cause of death in this age group both nationally and in NYC, with higher fatality rates than other leading causes of death, such as cancer, congenital malformations and other diseases.

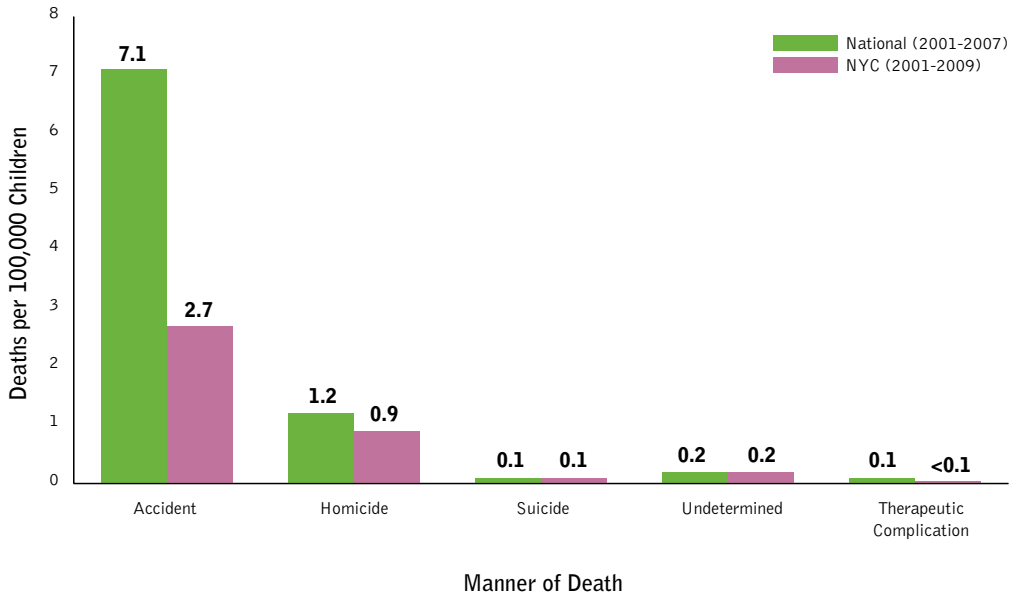
Figure 1. All Causes of Death Among Children (1-12 years), National vs. NYC



Source: Bureau of Vital Statistics, NYC DOHMH and Web-based Injury Statistics Query and Reporting System (WISQARS), Centers for Disease Control and Prevention.

Nationally, most injury-related deaths among children aged one to 12 years are accidental or unintentional (82%, 7.1 deaths per 100,000 children), whereas 15% are homicides (1.2 deaths per 100,000 children). Compared with national statistics, NYC children experience less than half as many unintentional injury deaths (2.7 deaths per 100,000). This is mostly due to the difference in transportation-related fatalities (3.6 per 100,000 children nationally compared with 1.2 deaths per 100,000 children in NYC). NYC children also experienced fewer child homicides (0.9 deaths per 100,000 in NYC compared with 1.2 deaths per 100,000 nationally). National and NYC findings regarding other fatal injuries such as suicide are similar.

Figure 2. Injury Deaths Among Children (1-12 years) by Manner of Death, National vs. NYC

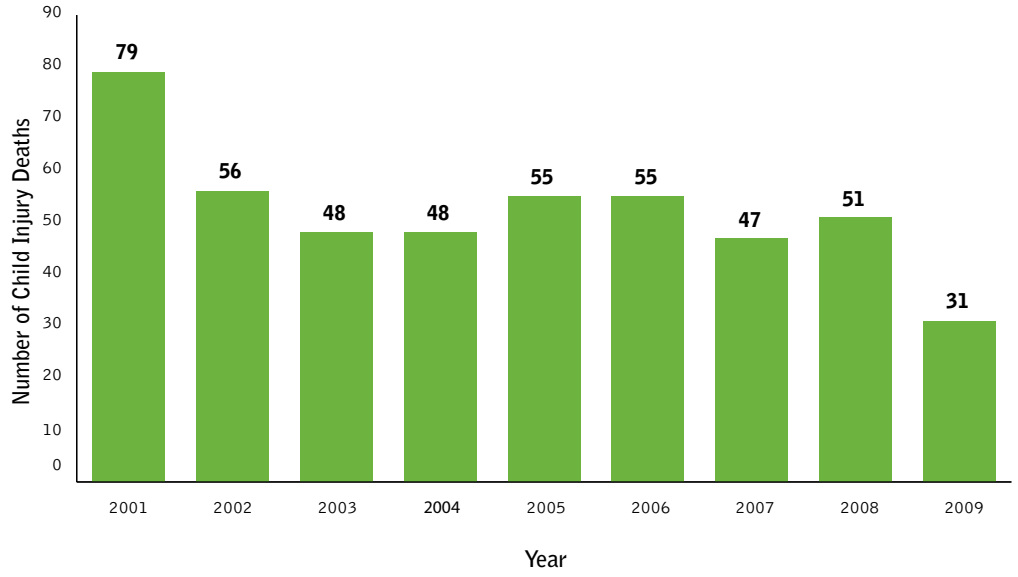


Source: Bureau of Vital Statistics, NYC DOHMH and WISQARS, Centers for Disease Control and Prevention

From 2001 to 2009, a total of 470 injury deaths occurred among NYC children aged one to 12 years old, accounting for 28% of all child deaths in NYC (n=1,681). Most injury-related deaths were unintentional (69%, n=324), including non-transportation (40%, n=190) and transportation accidents (29%, n=134). Twenty-four percent (24%, n=114) of injury deaths were due to intentional injuries including homicide (22%, n=104) and suicide (2%, n=10). Other injury deaths included undetermined deaths (6%, n=27) and cases of therapeutic complications (1%, n=5).

The graph at the top of page 7 shows that child injury deaths varied slightly from year to year, with no discernible trend from 2001 to 2009. In 2001, a total of 79 deaths were observed, including 18 deaths due to a plane crash in Queens. From 2002 to 2008, injury deaths remained relatively stable, ranging from 47 to 56 deaths per year. In 2009, there were 31 child injury deaths, a decrease attributable to fewer non-transportation-related unintentional injuries and homicides. Specifically, three fire deaths occurred in 2009 compared with a range of five to 17 fire deaths per year from 2001 through 2008, and three homicides occurred compared with a range of seven to 23 homicides per year from 2001 to 2008.

Figure 3. Injury Deaths Among Children (1-12 years) by Year NYC, 2001-2009, N=470



Source: Bureau of Vital Statistics, NYC DOHMH.

The graph below shows trends in child injury death rates from 2001 to 2009. Aside from the airplane crash that contributed to the higher rate of unintentional transportation deaths in 2001, no discernible trend is seen among transportation deaths. Despite the marked decline in fatal unintentional injury between 2008 and 2009, unintentional non-transportation injury has persisted as the major contributor to child injury deaths for the past nine years. Slight fluctuations are seen among homicide deaths from year to year, and the rate of suicide has remained stable over time.

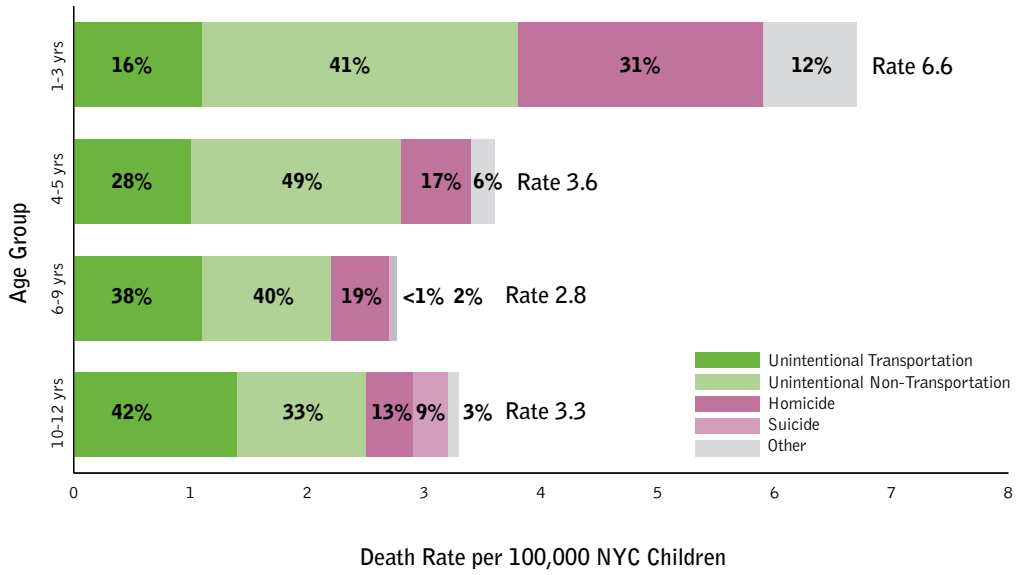
Figure 4. Injury Deaths Among Children (1-12 years) by Year and Injury Intent, NYC, 2001-2009, N=470

Source: Bureau of Vital Statistics, NYC DOHMH, OCME.

Demographic Characteristics

Age. In general, younger children had the highest injury death rates between 2001 and 2009. Children one to three years old had a higher burden of injury deaths, with a rate of 6.6 deaths per 100,000 NYC children compared with older children. Unintentional injury overall was the most common type of injury death observed. Children aged 10 to 12 years experienced a higher proportion of unintentional transportation deaths compared to other age groups, while children aged four to five years had a higher proportion of unintentional non-transportation deaths. Nearly one third (31%) of younger children died from homicide compared with 13% to 19% of older children. Almost all (90%) suicides occurred among children 10 to 12 years old.

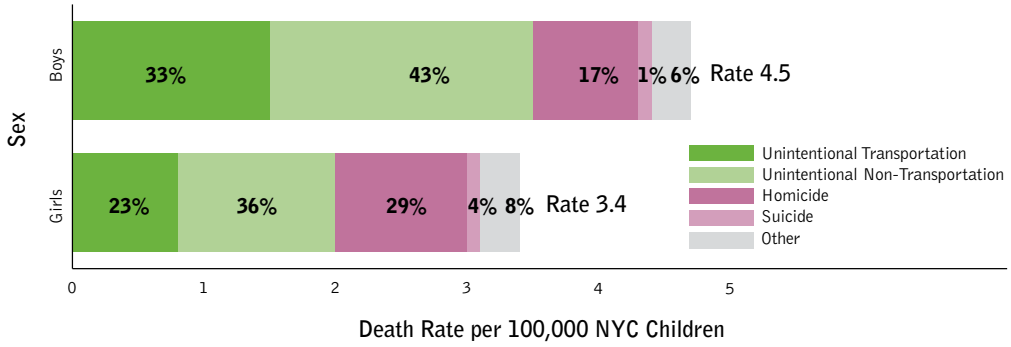
Figure 5. Injury Deaths Among Children (1-12 years) by Age Group, NYC, 2001-2009, N=470



Source: Bureau of Vital Statistics, NYC DOHMH, OCME.

Sex. Between 2001 and 2009, 273 boys and 197 girls died from fatal injuries. The death rate among boys was 32% more than the rate among girls (4.5 vs. 3.4 deaths per 100,000). However, differences in the type of child injury deaths varied by sex: unintentional injuries accounted for 76% of fatal injuries among boys and 59% among girls. Girls experienced a higher proportion of intentional injury deaths (for both homicide and suicide) than boys (approximately 29% vs. 17% homicides and 4% vs. 1% suicides, respectively).

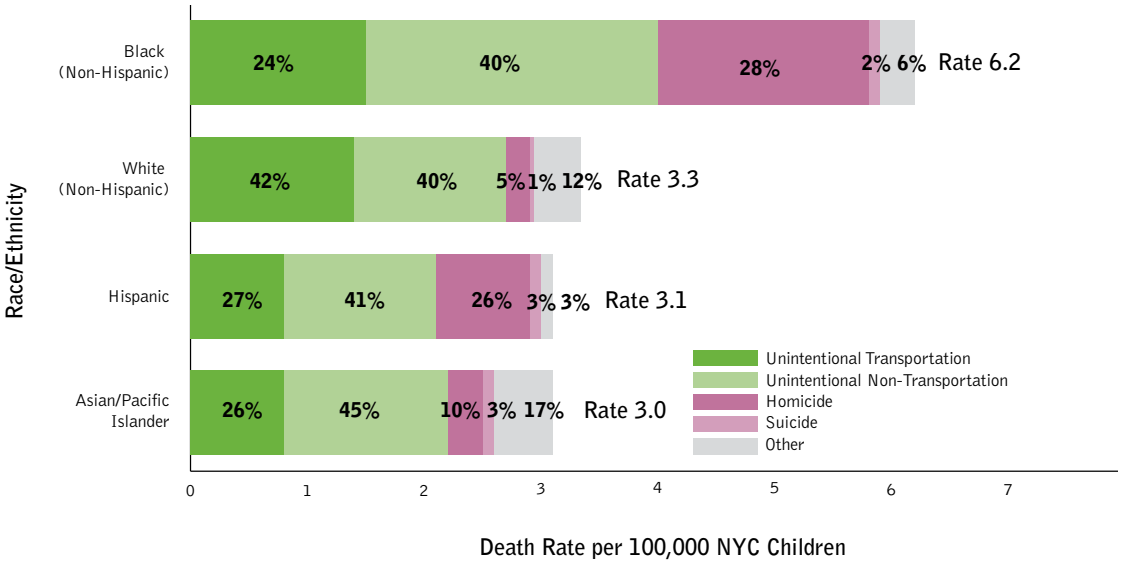
Figure 6. Injury Deaths Among Children (1-12 years) by Sex, NYC, 2001-2009, N=470



Source: Bureau of Vital Statistics, NYC DOHMH, OCME.

Race/Ethnicity. Between 2001 and 2009, black, non-Hispanic children experienced a disproportionately large burden of injury deaths (46% of all NYC child injury deaths). The rate among black, non-Hispanic children (6.2 deaths per 100,000 children) was approximately twice the rate among white, non-Hispanic children (3.3 deaths per 100,000 children), Hispanic children (3.1 deaths per 100,000 children) and Asian and Pacific Islander children (3.0 deaths per 100,000 children). The distribution of injury by intent varied across racial/ethnic groups. White, non-Hispanic children had the highest proportion of deaths caused by unintentional transportation injuries (42%) compared with other racial/ethnic groups in NYC. The distribution of non-transportation deaths was similar for all racial/ethnic groups. While black, non-Hispanic children and Hispanic children had the highest proportions of homicides (28% and 26%, respectively).

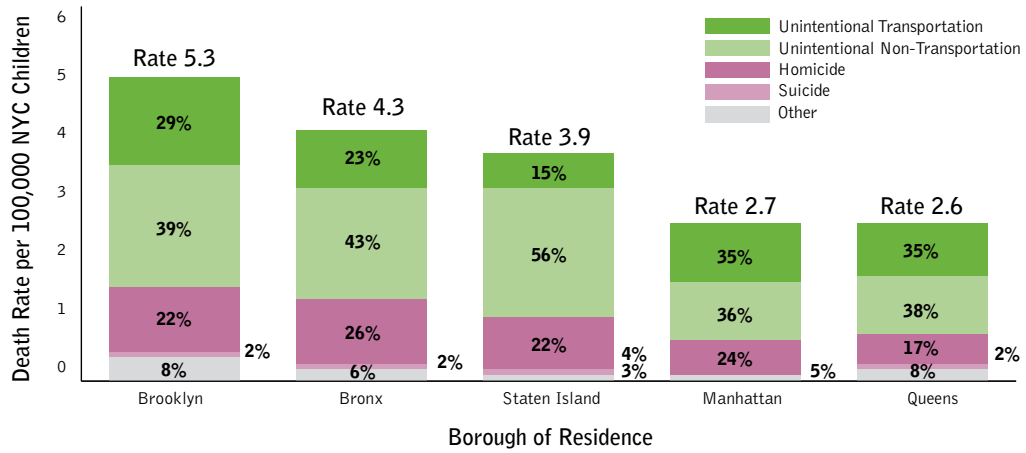
Figure 7. Injury Deaths Among Children (1-12 years) by Race/Ethnicity, NYC, 2001-2009, n=470



Source: Bureau of Vital Statistics, NYC DOHMH, OCME.

Borough of residence. The borough of the child's primary residence was most often the same as the location of fatal injury (88%). The highest injury death rate was found among Brooklyn residents (5.3 deaths per 100,000 children). The distribution of injury by intent was not uniform across the five boroughs. Manhattan and Queens residents had the highest percentage of unintentional transportation injuries (35%), and residents of Staten Island had the highest proportion of unintentional non-transportation injuries (56%). Bronx residents had the highest percentage of homicides (26%).

Figure 8. Injury Deaths Among Children (1-12 years) by Borough of Residence, NYC, 2001-2009, N=470



Source: Bureau of Vital Statistics, NYC DOHMH, OCME.

Causes of Fatal Injuries

Unintentional. Deaths that resulted from unintentional injuries comprised 69% (n=324) of the 470 injury-related child deaths between 2001 and 2009. Injuries resulting from blunt impact contributed to more than half (54%, n=175) of these deaths, including injuries sustained from a transportation accident (n=134), from a fall (n=32) or from being struck by a falling object (n=9), such as an unstable television or entertainment unit. Among the 134 deaths caused by transportation accidents, 87% (n=116) were motor vehicle-related and 13% (n=18) were due to a single airplane accident that occurred in Queens in 2001. Of motor vehicle-related accidents, the majority involved child pedestrians (76%, n=88), followed by child passengers (15%, n=17) and child cyclists (9%, n=11).

The remaining unintentional injury deaths were caused by unsafe environments that produced the following: thermal injuries (27%, n=89), including fire (n=86), scald (n=2) and electrocution-related (n=1) injuries; suffocation or asphyxia (10%, n=33); drowning (4%, n=13); poisoning (2%, n=5); weapon (1%, n=3) and other causes (2%, n=6).

Table 1. Causes of Unintentional Injury Deaths Among Children (1-12 years), NYC, 2001-2009, N=324.

Cause	N	%
Blunt Impact	175	54%
- Transportation (motor vehicle and other transport)	134	41%
- Fall	32	10%
- Struck by falling object	9	3%
Fire or burn	89	27%
Suffocation/asphyxia	33	10%
Drowning	13	4%
Poisoning	5	2%
Weapon	3	1%
Other	6	2%
Total	**324**	**100%**

Source: Bureau of Vital Statistics, NYC DOHMH, OCME.

Intentional. Deaths resulting from intentional injuries comprised 24% (n=114) of the 470 injury-related child deaths between 2001 and 2009. Most (91%) of these deaths were from homicide (n=104) and 9% were from suicide (n=10).

Four specific causes made up 65% of child homicide deaths. Blunt impact or blunt force trauma was the most common cause (26%, n=27), followed by gunshot wounds (14%, n=15), fatal child abuse syndrome (13%, n=14) and smoke inhalation (12%, n=12). Among the 10 injury deaths certified as suicide, 80% were caused by hanging (n=8) and 20% were caused by overdose (n=2). Girls made up 70% (n=7) of suicides.

Table 2. Causes of Intentional Injury Deaths Among Children (1-12 years), NYC, 2001-2009, N=114

Cause	N	%
Homicide		
Blunt impact	27	26%
Gunshot	15	14%
Fatal child abuse syndrome	14	13%
Smoke inhalation	12	12%
Stab wound	9	9%
Smothering	5	5%
Drowning	5	5%
Shaking, whiplash and blunt impact	5	5%
Poisoning (ingestion of toxic substance)	4	4%
Scald burn	2	2%
Hanging	1	1%
Other	5	5%
Total	**104**	**100%**
Suicide		
Hanging	8	80%
Overdose	2	20%
Total	**10**	**100%**

Source: Bureau of Vital Statistics, NYC DOHMH, OCME.

Other. Between 2001 and 2009, 27 deaths (6% of all injury deaths) were certified as having an undetermined manner of death. The causes of these deaths included blunt impact injuries, drowning, scald burns, threat to breathing and medication overdose. In these cases, circumstances remained ambiguous or unexplained following post-mortem examination and death scene investigation. In addition, five children experienced complications associated with medical treatment. These therapeutic complications were among children with pre-existing conditions and included self-extubation of tracheotomy tubing, entanglement in intravenous tubing and adverse effects of medication and treatment.

Nonfatal Injuries

While fatal injuries signify more severe injuries, they represent just a fraction of the injury burden among children. Nonfatal injuries are much more common and have many economic and social costs. Examination of the larger burden of nonfatal injuries enhances development of prevention programming and policy. A brief summary of injuries resulting in hospitalization is presented below.

In NYC, nonfatal injuries are a leading cause of hospitalizations among children aged one to 12 years old. According to the most current data from NYC hospitals, between 2001 and 2008 there were 32,681[1] injury-related hospitalizations among children, corresponding to an average of approximately 4,085 hospitalizations annually. Most (95%) of these were due to unintentional injuries. On average, there were 3,895 hospitalizations due to unintentional injuries and 149 due to intentional injuries (122 assaults and 27 self-inflicted injuries), annually. Self-inflicted injury hospitalizations include both self-harm and suicide attempts; the two subtypes cannot be distinguished. On average, 40 injury hospitalizations annually were due to injuries of undetermined intent.

From 2001 to 2008, the rate of injury-related hospitalizations among children decreased 20% from 2001 to 2008 (348 hospitalizations per 100,000 in 2001 to 279 per 100,000 in 2008). Most of this decline was due to decreases in unintentional injuries among children (333 hospitalizations in 2001, compared with 266 per 100,000 in 2008). From 2001 to 2008, no discernible trend was seen with nonfatal intentional injury

[1] Hospitalizations where the intent of injury was unintentional, intentional and undetermined were included in analyses.

hospitalizations. Child hospitalizations due to intentional assault ranged from 7 to 11 per 100,000; self-inflicted injuries ranged from 1 to 2 per 100,000; and injuries of undetermined intent varied from 2 to 4 per 100,000 children annually.

Although the leading causes of injury for nonfatal injury hospitalizations and fatal injuries were similar, the precise rank and magnitude of their contributions differed. Falls were the leading cause of nonfatal unintentional injury hospitalizations among children, accounting for more then one third (34%, n=10,711) of injury hospitalizations between 2001 and 2008. Falls included falls from a height, falls from one level to another or on the same level, as well as slips, trips or stumbles. Motor vehicle and other transportation-related accidents were the next leading cause accounting for 16% (n=4,944) of all unintentional injury hospitalizations among children, most of these involved pedestrian injury. Injuries from fire or burn were the third leading contributor to unintentional injury hospitalizations, accounting for 14% (n=4,374) of unintentional injury hospitalizations among children; most of these involved hot substances. Data for these and other causes of nonfatal child hospitalization from unintentional injuries are presented in Table 3.

Table 3. Causes of Nonfatal Unintentional Injury Hospitalizations Among Children (1-12 years), NYC, 2001-2008, N=31,163

Cause	N	%
Falls	10711	34%
Motor vehicle (MV) traffic and other transportation	4944	16%
- MV - pedestrian	2827	9%
- MV - occupant	579	2%
- MV - pedal cyclist	363	1%
- MV - other/unspecified	122	<1%
- Other transportation - pedal cyclist	777	2%
- Other transportation - other	276	1%
Fire or burn	4374	14%
- Hot substance	4023	13%
- Fire/flame	351	1%
Poisoning	2255	7%
Natural/environmental	2055	7%
Struck	1709	5%
Cut	869	3%
Suffocation	267	1%
Machinery	72	<1%
Drowning	68	<1%
Firearm	24	<1%
Other/unspecified	3815	12%
Total	**31163**	**100%**

Source: Statewide Planning and Research Cooperative System New York Sate (NYS) DOH, updated December 2009.

Also, during the eight years of study, there were 982 nonfatal intentional assault hospitalizations among NYC children aged one to 12 years old. Injuries sustained from child abuse (29%, n=283) and physical force during a fight or brawl (27%, n=269) were the leading causes of intentional assault hospitalizations among children. Two hundred and thirteen (n=213) nonfatal self-inflicted injury hospitalizations were also seen among children aged one to 12 years old between 2001 and 2008. Poisoning from drugs and medicinal substances were the leading cause of these nonfatal self-inflicted injuries (59%), followed by injuries from cutting or piercing (17%). Data for these and other causes of intentional child injury hospitalization are presented in Table 4.

Table 4. Causes of Nonfatal Intentional Assault and Self-Inflicted Injury Hospitalizations Among Children (1-12 years), NYC, 2001-2008, N=1,195.

Cause	N	%
Assault		
Child abuse	283	29%
Physical force	269	27%
Struck by blunt object	59	6%
Human bite	48	5%
Cut	44	4%
Firearm	36	4%
Rape	27	3%
Fire/hot substance	17	2%
Poisoning (drugs/medicinal substances and other)	7	<1%
Other/unspecified	192	20%
Total	**982**	**100%**
Self-inflicted		
Poisoning	130	61%
- Drugs/medicinal substances	125	59%
- Other solid/liquid/gas or vapor	5	2%
Cutting/piercing	37	17%
Hanging/strangulation	5	2%
Jump from high place	4	2%
Fire/flame	1	<1%
Other/unspecified	36	17%
Total	**213**	**100%**

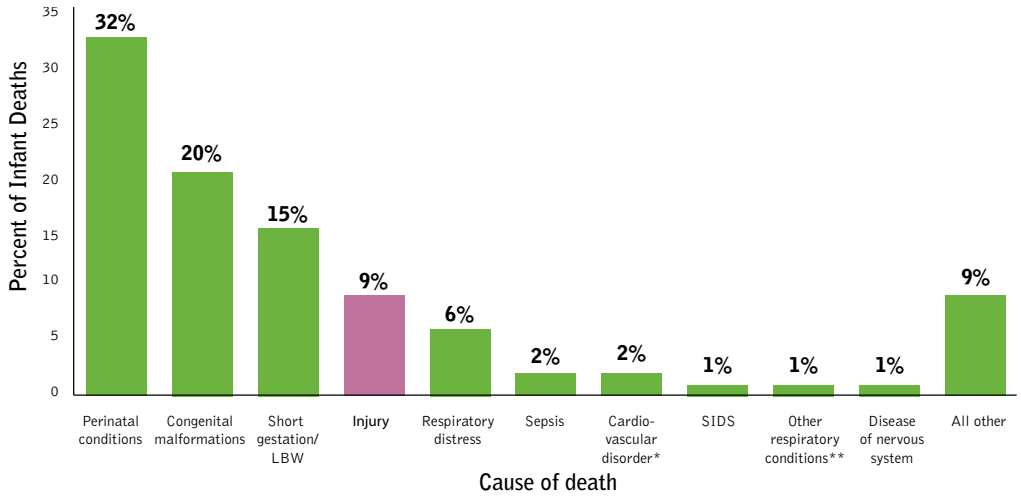
Source: Statewide Planning and Research Cooperative System NYS DOH, updated December 2009.

Special Section: Sleep-Related Injury Deaths Among Infants Younger Than One Year Old

While the NYC CFRT is mandated to review injury deaths among children aged one to 12 years old, for this report committee members also elected to review infant injury deaths (from birth up to 12 months) to highlight the main causes of preventable death among NYC's youngest children.

From 2004 to 2008, perinatal conditions, congenital malformations, and short gestation or low birth-weight were the leading causes of infant deaths in New York City. These conditions have multiple, complex causes. Data show injury as the fourth leading cause of death among infants younger than one year old, accounting for 9% (n=325) of all infant deaths (n=3,626) and corresponding to a rate of 58.9 deaths per 100,000 infants. Infant injury deaths resulted from unintentional injuries (22%, n=70), intentional injuries (14%, n=44), injuries of undetermined intent (64%, n=209) and therapeutic complications (<1%, n=2).

Figure 9. Leading Causes of Infant Deaths, NYC, 2004-2008, N=3,626



SIDS = sudden infant death syndrome, LBW = low birth weight

*Includes heart disease, cerebrovascular disease and other cardiovascular diseases.

**Includes influenza/pneumonia, chronic lower respiratory disease and pneumonitis.

Source: Bureau of Vital Statistics, NYC DOHMH.

Sleep-Related Infant Injury Deaths Explained

Sleep-related death is the name for a grouping of infant deaths caused by both injury (unintentional suffocation in bed and undetermined causes) and by sudden infant death syndrome (SIDS).

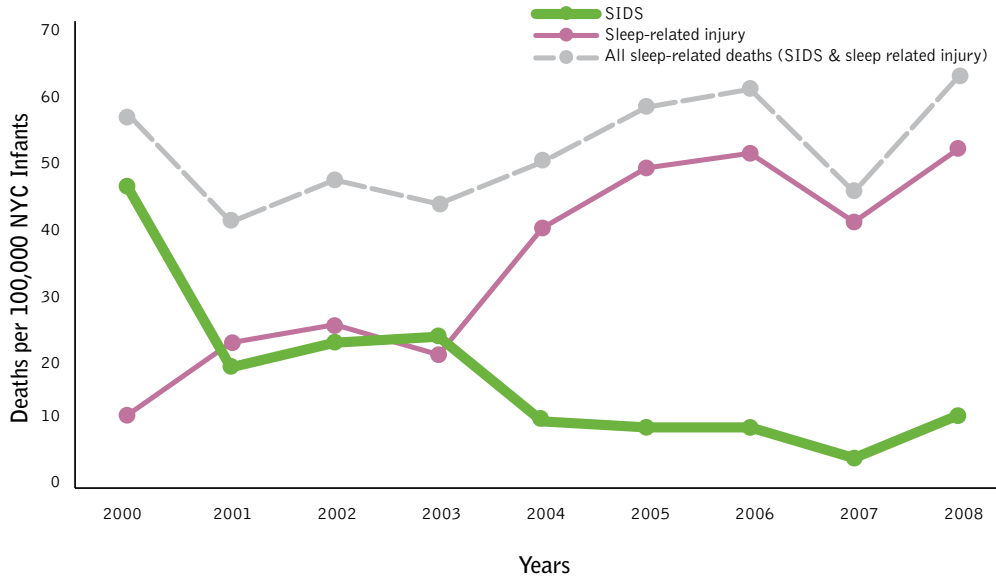
In NYC, more than three quarters (78%, n=252) of infant *injury* deaths between 2004 and 2008 were identified as having unsafe sleep conditions and environments.[2] Sleep-related injury deaths include unintentional suffocation in bed and sleep-related injuries of undetermined manner. These deaths are related to sleep when an infant was last seen asleep and when environmental factors related to sleep (e.g., position, excess bedding, bed-sharing or sleep surface) were present and may have contributed or been associated with the death.

Some sleep-related infant deaths are not caused by injury, but instead are caused by SIDS, a term that has long been used to categorize sleep-related infant deaths where a cause cannot be found. SIDS is a category of sleep-related deaths thought to be due to natural diseases.

[2] See Appendix for breakdown of non sleep-related infant injury deaths.

In NYC, the criteria to certify a death as SIDS narrowed in 2004, resulting in more sleep-related deaths being classified as unintentional suffocation in bed or having an undetermined cause of death. The graph below depicts the diagnostic coding shift of sleep-related infant deaths in NYC over time. The majority of sleep-related deaths identified in recent years (2004 to 2008) were not due to SIDS, as in years prior. Rather, the majority of sleep-related deaths since 2004 were classified as unintentional suffocation in bed and injuries of undetermined intent, resulting in a rise from 9.6 deaths per 100,000 infants in 2000 to 43.9 deaths per 100,000 infants in 2008. This shift reflects injury-related findings at death scene investigation that point towards unsafe sleep environment.

Figure 10. Trends in Sleep-Related Infant (<1 year) Injury Deaths, NYC, 2000-2008

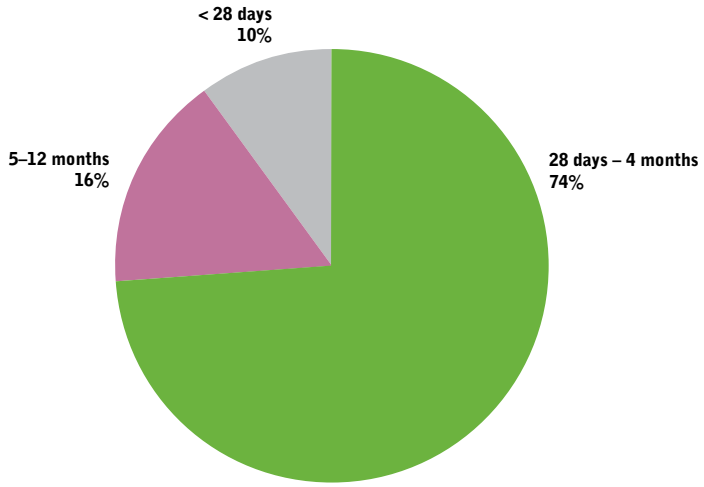


Source: Bureau of Maternal and Infant Reproductive Health, NYC DOHMH, Bureau of Vital Statistics, NYC DOHMH, OCME.

Demographics of Sleep-Related Infant Injury Deaths

Infant age at death. Between 2004 and 2008, 74% (186 of 252 infant deaths) of sleep-related infant injury deaths occurred when the infant was from 28 days to four months of age. Deaths among infants younger than 28 days old (10%, n=25) and among infants five to 12 months old (16%, n=41) were less frequent.

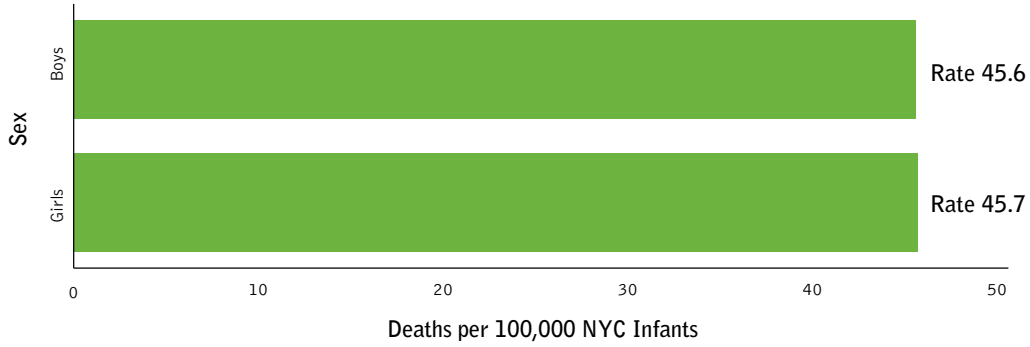
Figure 11. Sleep-Related Infant (<1 year) Injury Deaths by Age at Death, NYC, 2004-2008, N=252



Source: Bureau of Maternal and Infant Reproductive Health, NYC DOHMH, OCME.

Sex. Between 2004 and 2008, 129 infant boys and 123 infant girls died from sleep-related injury deaths. Deaths among infant boys and girls occurred at a similar rate, showing no differences in infant sleep-related injury deaths by sex. (45.6 vs. 45.7 deaths per 100,000 infants).

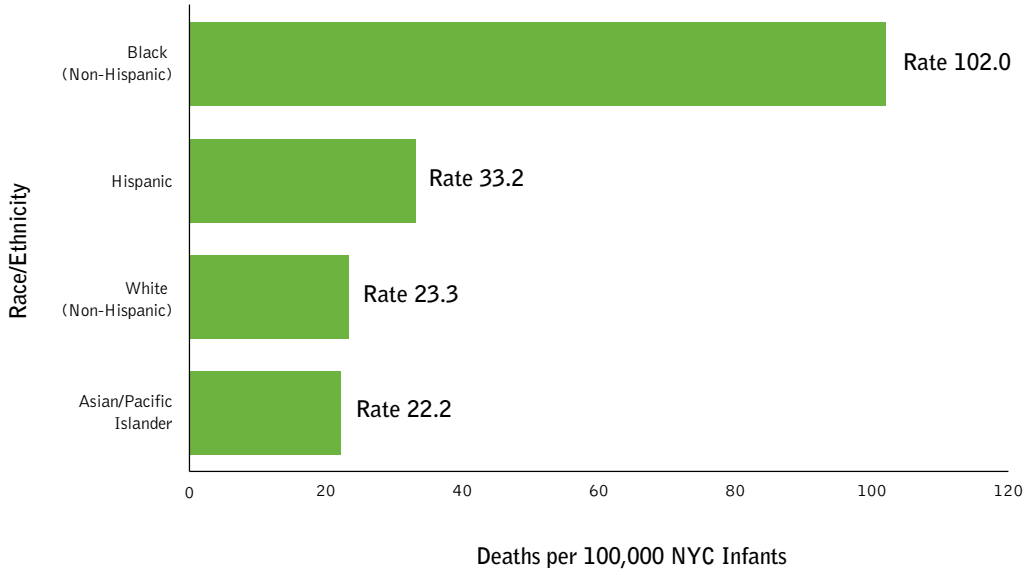
Figure 12. Sleep-Related Infant (<1 year) Injury Deaths by Sex, NYC, 2004-2008, NYC, N=252



Source: Bureau of Maternal and Infant Reproductive Health, NYC DOHMH, OCME.

Race/Ethnicity. Between 2004 and 2008, the rate of sleep-related deaths among black, non-Hispanic infants (102.0 deaths per 100,000 infants, n=144) was more than three times higher than among Hispanic infants (33.2 deaths per 100,000 infants, n=62), and more than four times higher than among white, non-Hispanic infants (23.3 deaths per 100,000 infants, n=34) and infants of Asian and Pacific Islander descent (22.2 deaths per 100,000, n=11).

Figure 13. Sleep-Related Infant (<1 year) Injury Deaths by Race/Ethnicity, NYC, 2004-2008, N=252*

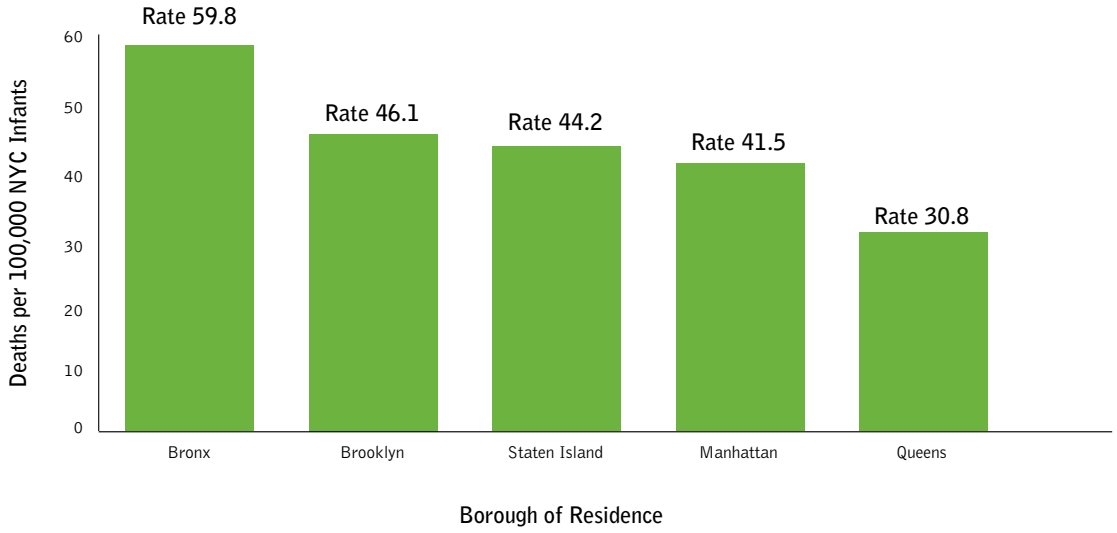


*One infant sleep-related death was missing race/ethnicity data.

Source: Bureau of Maternal and Infant Reproductive Health, NYC DOHMH, OCME.

Borough of residence. Bronx infants experienced the highest rate of sleep-related injury deaths, with 59.8 deaths per 100,000 infants, followed by Brooklyn infants (46.1 per 100,000), Staten Island infants (44.2 per 100,000) and Manhattan infants (41.5 per 100,000). Queens infants had the lowest rate, with 30.8 sleep-related injury deaths per 100,000.

Figure 14. Sleep-Related Infant (<1 year) Injury Deaths by Borough of Residence, NYC, 2004-2008, N=252*



*A small proportion (4%, n=10) of sleep-related injury deaths in NYC occurred among infants residing outside of NYC.

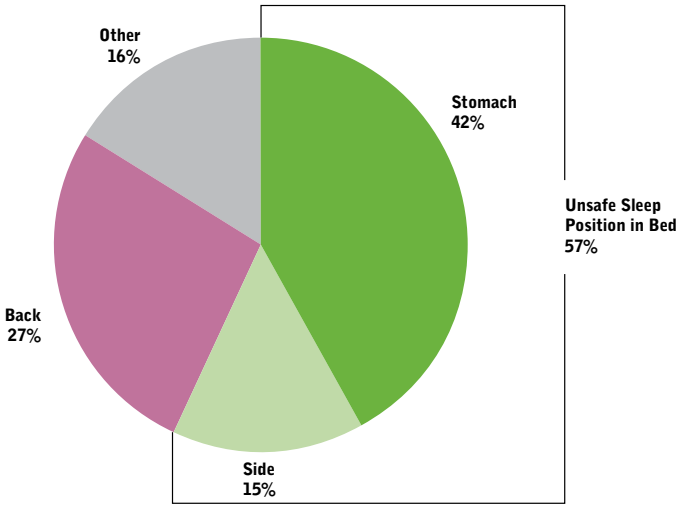
Source: Bureau of Maternal and Infant Reproductive Health, NYC DOHMH, OCME.

Case Review of Sleep-Related Infant Injury Deaths

An in-depth review of all 252 sleep-related infant injury deaths occurring between 2004 and 2008 was conducted (21% unintentional suffocation deaths, 79% undetermined deaths). These deaths involved circumstances in which an infant died during sleep or could be linked to some potentially unsafe sleep-related environmental factor. Information from the OCME revealed that the risk factors for these sleep-related injury deaths included infant sleep position and sleep environment, such as sleep surface, excess bedding and bed-sharing with an adult or another child.

Sleep position. A review of sleep position showed that 57% of infants who died of sleep-related injury were found either on their stomachs (42%, n=105) or on their side (15%, n=39), in a crib or bassinet. These positions are known to be unsafe infant sleeping positions; positioning infants on their backs is considered safer. Sixteen percent (16%, n=40) of infants were found in other positions or locations, such as in a stroller, carrier, sling or being held by a sleeping adult.

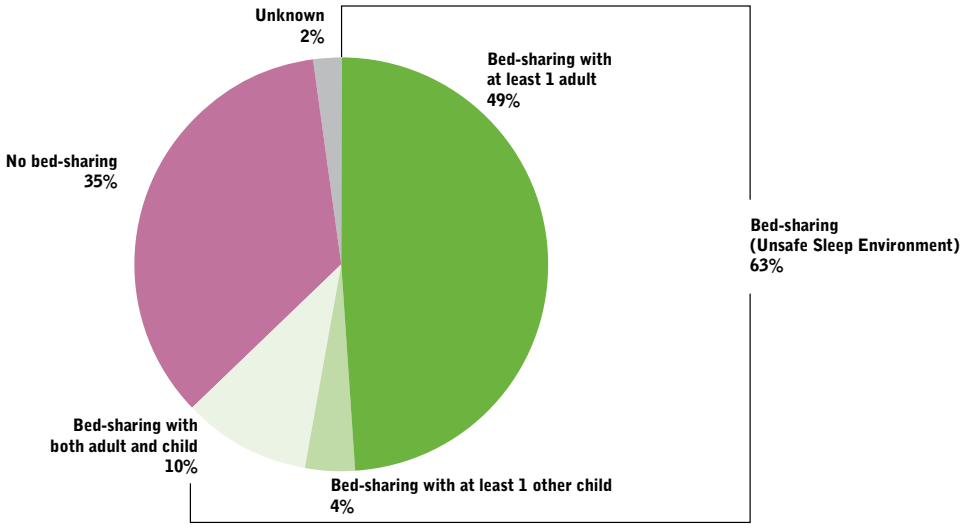
Figure 15. Sleep-Related Infant (<1 year) Injury Deaths by Sleep Position When Found, NYC, 2004-2008, N=252



Source: Bureau of Maternal, Infant and Reproductive Health, NYC DOHMH, OCME.

Bed-sharing. A review of bed-sharing showed that 63% (n=160) of infants who died of sleep-related injuries were found sharing a bed with another sleeper, a situation known to be unsafe. For infants, sleeping alone is safer than bed-sharing. Bed-sharing typically involved an infant sharing a bed with a parent or other adult (n=123); however several deaths involved bed-sharing with another child (n=10), such as a sibling, or with another child and an adult (n=25). For example, in one instance an infant girl died of unintentional suffocation while bed-sharing with her twin brother. No bed-sharing occurred in 35% (n=89) of cases, and the occurrence of bed-sharing was unknown in 2% (n=5) of cases.

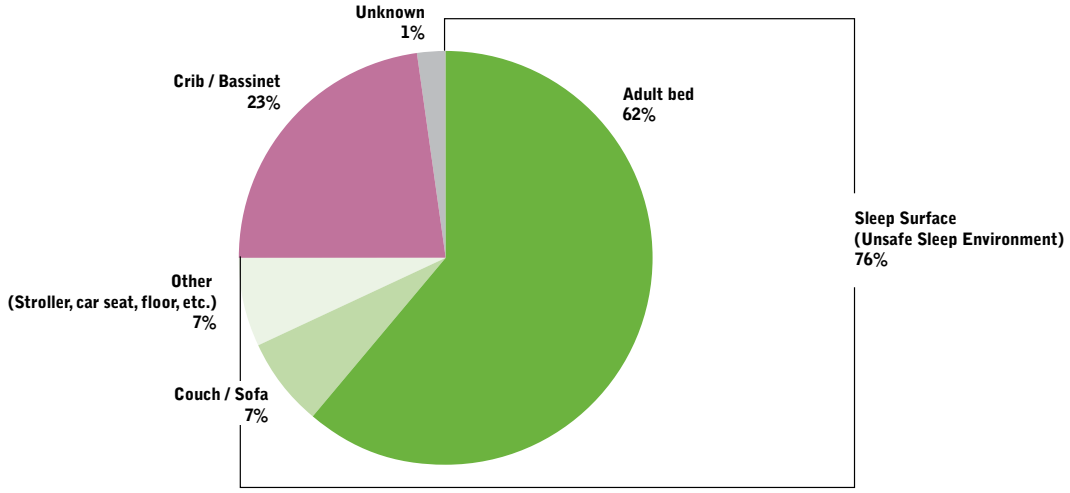
Figure 16. Sleep-Related Infant (<1 year) Injury Deaths by Bed-sharing, NYC, 2004-2008, N=252



Source: Bureau of Maternal, Infant and Reproductive Health, NYC DOHMH, OCME.

Sleep surface. The sleep surface and location of death was also considered. More than three quarters of infants (76%, n=191) who died from sleep-related injuries were found sleeping in an adult bed, couch, stroller, car seat or other environment known to be unsafe. Sleeping alone and on the infant's back in a crib or bassinet is known to be safest for infants. In some instances, the infant was moved from a safe crib or bassinet where he or she had been sleeping to a less safe sleep environment. For example, an infant girl was taken out of her bassinet because she was crying. Her father picked her up and held her on the couch until they both fell asleep. He later awoke and found that he was positioned on top of her.

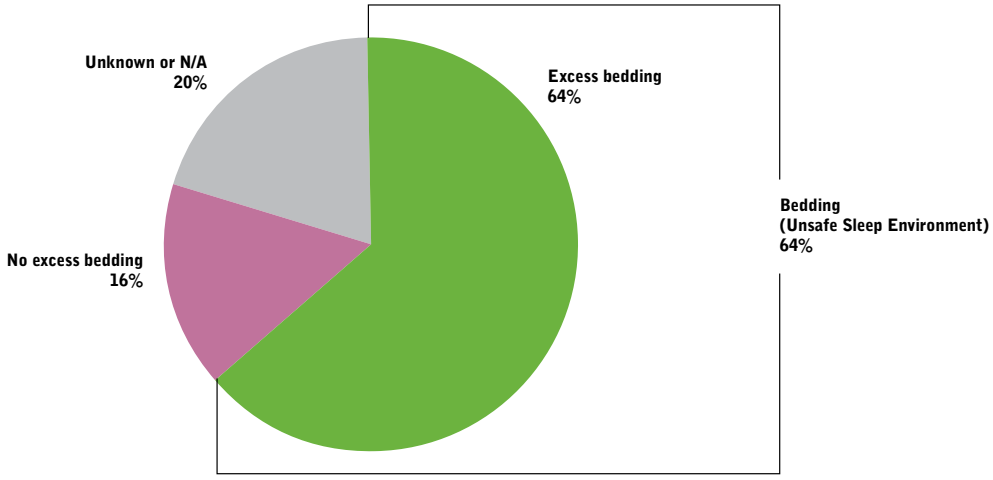
Figure 17. Sleep-Related Infant (<1 year) Injury Deaths by Sleep Surface, NYC, 2004-2008, N=252



Source: Bureau of Maternal, Infant and Reproductive Health, NYC DOHMH, OCME.

Bedding. The presence of excess bedding – defined as more than one bed sheet and one blanket – was found in almost two thirds (64%, n=162) of suffocation and undetermined deaths. Examples of excess bedding include pillows, comforters, quilts, crib-bumpers and towels, all of which are unsafe for infants.

Figure 18. Sleep-Related Infant (<1 year) Injury Deaths by Presence of Excess Bedding, NYC, 2004-2008, N=252



Source: Bureau of Maternal and Reproductive Health, NYC DOHMH, OCME.

Season. Though excess bedding was found in the majority of sleep-related infant injury deaths, these deaths did not vary by season. Overall, 28% (n=71) of infants died in the winter; 24% (n=60) died in the spring; 23% (n=59) died in the summer, and 25% (n=62) died in the fall. These findings suggest that excess bedding may not be related to seasonality, as common articles of bedding considered to be unsafe, such as pillows and crib bumpers, are often present in an infant's sleep environment year-round.

Overall, the majority of sleep-related injury deaths involved modifiable risk factors such as bed-sharing, sleep positioning, sleep surface, and excess bedding. These risk factors are not mutually exclusive; many of the infant deaths involved more than one sleep-related risk factor. In summary, more than three quarters (78%) of infant injury deaths identified unsafe sleep conditions or environments. Of these deaths, more than half involved at least one modifiable, sleep-related risk factor.

Summary

Injury Deaths Among Children

This 2011 report of the NYC CFRT presents an aggregate review of the 470 injury deaths that occurred among NYC children aged one to 12 years old from 2001 to 2009. Although they occur at less than half the rate of the national average, fatal child injuries are still a significant problem in NYC. A review of the data shows that injury deaths accounted for 28% of all child deaths in NYC children aged one to 12 years old. Data also show an unequal burden of fatal injuries among NYC children, with higher injury death rates found among younger aged children, boys and black, non-Hispanic children.

Data show that deaths among children were more likely to occur from unintentional injuries than from intentional injuries (69% vs. 24%, respectively). Unintentional motor vehicle traffic accidents contributed the most to child injury deaths in NYC overall (25%), with more than three quarters of deaths occurring among pedestrians. Also, fires or burns contributed to 22% of all child deaths in NYC. Intentional injuries accounted for 24% of all child injury deaths, nearly all of them (91%) were homicides. Although the number of fatal child injuries among children aged one to 12 years old has remained stable in recent years, a marked decrease was seen from 2008 to 2009 (51 deaths in 2008 vs. 31 deaths in 2009). This decrease was attributable to fewer unintentional non-transportation injuries and homicides. It is not clear whether this improvement reflects a trend.

Nonfatal Child Injuries

Serious, nonfatal injuries among children occur with much greater frequency than fatal injuries. While nonfatal injuries among children aged one to 12 occurred more frequently than fatal injuries, the leading causes of injury hospitalization are similar to the leading causes of injury death. On average there were about 3,900 nonfatal unintentional injury hospitalizations annually, and the leading causes of nonfatal unintentional injury hospitalization among children were falls, burns and motor vehicle-related accidents. Also on average there were about 150 nonfatal intentional injury hospitalizations annually. Leading causes of intentional injury hospitalizations were assault-related child abuse and physical force. Reviewing nonfatal child injuries in combination with fatal injuries provides a more comprehensive story of the substantial burden of severe injuries affecting NYC children.

Injury Deaths Among Infants

This year's report was expanded to include information on the causes and circumstances of infant deaths. Injury is also a leading cause of death among NYC children younger than one year old, with more than three quarters (78 %) of infant injury deaths related to unsafe sleeping conditions and environments. These sleep-related deaths included unintentional suffocation in bed and sleep-related deaths of undetermined manner. These deaths involve circumstances in which an infant died during sleep or could be linked to a potentially unsafe sleep environment, such as unsafe sleeping position or sleep surface, the presence of excess bedding or the practice of bed-sharing. Infants at highest risk for sleep-related infant injury deaths were between the ages of 28 days and 4 months old and were black, non-Hispanic. Data presented in this report should be used to raise awareness among parents and caregivers about the importance of safe sleep environments.

Limitations and Strengths

This retrospective review of child injury deaths has some important limitations. Some characteristics that may have been related to risk for an injury were not formally captured in case files, such as level of parental or guardian supervision and other family conditions or stressors. These factors, particularly for certain ages of children, may play a role in mitigating dangerous circumstances.

Similarly, hospitalization discharge data represent an important and useful data source for general surveillance of nonfatal child injuries. They are accessible, and enable epidemiologic descriptions of the children hospitalized for injuries. However, interpretation of discharge data presents certain difficulties. Hospitalization records reflect an event, and some children with injuries may be hospitalized more than once in any given year. This may result in a slight overestimate of the counts and rates of children injured. Further, some data elements are subject to incompleteness or lack of uniformity or both. Because data on the race and ethnicity of individual patients in hospitalization records are not collected in a standard manner across hospitals, we do not compare hospitalization rates by race and ethnicity. Similarly, the manner in which injury codes are selected across hospitalizations also may vary, and must be interpreted with caution.

Recommendations

Injuries are a leading cause of death among infants and children in NYC. Based on report findings, the CFRT identified key recommendations to make the physical and social environment safer for NYC children. The following are action steps for policymakers, parents and caregivers and service providers in addressing common childhood injuries identified in CFRT annual reports. In addition, the report includes an information sheet on safe sleep for infants, and a tip sheet for parents and caregivers to prevent injuries in the home.

Policymakers can promote safer environments to reduce the risk of injury among children.

- Increase child safety through enforcement of existing laws and regulations. Specifically:
  - Children up to age seven must be properly restrained in a child safety or booster seat, depending on the height and weight of the child, when riding in a motor vehicle.
  - Owners of multiple dwellings buildings must:
    - Install smoke detectors in all occupied apartments and carbon monoxide detecting devices within proximity of bedrooms.
    - Install approved window guards in homes where a child under age 11 resides and in public areas if a child under age 11 lives in the building.
  - Retailers must not sell drop-side cribs.
- Support current proposals and new legislation focused on increasing child safety. Specifically:
  - Hospitals should provide education to new parents on infant safe sleep and help parents obtain resources, such as cribs, if they do not have one.
  - Child safety seats should have labels outlining compatibility with different types of automobiles.
  - Large trucks, tractors and tractor-trailers or semitrailers should have convex mirrors to increase drivers' range of view.
  - Speed cameras should be installed along dangerous streets to reduce serious injuries and fatalities caused by speeding vehicles.
  - Children should be properly restrained in motor vehicles in accordance with best-practices endorsed by the American Academy of Pediatrics. Parents and guardians should slow the transition from a rear-facing child safety seat, to forward-facing seat to a booster seat. Children younger than 13 years of age should be restrained in the rear seats of vehicles.
  - Landlords should set tap water at a safe temperature – a maximum of 120 degrees Fahrenheit – for all dwelling units to prevent scald burns.
- Advocate for increased detail in systematic, uniform diagnostic coding standards for recording injury characteristics in official documentation of injury deaths and hospitalizations.

Parents and caregivers should watch children closely, learn about safety risks and create a safe home and play environment.

- Practice safe-sleep for infants. See tips sheet on page 24.
- Safeguard your home with devices like window guards, safety gates at stairs and other dangerous places, safety latches for drawers and cabinets, electrical outlet covers and smoke and carbon monoxide detectors. Keep medicines, cleaning products and matches out of the reach of children. See checklist for preventing child injuries in the home on page 26.
- Supervise young children closely. Choose caregivers carefully and discuss safety thoroughly with them.
- Supervise your children while crossing the street. Children under age 10 should only cross the street with a responsible adult and assess children's readiness to cross the street alone. Tell and show children to always look left, then right, then left again before crossing the street. Talk to your children about important traffic signs and signals.

- Secure children riding in cars with seat belts or place them in a car seat or booster seat (depending on the age and weight of the child).
- Teach your children about safety while at play; be sure they wear helmets and other protective gear whenever they are on wheels (e.g., bicycles, skates, skateboards and scooters).
- Get help:
  - Maintain positive parent-child interactions. When the stresses of parenting are overwhelming call the 24-hour Prevention and Parent Helpline 1-800-CHILDREN (1-800-244-5373) for support.
  - If you do not feel safe in your relationship or if you feel that stresses in your relationship compromise your parenting, call 24-hour Domestic Violence Hotline (1-800-621-HOPE).
  - Call 311 for information on housing-related safety issues and child services around the City.

Health care and other providers should screen for safety risks, document cases of injury in their records and support parents and caregivers in their efforts to safeguard their homes.

- Inquire about and document all information when a child presents with an injury.
- Counsel parents about safeguarding their homes to prevent child injuries.
- Counsel parents about the need for appropriate supervision, based on child's age, development and exposure to possible hazards. Children need close supervision when at play indoors and outdoors, while crossing streets and in and around motor vehicles. Provide information about choosing appropriate caregivers.
- Counsel expectant and new parents on infant safe-sleep practices and utilize every opportunity to visually demonstrate safe sleep practices for parents and other care givers.
- Report all poisonings, window falls and drownings to the DOHMH by calling 311.
- Look for early signs of abuse and report all suspected child abuse and neglect to the New York State Central Register of Child Abuse and Maltreatment (1-800-342-3720). All health care providers are mandated reporters. Never assume someone else is going to report it.
- Advise parents to call 311 for information on housing-related safety issues and child services around the City.
- Refer to the American Academy of Pediatrics website for additional information and safety tips. **www.aap.org/family/tippmain.htm**

For City agency activities that target child injury prevention, refer to previous CFRT reports **http://www.nyc.gov/html/doh/html/ip/ip-index.shtml**

Safe Sleep for Infants

Tip Sheet for Parents and Caregivers

Many homes have hazards that increase an infant's risk of being injured. Although there is no absolute way to prevent sleep-related injuries, taking certain steps and precautions can decrease the risk.

Always place a baby on his or her back to sleep, for naps and at night.

- The back sleep position is the safest, every time the baby sleeps.
- The side sleep position is not recommended. Babies can roll over on their stomachs, which increases the risk of suffocation.
- Don't use wedges or other devices to help a baby sleep on his or her back.

The safest way for a baby to sleep is alone, whether napping or at bedtime, on a firm mattress, in a safety-approved crib.

- A safety-approved crib has railings on all sides, the rails do not drop down and the rails are not too far apart from each other (a can of soda should not be able to fit through the rails).
- The mattress should fit tightly in the crib so that you can't fit more than two fingers between the mattress and the side of the crib.
- Use a crib with stationary sides. Do not use drop-side cribs; they can come apart creating a gap where a baby can get trapped or fall.

Keep soft objects, toys and loose bedding out of a baby's sleep area.

- Don't use pillows, blankets, quilts, sheepskins, mattress padding, stuffed animals or pillow-like crib bumpers in a baby's sleep area, and keep all objects away from your baby's face.
- Consider using a sleep sack, warm pajamas or a light blanket tucked under the foot of the crib mattress to keep babies warm.
- Avoid letting a baby overheat during sleep—dress him or her in light sleep clothing and keep the room at a temperature that is comfortable for an adult.

Keep the baby's sleep area close to, but separate from, where you and others sleep.

- A baby should not sleep in a bed or on a couch or armchair with adults or other children, but he or she can sleep in the same room as you.
- If you bring your baby into bed with you to breastfeed, put him or her back to sleep in a separate sleep area next to your bed, such as a bassinet, crib, cradle or a bedside co-sleeper (infant bed that attaches to an adult bed) when finished. This makes breastfeeding easier and will help with bonding with the baby.
- It is dangerous for an adult to sleep in the same bed with a newborn, especially if they have been drinking, using drugs or taking medication that causes drowsiness.

Don't let a baby sleep on a couch or chair, and don't sleep with a baby lying on your chest.

- Babies can get caught between sofa cushions and suffocate or fall.
- Babies can fall or stop breathing if face down on your chest or stomach.
- Put babies to sleep in a crib, bassinet or portable crib or Pack 'n Play every time.

Let babies play on their stomach when awake. This will help strengthen their neck, back and arms.

- Place a baby on his or her stomach when awake and someone is watching.
- "Tummy time" helps a baby practice lifting his head, which strengthens his upper body. Upper body strength is needed when the baby starts crawling.
- Time on a baby's stomach reduces the chance that flat spots will develop on his or her head.
- Avoid too much time in car seats, carriers and bouncers.

Think about using a clean, dry pacifier when placing an infant down to sleep.

- Do not force a baby to take it. Do not replace it in a baby's mouth, once he or she is asleep.
- If you are breastfeeding your baby, wait until your child is one month old or is used to breastfeeding before using a pacifier.

Get help when the stresses of parenting are overwhelming.

- For support, call the 24-Hour Prevention and Parent Helpline 1-800-CHILDREN (1-800-244-5373).

Make sure everyone who takes care of a baby knows:

- Always put a baby to sleep alone, on his or her back, in a safety-approved crib on a firm mattress with no soft bedding every time the baby sleeps.
- Never smoke, drink alcohol or use drugs around a baby.
- Place babies on their stomachs when they are awake and someone is watching.

Share this tip sheet with people who care for your baby!

For information and safe sleep trainings in NYC, visit: Sudden Infant Death Risk Reduction and Counseling **www.healthsolutions.org/sids**

For additional information, visit: NYC Department of Health and Mental Hygiene: **http://www.nyc.gov/html/doh/pregnancy/html/after/safety_sleep.shtml**
National Institute of Child Health and Human Development: **http://www.nichd.nih.gov/publications/pubs/upload/Safe_Sleep_2009_Eng.pdf** and **http://www.nichd.nih.gov/sids/**
American Academy of Pediatrics: **http://www.aap.org/healthtopics/Sleep.cfm**
Consumer Product Safety Commission for information on crib and product safety: **http://www.cpsc.gov** or 1-800-638-2772

Source: Bureau of Maternal Infant and Reproductive Health, DOHMH;
U.S. Department of Health and Human Services, National Institute of Child Health and Human Development.

Key Safety Messages for Preventing Child Injuries in the Home

A Checklist for Parents and Caregivers

Many homes have hazards that increase a child's risk of being injured. Although there is no absolute way to prevent injuries, taking certain steps and precautions can decrease the risk.

Falls and Falling Objects

- ☐ Make sure window guards are installed on all windows above the first floor that are not emergency exits. Do not rely on insect screens to keep children from falling out of windows.
- ☐ Keep furniture away from windows to avoid children from climbing out.
- ☐ Use safety gates to block access to stairs or other dangerous places.
- ☐ Securely anchor television sets to a wall or a large, balanced stand.

Poison

- ☐ Lock up potential poisons out of children's reach, including cleaning supplies, medicines and vitamins.
- ☐ Use safety latches for drawers and cabinets.
- ☐ Follow directions when giving medicine to children.
- ☐ Keep products (for example, medicine and cleaning products) in original, labeled containers. Never put them in food or drink containers.
- ☐ Avoid using aerosol spray products.
- ☐ Post the phone number for Poison Control near the phone (1-800-222-1222).

Choking and Suffocation

- ☐ Keep your home free of little things a child can choke on. Buttons, coins, jewelry and small toys cannot be left lying around.
- ☐ Don't give a child under age four any foods that can block the windpipe and cause choking such as nuts, hard candies, popcorn, pretzels or raw carrots. Cut hot dogs into small bites.
- ☐ Never let children run, play sports or ride in the car with gum, candy or lollipops in their mouths.
- ☐ Encourage children to sit when eating and to chew thoroughly.
- ☐ Learn how to provide early treatment for children who are choking; know the Heimlich maneuver to help a choking child (*Resource: American Red Cross at* **http://www.nyredcross.org/takeaclass**).
- ☐ Always follow manufacturers' age recommendations when buying toys. Some toys have small parts that can cause choking, so heed all warnings on a toy's packaging.
- ☐ Never place an infant face down on soft bedding.
- ☐ Infants and children should sleep alone in a crib, bassinet or bed.

Fire, Burns or Electrical Shock

- ☐ Install smoke detector in the home, particularly outside of each bedroom. Test smoke detectors once a month and change batteries every spring and fall when you change your clocks.
- ☐ Plan several ways to escape from each room if a fire starts and practice a fire escape plan with your family.
- ☐ Install carbon monoxide detectors in every sleeping area and test them monthly.
- ☐ Keep matches and lighters out of reach of children. Teach children fire is not a toy.
- ☐ Use back burners on stoves, and turn pot handles inward. Keep children away from the stove or microwave when cooking.
- ☐ Do not use stove, oven or burners to heat the home.
- ☐ Keep a fire extinguisher in the home.
- ☐ Cover electrical outlets with safety plugs.

Drowning

- ☐ If you have a pool in your backyard, install fencing on all sides of the pool. Install a self-closing gate with a lock that is out of a child's reach.
- ☐ Learn how to swim and provide your child with swimming lessons.
- ☐ Never leave a child unattended while bathing.
- ☐ Never leave a small child unattended near a bucket filled with any amount of water or other liquid.
- ☐ Never use air-filled swimming aids (such as water wings) in place of personal floatation devices (life preservers) or as a substitute for constant adult supervision.
- ☐ Dump out all water from a wading pool when you are finished using it.
- ☐ Learn CPR (cardiopulmonary resuscitation). In the time it might take for paramedics to arrive, your CPR skills could make a difference in someone's life. (*Resource: American Red Cross at* **http://www.nyredcross.org/takeaclass**)

Firearms

- ☐ If guns are in the house, unload them, put them in a locked place and keep the keys out of your child's reach. Store the gun in a separate place from the bullets.
- ☐ Make sure guns are equipped with a safety lock.

NYC's Child Fatality Reports and Other Information on Injuries in New York City are posted online at:
http://www.nyc.gov/html/doh/html/ip/ip-index.shtml.

Appendix A

Other Infant Injury Deaths

In addition to the 252 sleep-related infant injury deaths that occurred in NYC between 2004 and 2008, 73 infant deaths from other causes of injury occurred during this time period. These are summarized in the table below. Unintentional injury deaths were the result of fire and burns, non sleep-related suffocation, fall, drowning and other less frequently occurring causes. Intentional injury deaths primarily occurred as a result of blunt impact injuries, asphyxia and other forms of child abuse.

Table 5. Other Infant (<1 year) Injury Deaths by Cause of Injury, 2004-2008, n=73

Other Injury Deaths	N
Unintentional	n=17
Intentional (Homicide)	n=44
Undetermined	n=10
Therapeutic Complications	n=2
Total	**73**

Source: Bureau of Vital Statistics, NYC DOHMH.

Appendix B

Nonfatal Injuries Among Infants Younger Than One Year Old

Nonfatal injuries among infants are much more common than fatal injuries. In NYC, nonfatal injuries are a leading cause of hospitalizations among infants younger than one year old. To better understand the burden of injuries in NYC, a brief summary of the causes of injuries serious enough to require hospitalization are presented.

According to the most current data from NYC hospitals, there were 5,136[3] injury-related hospitalizations among infants between 2001 and 2008, corresponding to an annual average of approximately 642 hospitalizations. Most (92%) of these were due to unintentional injuries. On average, there were 589 hospitalizations due to unintentional injuries and 39 due to intentional injuries annually. On average, 14 injury hospitalizations were due to injuries of undetermined intent annually.

From 2001 to 2008, the rate of injury-related hospitalizations among infants decreased 8% (613.6 hospitalizations per 100,000 in 2001 compared to 562.8 per 100,000 in 2008). Most of this decline was due to decreases in unintentional injuries among infants (564.7 hospitalizations per 100,000 in 2001 compared with 511.2 per 100,000 in 2008). Other injuries examined fluctuated from year to year, with no discernible trend. Injuries from assaults ranged from 27 to 50 hospitalizations per 100,000 infants, and hospitalizations from injuries of undetermined intent ranged from 5 to 20 hospitalizations per 100,000 infants.

Although the causes of nonfatal injury hospitalizations and fatal injuries are similar, the precise rank and magnitude of their contributions differ. Falls were the leading cause of nonfatal unintentional injury hospitalizations among infants, accounting for 41% (n=1,917) of injury hospitalizations between 2001 and 2008. Injuries from fire or burn were the next leading cause of unintentional injury hospitalizations. Most of these involved hot substances and accounted for 19% (n=912) of unintentional injury hospitalizations among children. Unintentional suffocation ranked third and poisoning ranked fourth, accounting for 5% (n=227) and 4% (n=194) of unintentional injury hospitalizations, respectively. Data for these and other causes of nonfatal child hospitalization from unintentional injuries are presented in Table 6.

[3] Hospitalizations where the intent of injury was unintentional, intentional and undetermined were included in analyses.

Table 6. Causes of Nonfatal Unintentional Injury Hospitalizations Among Infants (<1 year), NYC, 2001-2008, N=4,708

Cause	N	%
Falls	1917	41%
Fire or burn	951	20%
- fire/flame	39	1%
- hot substance	912	19%
Suffocation	227	5%
Poisoning	194	4%
Natural/environmental	148	3%
Struck	133	3%
MV traffic and other transport	59	1%
- MV - occupant	31	1%
- MV - pedestrian	13	<1%
- MV other/unspecified and other transport	15	<1%
Cut	43	1%
Drowning	27	1%
Machinery	3	<1%
Firearm	1	<1%
Other/unspecified	1005	21%
Total	**4,708**	**100%**

Source: Statewide Planning and Research Cooperative System NYS DOH, updated December 2009.

Also, during the eight years of study, there were 310 nonfatal intentional assault hospitalizations among infants. Over two thirds (69%, n=213) of injuries sustained were from acts of child abuse. Data for these and other causes of intentional child injury hospitalization are presented in Table 7.

Table 7. Causes of Nonfatal Intentional Injury Hospitalizations Among Infants (<1 year), NYC, 2001-2008, N=310

Cause	N	%
Assault		
Child abuse	213	69%
Physical force	7	2%
Neglect	5	2%
Human bite	5	2%
Struck	3	1%
Cut	3	1%
Fire/hot substance	2	1%
Firearm	1	<1%
Drowning	1	<1%
Other/unspecified	70	22%
Total	**310**	**100%**

Source: Statewide Planning and Research Cooperative System NYS DOH, updated December 2009.

Technical Appendix

Injury deaths: Death certificates of all persons who die in NYC are collected and maintained by the DOHMH Bureau of Vital Statistics. For the years 2001 to 2009, injury deaths among children aged one to 12 years were identified by underlying cause of death with International Classification of Disease 10th Revision (ICD-10) Codes. Deaths due to injuries and other external causes, such as complications of medical and surgical care (also called therapeutic complications in this report) were identified using the following codes: V01–V99, W00–W99, X00–99 and Y00–Y89. CFRT staff abstracted de-identified demographic and injury information from death certificates for the purpose of aggregate data analysis.

For the years 2000 to 2009, infant death data maintained by DOHMH Bureau of Vital Statistics were also prepared and analyzed by CFRT staff. Deaths due to injuries and other external causes were identified in children younger than one year using the ICD-10 codes referenced above and code R95 for SIDS cases.

Fatal unintentional injuries: All fatal accidents among children are examined by the Office of Chief Medical Examiner (OCME). Unintentional injury deaths were identified using ICD-10 Codes (V01-X59). Based on the Medical Examiner number found on the death certificate, OCME files were reviewed and pertinent information abstracted. A data abstraction form was created using Microsoft Access. Documents examined in OCME records included autopsy, postmortem examination and toxicology reports; police reports (supplemental case information and precinct reports); investigation reports; hospital reports; and ambulance call reports.

Fatal intentional injuries: Deaths due to intentional injuries were identified using ICD-10 Codes (X60-X84, Y87.0, X85-Y09, Y87.1, Y35 and Y89.0). Cases that were subjects of an investigation and/or criminal and/or family court proceedings were restricted for case review as per Local Law 115.

Other fatal injuries: Deaths categorized with an undetermined manner were identified using ICD-10 Codes (Y10-Y34, Y87.2, Y89.9). Therapeutic complication deaths were identified using ICD-10 Codes for complications of medical and surgical care (Y40-Y84, Y88).

US comparison data: National data on overall child injury deaths are available from the CDC's National Center for Injury Prevention and Control Web-based Injury Statistics Query and Reporting System (WISQARS). **http://www.cdc.gov/injury/wisqars/fatal.html**. Data were accessed January 2011.

Nonfatal injury hospitalizations: Prepared by DOHMH staff, non-fatal injury hospitalizations with live discharges were identified using the New York State Department of Health Statewide Planning and Research Cooperative System (SPARCS) using the following ICD-9 E-codes. Codes E800-E869 and E880-E929 were used to identify unintentional non-fatal injuries; codes E950-E969 were used to identify intentional non-fatal injures. Data for 2001 to 2008 hospitalizations were updated in 2009; 2008 was the most current year available at the time of the report. Injuries from adverse effects of therapeutic complications and their late effects were excluded from the data.

Sleep-related infant injury deaths: This is a unique grouping of infant deaths inclusive of select injury causes. Vital statistics and medical examiner data were reviewed for deaths resulting from the following codes for unintentional suffocation in bed and undetermined causes: ICDI-10 code W75 (accidental suffocation and strangulation in bed); W84 (deaths resulting from unspecified threat to breathing); and Y33 and Y34 (deaths of undetermined intent). A subgroup of these deaths, with evidence of sleep-related factors, was analyzed by staff from the DOHMH Bureau of Maternal, Infant and Reproductive Health.

Data analysis: Frequency distributions and rates were conducted by DOHMH's Injury Surveillance and Prevention Program using SAS 9.1. Analyses by dedicated CFRT staff were performed. 2000 Census information was used to compute rates.

CRFT meetings: To maintain the confidentiality of case file information, CFRT meetings are closed to the public. All team members must sign a confidentiality statement before participating in the review process. The confidentiality statement specifically defines the conditions of participation and assures that members will not divulge information discussed in team meetings. To further maintain confidentiality, identifying information has been omitted from data and research reports.

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