New York City Child Fatality Report

2008 Report from the
Child Fatality Review Team

NYC Health

Michael R. Bloomberg, Mayor

Department of Health & Mental Hygiene
Thomas R. Frieden, MD, MPH
Commissioner

Fire Department
Nicholas Scoppetta
Commissioner

May 2008

Dear Fellow New Yorker,

Nothing is dearer to any of us than the safety of our children, yet New York City loses dozens of kids needlessly each year. Injuries – most of them preventable – are the city's leading cause of childhood death.

The City of New York is working hard to identify and address the causes of these injuries. Two years ago, the City established a multi-disciplinary Child Fatality Review Team to examine fatal injuries among children between one and 12 years old. This report, the team's second, focuses on fires and scald burns – the leading causes of child injury deaths in the home. Its findings and recommendations deserve careful consideration.

Although fire-related deaths have decreased in recent years – since 2002 we have seen the fewest civilian fire fatalities in the City's history – the report shows that additional gains are still needed, and still possible. Over the six years covered in this review, a quarter of the city's child fire deaths resulted from children playing with matches or lighters, most often in their bedrooms. Nearly half were due to hazardous adult activity, such as leaving a candle unattended or overloading electrical outlets. Fatal fires were also more likely in homes that lacked working smoke detectors, and in properties that were illegally occupied.

The report recognizes ongoing efforts to educate New Yorkers about fire safety and offers concrete recommendations for further addressing these hazards and preventing future tragedies. We urge all New Yorkers to help make the city a safe place for children. And, on behalf of the Child Fatality Review Team, we hope this report will help accomplish that goal.

Sincerely Yours,

Thomas R. Frieden, MD, MPH
Comissioner
New York City Health Department

Nicholas Scoppetta
Commissioner
New York City Fire Department

Annual Report 2008

NEW YORK CITY CHILD FATALITY REVIEW TEAM

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New York City Department of Health and Mental Hygiene

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Child Abuse Prevention Program

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Dova Marder MD, Medical Director

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Ann Marie Connell, Commanding Officer
Grace-Marie O'Donnell, Detective
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Gary Butts, MD, Associate Professor of Medical Education
Pediatrics and Community Preventive Medicine
Mount Sinai School of Medicine

Donna Lawrence, Executive Director
The Riggio Foundation

Tosan Oruwariye, MD, Pediatrician
Medical Director Community Based Service
Morris Heights Health Center

Mary Pulido, PhD, Executive Director
The New York Society for the Prevention of Cruelty to Children

Lisa White, LMSW, Program Director
Department of Obstetrics and Gynecology
Bronx Lebanon Hospital Center, South Bronx Healthy Families

Coordinator

Princess Fortin, MPH
New York City Department of Health and Mental Hygiene

Acknowledgments

We thank the following individuals who also contributed to this report:

Tara Das
Laura DiGrande
Andrew Faciano
Chris Goranson
Nathan Graber
Ed Hill
Donna Lawrence
Melanie Levin
Wenhui Li
Jenna Mandel-Ricci
Gil Manduro
Leze Nicaj
Emiko Otsubo
Catherine Stayton
Regina Zimmerman

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Key Findings

1. **Between 2001 and 2006, there were roughly 40% fewer deaths among New York City (NYC) children aged one through 12 years than the national average. Most of this difference is due to fewer motor vehicle-related deaths and homicides.**
   - Nationally, the death rate among children aged 1–12 years was 21 deaths per 100,000 children, compared to 15 deaths per 100,000 children in NYC.
   - Motor vehicle-related death rates among children were nearly three times higher nationally than in NYC (3.8 deaths per 100,000 compared to 1.3 deaths per 100,000 children).
   - Homicide death rates nationally were 18% higher than among NYC children (1.3 deaths per 100,000 vs 1.1 deaths 100,000 children).
2. **Injury deaths accounted for 28% of all child deaths in New York City between 2001 and 2006. Higher injury death rates were found among younger children, boys, black children and children living in Brooklyn.**
   - In general, younger children (aged 1–3 years) had higher injury death rates than older children.
   - Boys had a higher injury death rate (4.6 deaths per 100,000 male children) than girls (3.9 deaths per 100,000 female children).
   - The injury death rate among black children was 71% higher than white non-Hispanic children and double that of Hispanic children.
   - Brooklyn had the highest rate of child injury deaths (5.9 deaths per 100,000 children) and Manhattan had the lowest rate (2.7 deaths per 100,000 children).
3. **In NYC, motor vehicle-related crashes are the leading cause of unintentional child injury deaths, followed by fire and burn-related deaths, the leading cause of death to children in the home. In this report, fire-related deaths were the focus of an in-depth investigation.**
   - From 2001 to 2006, 43 separate residential fires led to 66 fire-related fatalities among children aged 1–12 years. These fires contributed to 95 deaths (adults and children).
   - The fire death rate among black children (1.4 deaths per 100,000 black children) was nearly twice that of white children (0.8 deaths per 100,000 white children) and more than three times that of Hispanic children (0.4 deaths per 100,000 Hispanic children).
   - Child fire death rates were comparable across most boroughs except Manhattan, where fewer fire deaths occurred.
   - Smoke inhalation was the cause of death for two thirds of fire-related deaths.
   - Fatal fires occurred most frequently in the fall and winter months and during late night and early morning hours.
4. **Eighty-five percent (85%) of child fire deaths were accidental and 15% were due to arson.**
   - Most accidental fire fatalities (78%) were the result of negligent human behavior.
   - Nearly half (48%) of accidental fire fatalities were due to adult activity, including leaving a candle unattended, overloaded outlets, and smoking.
   - Only one in four residences were identified as having a working smoke detector. Smoke detectors were either not present or non-working in 44% of homes; the presence of a smoke detector could not be determined in 30% of cases.
5. **Nearly one-quarter (24%) of all fire-related child deaths were caused by a child playing with matches or a lighter, the leading single ignition source for fires resulting in child deaths.**
   - Of these deaths, most (81%) were due to a fire that began in a bedroom (most often the child's room).
   - Mattresses and bedding were the primary materials first ignited in fires.
   - Almost all (89%) children who died in a fire were under supervision (an adult was in the household).
6. **Type of housing played an important role in child fire deaths.**
   - Nearly half (48%) of child fire deaths resulted from fires in multiple family walk-up buildings, although these buildings comprise only 16% of housing in NYC.
   - Illegal conversion of residence and illegal occupancies contributed to approximately 28% of fires where child fire fatalities occurred.
   - The proportion of fatal fires (16%) that occurred in public housing was disproportionate to the distribution of the NYC public housing (2%) overall.
   - Eleven (11%) percent of accidental fires were due to faulty wiring in the home.
7. **From 2001 through 2006 there were four scald burn deaths among children aged 1–12 years. Most scald burns among children are not fatal.**
   - Among NYC children, child fire deaths were 13 times more frequent than scald burn deaths (0.8 fire-related deaths vs. 0.06 scald-burn related deaths per 100,000 children).
   - In contrast to fatalities, non-fatal scald burns are 10 times more common than non-fatal fire injuries among NYC children, suggesting that prevention efforts need to address both fire and scald injuries.

Glossary of Terms

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

Arson – Arson is the intentional or reckless burning of a structure or motor vehicle.

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 (i.e., choking or drowning), compression of chest or neck, smothering, suffocation or inhalation of gas.

Blunt impact injury – Refers to a type of injury caused by striking a body part with a blunt object causing physical trauma (i.e., bruises, abrasions and lacerations). Internal injuries from severe blunt force can result in death; motor vehicle crashes and falls are the most common causes of blunt impact injury deaths.

Cause of death – The illness, disease or injury responsible for the death. Examples of natural disease include: heart defects, asthma, and malignancy. Examples of injury include: blunt impact, burns and drowning.

Child Fatality Review Team – A group of individuals representing a variety of agencies, organizations and disciplines charged with investigating preventable child deaths and making recommendations.

Drowning – Death due to submersion in liquid, usually a large body of water, bathtub or pool.

Combustible material – Materials capable of burning and sustaining fire.

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

Combustible material – Materials capable of burning and sustaining combustion (fire).

Fatal child abuse syndrome – Refers to a collection of findings including chronic neglect, abuse and battering over time, all of which contribute to death.

Fireplay – A child playing with an open flame, for example matches or a lighter.

Homicide – Death resulting from injuries sustained through an act of violence committed by another person aimed at causing fear, harm or death.

Ignition – The process of initiating combustion or catching fire; the act of setting something on fire.

Incendiary – Of or pertaining to the non-accidental causation of fire.

Manner of death – Describes the circumstances of the death determined by postmortem examination, death scene investigation, police and fire marshal reports, medical records, or other reports. Manner of death categories include: natural, accident, homicide, suicide, therapeutic complication and undetermined.

Natural death – Death due solely to illness or disease.

Non-structural fires – Fires that do not occur within a residence or building, examples are brush, rubbish or automobile fires.

Office of Chief Medical Examiner (OCME) – The office that investigates suspicious, violent, unexpected and select natural deaths that occur in NYC. OCME is responsible for postmortem examination, death scene investigation and final determination of cause and manner of death.

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

Scald – A burn caused by contact with hot liquid or steam.

Suicide – Fatal injury or poisoning from an intentional, self-inflicted act committed to kill oneself.

Structural fires – Fires that occur in structures such as homes and commercial use property.

Therapeutic complication – Death resulting from causes associated with a medical or surgical intervention used to treat an illness or disease.

Thermal injury – Fire or flame burns, scald burns due to contact with hot liquids or steam, or burns from contact with a hot object (excluding burns from chemicals or radiation). Thermal burns can be classified according to skin depth and percentage of total body area burned.

Undetermined death – Categorization 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.

Introduction

Injuries, most of which are preventable, are the leading cause of death of children in the United States. Injury deaths are categorized as either unintentional, such as deaths caused by a motor vehicle crash or fall from a building, or intentional, such as inflicted injury from child abuse.

The New York City Child Fatality Review Team (CFRT) was formed in early 2006, as mandated by Local Law 115, to review preventable causes of death among New York City children aged 1 to 12 years. The CFRT is a multi-disciplinary review committee made up of representatives from city agencies and child welfare and medical experts appointed by the Mayor, the City Council Speaker and the Public Advocate. The goal of reviewing fatal injury deaths is to inform policies, laws, regulations, and prevention activities to avert future deaths. Based on findings, committee members present recommendations for health care and social service providers, city agencies, educators, and parents to safeguard children.

In 2007 the CFRT published its first annual report (www.nyc.gov/html/doh/downloads/pdf/episrv/episrv-childfatality-book.pdf), which presented an aggregate review of child injury deaths for a five year time period (2001–2005) and an in-depth case review of all child motor vehicle-related deaths, the leading cause of child injury deaths during that time period.

This 2008 annual report builds on first-year findings. The CFRT expanded its review of unintentional and intentional injury deaths to include another year of data, 2001–2006. Aggregate patterns of all injury deaths among children 1 to 12 years of age are presented. This year, fire and burn-related deaths were selected by committee members for an in-depth case review as the second leading contributor to unintentional injury deaths among New York City children and the leading cause of death among children in the home. Although New York City has experienced an all-time low in civilian fire fatalities since 2002, residential fire-related deaths are preventable and continue to pose a significant public health problem.

Background

New York City's Child Fatality Review Team

The New York City CFRT is a multi-disciplinary committee with members from numerous city agencies including:

- Administration for Children's Services
- Department of Education
- Department of Health and Mental Hygiene
- New York Police Department
- Office of Chief Medical Examiner
- Experts in child welfare and pediatrics as appointed by the Mayor, City Council Speaker and Public Advocate.

For the 2008 review of fire and burn-related deaths, the committee invited representatives from the following city agencies to participate in committee meetings:

- Department of Buildings
- Department of Homeless Services
- Fire Department of New York

The CFRT is chaired by the New York City Department of Health and Mental Hygiene (DOHMH). The goals of the committee are to:

- Examine significant social, economic, cultural, safety and health-systems factors associated with child fatality in order to identify preventable risk factors for child deaths, and
- Develop policy and program recommendations to address these associated risk factors.

Methods

Injury Deaths

To identify injury-related deaths among children 1–12 years of age in New York City for years 2001 through 2006, death certificates maintained by the NYC Office of Vital Statistics were reviewed. Deaths were included if the cause of death listed an International Classification of Disease Code (ICD) consistent with an unintentional or intentional injury (*for a listing of these codes please see the Appendix*). World Trade Center deaths were not included in this report.

In addition to cause, deaths were classified by the manner or circumstances under which they occurred. Manner of death was determined by findings on postmortem examination by the Office of Chief Medical Examiner (OCME), death scene investigation, police and fire marshal reports, medical records, and other reports. Manner of death was classified as follows:

- Accident – Fatal injury or poisoning that occurred without intent to harm or cause death, also called unintentional.
- Homicide – Death resulting from injuries sustained through an act of violence committed by another person aimed at causing fear, harm or death.
- Suicide – Fatal injury or poisoning from an intentional, self-inflicted act committed to do self-harm or kill one's self.
- Undetermined – Deaths are categorized as undetermined when all available information is insufficient to point to one manner of death. In some cases, both cause and manner of death may remain undetermined.
- Therapeutic complications – Death associated with a medical or surgical intervention to treat an illness or disease (i.e., allergic reaction following antibiotic use for an infection, or wound infection after surgical repair of a heart defect).
- Natural – Deaths due solely or nearly totally to disease and/or the aging process. Deaths of a natural manner were not included in this report.

In-Depth Case Review of Fire and Burn-Related Deaths

From 2001 through 2006, there were 66 fire-related child deaths and four deaths due to scald burns among children 1–12 years of age. The CFRT performed extensive case reviews of these deaths and abstracted data from a number of data sources, including:

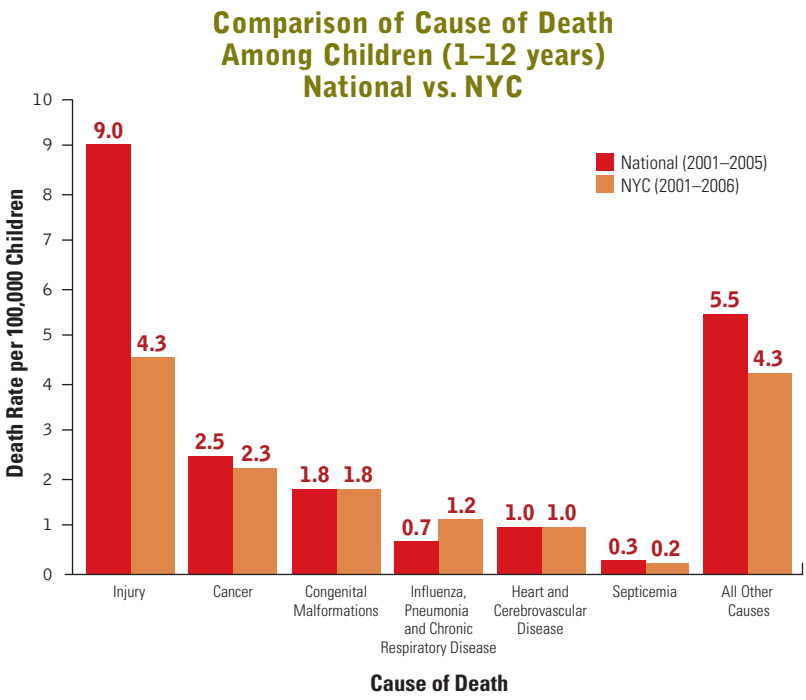
- OCME files containing autopsy or external examination reports, toxicology and other postmortem special studies, and police reports. Abstraction, using a form adapted from the National Center for Child Death Review Case Report, and data analysis were conducted by a dedicated DOHMH staff person
- FDNY Bureau of Fire Investigation Reports containing an incident face sheet, 10–45 report for fire-related injuries, and investigation interview sheet(s) were reviewed for incident information, including cause and origin of fire
- NYC Department of Buildings Building Information System (BIS) database for building classifications
- NYC Department of City Planning PLUTO dataset for building characteristics
- Injury hospitalization data from the New York State Department of Health Statewide Planning and Research Cooperative System (SPARCS), prepared by NYC DOHMH

Aggregate information and de-identified individual cases were shared and discussed with CFRT members at quarterly meetings. Based on suggestions by members, analyses were then refined.

Results

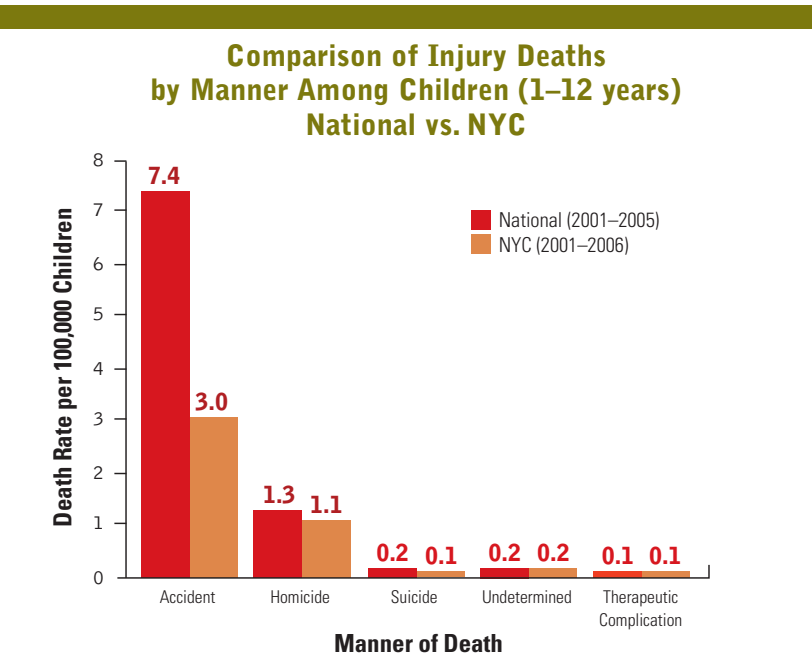
What Do Children Die From?

As highlighted in the first-year CFRT report, fewer child deaths occur in NYC than nationally. Approximately 21 of every 100,000 children aged 1–12 years nationwide die each year, compared to approximately 15 of every 100,000 NYC children. Most of the difference is due to fewer injury deaths in NYC (nine injury deaths per 100,000 children nationally compared to 4.3 injury deaths per 100,000 NYC children). For all other leading causes of death, NYC children have death rates similar to the national average, with the exception of influenza, pneumonia and chronic respiratory disease.



Source: Bureau of Vital Statistics NYC DOHMH, WISQARS

Nationally, most (80%) injury deaths are accidental in manner (7.4 deaths per 100,000 children), and 14% are deemed homicides (1.3 deaths per 100,000 children). Compared to their national counterparts, NYC children experience less than half as many accidental deaths (3.0 deaths per 100,000 children) as well as fewer child homicides (1.1 deaths per 100,000 children). The national and NYC patterns of other fatal injuries are otherwise similar.



Source: Bureau of Vital Statistics NYC DOHMH, WISQARS

Table 1 lists the top five causes of accidental injury deaths nationally and for NYC. Motor vehicle and other transportation accidents represent the leading cause of accidental deaths among children in both settings; however the national death rate among children is nearly three times higher than in NYC. Fire and burn related deaths, were the second leading cause of accidental deaths in NYC and the third leading cause nationally. These deaths are reviewed in detail in this report.

Table 1. Leading Causes of Accidental Injury Deaths, National vs. NYC Children (1–12 years)

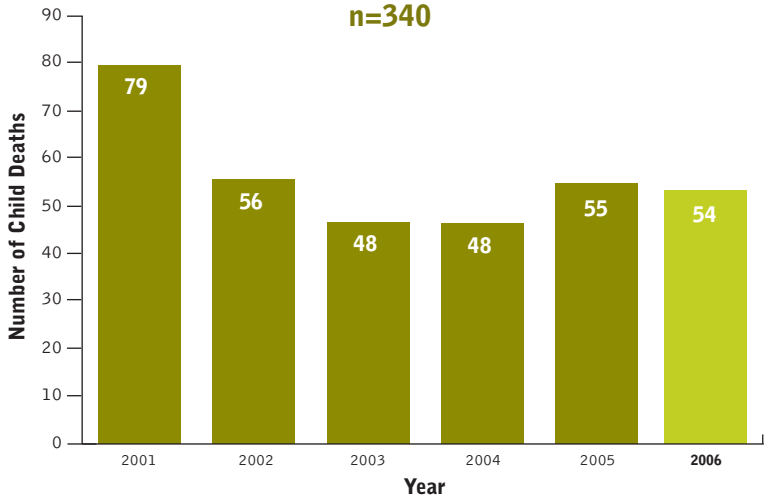
Rank	National (2001–2005)		New York City (2001–2006)	
		Rate		Rate
1	Motor vehicle and other transportation	3.8	Motor vehicle and other transportation	1.3
2	Drowning	1.4	**Fire or burn**	**0.7**
3	**Fire or burn**	**0.9**	Fall or crush	0.4
4	Suffocation	0.5	Suffocation	0.3
5	Fall or crush	0.3	Drowning	0.1

Source: Bureau of Vital Statistics NYC DOHMH, WISQARS

Overall, demographic patterns of child injury deaths for 2001–2006 in NYC remained similar to those identified in the first-year CFRT report, which focused on the years 2001–2005. In 2006, there were 54 injury deaths among children, similar to the number of deaths in each of the previous five years (range 48 to 79). From 2001 through 2006, there were a total of 340 injury deaths among NYC children aged 1–12 years old.

Table 2 shows that in 2006 a slightly higher proportion of child deaths were among girls and Hispanic children than in the prior five years, and a larger number of child homicides occurred.

Injury Deaths Among Children (1–12 years) by Year
NYC, 2001–2006
n=340



Source: Bureau of Vital Statistics NYC DOHMH
Note: 18 deaths due to a plane crash in Queens contributed to the higher number of child injury deaths in 2001.

Table 2. Demographic Comparison of Injury Deaths Among NYC Children (1–12 years)

Demographic characteristics	Annual average 2001–2005	2006
Total	57	54
Gender		
Girls	**25**	**30**
Boys	33	24
Race/Ethnicity*		
Black Non-Hispanic	26	20
White Non-Hispanic	12	9
Hispanic	**14**	**21**
Asian and Pacific Islander	3	2
Manner of Death		
Transportation Accident	18	14
Non-Transportation Accident	23	16
Homicide	**12**	**23**
Therapeutic complication	1	1
Undetermined	3	0
Suicide	1	0

Source: Bureau of Vital Statistics NYC DOHMH

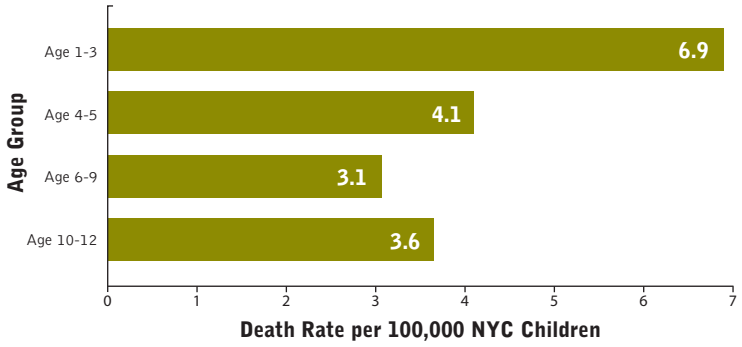
* In 2006, race/ethnicity was listed as other or unknown for 2 cases of child injury deaths.

Demographic Characteristics of Injury Deaths

Age

In general, younger children had higher injury death rates than older ones. Children in the one to three years of age group had a death rate of 6.9 deaths per 100,000 NYC children, whereas children aged six to nine years had a death rate of 3.1 deaths per 100,000 children.

Injury Death Rates Among Children (1–12 years) by Age Group, 2001–2006 n=340

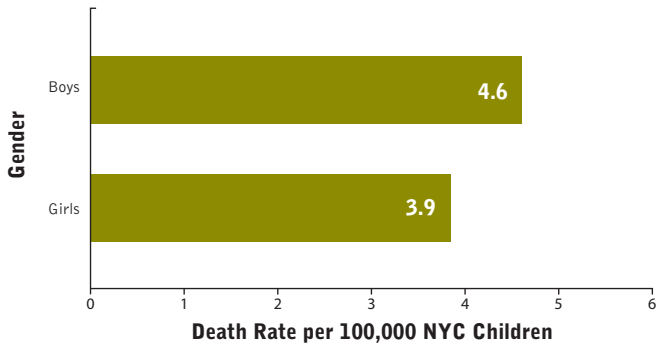


Source: Bureau of Vital Statistics NYC DOHMH

Gender

Between 2001 and 2006, a total of 187 boys and 153 girls died from injuries. Deaths among boys occurred at a rate of 4.6 per 100,000 boys, 18% higher than girls, at 3.9 deaths per 100,000 girls.

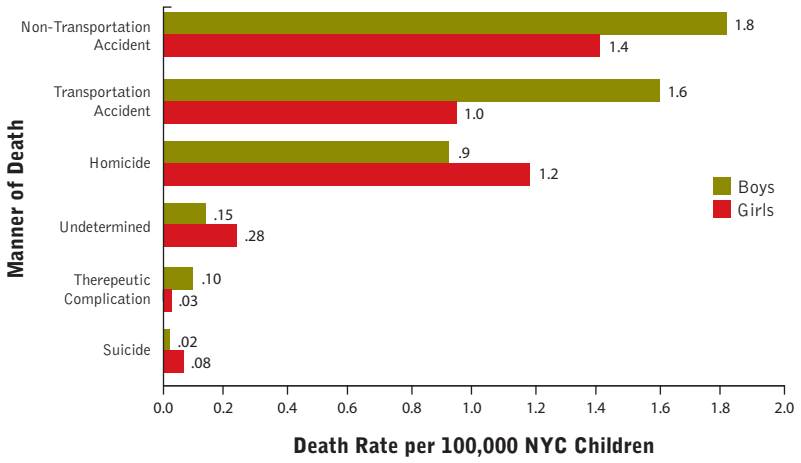
Injury Death Rates Among Children (1–12 years) by Gender, 2001–2006 n=340



Source: Bureau of Vital Statistics NYC DOHMH

Gender disparities were greatest among unintentional injuries. Boys had a higher death rate from both transportation and non-transportation accidents than girls. In contrast, rates of death due to homicide were higher among girls than boys. Death rates due to suicide, therapeutic complication and deaths of undetermined manner were comparable between genders.

Injury Death Rates Among Children (1–12 years) by Manner of Death and Gender, 2001–2006 n=340

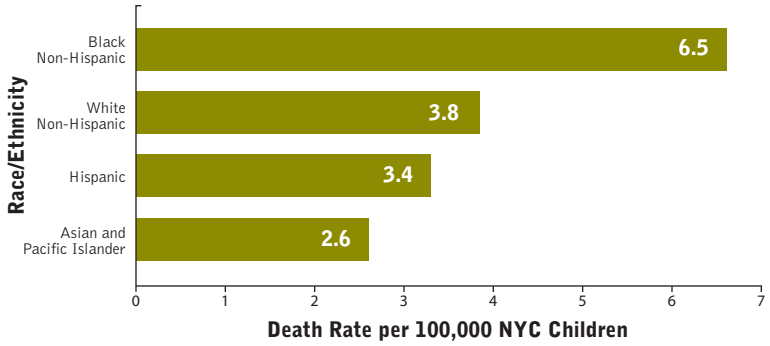


Source: Bureau of Vital Statistics NYC DOHMH

Race/Ethnicity

During 2001–2006, black non-Hispanic children had the largest burden of injury deaths with a rate of 6.5 injury deaths per 100,000 children, or 44% of all child injury deaths. The injury death rate was 71% higher among black children than white non-Hispanic children and nearly double that of Hispanic children. White children had an injury death rate of 3.8 per 100,000 children and Hispanic children had a rate of 3.4 deaths per 100,000 children. Injury death rates were lowest among Asian and Pacific Islander children.

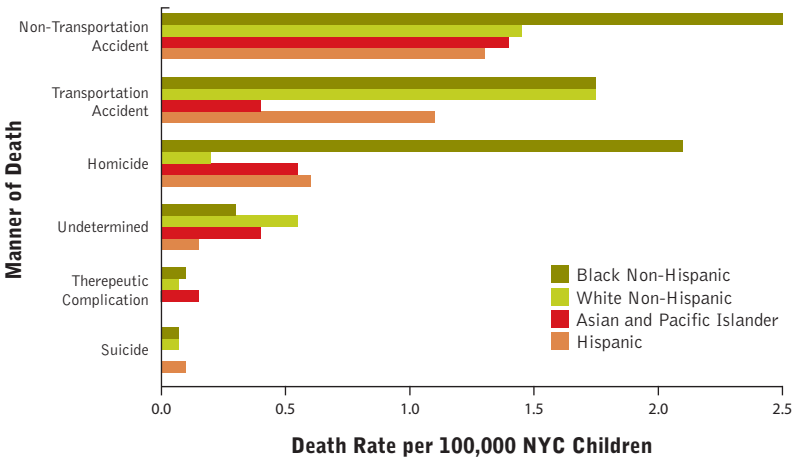
Injury Death Rates Among Children (1–12 years) by Race/Ethnicity, 2001–2006 n=340



Source: Bureau of Vital Statistics NYC DOHMH

Black children had higher rates of non-transportation accident deaths and homicide deaths than other children. White and black children had equal rates of transportation deaths, both of which were higher than transportation death rates for Asian/Pacific Islander and Hispanic children.

Injury Death Rates Among Children (1–12 years) by Race/Ethnicity and Manner of Death, 2001–2006 n=340

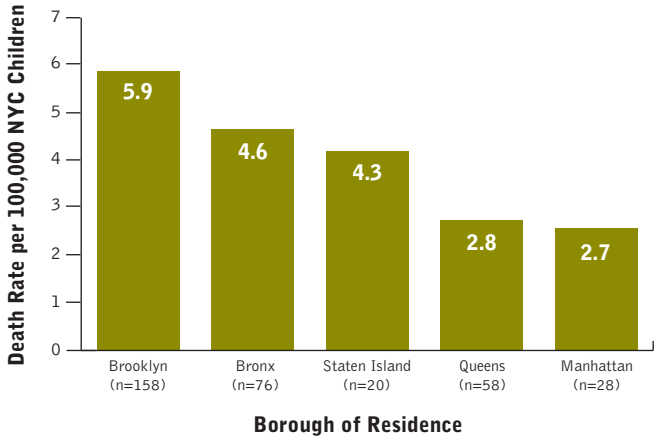


Source: Bureau of Vital Statistics NYC DOHMH

Injury Deaths by Borough

When taking into account the population distribution of children in each borough, Brooklyn had the highest rate of child injury deaths, followed by the Bronx. Manhattan had the lowest rate at 2.7 deaths per 100,000 children. Location of fatal incident is not always the borough of the child's primary residence, although in most cases it is the same.

Injury Death Rates Among Children (1–12 years) by Borough of Residence, 2001–2006 n=340

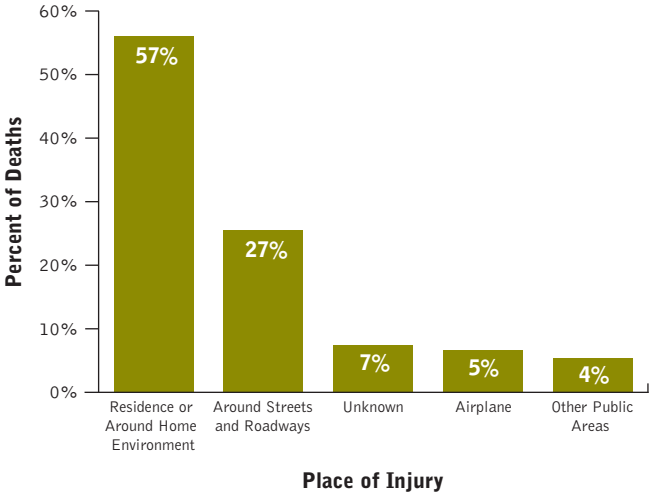


Source: Bureau of Vital Statistics NYC DOHMH

Place of Fatal Injury

The place of injury is important to take into account when considering prevention efforts. More than half of fatal injuries occurred within a residence or home environment (57%), including inside a house, apartment or apartment building (i.e., elevators and stairwells), in a caregiver's residence, on a building roof, courtyard, or backyard pool. More than one quarter (27%) of fatal injuries occurred on or around streets, intersections, roadways, shoulder of roads, or sidewalks. Place of injury was unknown for 7% of deaths. Five percent (5%) of fatal injuries occurred during a single airplane crash, and 4% of injuries occurred in other public areas such as a hospital, park, pool, school, nursing home, department store, motel, parking lot, and pier.

Injury Deaths Among Children (1–12 years) by Place of Injury, 2001–2006 n=340



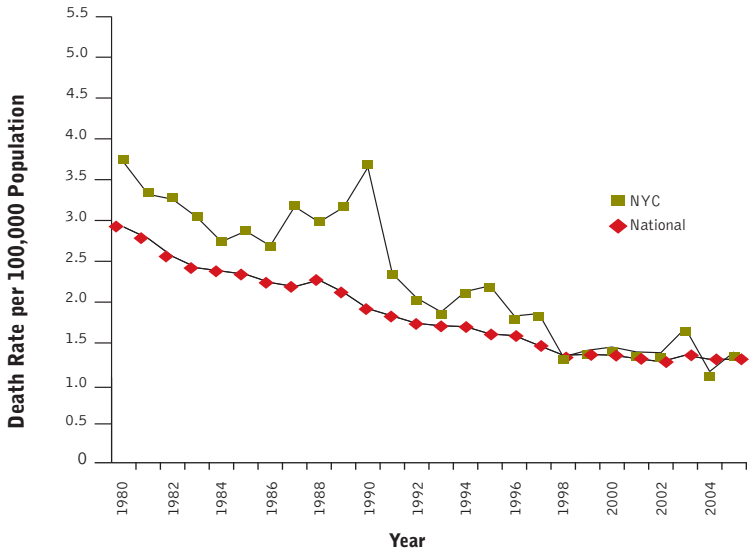
Source:Bureau of Vital Statistics NYC DOHMH

Fire and Burn-Related Deaths

Fires and burns remain the second leading cause of unintentional injury death among NYC children, after motor vehicle deaths, and the leading cause of death in the home. Studies suggest that children can be at high risk for fire and burn-related deaths if adults are not present as supervisors or rescuers, and if children themselves create and can't escape from danger.

In the past 25 years, fire-related fatalities among all age groups in NYC have decreased dramatically, by more than half (3.7 fire related deaths in 1980 to 1.3 deaths per 100,000 in 2005). The graph shows that fire-related death rates for NYC residents and the nation have been comparable, particularly in recent years. The NYC spike in 1990 was due to an intentionally set fire in a single setting that resulted in 87 deaths.

Comparison of Fire Death Rates (All Intent), All Age Groups National vs. NYC

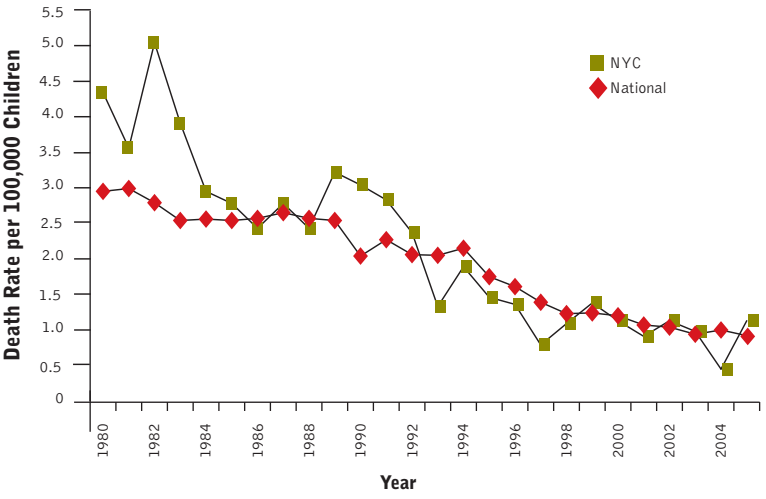


Source: Bureau of Vital Statistics, NYC DOHMH

Fire fatality rates for children age 1–12 years also show a continual decrease over time, both nationally and in NYC. In recent years, death rates in NYC were similar or slightly lower than the national rate.

The next section of the report presents findings from an in-depth review of all fire and scald burn-related deaths among NYC children aged 1 to 12 from 2001 through 2006. During the six year time period, 43 separate residential fires involving child death killed 95 people total, 66 of which were children 1 to 12 years old. Four additional child fatalities resulted from scald burns.

Comparison of Child (1–12 years) Fire Death Rates (All Intent) National vs. NYC



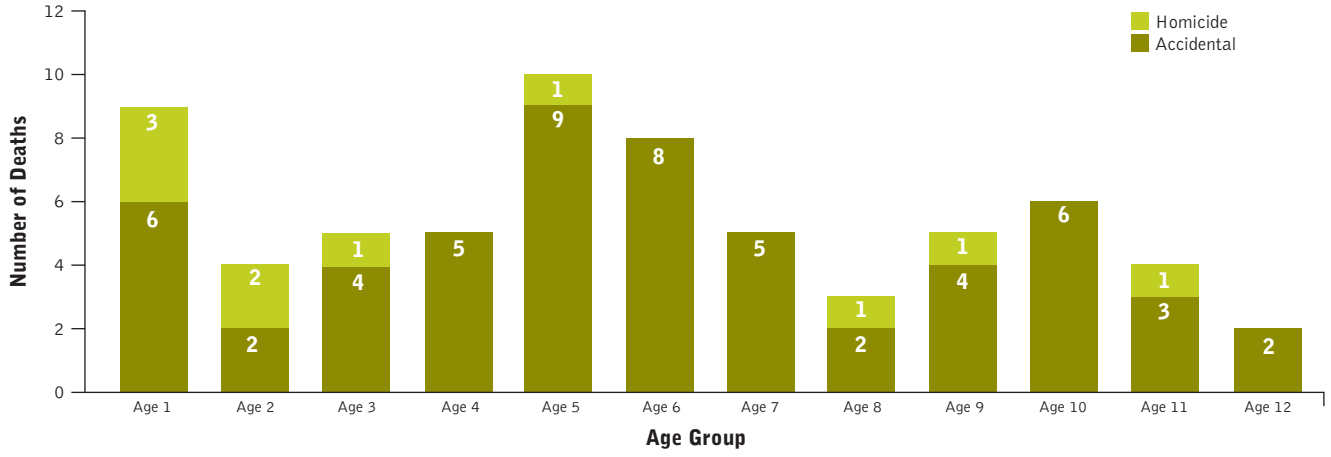
Source: Bureau of Vital Statistics, NYC DOHMH

Fire-Related Case Review

Age

According to national studies, young children often face an elevated risk of injury or death in a fire due due to lack of mobility and inability to protect themselves. A review of the ages of children who died from fire deaths in NYC did not show a striking younger age pattern. In NYC 50% of child fire deaths occurred in children one to five years of age.

Fire Deaths Among Children (1–12 years) by Age and Manner, 2001–2006 n=66



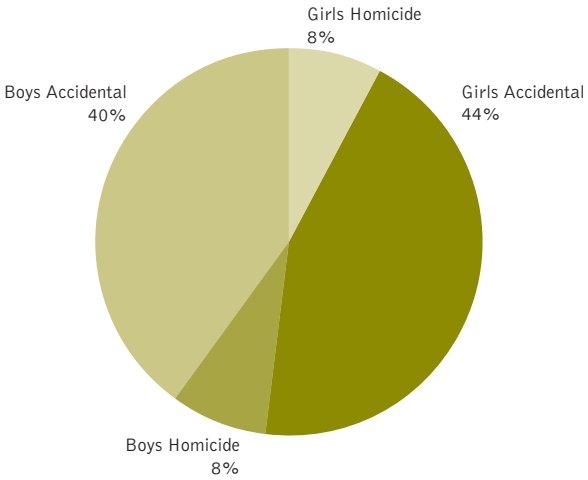
Source: Bureau of Vital Statistics, NYC DOHMH

Note: Four fire-related deaths among children 0–1 occurred during the same time period but are not part of the age ranges covered in this report; circumstances for fire-related deaths among 0–1-year-olds show no difference than cases of 1–12-year-olds reported here.

Gender

Fifty-two percent of fire fatalities occurred among girls and 48% occurred among boys. For both genders, 8% of fatalities were due to homicide. Girls and boys had comparable fire death rates, with 0.8 deaths per 100,000 girls (n=34), and 0.9 deaths per 100,000 boys (n=32).

Fire Deaths Among Children (1–12 years) by Gender and Manner, 2001–2006 n=66

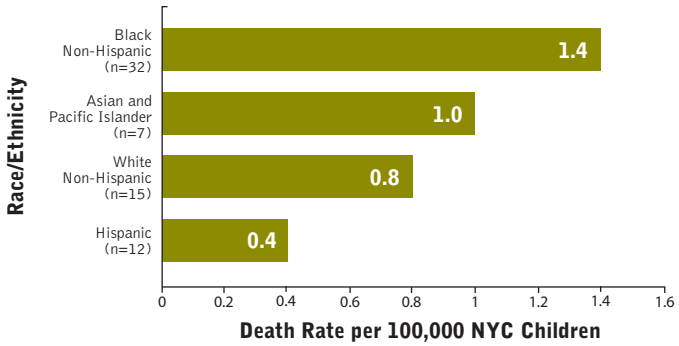


Source: Bureau of Vital Statistics NYC DOHMH

Race/Ethnicity

Almost half (n=32) of child fire deaths in NYC between 2001 and 2006 were among black children. Fire death rates among black children were nearly twice that of whites and more than three times that of Hispanic children. Asian and Pacific Islander children experienced the second highest rate of fire deaths after black children, with 1 death per 100,000 Asian/Pacific Islander children.

Fire Death Among Children (1–12 years) by Race/Ethnicity, 2001–2006 n=66

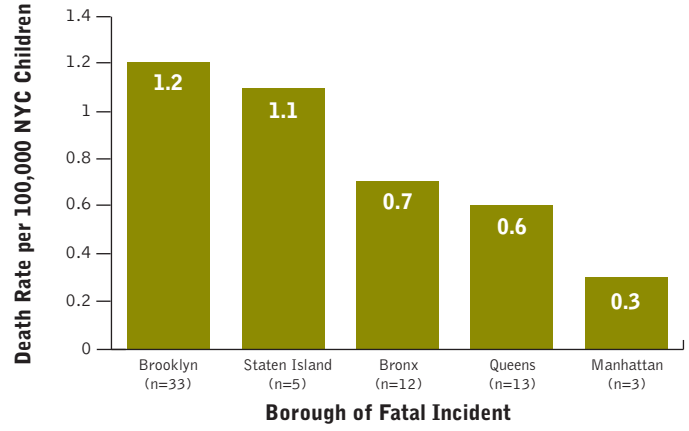


Source: Bureau of Vital Statistics NYC DOHMH

Location of Fatal Fire

Taking into account population size, fire death rates are comparable across boroughs, with the exception of fewer child deaths in Manhattan than other boroughs. Half of the 66 fire-related child deaths occurred in Brooklyn (n=33), followed by Queens with 13 deaths and the Bronx with 12 deaths. Five fire-related child deaths occurred in Staten Island; the fewest number (n=3) of child fire fatalities occurred in Manhattan.

Fire Death Rates Among Children (1–12 years) by Borough of Fatal Fire 2001–2006 n=66



Source: Bureau of Vital Statistics NYC DOHMH

The map below shows the geographic location of the 43 fatal fires that contributed to child deaths for years 2001 through 2006. The white circles on the map show accidental fires and the red circles depict arson fires. Both accidental and arson fires are dispersed throughout neighborhoods, showing no discernable neighborhood trend. Two thirds of arson fires occurred in Brooklyn.

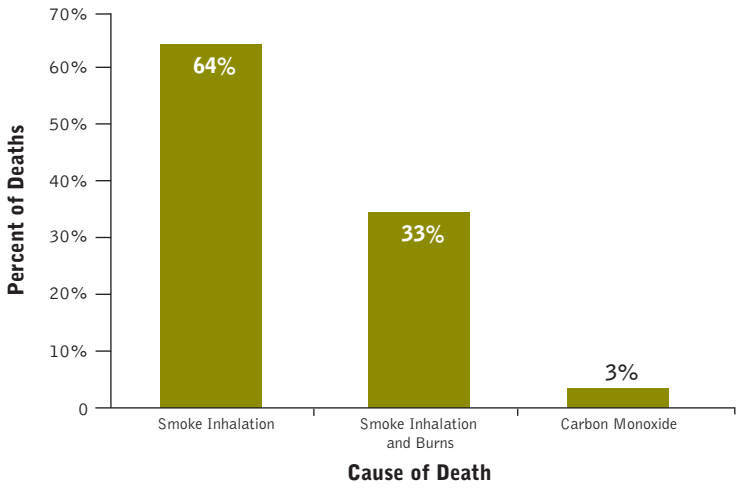
Geographic Location of Fatal Fires
NYC, 2001–2006
n=43

Source: FDNY Bureau Investigation Reports, Bureau of Vital Statistic NYC DOHMH

Cause of Death

Nearly two thirds (64%) of fire-related child deaths were due to smoke inhalation; 33% resulted from a combination of smoke inhalation and burns. Two deaths (3%) were due to carbon monoxide poisoning from the intentional burning of charcoal in an enclosed space. These findings are consistent with national studies, which show that fire-related deaths are largely the result of smoke inhalation.

Fire Deaths Among NYC Children (1–12 years) by Cause of Death, 2001–2006 n=66



Source: Office of Chief Medical Examiner

Fire Characteristics

Ignition Source

A child playing with matches or a lighter was the leading ignition source for fires resulting in child fatalities for years 2001 through 2006, causing 16 (24%) fire-related deaths. Ignitable liquids such as gasoline, charcoal lighter fluid or cooking oil, were the second leading ignition source. For example, a single fire ignited by cooking oil resulted in four unintentional child deaths. The remaining seven fatalities from ignitable liquids were the result of four different arson fires, set with the use of charcoal lighter fluid or gasoline.

Among the remaining deaths, nine resulted from a candle left unattended. Eight resulted from the overload of an extension cord, power strip or electrical outlet, and six were caused by heat from faulty structural electrical wiring. Improper discard of cigarette or other smoking materials resulted in five child fatalities. Four deaths resulted from problems with appliances, such as a faulty refrigerator plug, electrical wiring from a floor fan, and a severed power cord to a halogen lamp. The use of combustible materials including charcoal and newspaper resulted in two arson fires causing three child deaths. A cooking stove inadvertently left on resulted in a fire that led to the death of a single child, and a fire resulting from a space heater also caused the death of a child. The ignition source was unknown for two child deaths.

Table 3. Child (1–12 years) Fatalities by Ignition Source

Ignition source	Number of child fatalities	Percent
Matches or Lighter	16	24%
Ignitable liquid *Cooking oil* *Charcoal lighter fluid* *Gasoline*	11	17%
Candle*	9	14%
Overloaded outlet, extension cord or power strip	8	12%
Structural electrical wiring	6	9%
Cigarette/cigar	5	8%
Faulty appliance wiring or cord	4	6%
Other combustible material *charcoal* *newspaper*	3	5%
Open stove	1	1%
Space heater	1	1%
Unknown	2	3%
Total	**66**	**100**

Source: FDNY Bureau of Fire Investigation, Office of Chief Medical Examiner
*Use of candles after electricity was shut off contributed to one child death.

Location of Fire

Fires were most commonly started in the bedroom causing 42% (n=28) of child fire deaths, nearly half of which were caused by children playing with matches or a lighter, followed by the living room 20% (n=13) and kitchen 17% (n=11). Fires in the "other room" category included a fire on a front porch, a fire in a basement hallway of an apartment building, and a fire in the entrance foyer of an apartment building.

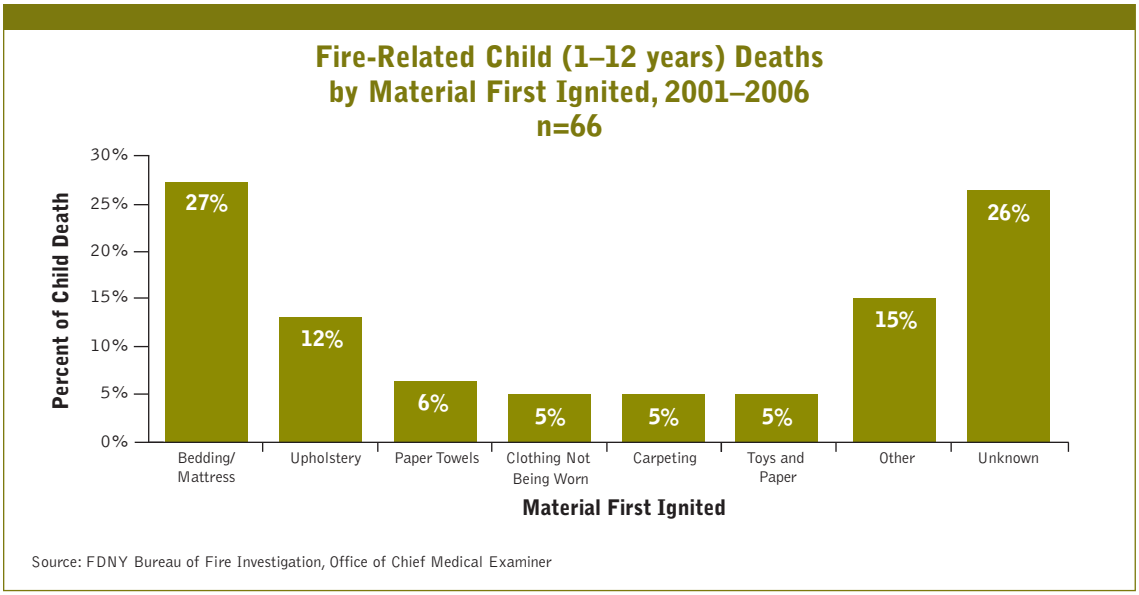
Table 4. Child Fire Fatalities by Room Where Fire Began and Fire Ignition Source

	Bedroom	Living room	Kitchen	Dining room	Bathroom	Other room	Unknown	Total
Matches or Lighter	13		1			2		16
Ignitable liquid	2		4			5		11
Candle	4	3		2				9
Overloaded outlet, extension cord or power strip	4	3		1				8
Structural electrical wiring	1		2		3			6
Cigarette/cigar		4	1					5
Appliance cord/wiring	2		2					4
Other combustible material	2	1						3
Open stove			1					1
Space heater		1						1
Unknown		1					1	2
Total	**28**	**13**	**11**	**3**	**3**	**7**	**1**	**66**

Source: FDNY Bureau of Fire Investigation, Office of Chief Medical Examiner

Materials First Ignited

More than one quarter (27%, n=18) of child fatalities resulted from bedding or a mattress catching on fire. This finding is similar to national data which shows that mattresses, bedding, clothing not being worn and other "soft materials" are the primary materials first ignited in fires that result in casualties.



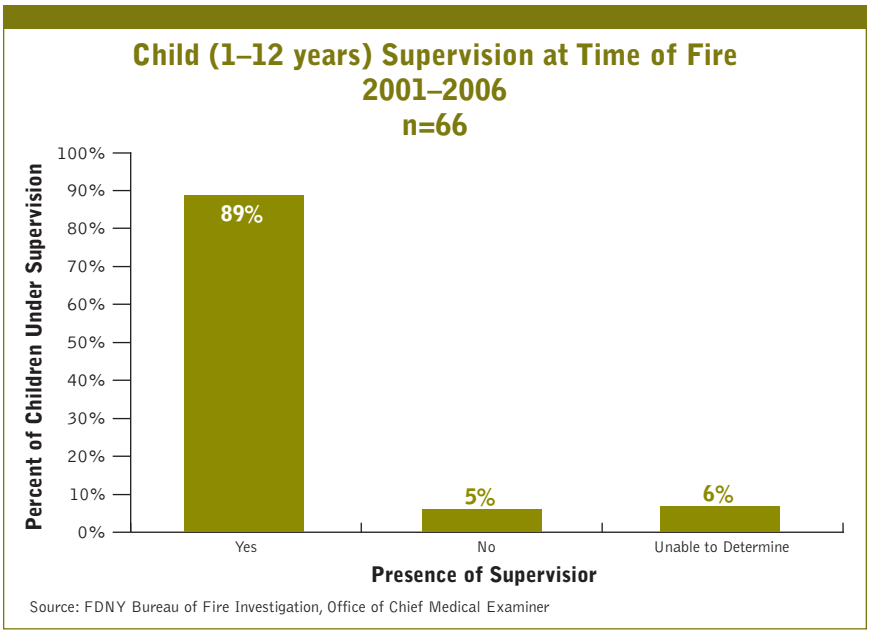
Source: FDNY Bureau of Fire Investigation, Office of Chief Medical Examiner

Playing with Matches or Lighter

The 16 child deaths with matches or a lighter as the ignition source were the result of nine individual fires, where children between ages 1–10 were playing with matches or a lighter. All but two of these fatal fires began in a bedroom, most often the child's bedroom. In most cases, there were two or more children playing out of the supervisor's view.

Supervision

While fire investigation records cannot assess the quality of supervision at the time of each fatal fire, they do document if a child was left alone in the home. Records show that most children (89%, n=59) were under supervision, 5% (n=3) were known to be unsupervised, and supervision could not be determined for 6% (n=4) of children. Children were supervised by a biological parent (n=34), a grandparent (n=7), by another relative (n=3), by a foster parent (n=3), and by a mother's partner (n=2). Of the three children left unsupervised, the mother's partner was responsible for one child's supervision, and a babysitter was responsible for supervision of two children. The person supervising the child could not be determined for 15% (n=10) of supervised cases.



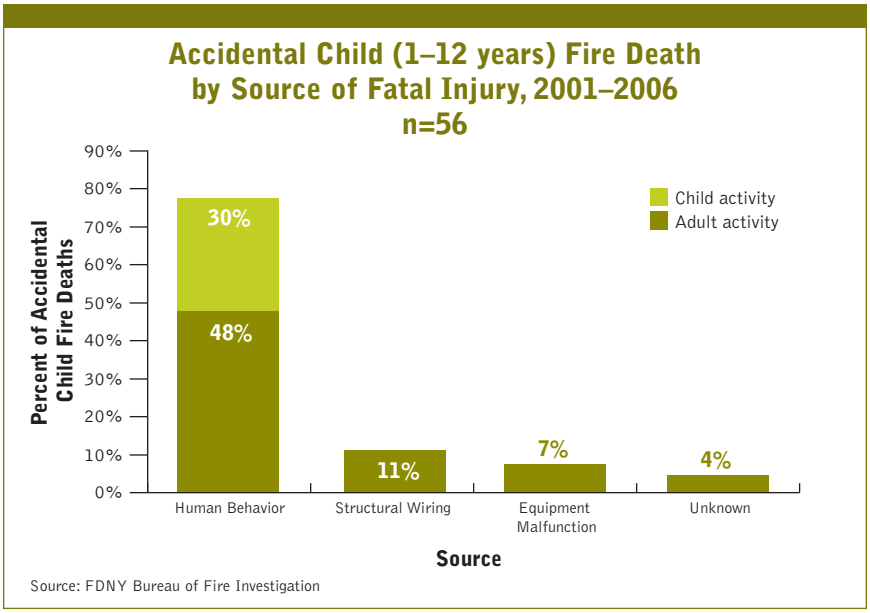
Source: FDNY Bureau of Fire Investigation, Office of Chief Medical Examiner

Arson

Of the 66 fire-related child fatalities, 56 deaths (85%) were accidental and the remaining ten (15%) were homicide deaths due to arson. The ten child homicide deaths were the result of six intentionally set fires that killed 19 people in total (all ages). No particular pattern was discerned in how these fires were set. The fires involved gasoline, charcoal, lighter fluid, an unspecified ignitable liquid, a cooking pot with charcoal lit in an enclosed space, and an unidentified flammable object thrown into a building hallway.

Source of Fire

The majority of fires reviewed were a direct consequence of human behavior. Of the 56 unintentional deaths, 78% resulted from negligent human behavior. Nearly one half (48%, n=27) of deaths resulted from adult activity (i.e., candle, overloaded outlet or extension cords, cooking, or smoking) and 30% (n=17) resulted from child activity, including playing with matches or a lighter or, in one case, leaving a candle unattended. Faulty structural wiring within homes resulted in 11% (n=6) of fire-related child deaths. Seven percent (n=4) of unintentional deaths were the result of electrical equipment malfunctions including faulty appliance cords or wiring, the source was unknown for 4% of unintentional deaths.



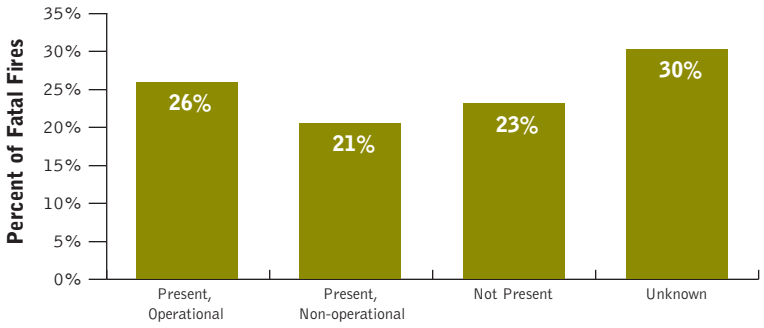
Source: FDNY Bureau of Fire Investigation

Smoke Detector

Research shows that proper placement of smoke detectors in the home can prevent fire-related injuries and death. Of the 43 residences where fatal fires occurred, only one in four had a working smoke detector identified. A smoke detector was present but not working in 21% of residences, and not present in 23% of residences. The presence of smoke detectors was unknown in 30% of cases.

The percentage for present and operational detectors is likely an underestimate however, because in many cases after a house fire has been extinguished, the exact placement of smoke detectors and whether they were operational cannot be determined.

Presence of Smoke Detector in Fatal Fires Involving Children (1–12 years), 2001–2006 n=43

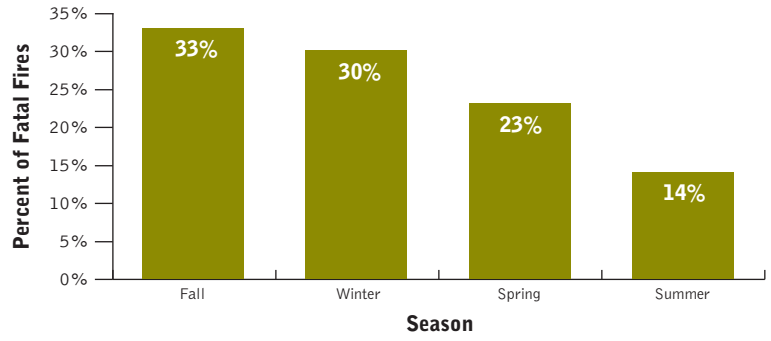


Source: FDNY Bureau of Fire Investigation, Office of Chief Medical Examiner

Time of Year and Time of Day

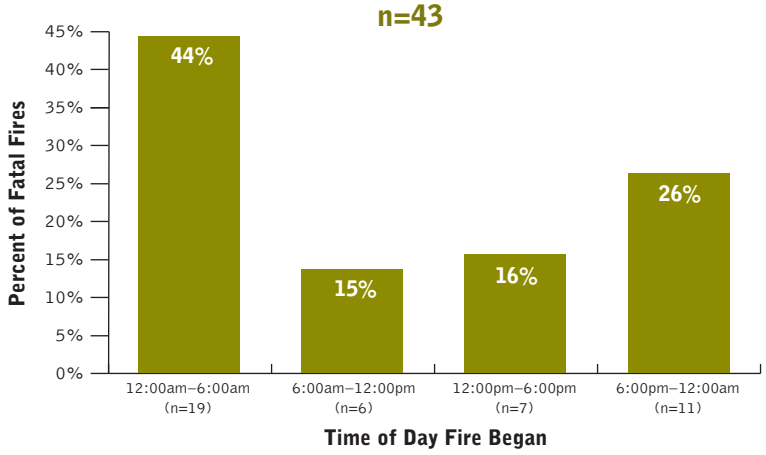
Consistent with national data, in NYC the occurrence of fatalities was lowest in the summer and highest in the winter; fires most often occurred late at night or early in the morning when victims where more likely to be asleep and unaware that a fire was taking place. Of the 43 fires that led to child fire deaths, 63% occurred in fall and winter months. Most fatal fires occurred during late night and early morning hours.

Fatal Fires Involving Children (1–12 years) by Time of Year, 2001–2006 n=43



Source: FDNY Bureau of Fire Investigation, Office of Chief Medical Examiner

Fatal Fires Involving Children (1–12 years) by Time of Day, 2001–2006 n=43



Source: FDNY Bureau of Fire Investigation, Office of Chief Medical Examiner

Building Characteristics

Type of Residence and Ownership

The CFRT reviewed characteristics of the buildings where each of the child fire deaths occurred. Type of buildings included one and two family homes, multi-family walk-ups and elevator buildings, and mixed residential/commercial use properties (buildings with commercial store fronts and residential units). Child deaths occurred disproportionately from fires in multi-family walk-ups in comparison to their contribution to the overall building composition of NYC.

Table 5. Type of Residence where Fatal Fire Occurred*

Type of Residence	Number of Deaths	Percent of Child Fire Deaths	Distribution of Residence Types, NYC**
1 and 2 family homes	18	43%	65%
Multi family walk-up or elevator building (including 3 family homes)	**20**	**48%**	**16%**
Mixed residential/commercial	4	9%	6%

*Data presented on 42 of 43 fires, one location was unavailable

** The remaining 13% of NYC land use includes commercial and office buildings, industrial and manufacturing buildings, public facilities and institutions, transportation, recreation and parking facilities, utility and vacant buildings

Source: NYC Department of Buildings BIS database, NYC Department of City Planning PLUTO dataset

A review of type of ownership of residences where child fire deaths occurred showed that more than three quarters (83%) of child fire deaths occurred in privately owned buildings. While only a small portion of fires (16%) occurred in public housing, this was disproportionate to the distribution of NYC public housing overall (2%). Of the seven unintentional fires that occurred in public housing, six were New York City Housing Authority public housing units and one residence owned by New York City Department of Housing Preservation and Development.

Table 6. Type of Ownership for Residences where Fatal Fires Occurred

Type of Ownership	Frequency	Percent of Fatal Fires	Percent of Ownership, NYC
Private	35	83%	97%
Public	**7**	**16%**	**2%**

Source: NYC Department of Buildings BIS database, NYC Department of City Planning PLUTO dataset

Violations

A review of violations issued by the NYC Department of Buildings showed that of the 43 buildings where fatal fires occurred, 12 (28%) had illegal conversion of space or illegal occupancy violations issued prior to or immediately following the fire.

The conversion of space for illegal occupancy introduced a number of fire hazards, for example one conversion of a basement produced inadequate means of egress and blocked entry for firefighters. The conversion of a three-family home into a five-family home led to overcrowding which may have contributed to fire fatalities. An overloaded power strip in an illegally converted basement added stress to the home's wiring, and caused a fatal fire. In one instance an illegal conversion of space for a rental unit where the tenant was careless in discarding smoking materials contributed to a fire. Illegal conversions of homes led to four fires ignited by faulty wiring, and a fire that started in an illegal trailer on the grounds of a one family home.

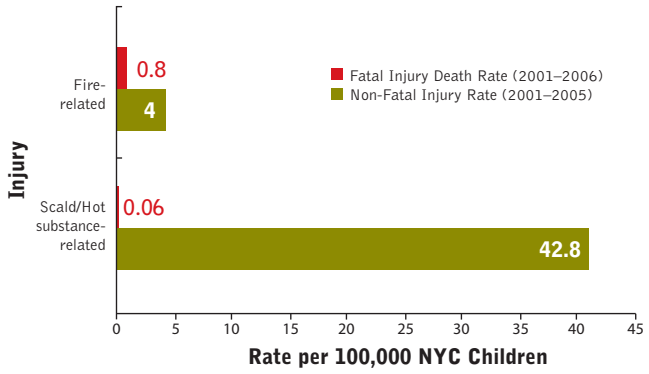
In the homes for which violations were issued, 16 children (15 deaths of children aged 1 to 12) and seven adults died as a result of fire-related injuries.

Scald Deaths

Other causes of fatal burns among children ages 1 to 12 were also reviewed. From 2001 through 2006, four scald burn deaths occurred among one-year-old children, including two unintentional deaths. In one case a girl was fatally burned from a sudden increase in water temperature while being bathed by her 11-year-old brother with no adult supervision. Another boy suffered fatal burns after accidentally knocking over a pot filled with hot cooking oil.

A third scald burn death was deemed a homicide, where a child was intentionally immersed in a bath of hot water by an adult. Another child was killed from immersion in hot water, but the incident was of an undetermined intent.

Comparison of Fatal and Non-Fatal Fire/Burn Injuries Among Children (1-12 years)



Source: NYS DOH Statewide Planning and Research Cooperative System, Bureau of Vital Statistics, NYC DOHMH

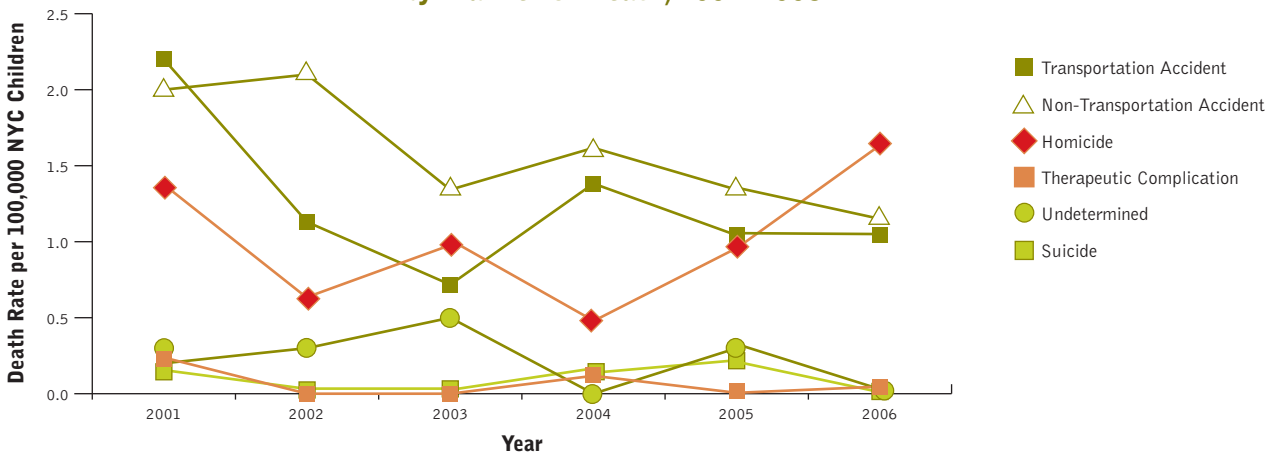
Which are more common, fire or scald burn injuries?
While child deaths from fires occur at a higher rate than deaths from scald burn injuries, data on NYC hospitalizations show that non-fatal scald burn injuries are ten times more common than non-fatal fire injuries.

Cause and Manner of Injury Deaths Among NYC Children

Overview

In addition to the in-depth case review of fire and scald burn-related deaths, aggregate summaries of other causes of child death were examined. The graph below shows trends in child deaths by manner of death from 2001 through 2006. In four of the six years, non-transportation accidents from a wide range of causes were the highest contributor to injury deaths in children and have been gradually declining over time. In most years, transportation deaths were the second leading cause of injury death. In 2006, homicides were the leading cause of child injury death. Homicides were also elevated in most adult age groups during 2006, but preliminary evidence from 2007 deaths suggest that homicides among adults and children have since declined (data not shown). The next two pages describe child injury deaths from 2001 to 2006 by manner of death (accidental, homicide, suicide, and undetermined).

Trends in Injury Death Rates of Children (1–12 years) by Manner of Death, 2001–2006



Source: Bureau of Vital Statistics NYC DOHMH

Other Fatality Review Teams

There are several additional Fatality Review groups in NYC. Two of these groups — The Administration for Children's Services (ACS) Accountability Review Panel and The New York City Domestic Violence Fatality Review Committee (DVFRC) — reviewed many of the child deaths included in this report. For years 2001-2006, ACS reviewed 52% of the child accident deaths, 55% of the child homicide deaths, 33% of child suicides and 18% of child under determined deaths. For a slightly shorter time period (2002-2006), the DVFRC reviewed 72% of child homicide cases included in this report.

For more information about these and other NYC Fatality Review groups please see the Appendix on page 31.

Accidental Deaths

Deaths classified as accidents comprised 68% (n=231) of the 340 child injury deaths between 2001 and 2006. More than half of the fatal accident injuries (57%) were caused by blunt impact of some type, followed by death due to thermal, fire and burn-related injuries (25%), asphyxia (10%), drowning (4%), and other causes (4%).

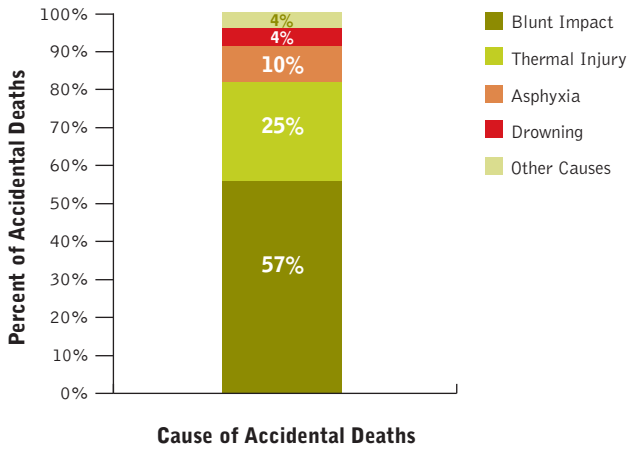
Blunt impact injuries caused 131 child deaths. Most blunt impact injuries (77%, n=102) were related to a transportation accident. Among these, 86% were due to a motor vehicle crash and 14% due to a single airplane accident that occurred in Queens in 2001. Of the motor vehicle crashes, the majority (80%, n=67) involved child pedestrians; child bicyclists accounted for 6% (n=5), and the remaining 14% were among child passengers. Sixty-four percent of transportation deaths were among boys and more than a third (37%) were among black children. (See first annual report for in-depth review of motor vehicle deaths).

Falls were the next highest contributor; 16% of blunt impact injuries occurred from a fall from a height including from a window, balcony, or porch (n=20). All but three of these fatal falls were among boys. Falls were evenly distributed between younger (ages 1–6) and older (ages 9–12) children. The remaining 7% of child accidental deaths due to blunt impact injuries were the result of the child being struck by a falling object (n=9). There were five incidents of televisions on unstable surfaces falling over on a child, four of these children were between ages one and two years.

As this report describes in detail, thermal injuries (i.e., burns from an open flame, smoke inhalation, or scald burns) were the second largest contributor to fatal child accident injuries, and the leading cause of fatal child injuries in the home. Thermal injuries accounted for 58 child deaths, 25% of accidental injury deaths (see case review section, page 13).

Asphyxia caused 24 child deaths (10% of the accidental injury deaths). Aspiration of food or a foreign object was the leading cause of asphyxia and occurred among four girls and six boys between two and 10 years of age, including one mentally retarded boy. Eight cases were positional asphyxia, or asphyxia due to entrapment in seven boys and one girl of varying ages (1–10 years), three deaths occurring in one-year-olds, two of which became wedged or entrapped between a bed and a wall, or between a bed and a plastic garment bag. The third

Causes of Child (1–12 years) Accidental Deaths NYC, 2001–2006 n=231



Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

Table 7. Type of Fatal Blunt Impact Injuries Among NYC Children, 2001–2006

Blunt Impact Injuries	n=131	%
Transportation accidents (motor vehicle = 84, airplane = 18)	102	77
Fall from height	20	16
Struck by falling object	9	7

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

Table 8. Type of Fatal Thermal Injuries Among NYC Children, 2001–2006

Thermal Injuries	n=58	%
Smoke inhalation	40	69
Smoke inhalation and burns	16	28
Scald burn	2	3

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

positional asphyxia death in a one-year-old resulted from a child entrapped in a commercial bucket partially filled with water. The five remaining positional asphyxia deaths among older children occurred from other forms of asphyxia, such as entrapment in a laundry chute, smothering in soft bedding, and neck compression between a window and its window guard. One death occurred in a ten-year-old boy with epilepsy who was suffocated by a pillow during a seizure and a similar death occurred to a three-year-old boy with cerebral palsy who suffocated by becoming entangled in bedding.

Cases of self extubation from medical equipment occurred in two boys and one girl, all age three years. The remaining asphyxia deaths were due to unintentional hanging when a three-year-old girl's necklace became entangled on a chair, a nine-year-old fell in the shower and became suspended by her neck from shower tubing, and a ten-year-old boy diagnosed with attention deficit hyperactivity disorder accidentally hanged himself while playing. Four of the asphyxia deaths discussed involved children with behavioral or cognitive disorders.

Drowning caused eight child deaths, (4% of accidental injury deaths). Seven were one to six years of age (four boys, three girls). Four drowned in a bathtub, three drowned in a swimming pool, and a 12-year-old boy drowned in the ocean.

Other accidental causes of death included accidental gunshot wounds of two boys aged four and five, carbon monoxide poisoning of two girls aged eight and nine, medication overdose in two girls age 11 and 12, indoor hyperthermia of a one-year-old girl due to faulty radiator, an accidental stab wound with a kitchen knife in a ten year-old boy, one death of a ten-year-old girl from inhalation of hydrocarbons from an air freshener, and the accident death of a one-year-old girl from undetermined causes.

Homicides

There were 83 child homicide cases between 2001–2006, accounting for approximately one quarter (24%) of all injury deaths during the six year study period. Homicides affected boys and girls similarly. More than half (54%) of all homicide victims were 1–3 years old. Among racial and ethnic groups, black children accounted for 59% of all homicide victims, and Hispanic children accounted for nearly one third (31%).

Among homicides, blunt impact injuries continued to be the most common cause of death in children (20%). There were 15 child homicide fatalities due to gunshot wounds, one third of which occurred in 2006 alone, eight stab-related deaths, and 11 due to fatal child abuse syndrome, meaning that the child showed evidence of being battered over time. There were ten homicide deaths due to smoke inhalation, with or without burns from residential fires. Eight child homicide deaths were due to stab wounds, six were due to drowning, four to smothering, and four to a combination of shaking, whiplash, and blunt impact. Two child homicides occurred due to hanging, and two to ingestion of a toxic substance

Table 9. Type of Fatal Asphyxia Injuries Among NYC Children, 2001–2006

Asphyxia	n=24	%
Aspiration of food or foreign object	10	45
Positional or entrapment	8	27
Self extubation (by medical patient)	3	14
Inadvertent hanging	3	14

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

Table 10. Type of Fatal Drowning Injuries Among NYC Children, 2001–2006

Drowning	n=8	%
Bathtub	4	50
Pool	3	38
Swimming in ocean	1	12

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

Table 11. Other Types of Fatal Injuries Among NYC Children, 2001–2006

Other Causes of Death	n=10	%
Gunshot wound	2	20
Carbon monoxide poisoning	2	20
Overdose (medication)	2	20
Hyperthermia	1	10
Stab wound	1	10
Inhalation of hydrocarbons (aerosol)	1	10
Undetermined	1	10

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

Table 12. Causes of Homicides Deaths Among NYC Children, 2001–2006

Homicide	n=83	%
Blunt impact injuries	17	20
Gunshot wounds	15	18
Fatal child abuse syndrome	11	13
Smoke inhalation-arson (with or without burns)	10	12
Stab wounds	8	10
Drowning	6	7
Smothering	4	5
Shaking, whiplash, and blunt impact	4	5
Hanging	2	2
Ingestion (methadone, heroin)	2	2
Environmental hyperthermia	1	1
Dehydration (parental neglect)	1	1
Scald burns	1	1
Sepsis (parental medical neglect)	1	1

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

(methadone, heroin). One child died from environmental hyperthermia as a result of being left unattended in a car, one child died due to scald burns, and dehydration and sepsis due to parental neglect were also the cause of one child death each.

Suicides

Four child deaths were ruled to be suicides (1% of all injury deaths), three girls and one boy. All occurred among the 10 to 12 year age group. Of these, three occurred as a result of asphyxia. The fourth death occurred as a result of ingestion of prescription medications.

Undetermined Deaths

From 2001 through 2006, there were 17 deaths (5% of all fatal injuries) certified as having an undetermined manner of death. These deaths included blunt impact injuries of the head, drowning, scald burns, and intoxication from medication. In nine of these 17 cases (53%), the cause of death was also certified as undetermined. Some of these deaths were due to injuries that remained unexplained following postmortem examination and death scene investigation.

Table 13. Causes of Suicide Among NYC Children, 2001–2006

Suicide	n=4	%
Asphyxia by hanging	3	75
Ingestion (oxycodone and temazepam)	1	25

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

Table 14. Death of Undetermined Manner Among NYC Children, 2001–2006

Undetermined	n=17	%
Blunt impact	4	24
Drowning	2	11
Scald burns	1	6
Intoxication from medication	1	6
Undetermined cause	9	53

Source: Bureau of Vital Statistics, NYC DOHMH, Office of Chief Medical Examiner

Summary

This 2008 report of the New York City Child Fatality Review Team (CFRT) looks retrospectively at injury deaths for years 2001 through 2006 for NYC children aged 1 to 12 years, and summarizes findings from an in-depth case review of fire and scald burn-related deaths.

All Injury Deaths

Report findings show that NYC death rates among children are half that of national child injury death rates. An aggregate review of all 340 NYC child injury deaths between 2001 and 2006 shows that the annual number of deaths has been stable, ranging between 48 and 79 child injury deaths per year. Boys, children aged one to three, and black children were more likely to die from injuries than other children.

Unintentional deaths comprise more than two thirds (68%) of child injury deaths. Motor vehicle accidents, especially those involving child pedestrians, remain the single largest contributor to child injury deaths overall and to unintentional deaths. Fire and burn-related deaths were the second leading contributor to unintentional injury deaths and the leading contributor to fatal child injuries in the home.

Fire and Burn-Related Deaths

In this 2008 report, the CFRT conducted an in-depth case review of fire and scald burn deaths for the years 2001 through 2006. A review of cases shows that child fire deaths in NYC have been declining over time and are currently comparable to national rates.

In our period of study, a total of 66 child fire-related deaths occurred in NYC resulting from 43 residential fires, and four scald burn-related child deaths. Most child fire-related deaths occurred as a result of smoke inhalation, rather than directly from fire-related burns. While only four scald-related deaths occurred, non-fatal scald burn injuries were very common.

For both fire and scald burn-related deaths, there were no distinct differences between younger and older aged children, and boys and girls had comparable rates of death. Fire-related death rates for black children were nearly twice that of whites and more than three times that of Hispanic children.

Among fire-related deaths, the majority (85%) were accidental and 15% were the result of arson. Several of the fires contributed to multiple fatalities causing 95 total deaths (adults and children). One quarter of all child fire deaths occurred as a direct result of fireplay, where a child was known to have been playing with matches or a lighter. The majority of fires set by fireplay began in the bedroom. Items ignited in the fires were predominantly soft goods, including mattresses, bedding, clothing, or upholstery. Candles, overloaded outlets, and faulty wiring, cooking accidents and smoking were additional contributors to residential fires. Of the 43 fires reviewed, a functioning smoke detector was found in one quarter (26%) of residences. Findings also show that winter months and over night hours are the most common time for residential fires to occur.

In addition, the type of housing played an important role in child fire deaths. Sixteen percent (16%) of fatal fires occurred in public housing, disproportionate to the distribution of public housing overall. Nearly half of fires occurred in multi-family walk-ups or elevator buildings, a disproportionate proportion in comparison to the overall building composition in NYC. Illegal conversion of residence and illegal occupancies contributed to 28% of fires where child fire fatalities occurred, and 11% of fires were due to faulty wiring in the home.

Residential fires are largely preventable. Smoke detectors, parent and child education, and the availability of safer lighters and matches are critical prevention strategies. Findings from this study should be used to target prevention strategies. Findings on fireplay raise questions of supervision and the provision of a safe home environment. Recommendations are presented on a range of approaches to keep our City's children safe.

Limitations

This retrospective review of child deaths has some important limitations. The limited number of injury deaths in children aged 1 to12, while encouraging and lower than the national average, reduced our ability to examine their commonalities, and trends in detail. Another limitation was the frequency of missing information and lack of descriptive detail in report files. Substantial effort was made to improve quality and completeness of data by collecting and reviewing original records from multiple sources including DOB, DOHMH, FDNY, OCME, and NYPD for each death. In addition, some characteristics that may be related to risk for an injury were not formally captured, such as level of parental or guardian supervision, and other family conditions or stressors. These factors, particularly for certain age groups of children, may play a critical role in mitigating dangerous circumstances.

Recommendations

Preventing Fire-Related Deaths

Based on analyses of fire-related deaths between 2001 and 2006, committee members identified the following recommendations to increase child safety through education, outreach, legislation and regulation.

Education and Outreach

For Parents

- Begin to talk to your children as early as possible about fire safety. Very young children are capable of starting fires.
- Discuss child fire safety and review fire safety plans with others caregivers in your home such as babysitters and relatives.
- Get assistance if a child is found to be playing with fire. Fire play is extremely dangerous and can be a symptom of underlying distress. Assistance is available from the FDNY Fire Marshal Juvenile Fire Setter Intervention Program, (718) 722-3600.
- While cooking, use back burners whenever possible and turn pot handles inward.
- Purchase flame retardant pajamas and other clothing (indicated on clothing tag) for infants and older children.
- Smoking poses both health and safety risks. Consider quitting. Until you quit, purchase fire safe cigarettes as required by NYS law. Fire safe cigarettes burn slower than other cigarettes and are less likely to ignite clothing and bedding.

For Health Care Providers

- Discuss fire hazards and fire ignition sources (lighters, matches, candles, stoves, overloaded outlets, etc.) when talking to parents about child-proofing one's home.
- At each well child visit, counsel parents about fire and scald burn prevention including adequate supervision, use and placement of smoke detectors, escape plans, safe cooking procedures, safe behavior in fires and initial treatment of burns. (Parent counseling materials are available from the American Academy of Pediatrics at www.aap.org/family/tippmain.htm and through the Parent's Corner at www.aap.org/parents.html)

For Child Safety and Fire Safety Professionals

- Ensure that public education messages continue to emphasize the importance of working smoke detectors. Stress the importance of replacing smoke detector batteries twice a year and recommend using multiple detectors placed in or near all bedrooms, especially children's bedrooms.
- Home safety messages should emphasize the danger of overloading outlets, the need to use Underwriters Laboratories-approved power strips, and the importance of replacing smoke detector batteries twice a year.
- Promote fire safety messages and lessons at the pre-school level. Children as young as 3 years old can be taught what to do in case of a fire.
- Encourage replacement of old bedding and mattresses with flame-retardant materials.
- Educate parents to safely store all matches and lighters where children cannot find them, and more closely supervise young children at all times, especially when in or near the kitchen.

For Educators

- Prioritize fire safety in elementary and middle school curricula.
- Targeted awareness campaigns for pre-school and elementary school children regarding fire safety and the danger of fire play. Dissemination to Head Start programs, daycares, Early Intervention sites and schools.

Legislation and Regulations

- Support current NYS bill (A1417A, S3616) that amends the general business law to require that mattresses and upholstered furniture be fire retardant, meaning materials must resist an open flame. The current law only requires materials to be fire resistant, signifying the ability to resist a smoldering object. A similar law was passed in California in 2005.
- Support current NYS bill (A10651) that would prohibit the sale of novelty lighters. Support the re-introduction of a similar 2004 City Council bill (Intro 444). Novelty lighters often have lights and are shaped like toys, cartoon figures and other items attractive to children. Maine has banned such lighters state-wide and several similar bans have been passed or are under consideration in other jurisdictions.
- Support current NYS bill (A10292) that would require safe temperatures for tap water, a maximum of 120 degrees Fahrenheit, for one- and two-family tenant occupied dwellings and multiple family dwellings to prevent scalding burns. A similar law was passed in the State of Washington. The U.S. Consumer Product Safety Commission also recommends 120 degrees Fahrenheit as a maximum.

City Action Steps

There are a number of steps that city agencies can take to improve child fire safety.

Administration for Children's Services

- Encourage staff from preventive and foster care agencies to actively test smoke detectors during home visits.
- Recommend to the NYS Office of Children and Family Services the expansion of fire safety education activities in state-funded Healthy Families New York Home Visitation Program.

Department of Education

- Assess the capacity of parent coordinators to conduct parent fire safety education and outreach to parents and guardians of elementary and middle school children.
- Post fire safety and prevention information in elementary and middle schools.

Department of Health and Mental Hygiene

- Educate families and ensure that smoke and carbon monoxide detector checks, and fire and scald burn prevention and safety messages are part of DOHMH home visiting program curriculum (i.e., Nurse Family Partnership, Newborn Home Visit Program, Lead Poisoning Prevention program, and Window Falls Prevention Program).
- Supplement current fire safety requirements for daycares with fire and scald burn prevention and safety messages, and smoke and carbon monoxide checks for daycare operators.
- Revise the DOHMH's Healthy Homes brochure to include additional fire safety and prevention information.
- Work with other city agencies (NYCHA, HPD) to publicize injury prevention in the home, including fire prevention.

Fire Department of New York

- Utilize demographic information in this report to further target Fire Safety Education programming.
- Continue to seek federal and other grant funding to create multi-lingual fire safety campaigns on themes identified in this report.
- Review existing procedures for transporting fire victims to hospitals that provide hyperbaric treatment for smoke inhalation and assess evidence of effectiveness.
- Assess the capacity of the FDNY Fire Marshal Juvenile Fire Setter Intervention Program to provide counseling to more parents of children with a history of setting fires.

Key Safety Messages

Certain safety practices are known to decrease the risk of fire and burns. Home and child safety messages are offered below. Additional fire safety information can be found at: www.nyc.gov/html/fdny/html/safety/firesafety.shtml

Cigarette, Lighter, Match and Candle Safety

- Keep matches and lighters in a secure drawer or cabinet, out of the reach of children.
- Take the mystery out of fire play by teaching children that fire is a tool, not a toy
- Check under beds and in closets for burned matches, evidence that a child may be playing with fire.
- Make sure cigarettes are completely extinguished before throwing them away.
- Never leave a lit candle unattended. Place candles on a flat, stable, non-flammable surface.
- Never leave a child or pet alone with a lit candle or any open flame.
- Never use candles near combustible materials such as curtains, drapes, bedding and or cabinets.
- Never spray an aerosol can near an open flame.

Kitchen Safety

- Don't leave cooking food unattended.
- Enforce a kid-free zone of three feet around your stove. Turn pot handles inward to prevent burns caused by overturning or spills. Use back burners when possible.
- Use stove top covers and keep the area around the stove clear of towels, papers, pot holders or anything that could burn.
- If a pan fire starts, turn off the heat and use baking soda and a pot lid to smother the fire. Do not pick up the pan and do not use water.
- Get a kitchen fire extinguisher and learn how to use it.
- Keep hot foods and liquids away from table and counter edges. Never carry or hold children and hot foods or liquids at the same time.

Electrical and Heating Equipment Safety

- Use electrical cords, power strips and surge protectors that have polarized plugs with one blade slightly wider than the other, or grounded three-pronged plugs.
- Use items with an approved certification label from an independent testing lab such as UL (Underwriters Laboratories) or ETL (Electrical Testing Laboratories).
- Don't use extension cords to compensate for inadequate home wiring. Use extension cords only when necessary.
- Do not overload outlets.
- If a cord feels hot to the touch, stop using the appliance and throw it away.
- Replace appliances that have frayed or damaged cords.
- Do not place electrical cords under rugs or behind radiators.
- Keep all furniture and combustible items at least three feet away from space heaters. Do not use an extension cord with a space heater and limit appliance use. Do not place anything directly on the heater and keep children away.

Bathroom Safety

- Never leave a baby, toddler, or young child alone in the bathroom.
- Set your water heater thermostat to 120 degrees Fahrenheit or below.

Storage Safety

- Properly dispose of trash and debris. Piles of trash, like newspapers and old home furnishings are potential fire hazards.
- Store flammable liquids properly away from heat sources and at the indicated temperature.

Fire Prevention Device Use

- Install a smoke detector outside of each bedroom or sleeping area in your home.
- Test your smoke detector once a week by pressing the test button of the unit. Replace batteries twice a year.
- Replace the smoke alarm every ten years, or as recommended by the manufacturer.
- Familiarize children with the sound of your smoke alarm.
- Install a carbon monoxide detector and replace batteries twice a year. Gas fireplaces, gas stoves, barbecues, gas furnaces, automobiles, propane appliances and any other device that burns fuel will produce carbon monoxide.

Safe Exit

- Develop an escape plan and review the plan with all members of the family frequently. Be aware that children and the elderly may need special assistance should a fire occur. Establish a meeting place outside the house for all members of the family to ensure that everyone gets out safely.
- Show children how to crawl low on the floor, below the smoke, to get out of the house in the case of fire.
- Do not block fire escape windows. Only use approved window gates that can be opened without a key. Do not use a padlock which will prevent escape from a fire.

If a fire occurs:

- Dial 911 to report the fire. You can also use the local Fire Alarm Box.
- Stay low and go. If there is smoke, escape by staying very low to the ground where the air is cooler.
- Feel all doors with the back of your hand. If the door is hot do not open it. Close each door behind you to slow the fire.
- Use stairs, don't use the elevator. Try to keep one hand in contact with the wall. This may prevent you from getting lost.
- If trapped, open a window at the top to let out heat and smoke and at the bottom to breathe. If you cannot get out, wave a sheet out the window.
- Do not go back into a fire for anything! Your life is your MOST valuable possession.

Ongoing City Initiatives to Improve Child Safety

Department of Buildings

- DOB inspectors enforce a local law that requires landlords to install smoke detectors in multiple dwelling apartment buildings, and a law that requires carbon monoxide detectors to be installed in all multiple and private dwellings, as well as institutional and educational settings.
- DOB inspectors enforce New York State code requiring checks for hardwire smoke detectors for all newly constructed buildings and buildings undergoing major construction alterations.
- DOB inspectors enforce New York State code that requires permits and an approved licensed electrical contractor for electrical work in apartments and buildings. Violations are issued for non-compliance.

Department of Education

- Standardized lessons in personal and fire safety are included in the designated health curriculum for children in elementary school, middle school, and high school.
- The Fire Department and contract vendors are invited to talk with students about how to respond to emergencies.
- Child safety materials are disseminated to parents and caregivers.

Department of Health and Mental Hygiene

- The Newborn Home Visit Program (NHVP), which visits low-income first time mothers to provide information on child and maternal health and environmental issues, assesses homes for smoke and carbon monoxide detectors, overloaded sockets and other fire and burn safety health hazards. NHVP is currently seeking funding to provide smoke detectors and carbon monoxide detectors to all program families.
- The Nurse Family Partnership (NFP), a nurse home visiting program for low-income, first-time mothers, their infants and families, incorporates scald burn educational materials into program curriculum.
- The Bureau of Environmental Disease Prevention produces and distributes fact sheets about the dangers of carbon monoxide; and a Healthy Homes brochure, which includes fire safety and prevention information, is distributed during community outreach activities and in daycare centers.
- The Lead Poisoning Prevention Program provides healthy home and child safety information to families during all home visits. Inspectors also check for window guards, smoke and carbon monoxide detectors, and provides batteries for detectors.
- The Poison Control Center distributes thousands of carbon monoxide detectors each year.

FDNY Fire Safety Education Unit & FDNY Foundation

- Operates the FDNY Fire Zone, a state of the art fire safety learning center located in Rockefeller Center, which educates more than 100,000 people, including more than 25,000 school age children, annually.
- Conducts nearly 10,000 public fire safety presentations each year, focusing on high fire risk neighborhoods. The "Fire Zone on the Road" program features active and retired firefighters delivering fire safety presentations at schools, community centers, health fairs and other venues.
- Promotes the importance of smoke detectors through a citywide advertising campaign funded by a $1 million grant from the U.S. Department of Homeland Security.
- Distributes hundreds of thousands of smoke and carbon monoxide detectors and batteries directly to the public during "Operation Fresh Battery" — the largest single giveaway of smoke alarm batteries in New York City history — and other public safety campaigns.
- Conducts hundreds of "Operation Sidewalk" programs, in which teams of fire safety educators respond immediately to communities where serious fires occur, presenting information on fire safety and prevention.
- Distributes fire safety literature in 10 languages throughout New York City.
- Presents information on fire safety, including informational videos, downloadable coloring books, and resources for parents and kids, on the FDNY http://www.nyc.gov/html/fdny/html/safety/firesafety.shtml and FDNY Foundation http://fdnyfoundation.org/ websites.

New York State Regulations

- NYS was the first state to establish the Fire Safe Cigarette law requiring the sale of self-extinguishing cigarettes (2003). The Office of Fire Safety Prevention and Control adopted the fire safety standards for cigarettes in June 2004.

Appendix

Data Sources

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 through 2006, injury deaths of children 1–12 years of age were identified by underlying cause of death with International Classification of Disease 10 Codes (ICD-10). Deaths due to injuries and other external causes, such as therapeutic complications and sequelae of complications of medical and surgical care were identified using the following codes: V01–V99, W00–W99, X00–99, Y00–Y89. CFRT staff abstracted de-identified demographic, accident and injury information from death certificates for the purpose of aggregate data analysis.

Fire and burn-related deaths: All fatal accidents of children are examined by the Office of Chief Medical Examiner (OCME). OCME information was reviewed by CFRT staff for all 66 fire-related deaths and four scald-related deaths among NYC children 1–12 years of age between 2001 and 2006. Fire and scald-related child deaths were identified using the following International Classification of Disease 10 Codes: X00–X09, X97, X76, Y26; and X10–X19, X98, X77, Y27. Fire and scald-related death for years 1980–1999 were examined for comparison purposes; these deaths were identified using the following International Classification of Disease 9 Codes: 890–899, 9581, 9680, 9881 and 924, 9582, 9683, 9882.

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); fire investigation reports and interview sheets; hospital reports; and ambulance call reports.

Bureau of Fire Investigation Reports obtained from FDNY were also examined. These files contained an incident face sheet, 10–45 report for fire-related injuries, and investigation interview sheet(s) for each fatal fire. Incident information including cause and origin of fire were obtained from these sources.

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://webappa.cdc.gov/sasweb/ncipc/mortrate.html). Data were accessed January-March 2008. For fire and scald burn-related deaths, national death counts were obtained from the NCHS public use files provided by the National Bureau of Economic Research.

Building characteristics: Limited building characteristics were collected for all buildings at which a fire-related child death occurred. Type of residence and type of ownership information was obtained from the NYC land use field within the PLUTO dataset for building classifications.

Other building characteristics including location of fatal fires, evidence of violations, and illegal occupancy was collected from the NYC Department of Buildings Building Information System (BIS) database for building classifications.

Non-fatal fire and burn-related injuries: Prepared by NYC DOHMH staff, non-fatal fire and scald or hot substance-related 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 ICD9 E-codes: E890.0-E899, E958.1, E968.0, E979.3, E988.1 and E924-E924.9, E958.2, E958.7, E961, E968.3, E988.2, E988.7. Data for 2001–2002 were updated in April 2005, and 2003-2005 data were updated in 2006. Hospitalizations without fire or burn-related E-codes, but with a burn listed as a primary diagnosis were excluded from the data.

Mapping Procedures

Locations of fatal fires were geocoded using the NYC Department of City Planning's Geosupport Desktop Edition Software 9.6.9. Geocoded addresses were then mapped using ArcGIS 9.1.

Additional Information

Data analysis: Rate calculations conducted by the DOHMH Bureau of Vital Statistics were conducted using SAS 9.1. Analyses by dedicated CFRT staff were performed with SAS 9.1. 2000 Census information was used to compute rates.

CRFT meetings: 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 in data and research reports has been omitted.

Appendix

History and Purpose of Child Fatality Review Teams

Local and state CFRTs have been in operation in the United States for more than a quarter of a century; today there are teams in all 50 states. These teams are designed to identify the circumstances leading to a child's death, and to provide suggestions for preventing future child deaths. Historically, child death review processes were intended to address suspected child abuse or neglect fatalities. Today, however, NYC and many other state and local teams work under expanded mandates, examining wider issues surrounding preventable child deaths.

The age range of children under review often varies across teams, and CFRTs are chaired by different institutions such as public health departments, child welfare agencies or district attorneys' offices. In all cases, teams are multi-disciplinary in nature, often including representatives from law enforcement, criminal justice, the medical community, public health, fire department, and agencies that have direct contact with children and families such as local school boards and child protective services. Recommendations made by CFRTs may include addressing systems gaps and opportunities, supporting the development and passage of legislation, and creation of public awareness campaigns.

Other Fatality Review Groups in New York City
There are several other fatality review teams that operate in New York City; all share the common goal of examining deaths to prevent future tragedies. Current teams include:

The Department of Health and Mental Hygiene Infant Mortality Review Committee (IMRC):
Founded in 2002, the Infant Mortality Review Committee is a multi-disciplinary team with representatives from city and state agencies, health care institutions and community groups. The Committee reviews and summarizes NYC infant (birth to age 1 year) mortality trends based on detailed case summaries examining the medical and social conditions surrounding deaths. *There is no overlap between this committee and the CFRT due to the fact that the age group under review by CFRT is limited to 1–12 year olds.*

The Department of Health and Mental Hygiene Maternal Mortality Review Committee (MMRC):
Reactivated in 2004, the Maternal Mortality Review Committee is a multi-disciplinary team with representatives from city and state agencies, health care institutions and community groups. Each year, the Committee reviews data on NYC maternal deaths and provides recommendations regarding surveillance, policies, and practices that may lead to reductions in maternal mortality. *There is no overlap between this committee and the CFRT unless a female child age 12 or younger dies as a result of delivering a baby.*

The Administration for Children's Services (ACS) Accountability Review Panel:
First formed in 1985, the Accountability Review Panel is an independent advisory body that reviews fatalities of children (birth to age 17 years) reported to the State Central Registry of Child Abuse and Maltreatment whose family history was previously known to the child welfare system. The panel evaluates the quality of investigations, assessments, service planning and service delivery, identifies case-specific and systemic issues, and recommends ways to improve interventions and overall functioning of the ACS and other service systems. *For injury deaths that occurred during years 2001 through 2006, ACS reviewed 37 cases of child homicide for children age 1–12 whose family history was already known to ACS. Overall, ACS reviewed 55% of child homicides, 52% of child accident deaths, 33% of child suicides and 18% of child undetermined deaths during the time period examined by the CFRT. Of the 66 child deaths that occurred as a result of residential fires and scald burns, 18 children previously had an open ACS case that was closed prior to the fatal fire. Eight children had an open case at the time the fatal fire occurred, and the death of 1 child, with no previously known child welfare history, prompted an ACS investigation.*

The New York City Domestic Violence Fatality Review Committee (DVFRC):
Established in 2005 as mandated by Local Law 61, and under the direction of the Mayor's Office to Combat Domestic Violence, the Domestic Violence Fatality Review Committee examines all domestic violence fatalities, defined as "the death of a family or household member resulting from an act or acts of violence committed by another family or household member that does not include self-defense." *The DVFRC reviewed 48 cases of family-related homicides involving NYC children aged 1–12 for years 2002–2006. This represents 72% of child homicide cases during this period.*

The majority of homicide cases of children aged 1–12 years in NYC are thus reviewed by either the ACS's Accountability Review Panel or the Domestic Violence Fatality Review Committee. As a result, members of the CFRT chose not to conduct in-depth case reviews of child homicides so as to not duplicate efforts or further compromise any ongoing criminal investigations.

NYC
Michael R. Bloomberg,
Mayor

Department of Health & Mental Hygiene
Thomas R. Frieden, MD, MPH
Commissioner

Fire Department
Nicholas Scoppetta
Commissioner