New York City Child Fatality Report

2007 Report from the
Child Fatality Review Team

NYC Health

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Dear Fellow New Yorkers:

The following report presents major findings from year 1 of the New York City Child Fatality Review Team (CFRT), a multi-disciplinary committee formed in 2006 to review fatal injuries among NYC children aged 1-12.

Injury-related deaths are the leading cause of death in children. The report takes a five-year retrospective look at intentional and unintentional injury deaths among NYC children, with a particular focus on the single largest contributor: motor vehicle-related deaths.

Although child motor vehicle-related deaths in NYC are lower than the national average and have declined during the past decade, rates are still disconcertingly high and each death is preventable. Most motor vehicle-related deaths in NYC were among child pedestrians struck by moving vehicles; nearly 60 children were fatally struck on NYC streets in the past 5 years, many of whom were playing in or near streets, especially during warm weather evening hours.

Based on these findings, the report offers recommendations to reduce motor vehicle and other injury deaths among children. On behalf of the CFRT members, I hope this report helps make NYC a safer place for our children.

Lorna E. Thorpe, Ph.D.
Chair, Child Fatality Review Team
Deputy Commissioner, NYC Department of Health and Mental Hygiene

Annual Report 2007

NEW YORK CITY CHILD FATALITY REVIEW TEAM

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Glossary of Terms

Accident – Fatal injury or poisoning that occurred without intent to harm or cause death, also called unintentional injuries. In this report, accidents are further divided into transportation and non-transportation related.

Arterial road – A high volume main roadway or through corridor with multiple lanes of traffic. Examples of arterial roadways include Queens Boulevard in Queens, Grand Concourse in the Bronx, Ocean Parkway in Brooklyn, and Hylan Boulevard in Staten Island.

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.

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.

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

Limited access highway – Major, multi-lane roads with traffic moving at high speeds; this road type can only be accessed at limited locations such as entrance and exit ramps with no crossing intersections. Examples of limited access highways are the Cross Bronx Expressway and the Long Island Expressway.

Local street – A low volume street which primarily provides access to residences or businesses. Trips are mainly of short length or a part of a longer trip where the local street connects with a major street or highway. Local streets comprise a majority of the streets in the city.

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.

New York Police Department Accident Investigation Squad (AIS) – The unit that investigates transportation-related accidents in which a person is killed or seriously injured and likely to die.

Non-transportation accident – A subcategory of accidents that encompasses a variety of injuries not associated with any mode of transportation, such as a fall, drowning and house fire.

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.

Severe Accident Forensic Evaluation Team (SAFETeam) – A group of investigators housed at the NYC Department of Transportation who are dispatched to fatal accident sites to expedite priority regulatory repairs and recommend other corrective measures that may prevent future incidents.

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

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

Transportation accident – A subcategory of accidents in which the victim was a passenger in or injured by a transportation vehicle (car, plane, train).

Undetermined – 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.

Key Findings

1. In New York City (NYC), there are roughly 40% fewer deaths among children aged 1 to 12 compared to the national average. Most of this difference is due to fewer motor vehicle-related deaths and homicides.

- Between 2001 and 2004, the national death rate among children aged 1-12 years was 21 deaths per 100,000 children, compared to 15 per 100,000 children in NYC from 2001 through 2005.
- Nationally, the motor vehicle-related death rate among children was more than twice that found in NYC (4.4 deaths per 100,000 compared to 1.8 deaths per 100,000 children).
- The homicide rate among NYC children was 40% lower than the national average (0.9 deaths per 100,000 vs. 1.3 deaths per 100,000 children).

2. Between 2001 and 2005, injury deaths accounted for 28% of all child deaths in New York City. 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 (4.8 deaths per 100,000 male children) than girls (3.8 deaths per 100,000 female children).
- Black children had an injury death rate 1.5 times higher than children of other racial/ethnic groups.
- Brooklyn had the highest rate of child injury deaths (5.7 deaths per 100,000 children) and Manhattan had the lowest rate (2.9 deaths per 100,000 children).

3. Similar to national trends, motor vehicle-related deaths represent the single largest contributor to injury deaths among children aged 1-12. However, unlike national trends, most (84%) child motor vehicle-related deaths in NYC are among pedestrians.

- Child pedestrian death rates in NYC were comparable to national trends (approximately 0.8 deaths per 100,000 children), whereas child passenger death rates were 7 times higher nationally than in NYC.
- Black children had the highest rate of motor vehicle-related deaths among all racial/ethnic groups.
- Boys had a higher motor vehicle-related death rate (1.3 deaths per 100,000 male children) than girls (0.8 deaths per 100,000 female children).
- Unlike most other injuries, the age group with the highest risk for motor vehicle-related deaths in NYC was children aged 10-12 years.
- Emerging from between parked cars and entering the street mid-block were the largest contributing factors to child pedestrian deaths on the part of the pedestrian.
- Driver inattention, traveling at unsafe speed, failure to yield, and alcohol involvement were leading contributing factors to child motor vehicle-related death on the part of the driver.
- Light trucks including SUVs, vans, and trucks were disproportionately involved in fatal child motor vehicle accidents (37%); more than half (58%) of the light trucks were SUVs.

4. Nearly half (46%) of all fatal motor vehicle-related accidents involving children occur during spring and summer evenings between 5pm and 11pm.

5. Fatal motor vehicle accidents involving children occur most frequently outside of Manhattan.

- The rate of motor vehicle accidents among children was highest in Brooklyn and Queens (1.3 deaths per 100,000 children, compared to less than 0.8 deaths in the Bronx and Staten Island and 0.2 deaths in Manhattan).
- Motor vehicle accidents involving the death of a child passenger occurred predominantly in Eastern Queens and South and Central Brooklyn.

6. Half (50%) of fatal child pedestrian accidents occur within 700 feet of a city elementary, middle or junior high school.

- Only one of these pedestrian accidents occurred during school hours. The majority (71%) occurred during evenings, weekends and during the summer.
- The high frequency of fatal accidents near schools reflects both the amount of time children spend near schools and the high density of schools across the city.

Introduction

Injuries are the leading cause of death of children in the United States. With adequate attention and support, the occurrence of these deaths can be reduced. Raising awareness, educating parents and communities, and enacting policies and laws designed to protect children can influence circumstances that lead to fatal injuries and prevent them from occurring.

Injury deaths are categorized as either 1) unintentional, such as a motor vehicle crash or fall from a building, or 2) intentional, such as inflicted injury from child abuse.

Across the country, state and local government agencies and child advocate experts have established multi-disciplinary coalitions to investigate how preventable child deaths occur and identify how they might be avoided in the future. 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. The CFRT is a multi-disciplinary review committee made up of representatives from city agencies as well as child welfare and medical experts appointed by the Mayor, the City Council Speaker and the Public Advocate.

This first report produced by the CFRT takes a five-year retrospective look at unintentional and intentional injury deaths from 2001 through 2005. Motor vehicle deaths (those in which children were pedestrians, bicyclists or motor vehicle passengers) were selected by committee members for a focused case review, as they are the single largest contributor to injury deaths among New York City children.

The report also examines aggregate patterns of all injury deaths among children 1-12 years of age based on cause and manner of death to provide broader context. The goal of reviewing fatal injury deaths is to inform policies, laws, regulations, and prevention activities that avert future deaths. Based on these findings, committee members present recommendations for health care and social service providers, city agencies, educators, drivers, and parents.

Background

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.

New York City's Child Fatality Review Team

The New York City Child Fatality Review Team is a multi-disciplinary committee with members from numerous city agencies including:

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

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

- Examine the significant social, economic, cultural, safety and health systems factors that are 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.

These goals are accomplished through review of aggregate data and in-depth case reviews at quarterly meetings. Findings and recommendations are shared through the publication of an annual report. This is the first annual report from this committee.

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 2005, ACS reviewed 28 cases of child homicide for children age 1-12 whose family history was already known to ACS. Overall, ACS reviewed 47% of child homicides, 10% of child accident deaths, and 6% of child undetermined deaths during the time period examined by the CFRT.*

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 31 cases of family-related homicides involving NYC children aged 1-12 for years 2002-2005. 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 <u>not</u> to conduct in-depth case reviews of child homicides so as to not duplicate efforts or further compromise any ongoing criminal investigations.

Methods

Injury Deaths

Death certificates maintained by the NYC Office of Vital Statistics were the primary data source used to identify injury-related deaths among children 1-12 years of age in New York City for years 2001 through 2005 (World Trade Center deaths were not included in this report). 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 Technical Appendix*).

In addition to cause of death, deaths were classified by the manner, or circumstances under which they occurred. Manner of death (MOD) 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 identified 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.

In-Depth Case Review of Motor Vehicle-Related Deaths

Between 2001 and 2005, all child transportation deaths in NYC were motor vehicle-related, except for 18 children who died in November 2001 as a result of a plane crash in Queens. The CFRT performed extensive case reviews of all motor vehicle-related deaths and abstracted data from a number of sources, including:

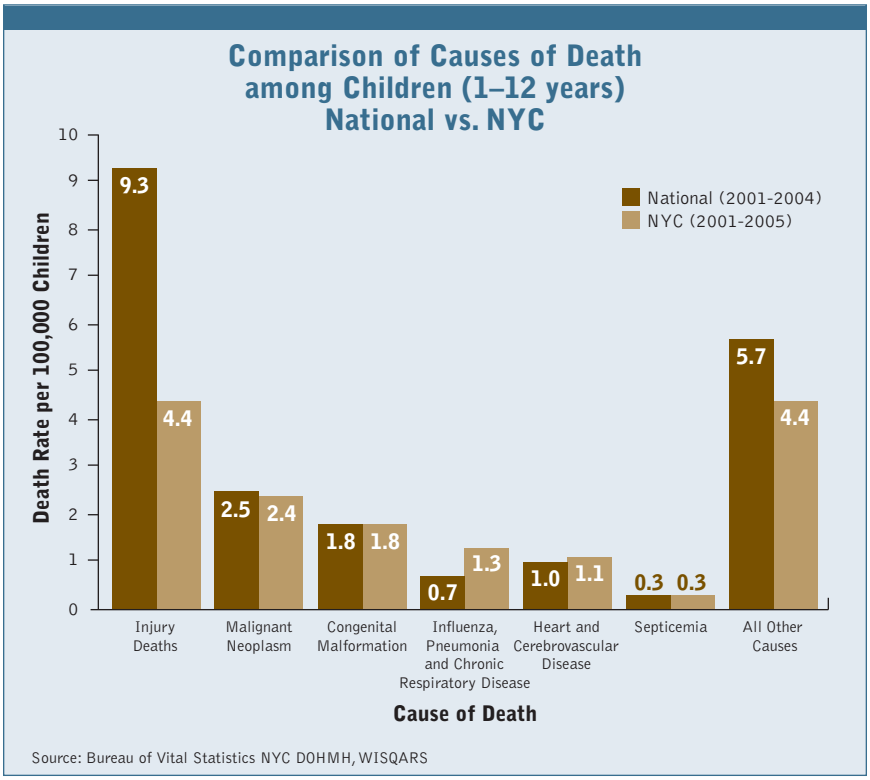
- OCME files containing autopsy or external examination reports, toxicology and other postmortem special studies, and police reports. Abstraction, using a form adapted from the National Center for Child Death Review Case Report, and data analysis was conducted by a dedicated CFRT staff person at the DOHMH.
- Severe Accident Forensic Evaluation Team (SAFETeam) reports maintained by the Department of Transportation (DOT).
- New York Police Department (NYPD) preliminary Accident Investigation Squad (AIS) reports, and MV-104 police reports that detail the incident surrounding motor vehicle accidents.

De-identified narrative information and aggregate analysis were shared and discussed with CFRT members at quarterly meetings. Based on suggestions by members, analyses were then refined.

Results

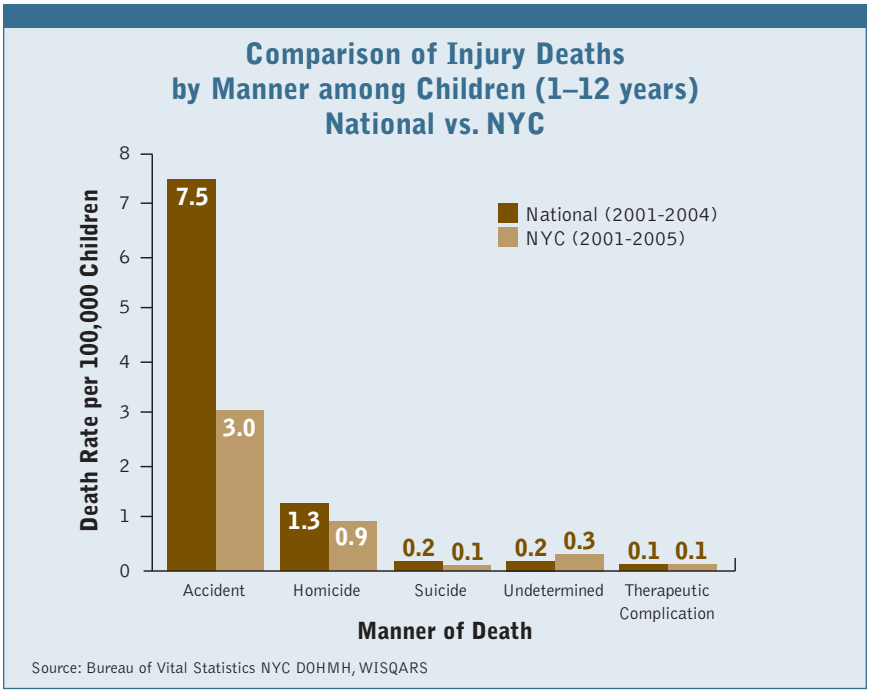
What Do Children Die From?

Fewer child deaths occur in NYC than nationally. Approximately 21 of every 100,000 children aged 1-12 years nationwide die each year (2001-2004). In comparison, approximately 15 of every 100,000 NYC children aged 1-12 die annually (2001-2005). Injury-related deaths comprise a substantial proportion of all child deaths both nationally and in NYC; most of the difference in child death rates is due to fewer injury deaths in NYC (9.3 injury deaths per 100,000 children nationally compared to 4.4 injury deaths per 100,000 NYC children). For all other leading causes of death, NYC children have similar or lower death rates than the national average with the exception of influenza, pneumonia and chronic respiratory disease. Restricting the NYC data to the same timeframe as presented for national patterns (2001-2004) does not alter the pattern.



Source: Bureau of Vital Statistics NYC DOHMH, WISQARS

Injury deaths can be the result of an accident, homicide, suicide, therapeutic complication, or of an undetermined manner. The circumstances under which injury deaths occur also differ between NYC and the nation. Nationally, most (80%) injury deaths were accidental in manner (7.5 deaths per 100,000 children), followed by homicide (1.3 deaths per 100,000 children). NYC children experienced less than half as many accident deaths (3.0 deaths per 100,000 children) as their national counterparts, as well as fewer child homicides (0.9 deaths per 100,000 children). Nonetheless, accidents and homicides remain a leading cause of child injury deaths in NYC; national and NYC patterns of other fatal injuries were otherwise similar.



Source: Bureau of Vital Statistics NYC DOHMH, WISQARS

From 2001 to 2005, there were a total of 286 injury-related deaths among NYC children aged 1-12 years, with an average annual number of 57 (range 47 to 79 injury-related deaths). The number of injury deaths has remained relatively stable over time. Of the 286 child injury deaths in the 5 year time period, most (70%) were accidental in manner (n=200).

Table 1 lists the top five causes of accidental injury deaths nationally and for NYC. The table presents categories as reported by the National Center for Injury Prevention and Control (WISQARS) and the NYC Bureau of Vital Statistics, accounting for the slight differences in groupings. Both nationally and in NYC, motor vehicle and other transportation accidents represent the leading cause of accident deaths; however the national death rate among children was nearly three times higher than in NYC.

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

	National 2001-2004		New York City 2001-2005	
Rank		Rate		Rate
1	Motor vehicle and other transportation	3.8	Motor vehicle and other transportation	1.3
2	Drowning	1.4	Fire, burn or smoke inhalation	0.8
3	Fire or burn	0.9	Fall or crush	0.3
4	Suffocation	0.5	Suffocation or strangulation	0.3
5	Falls	0.2	Drowning	0.1

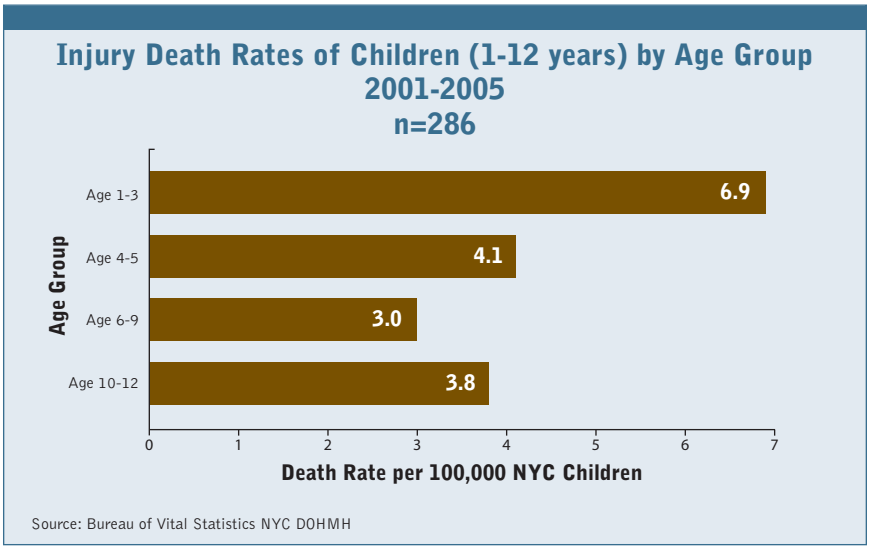
Source: WISQARS Injury Mortality Reports CDC, Bureau of Vital Statistics NYC DOHMH

Demographic Characteristics of Injury Deaths

The following section presents demographic information on the 286 deaths due to injuries among NYC children during 2001-2005.

Age

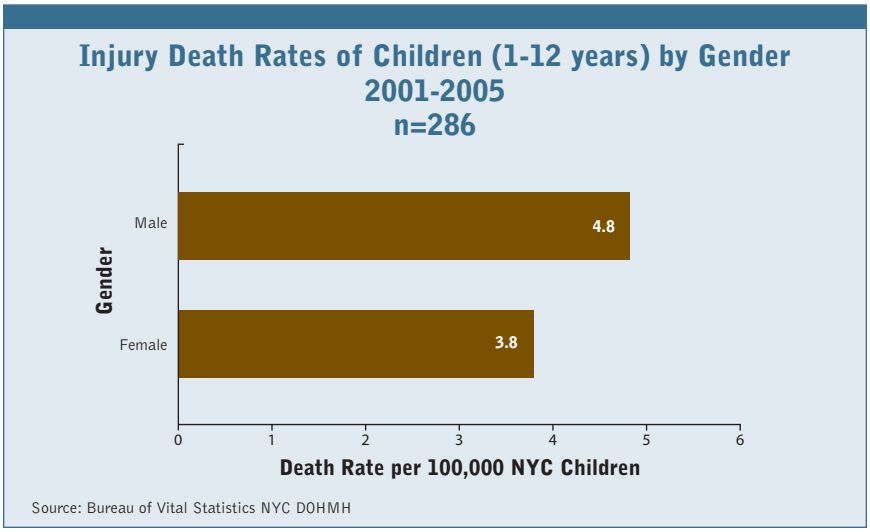
Age is an important factor in determining a child's degree of mobility, independence, and risk-taking behavior. Fatal injuries vary across the different stages of child development. In general, younger children had higher injury death rates than older ones. Children in the 1-3 age group had the highest fatality rate, with 6.9 deaths per 100,000 NYC children. Children ages 6-9 had the lowest injury death rate, with 3.0 deaths per 100,000 children.



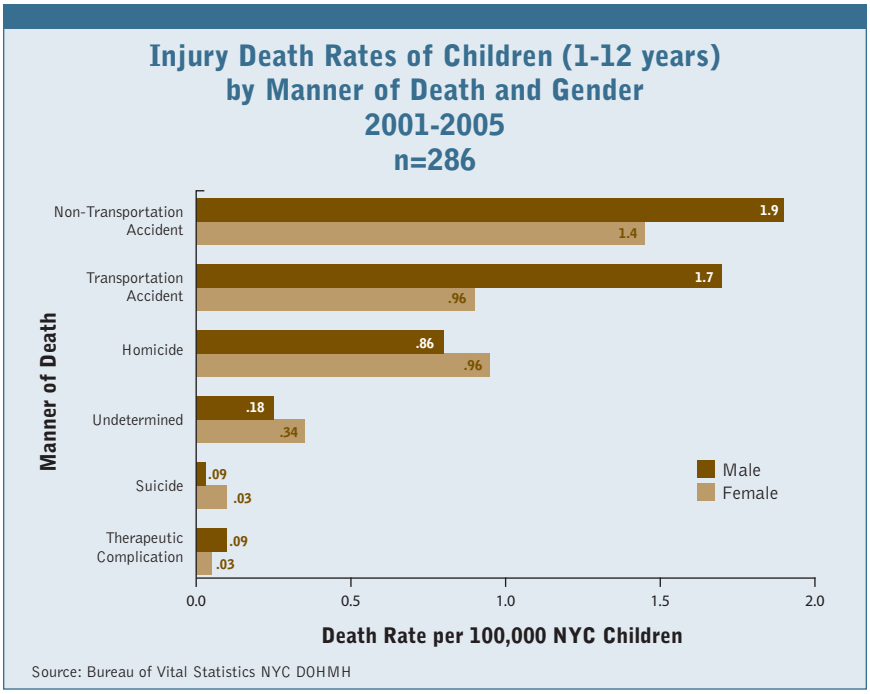
Source: Bureau of Vital Statistics NYC DOHMH

Gender

Between 2001 and 2005, a total of 163 male children and 123 female children died from injuries. Male children had a 26% higher death rate than female children; male deaths occurred at a rate of 4.8 per 100,000 male children, compared to 3.8 deaths per 100,000 among female children.

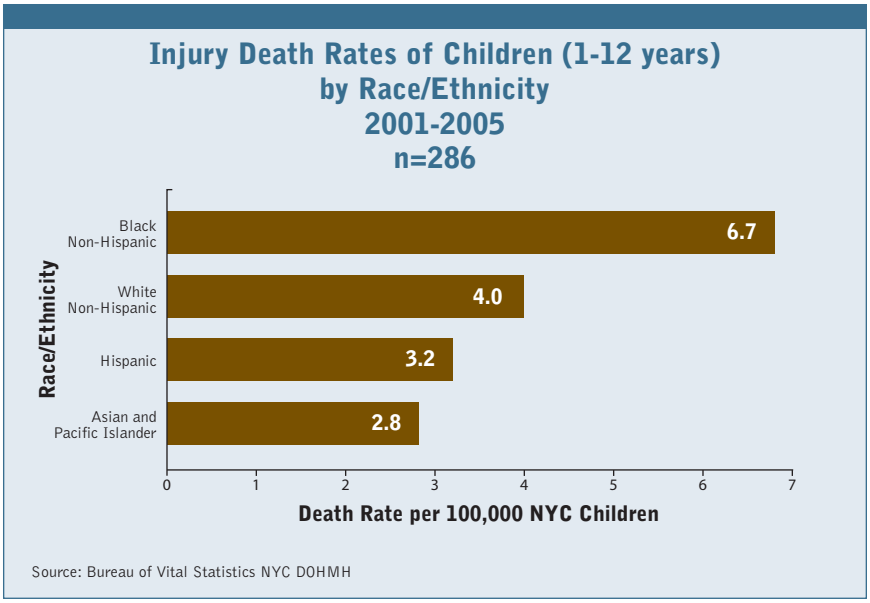


Males had a higher rate of death from accidents (both transportation and non-transportation), while rates of death due to homicides, suicides, and therapeutic complication were comparable between genders. For deaths of undetermined manner, females had a slightly higher rate.

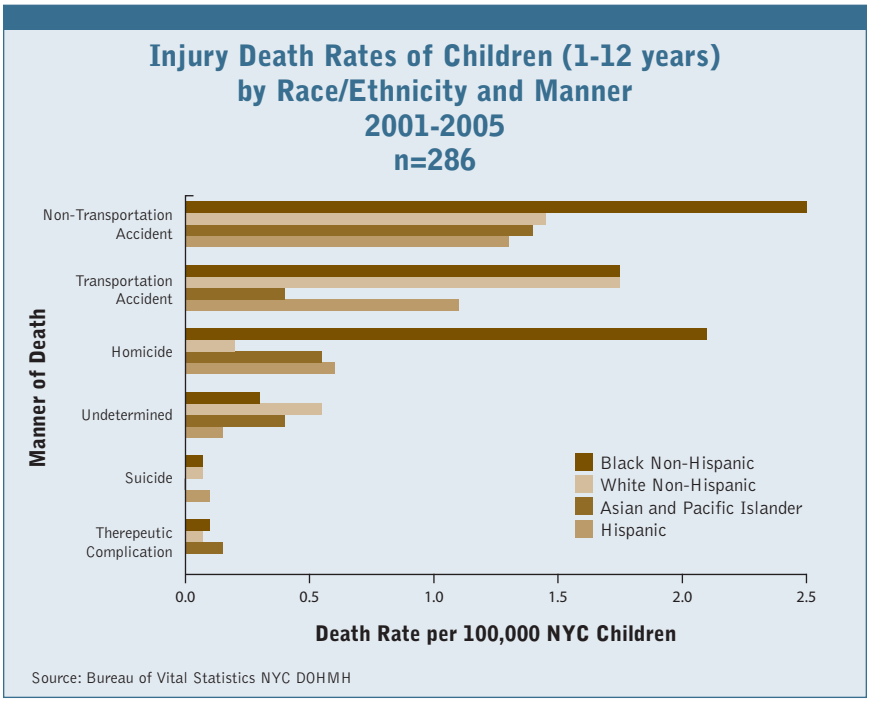


Race/Ethnicity

In reporting on race and ethnicity, the CFRT used categories developed from death certificate information, including white (Non-Hispanic), black (Non-Hispanic), Hispanic, Asian/Pacific Islander, or other. During 2001-2005, almost half (46%) of the injury deaths among 1-12 year-olds occurred among black children, followed by Hispanics (25%), whites (21%), Asian/Pacific Islander (6%), and Other (2%) (not shown). Taking population size into account, black children had injury death rates that were 1.5 times higher than white children and more than twice as high as Asian/Pacific Islander and Hispanic children.

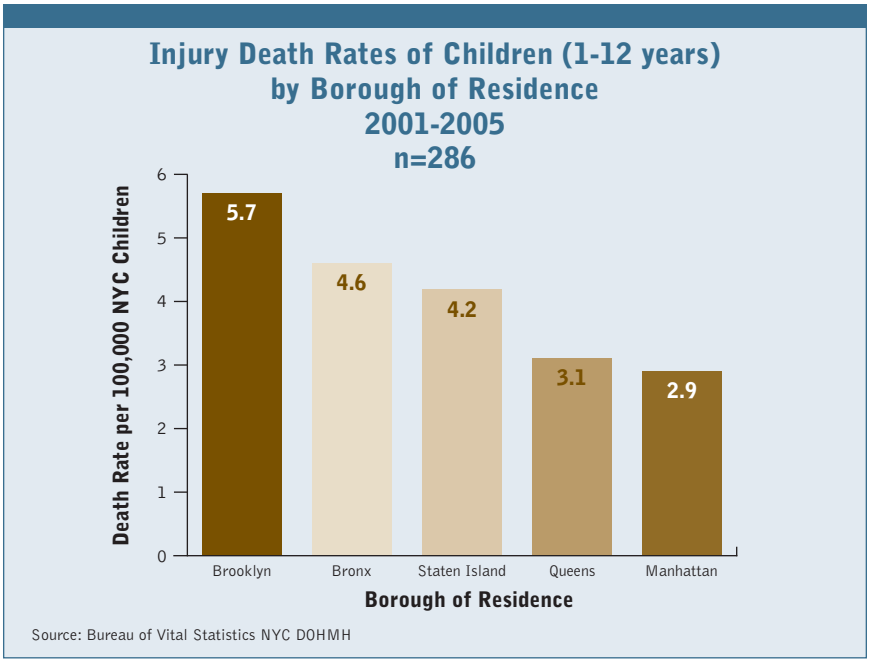


Black children had much higher rates of non-transportation accidents and homicides than other children. White and black children had equal rates of transportation accidents, both of which were higher than death rates for Asian/Pacific Islander and Hispanic children. If, however, the 18 deaths due to an airplane crash in 2001 are excluded, black children would have a 50% higher rate of transportation deaths than whites (as shown later on pg. 15). No stark variability in death rates by race/ethnicity was observed for the less frequent manners of death.

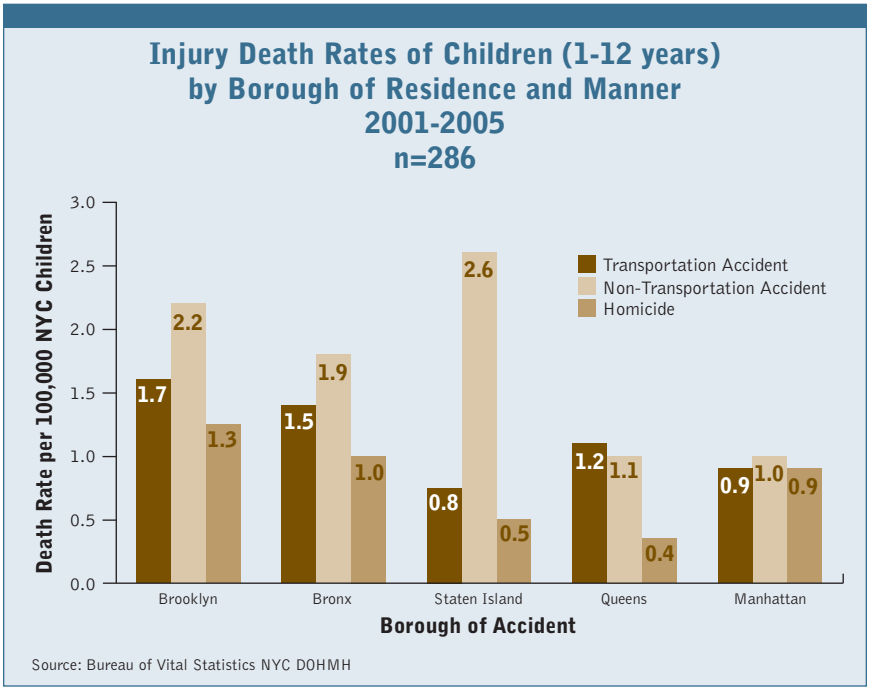


Injury Deaths by Borough

When taking into account the size of the child population in each borough, Brooklyn had the highest rate of child injury deaths at 5.7 deaths per 100,000 children. The Bronx had the second highest rate at 4.6 deaths per 100,000 children, and Manhattan had the lowest rate at 2.9 deaths per 100,000. It is important to note that the location of fatal incident is not always the borough of the child's primary residence, although it was in more than 90% of cases presented here.

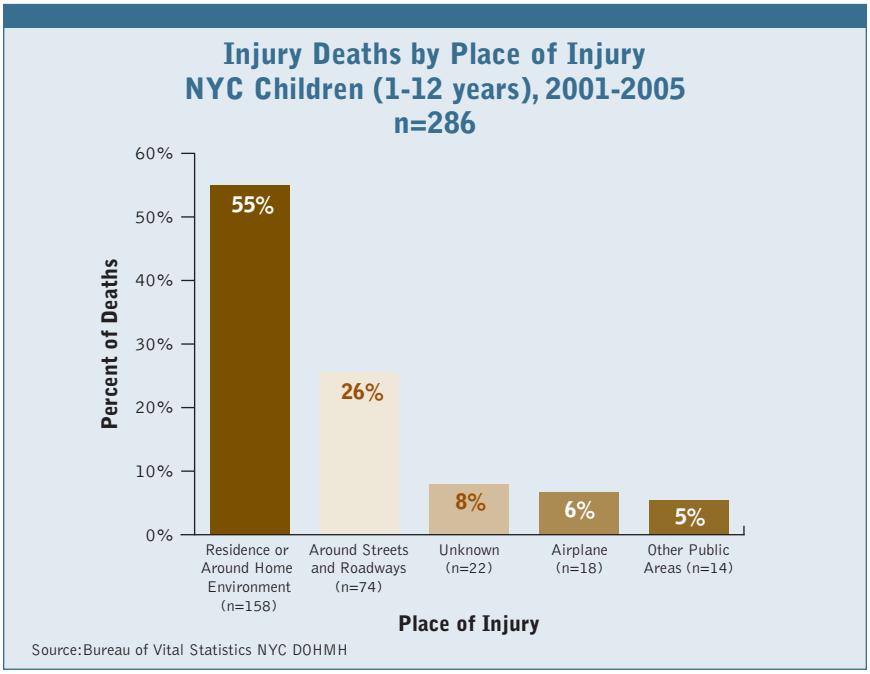


During years 2001-2005, Staten Island had the highest rate of non-transportation accidents, at 2.6 deaths per 100,000 children, followed by Brooklyn with a rate of 2.1 deaths per 100,000. Brooklyn had the highest transportation death rate among children at 1.7 per 100,000 and the highest rate of homicides at 1.3 deaths per 100,000 children.



Place of Fatal Injury

The location where a fatal injury takes place is important to take into account when considering preventive efforts. More than half of fatal injuries occurred within a residence or home environment (55%), including inside an apartment or apartment building (including elevators and stairwells), in a caregiver's residence, or on a building roof or courtyard. More than one quarter (26%) of fatal injuries occurred on or around streets, intersections, roadways, shoulder of roads, or sidewalks. Place of injury was unknown for 8% of deaths. Six percent (6%) of fatal injuries occurred during a single airplane crash, and 5% of injuries occurred in other public areas such as a hospital, park, pool, school, nursing home, department store, motel, parking lot, and pier.



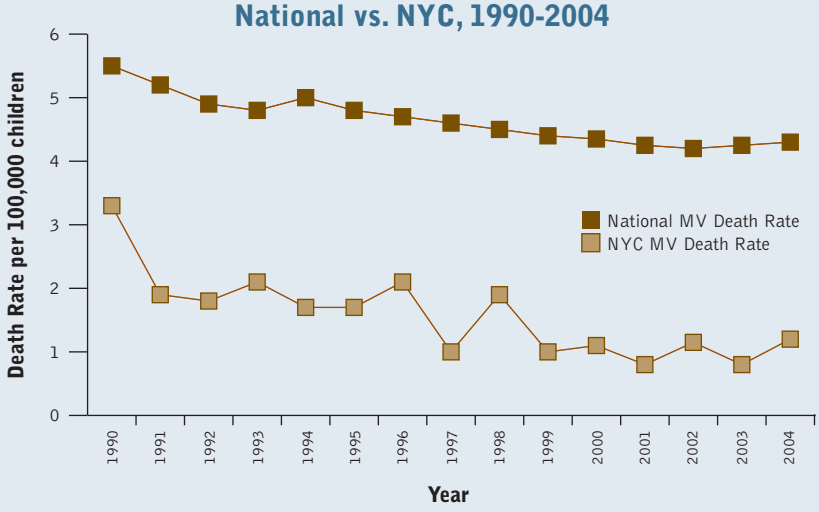
Motor Vehicle-Related Deaths

Motor vehicle accidents are the leading cause of child injury deaths across the nation. For the years 1990 to 2004, national motor vehicle-related child death rates were almost three times higher than in NYC (4.4 per 100,000 vs. 1.5 per 100,000 in NYC), placing NYC well below the national average. This may be due to the fact that NYC children ride less frequently as passengers in cars than children in other parts of the country. Among child passengers, motor vehicle-related death rates were 7 times lower in NYC than the national average, whereas death rates among child pedestrians in NYC were comparable to national figures (0.8 deaths per 100,000 children), despite the fact that walking is a more predominant mode of transportation in NYC.

Both national and NYC data show an overall decrease in motor vehicle-related deaths over time, although declines in NYC have been less consistent given the smaller population. Death rates in NYC declined from 3.3 per 100,000 children in 1990 to 1.4 per 100,000 in 2004.

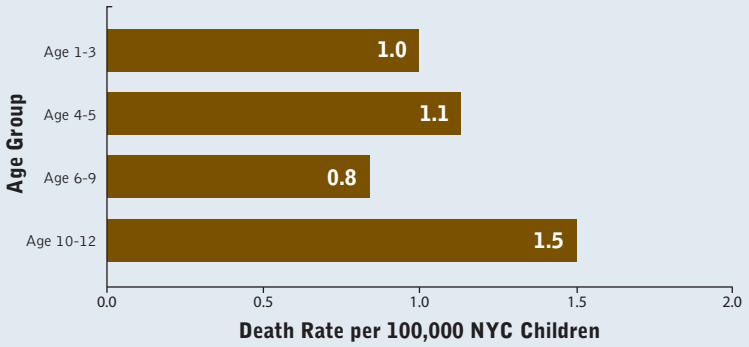
In NYC, motor vehicle accidents made up most of the transportation deaths (80%), the remaining 20% resulted from a single plane crash in 2001, where 18 children were killed. No subway-related child fatalities occurred during this time.

Comparison of Motor Vehicle-Related Death Rates among Children (1-12 years) National vs. NYC, 1990-2004



Source: WISQARS Injury Mortality Reports CDC, Bureau of Vital Statistics NYC DOHMH

Motor Vehicle-Related Death Rates by Age Group (1-12 years) 2001-2005 n=70



Source: Bureau of Vital Statistics NYC DOHMH

Investigation of Motor Vehicle Accidents

Motor vehicle accidents are investigated by NYPD, DOT and the OCME. Procedures for investigation are as follows:

NYPD: The NYPD Highway Patrol District Accident Investigation Squad (AIS) investigates motor vehicle accidents in which a person is killed, or seriously injured and likely to die. Investigators are charged with locating witnesses and operators of vehicles involved to record statements, making arrests when necessary, conducting scene reconstruction and taking photographs, collecting evidence, processing, and conducting vehicle examinations.

DOT: Fatal accidents are investigated by the Severe Accident Forensic Evaluation Team (SAFETeam). SAFETeam is dispatched to fatal accident sites to expedite priority regulatory repairs and recommend other corrective measures that may prevent future incidents. SAFETeam investigations examine fatality locations to determine how and why the accident occurred. On local roadways, SAFETeam investigators review signage, all traffic and pedestrian signals, street markings, lighting, and street surface conditions to ensure that all are present, visible and functioning properly. SAFETeam also conducts speed surveys where necessary. The accident location is photographed and an inspection is conducted in the two-block area surrounding the accident location to ascertain contributing factors or potential conflicts. On highways and parkways, SAFETeam examines signage, markings, roadway conditions, damage to highway structures such as medians, guard rails, and light poles, and investigates other potential conflicts.

OCME: Motor vehicle-related fatalities fall within the jurisdiction of the OCME. The medical examiner is responsible for the postmortem examination and final death certification.

Case Reviews

The CFRT conducted an in-depth case review of the 70 motor vehicle-related deaths that occurred in NYC during years 2001 through 2005. All involved contact with a moving motor vehicle, resulting in the death of child passengers, child pedestrians, child bicyclists or children in strollers. In this next section, findings are presented from the case reviews.

Age and Position of Child

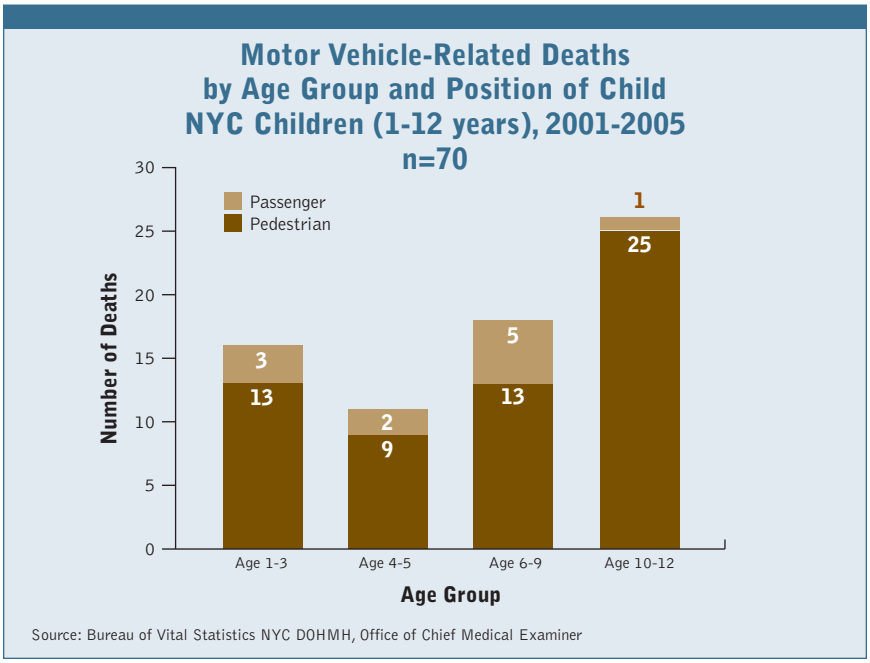
Distributed by age, the 10-12 age group experienced the highest motor vehicle-related death rate, with 1.5 per 100,000 NYC children. Six to 9-year-olds had the lowest rate of motor vehicle-related death (0.8 per 100,000 NYC children).

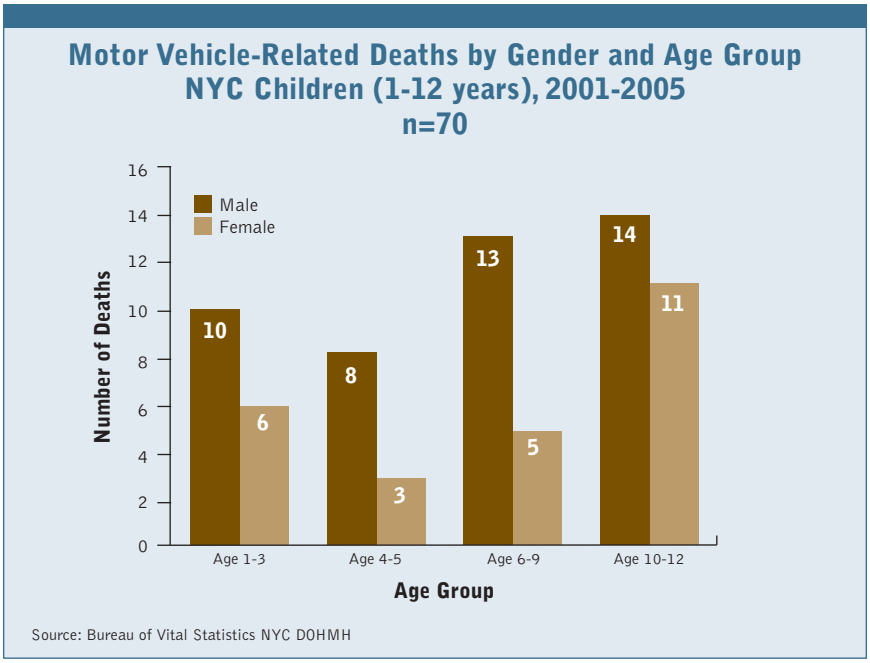
Of the 70 accidents, only 11 (16%) involved child passengers. Passenger deaths include instances where the child's driver either lost control of the vehicle, struck, or was struck by another vehicle. Most of the child motor vehicle deaths (84%) were of child pedestrians. This pedestrian category includes the deaths of 3 children who were sitting in strollers supervised by a parent or babysitter, another 3 fatalities among child bicyclists, and 1 fatal accident involving a child on a non-motorized scooter being struck by a motor vehicle. The remaining 52 deaths were child pedestrians on foot who were struck by motor vehicles.

Pedestrian and passenger findings by age show that almost all deaths among children 10-12 years were of pedestrians. The 6-9 year-old group experienced the largest number of passenger deaths.

Gender

Of the 70 fatal motor vehicle-related deaths, 45 (64%) involved boys and 25 (36%) involved girls. The gender disparity was the least apparent in the 10-12 year-old age group.



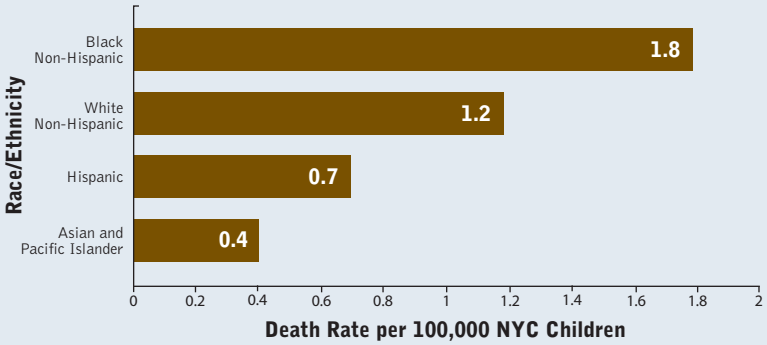


Race/Ethnicity

Black children experienced 34 (49%) of the fatal motor vehicle accidents; 18 (26%) involved white children, 12 (21%) involved Hispanic children, and 2 (3%) involved Asian/Pacific Islander children. Comparing rates of fatal motor vehicle accidents according to population size and race/ethnicity, black children experienced the highest rate of death at 1.8 per 100,000 children. The death rate among white children was 1.2 per 100,000, followed by Hispanic children with 0.9 per 100,000, and Asian and Pacific Islander children with 0.4 deaths per 100,000 children.

The racial/ethnic disparity in motor vehicle deaths exists for both younger and older children. Black children in both age groups had the highest overall rate of motor vehicle-related deaths at 1.8 per 100,000 children each.

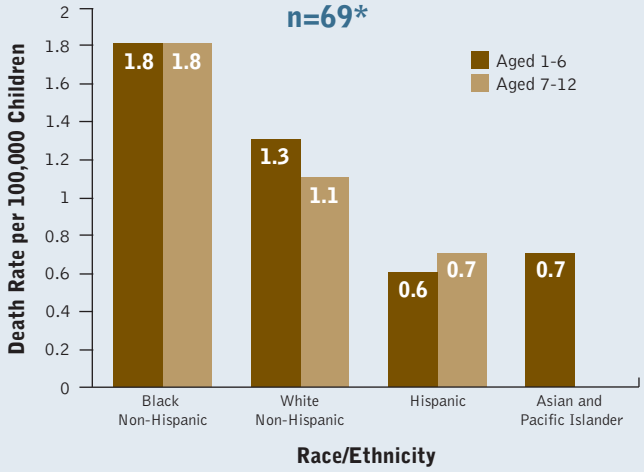
Motor Vehicle-Related Death Rates of Children (1-12 years) by Race/Ethnicity, 2001-2005 n=69*



Source: Bureau of Vital Statistics NYC DOHMH

* 1 death of "other" race excluded from chart.

Motor Vehicle-Related Death Rates of Children (1-12 years) by Race/Ethnicity and Age 2001-2005 n=69*



Source: Bureau of Vital Statistics NYC DOHMH

* 1 death of "other" race excluded from chart.

Borough of Accident

Fatal motor vehicle accidents were not evenly distributed throughout the city. The rate of motor vehicle accidents by location was highest in Brooklyn and Queens, with death rates of 1.3 per 100,000 NYC children in each. The Bronx and Staten Island followed with the next highest rates at 0.8 per 100,000 children. Manhattan had the lowest child motor vehicle death rate (0.2 deaths per 100,000).

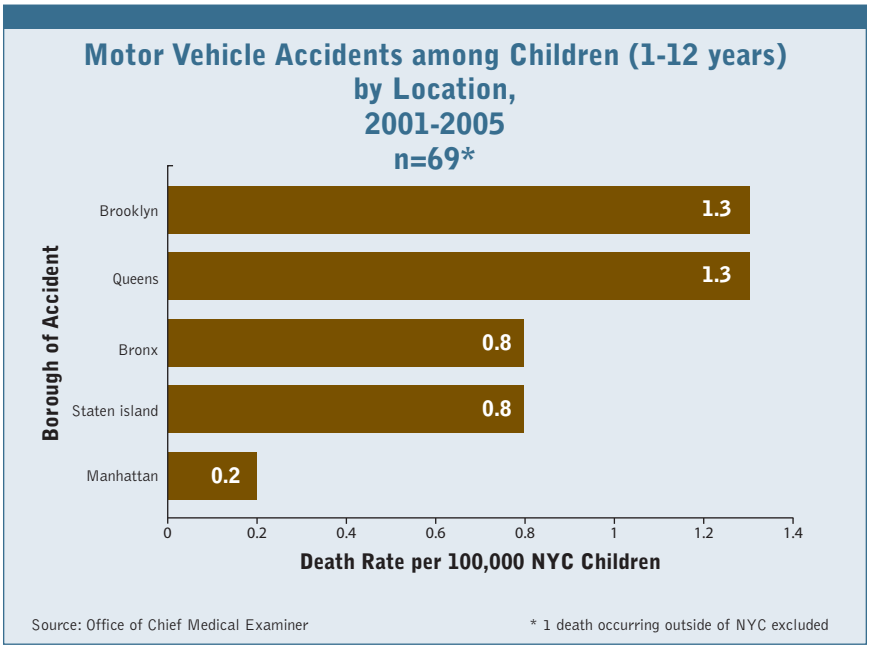
When examining the breakdown of fatal pedestrian and passenger motor vehicle accidents by borough of accident and position of child, Brooklyn had the highest rate of pedestrian deaths, at 1.2 fatal accidents per 100,000 children. Queens followed with 0.9 pedestrian accidents per 100,000 children, but also showed the highest rate of fatal accidents among child passengers at 0.4 deaths per 100,000 children. There were no fatal accidents among child passengers in the Bronx or Manhattan.

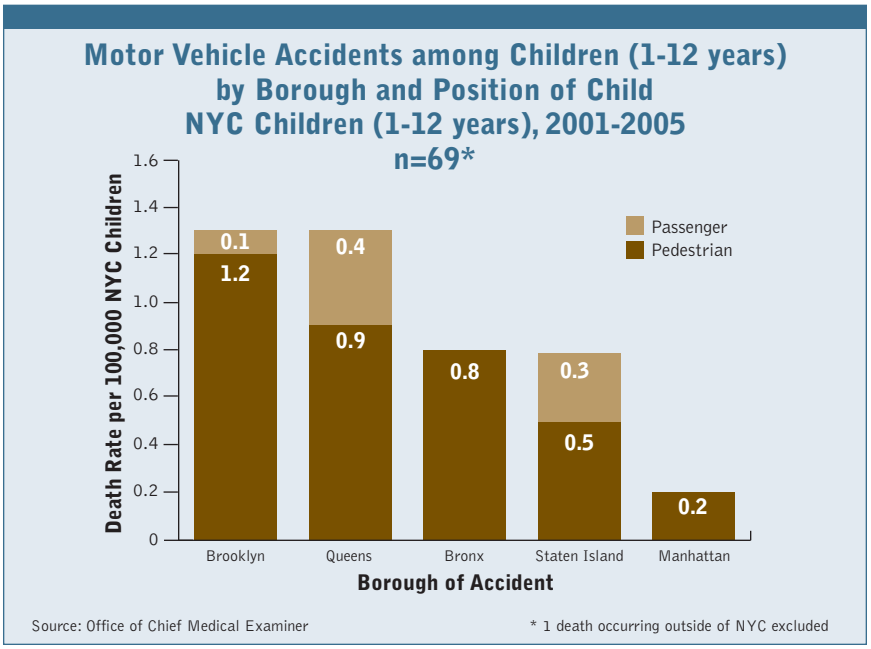
The map on the next page shows the accident locations for motor vehicle-related child deaths for NYC children aged 1-12 during years 2001 through 2005. Most of the fatal accidents occurred in Central and Southern Brooklyn, Eastern Queens and the South Bronx. One fatal accident involving a NYC resident occurred just outside NYC limits. Passenger vs. pedestrian child deaths are also noted.

Vehicle Type

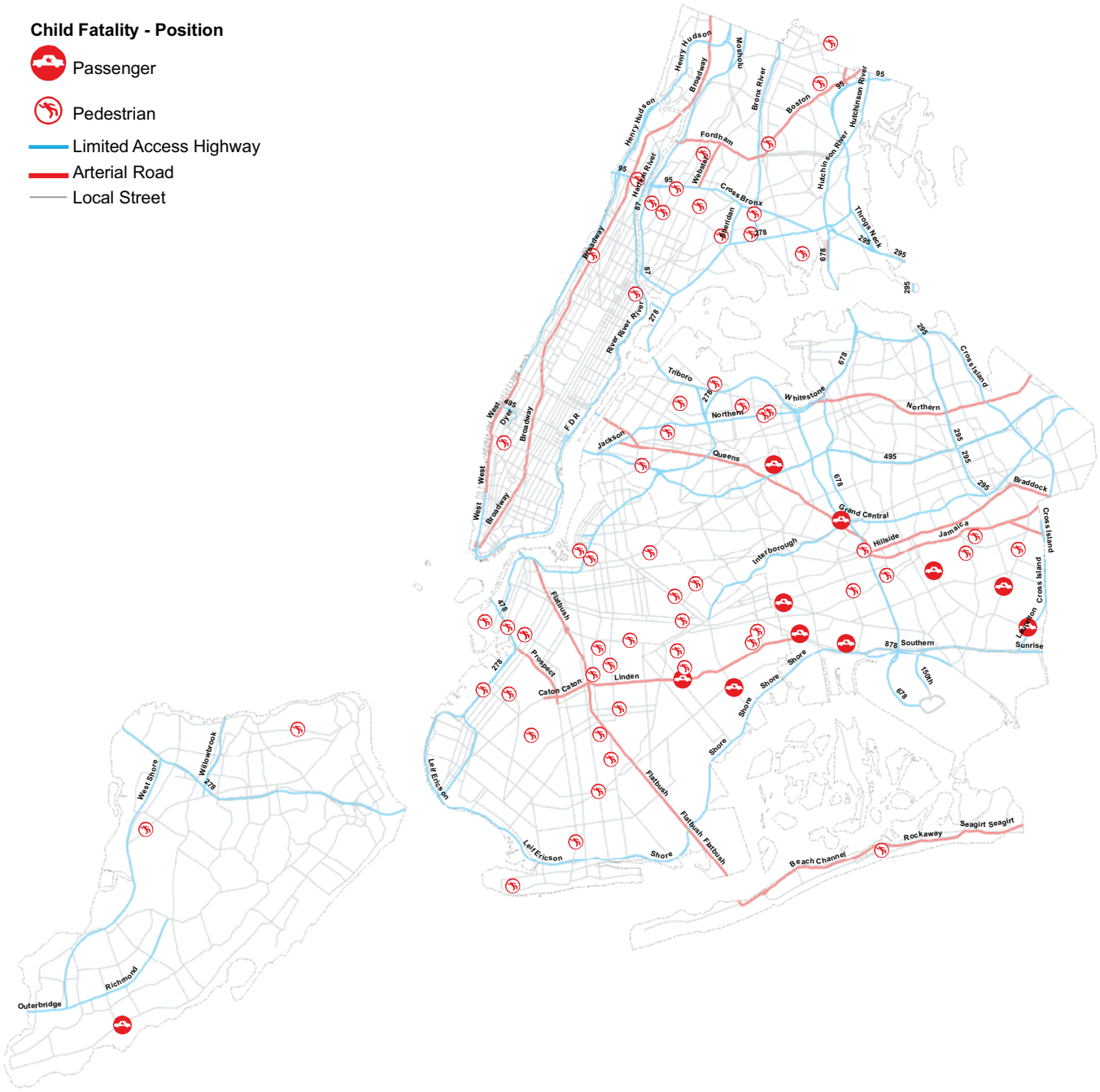
The type of vehicle involved in each fatal accident was also examined (see chart on page 18). Thirty-seven percent (n=26) of vehicles were in the light truck category, including SUVs, vans, and trucks. Of the light truck vehicles, 15 were identified as SUVs, 5 as vans, and 6 as trucks.

Cars represented another third (36%, n=25) of the vehicles involved in fatal accidents. Buses were involved in 6% (n=4) of the fatalities (including one identified as a school bus) and tractor-trailers in 3%; vehicle type was unknown in 10% (n=7) of fatalities. In 3 cases (4%), no second vehicle was involved in the fatality – drivers lost control and crashed into an object. Vehicles in the 'other' category (4%) include a motorized scooter, a motorcycle, and an ambulance.





Fatal Motor Vehicle Accidents among NYC Children (1-12 years) by Accident Location and Position of Child 2001-2005 n=70



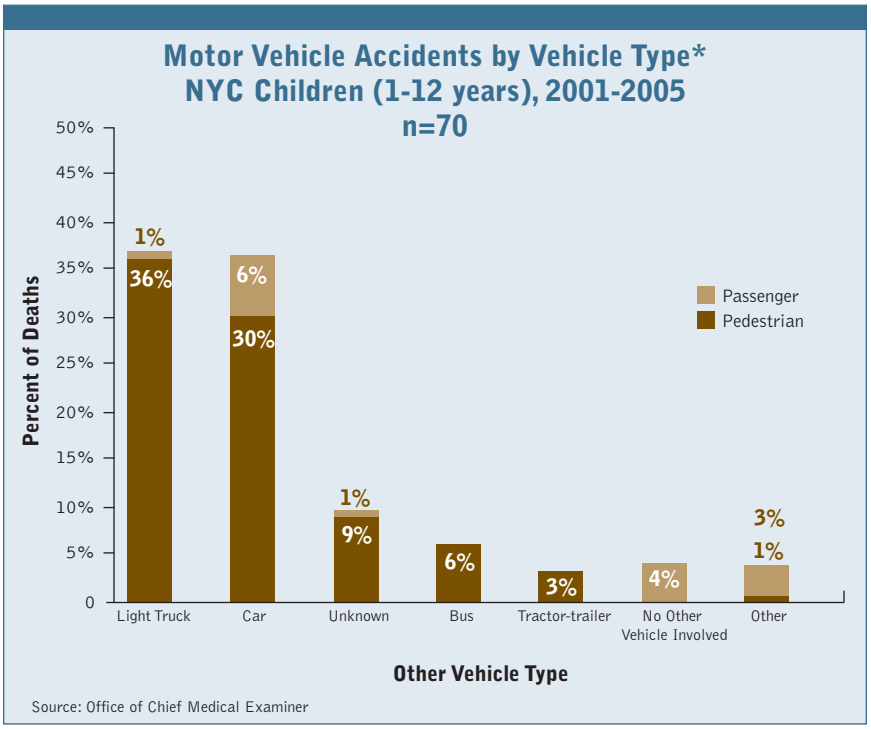
Source: NYPD Accident Reports

Contributing Factors

Many of the 70 motor vehicle accidents investigated were assigned multiple contributing factors, meaning that actions by both the motor vehicle driver and child victim or child supervisor may have contributed to the accident. Tables 2 and 3 illustrate the distribution of main contributing factors as recorded in the DOT fatality database.

Driver error alone was cited most frequently (39%) as the main contributing factor; pedestrian error alone was cited 29% of the time; and in 17% of cases both driver and pedestrian error contributed to the accident (Table 2). DOT had no police report information to determine contributing factor for 9% of cases and contributing factor was unknown in 7% of cases. These findings underscore the need for greater driver precautions and additional pedestrian safety education among NYC children.

Table 3 shows the top 5 factors that contributed to fatal child motor vehicle accidents on the part of drivers and child pedestrians. Driver inattention, followed by unsafe speed, failure to yield, and alcohol involvement are the highest ranking contributing factors for accidents involving driver error. Contributing factors on the part of child pedestrians show accidents occurring most frequently as a result of children emerging from between parked vehicles, crossing against a signal or crossing mid-block.



**Vehicle type* refers to motor vehicles involved in fatally injuring a child pedestrian or passenger. Vehicle type presented in the graph does not include the vehicle a child was riding in as a passenger at the time of incident.

Location of Accident

Of the 59 fatal child pedestrian accidents that occurred during 2001-2005, 37% occurred mid-block with more that half (59%) of fatal mid-block accidents occurring as a result of children emerging from between parked or stopped cars. Twenty-nine percent (29%) occurred at intersections or within a 25 foot radius from the center of an intersection, nearly half (41%) of which resulted from driver inattention only. Twelve percent of fatal pedestrian accidents occurred in non-traffic areas such as a sidewalk, in a parking lot, gas station, or driveway. No police report was reviewed for 17% of pedestrian fatalities and location of accident was unspecified in 5% of cases.

What are Contributing Factors?

In a fatal crash scene investigation, investigators determine apparent contributing factors for the crash. Contributing factors do not assign blame. The purpose of assigning contributing factors to the motor vehicle driver, pedestrian, bicyclist or other involved party is to understand the actions that may have played a role in the crash. Contributing factors are listed on the police accident report; crash investigators use their professional judgment to indicate the apparent reasons for the accident. There can be multiple contributing factors for an accident. Examples of contributing factors include traveling at unsafe speed, crossing at mid-block, and disregard for traffic signals.

Table 2. Motor Vehicle-Related Deaths among Children (1-12 years) by Contributing Factor, NYC Children, 2001-2005

Contributing Factors	Number of Deaths	Percent
Driver error only	27	39%
Pedestrian error only	20	29%
Pedestrian and Driver error	12	17%
No report	6	9%
Unknown	5	7%

Source: DOT Fatality Database

Table 3. Motor Vehicle-Related Deaths among Children (1-12 years), Ranking of Top 5 Contributing Factors, NYC Residents, 2001-2005

Rank Frequency	Driver	Frequency	Pedestrian	
1	Inattention	14	Emerging from between parked or stopped vehicles (intersection or mid-block)	11
2	Unsafe speed	8	Crossing against signal (intersection)	6
3	Failure to yield	6	Crossing mid-block	5
4	Alcohol involvement	5	Other action in roadway	3
5	Traffic control disregard and unsafe lane change	3	Playing on roadway	2

Source: DOT Fatality Database

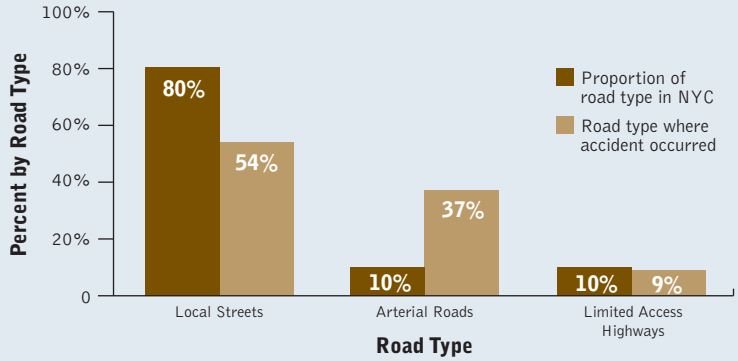
Type of Road

Local streets comprise 80% of New York City roadways, with arterial roads and limited access highways each accounting for 10% of roadways. More than half (54%) of fatal motor vehicle accidents took place on local streets. Thirty-seven percent (37%) occurred on arterial roads and 9% on limited access highways. These results point to a disproportionate percentage of deaths occurring on arterial roads.

Alcohol Involvement

Based on case reviews, 5 fatal motor vehicle accidents involved alcohol on the part of the driver. Collectively, these 5 accidents caused 5 child deaths, 2 adult deaths (including that of a pregnant woman), death of one teenager, as well as 2 severe and 4 minor injuries in adults. Two of the alcohol-related accidents occurred in Brooklyn, 2 in the Bronx, and one in Queens.

Motor Vehicle Accidents by Road Type NYC Children (1-12 Years), 2001-2005 n=70



Source: DOT Fatality Database

Case examples of child emerging from between parked vehicles

A driver of a car was looking for a parking spot in Brooklyn on a clear weekend evening in the summer. While playing tag with some friends, a 12-year-old child emerged from the front of a legally parked car, and ran into the street. The 24-year-old driver of the vehicle struck the child, causing her to suffer head trauma. The child was taken to a nearby hospital where she later died due to her injuries.

On a clear weekday afternoon in the spring, a 3-year-old boy was standing with his mother near their home in Brooklyn. Seemingly to greet a nearby relative, the child suddenly ran from his mother's side between two parked cars into the street and into the path of an oncoming car.

Case example of driver inattention

The driver of a tractor-trailer was traveling in a north-bound direction when he stopped for a traffic signal at an intersection. Three pedestrians were midway across the intersection when the traffic signal changed from red to green. The driver proceeded forward not realizing the pedestrians were very close to the vehicle. One of the pedestrians, a 4-year-old boy, was struck by the vehicle's passenger side, causing him to be run over with the rear wheels of the passenger side of the tractor-trailer. The other pedestrians were able to make it to the other side of the intersection without being struck. The driver stated that he never realized that he struck someone with his vehicle until he was stopped.

Case example of failure to yield to pedestrian

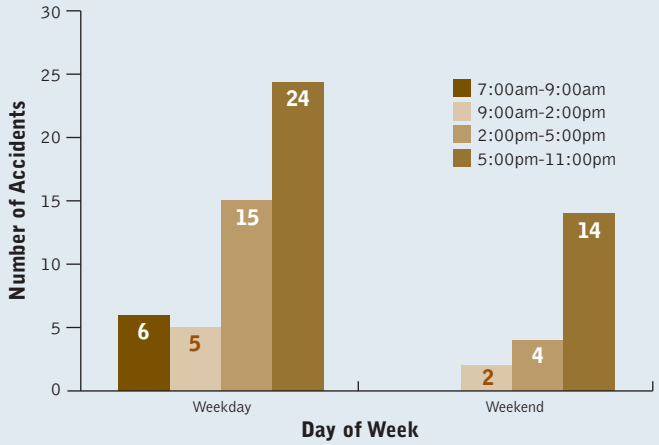
A 68-year-old male driver made a left turn onto an entrance ramp of a highway in the Bronx and struck a pedestrian and her 1-year-old child. The male child was being pushed in a stroller as the mother crossed the street on a weekday evening. The pedestrian had the right of way; failure to yield to pedestrian was the documented contributing factor.

Day of Week and Time of Day

Nearly three-quarters (71%) of fatal child motor vehicle accidents occurred on a weekday with the remaining 29% occurring on a weekend. Overall, more than half (54%) of accidents occurred during evening hours (5:00pm-11:00pm). Early morning accidents were less common and no early morning accidents occurred on the weekends. No accidents occurred between the hours of 11:00pm-7:00am.

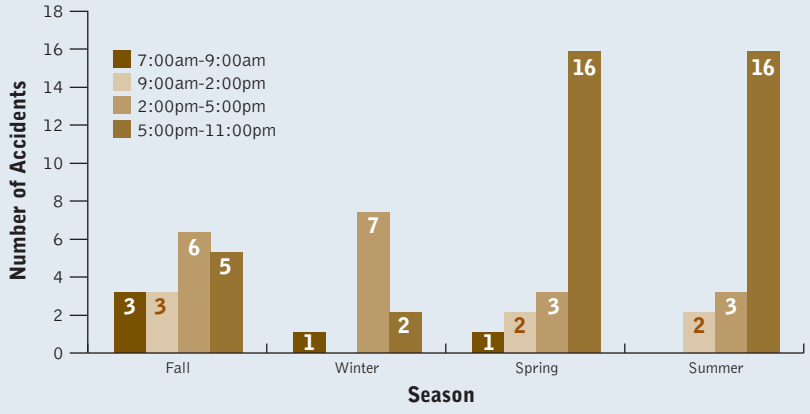
Accidents also occurred most frequently (61%) during spring and summer months. These results may be linked to the warmer weather when children engage in more outdoor activities. Deaths were particularly high in the spring and summer evening hours (5:00-11:00pm). During the fall and winter months, 48% of fatal motor vehicle accidents occurred between 2:00pm-5:00pm, potentially coinciding with after school commuting hours. The least amount of fatal accidents occurred in the early morning, with no early morning accidents occurring during summer months.

Motor Vehicle-Related Deaths by Time and Day of Accident
NYC Children (1-12 years), 2001-2005
n=70



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

Motor Vehicle-Related Deaths by Time of Day and Season
NYC Children (1-12 years), 2001-2005
n=70

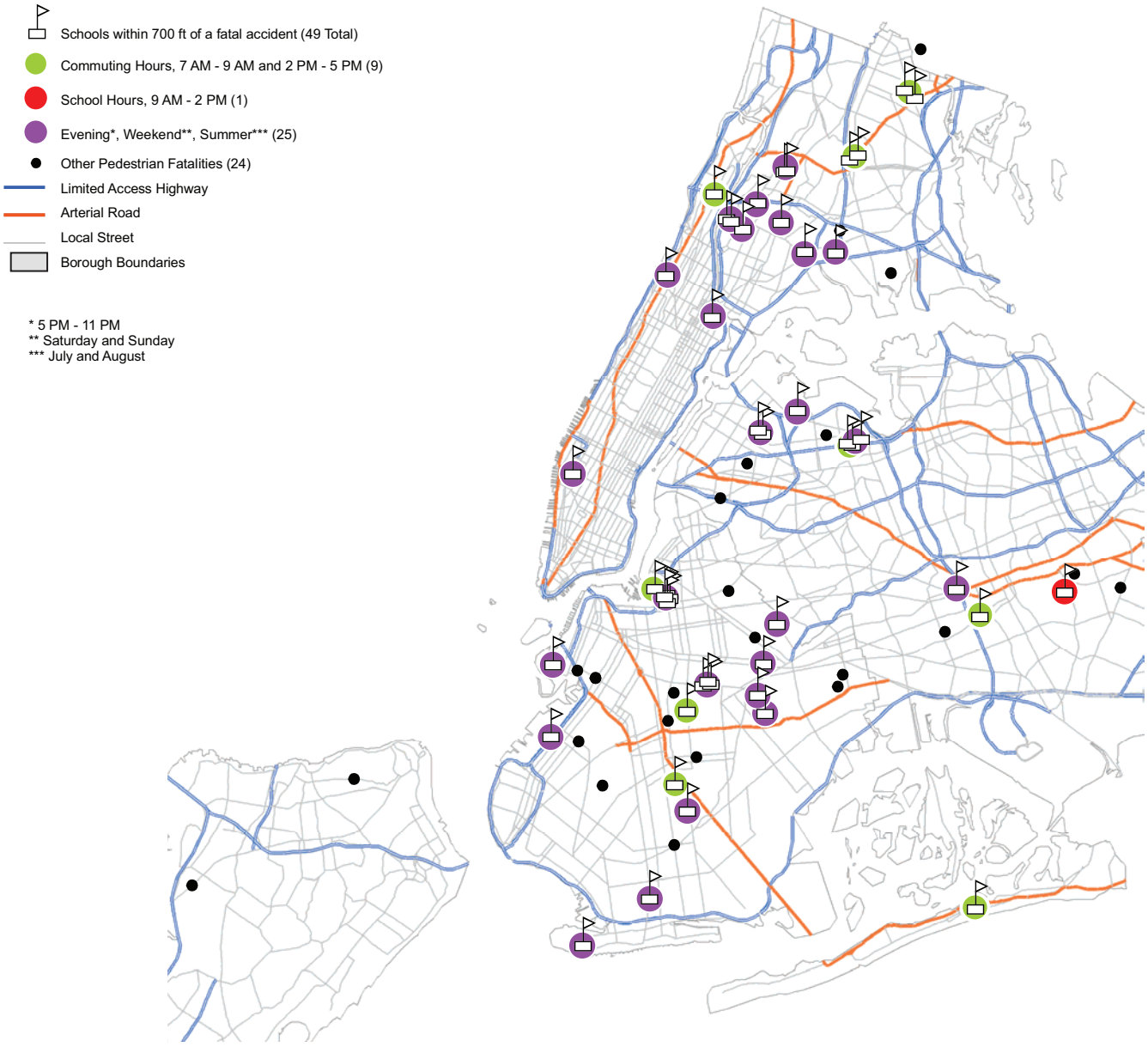


Source: Bureau of Vital Statistics NYC DOHMH, Office of Chief Medical Examiner

Location of Fatal Pedestrian Accidents

The map below shows the location of the 59 fatal pedestrian accidents that were motor vehicle-related. The colored circles represent fatal accidents that occurred within 700 feet of a school, showing that half (50%, or n=35) of pedestrian fatalities occurred within 700 feet of a NYC elementary, middle or junior/senior high school; black dots represent pedestrian accidents not in close proximity to a school. Each of the 49 small white flags shown on the map represents a school near the fatal accident. Accidents are differentiated by time of occurrence. Of pedestrian accidents occurring near schools, over half (71%) took place during the evening, the summer or over the weekend, 25% occurred during morning or afternoon commuting hours, and only 3% (1 accident) occurred during school hours. The high frequency of fatal accidents near schools relates to the amount of time children spend near schools and the high density of schools across the city. This points to the importance of prioritizing safety messages and engineering improvements at and around school locations.

Fatal Motor Vehicle-Related Accidents among Child Pedestrians (1-12 years) within 700 feet of NYC Schools 2001-2005 n=59



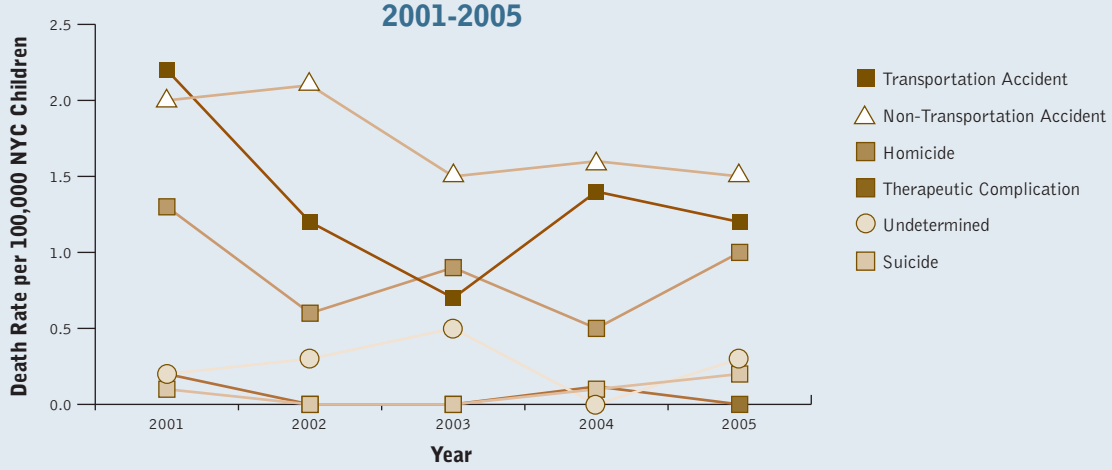
Source: NYPD Accident Reports, Division of Epidemiology NYCDOHMH

Cause and Manner of All Injury Deaths Among NYC Children

Overview

In addition to the in-depth case reviews of motor vehicle deaths during the 5-year study period, aggregate summaries of other causes of child death were examined. The graph below shows the annual trends in child deaths by manner of death from 2001-2005. In 4 of the 5 years, non-transportation accidents (a wide range of causes of death) were the highest contributor to injury deaths in children, most typically followed by transportation accidents. In 2003, homicides occurred at a slightly higher rate than transportation accidents.

Trends in Injury Death Rates of NYC Children (1-12 years) by Manner of Death 2001-2005



Source: Bureau of Vital Statistics NYC DOHMH

Accident Deaths

Deaths classified as accidents comprised 70% (n=200) of the 286 child injury deaths between 2001 and 2005. More than half of the fatal accident injuries (57%) were caused by blunt impact of some type, followed by death due to thermal injuries (27%), asphyxia (9%), drowning (4%), and other fatal accident causes (5%). Most blunt impact injuries (77%) were related to a motor vehicle or airplane accident, as described in detail earlier. Falls were the next highest contributor, with nearly one-fifth of injuries (18%) occurring as a result of a fall from a height including from a window, balcony, or porch. Half of falls (50%) were among children ages 1-6, with the remaining falls occurring in children ages 9-12. All but 3 of these fatal falls were by boys. The remaining 5% of child accidental deaths due to blunt impact injuries were the result of the child being struck by a falling object (n=6). There were 4 incidents of televisions on unstable surfaces falling over on a child. Three of these children were between ages 1-3 and one was a 7-year-old child; gender was equally distributed.

Table 4a. Cause of Accident Deaths

Blunt Impact Injuries	(n=114)	%
Transportation accidents (motor vehicle = 70, airplane = 18)	88	77
Fall from height	20	18
Struck by falling object	6	5

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

Table 4b. Cause of Accident Deaths

Thermal Injury	(n=53)	%
Smoke inhalation	36	68
Smoke inhalation and burns	15	28
Scald burn	2	4

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

Thermal injuries (i.e., burns from an open flame or smoke inhalation) were the second largest contributor to fatal accident injuries, accounting for more than one-fourth (27%) of the 200 accident injury deaths. Thermal injuries largely occurred as a result of house fires and malfunctions of electrical wiring in the home. In 9 of the 36 cases, more than one child died as a result of a single house fire. Relatives or friends present at the time of a fire were also at risk for fatal injuries. Deaths due to thermal injuries occurred in all ages with roughly 60% occurring in children between ages 1-6 and 40% in children ages 7-12. Eight fatal injuries occurred as a result of a child playing with matches or a lighter, either by themselves or with another child. Two deaths occurred from scald burns in 1-year-old children, one as a result of a sudden increase in water temperature while being bathed, and another due to burns from hot cooking oil. Fatal thermal injuries were almost evenly distributed by gender, and 43% of thermal injuries occurred in black children.

Asphyxia caused 17 child deaths or 9% of the accidental injury deaths. Seven cases were positional asphyxia, or asphyxia due to entrapment. Decedents were 6 males and 1 female of varying ages (1-10 years), with 3 deaths occurring in 1-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 positional asphyxia death in a 1-year-old resulted from a child entrapped in a commercial bucket partially filled with water. The 4 remaining positional asphyxia deaths among older children occurred from other forms of asphyxia, such as entrapment in a laundry chute and neck compression between window and window guard. One death occurred in a 10-year-old male suffering from epilepsy who was suffocated by a pillow during a seizure. Aspiration of food or a foreign object was a second type of asphyxia and occurred among 4 females and 2 males between 2-10 years of age, including one mentally retarded male. Cases of self extubation from medical equipment occurred among 2 males and 1 female, all age 3. The remaining asphyxia death was that of a 10-year-old male diagnosed with attention deficit hyperactivity disorder who inadvertently hanged himself while playing. Three of the asphyxia deaths discussed above involved children with behavioral or cognitive disorders.

During the five year study period, 7 children drowned (4% of accidental injury deaths). Six were 1-5 years of age (4 females, 2 males), and 1 was a 12-year-old male. Four drowned in a bathtub, 1 drowned in the ocean, and 2 drowned in a swimming pool, including the 12-year-old male.

Other accidental causes of death occurring less frequently, included accidental gunshot wounds of two males ages 4 and 5, carbon monoxide poisoning of 2 females age 8 and 9, overdose of medication of two females age 11 and 12, indoor hyperthermia of a 1-year-old female, due to faulty radiator an accidental stab wound with a kitchen knife in a 10-year-old male, and 1 death of a 10-year-old female from inhalation of hydrocarbons from an air freshener.

Table 4c. Cause of Accident Deaths

Asphyxia	(n=17)	%
Positional or entrapment	7	41
Aspiration of food or foreign object	6	35
Self extubation (by medical patient)	3	18
Inadvertent hanging	1	6

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

Table 4d. Cause of Accident Deaths

Drowning	(n=7)	%
Bathtub	4	57
Swimming in ocean	1	14
Pool	2	29

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

Table 4e. Cause of Accident Deaths

Other Causes of Death	(n=9)	%
Gunshot wound	2	22
Carbon monoxide poisoning	2	22
Overdose (medication)	2	22
Hyperthermia	1	11
Stab wound	1	11
Inhalation of hydrocarbons (aerosol)	1	11

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

Homicides

There were 60 child homicide cases between 2001-2005 accounting for approximately one-fifth (21%) of all injury deaths during the 5-year study period. Homicides affected boys and girls similarly. More than half (55%) of all homicide victims were ages 1-3 years old. Among racial and ethnic groups, black children accounted for more than two-thirds (67%) of all homicide victims.

Among homicides, blunt impact injuries continued to be the most common cause of death in young children (n=14, 23%). There were 10 child homicide fatalities by gunshot wounds, 7 stab-related deaths and 6 due to fatal child abuse syndrome, meaning that the child showed evidence of being battered over time. There were 8 homicide deaths due to smoke inhalation, with or without burns from residential fires. Three child homicide deaths were due to drowning, 3 to smothering, 2 due to a combination of shaking, whiplash, and blunt impact and 2 due to scald burns. Hanging, ingestion of a toxic substance (methadone), environmental hyperthermia as a result of being left unattended in a car, dehydration, and sepsis due to parental neglect were the cause of 1 child death each.

Suicides

Four child deaths were ruled to be suicides (1.4% of all injury deaths), 3 females and 1 male. All occurred among the 10-12 year age group. Of these, 3 occurred as a result of asphyxia by hanging. The fourth death occurred as a result of ingestion of prescription medications.

Undetermined Deaths

From 2001 through 2005, there were 18 deaths (6% of all fatal injuries) certified as undetermined manner of death. These deaths included drowning, blunt impact injuries of the head, scald burns, and intoxication from medication. In 11 of these 18 cases (61%), 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 5. Cause of Homicide Deaths

Homicide	(n=60)	%
Blunt impact injuries	14	23
Gunshot wounds	10	17
Stab or incised wounds	7	12
Blunt impact injuries and Fatal Child Abuse Syndrome	6	10
Smoke inhalation (arson)	4	6
Smoke inhalation and burns (arson)	4	6
Drowning	3	5
Smothering	3	5
Shaking, whiplash, and blunt impact	2	3
Scald burns	2	3
Hanging	1	2
Ingestion (methadone)	1	2
Environmental hyperthermia (left unattended in car)	1	2
Dehydration (parental neglect)	1	2
Sepsis (parental medical neglect)	1	2

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

Table 6. Cause of Suicide Deaths

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 7. Cause of Undetermined Deaths

Undetermined	(n=18)	%
Drowning	3	17
Blunt impact	2	11
Scald burns	1	5
Intoxication from medication	1	5
Undetermined cause	11	61

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

Summary

This first report of the New York City CFRT looks retrospectively at unintentional and intentional injury deaths from years 2001 through 2005 for NYC residents aged 1-12. The report summarizes findings from an in-depth case review of motor vehicle-related deaths, as well as aggregate data for all injury-related deaths.

Motor Vehicle Deaths

In NYC, between 2001-2005, motor vehicle-related death rates among children were considerably lower than the national average. Nonetheless, motor vehicle accidents were the single leading contributor to child fatalities citywide. Brooklyn and Queens had the highest rates of motor vehicle-related deaths, while Manhattan, the borough with the highest traffic congestion and greatest volume of pedestrians, had the lowest rate. The rate of death among child passengers was 7 times lower in NYC than nationally, potentially due to less frequent car use. In contrast, despite walking as a predominant mode of transportation, death rates among child pedestrians in NYC were comparable to national figures and comprised the majority of child motor vehicle-related deaths. The highest rates of child motor vehicle-related deaths were among older children, aged 10-12 (unlike national findings, where children 1-2 years comprised the largest percentage of child pedestrian deaths, often due to accidents in non-traffic areas like driveways). Boys were more likely than girls to be injured, and black children had the highest rate of motor vehicle-related deaths compared to other racial/ethnic groups. This racial/ethnic disparity is high for both younger and older children.

More than one-third of all fatal motor vehicle accidents involved vehicles in the light truck category, particularly SUVs. Driver inattention was the leading contributing factor to child motor vehicle-related deaths overall, though speeding and failure to yield were also key contributing factors. Local streets were the site of more than half of fatal accidents, and a disproportionate percentage of deaths occurred on arterial roads.

Nearly half of all fatal child motor vehicle accidents occurred in the evening during spring and summer months. Many of the fatal pedestrian injuries were due to children emerging from between parked vehicles, crossing against signals, and crossing mid-block. These findings, combined with a high prevalence of contributing factors such as emerging from between parked vehicles, crossing mid-block, and playing in roadways suggest children may lack safe outdoor play spaces such as city parks. Mapping the location of motor vehicle-related deaths demonstrated that the majority of deaths appear to be concentrated in Central and Southern Brooklyn, Eastern Queens, and the South Bronx. An additional geographic analysis found that more than half of child pedestrian fatalities occurred within 700 feet of a school, though only one of these fatalities occurred during school hours; the majority of near-school fatal accidents occurred during the afternoon and early evening, on the weekend or in the summer. The high frequency of fatal motor vehicle accidents near schools relates to the amount of time children spend near schools and the high density of schools across the city. These findings underscore the importance of safety improvements including traffic calming near schools.

As a result of required DOT investigations of these fatal accidents, DOT SAFETeam recommendations were made for environmental improvements in more than 40% of accident locations, such as sign replacement, refurbished crosswalks, and additional signage (i.e., one-way arrows, stop signs, yield to pedestrian signs). Continued and expanded use of safety measures to reduce the risk of motor vehicle accidents, especially around schools, are needed.

All Injury Deaths

The aggregate review of all child injury deaths between 2001-2005 shows that more than two-thirds of injury-related deaths were unintentional (including the motor vehicle-related deaths described above). Overall, boys, younger age groups, and black children were more likely to die from injuries than other children.

Excluding transportation accidents, most unintentional injuries occurred in or around the home, pointing to the importance of supervision of young children and attention to possible dangers in these environments. Blunt impact injuries were the primary cause of injury deaths, typically as a result of a motor vehicle injury or a fall. However, the number of deaths due to thermal injuries, particularly from house fires, and asphyxia deaths are also noteworthy. Homicide rates, while lower than the national average, were disconcertingly high, affecting boys and girls similarly. Differences were noted by race/ethnicity and age, with black children and those between ages 1-3 at greatest risk. Four suicides occurred in older age children between 2001-2005.

All of the child deaths described in this report are preventable. Efforts to avert future deaths must be multi-pronged and include improvements in investigation and data sharing, engineering and safety approaches, criminal justice and child welfare involvement, and educational outreach. The recommendation section that follows outlines detailed recommendations for a range of constituencies and city agencies involved in keeping our City's children safe.

Limitations

This retrospective review of child deaths has some important limitations. While it is encouraging that child injury fatalities are lower in New York City than the national average, the limited number of injury deaths in children aged 1-12, particularly of motor vehicle-related deaths, reduced our ability to examine their commonalities, trends and patterns in detail. Another limitation was the frequency of missing information in report files. Substantial effort was made to improve quality and completeness of data by reviewing and compiling original records at OCME, DOHMH, NYPD and DOT for each death, but certain data were hard to capture or were not consistently documented. In addition, some of the more important 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. Finally, the CFRT was assembled after Local Law 115 went into effect in January 2006. Time was needed to nominate and appoint the various members. As a result, the CFRT members had a limited timeframe to research and assemble this first annual report. The process of developing and reviewing subsequent reports and updates should improve over time and allow for additional resources to be included in analysis and investigation.

Recommendations

Preventing Transportation Accidents

Based on analyses of motor vehicle-related deaths between 2001 and 2005, committee members identified a number of recommendations, organized into five key areas. These recommendations are designed to increase child safety and ensure thorough investigation of future child deaths.

1. Infrastructure and Engineering Improvements

- Continue implementation, where appropriate and effective, of engineering and traffic measures that enhance pedestrian safety and calm traffic including: expanding pedestrian crossing areas at intersections; giving pedestrians more time to cross intersections; building out sidewalks at intersections; creating high visibility crosswalks; installing speed reducers; and adding traffic signal enhancements, *yield to pedestrian* signs and marked medians.
- Use child transportation fatality data presented here to inform selection of the next round of priority schools for DOT's Safe Routes to School program.
- Work with city, state, and federal funding sources to ensure funding for the Safe Routes to School program.
- Support ongoing efforts by multiple city agencies to ensure that every New Yorker lives within a 10-minute walk of a park or playground.

2. Education and Outreach

- Identify best practices related to traffic safety awareness and messaging targeted at motorists, parents and children.
- Support the creation of a traffic safety awareness website that would contain information, brochures, games and other resources appropriate for a wide range of audiences. The website should be easily accessible through the nyc.gov portal.
- Seek funding for periodic, city-wide traffic safety awareness campaigns.
- Consider developing a traffic safety awareness campaign specifically targeted at children and their parents.
- Consider enhancing "midblock crossing" and "parked car crossing" lessons in DOT safety education programs.
- Support the expanded use of traffic safety curricula developed by DOT and DOE in additional public and private school classrooms and other educational settings.
- Ensure broader dissemination of existing DOT child traffic safety materials. Venues may include Parent Teacher Association meetings, after school programs and health clinics.
- Continue DOT safety education programs (Safety City, Traffic Safety Education: On the Road, bike helmet fitting programs, parent safety awareness workshops) and support expansion of those programs.
- Make safety materials available at ACS Preventive Services sites across the City.

For health care providers

- Increase dialogue with targeted healthcare provider groups (i.e., pediatricians) through vehicles such as Webcasts and events.
- Target prevention messages and materials to members of regional chapters of the American Academy of Pediatrics and the American Academy of Family Physicians.
- Encourage providers to discuss traffic safety with parents and children over five. Providers should underscore prevention messages by making education and awareness materials available. (Traffic safety resources can be ordered at: http://nyc.gov/html/dot/html/safety/safety_form.html)

3. Legislation

- Pursue state legislation requiring that all large commercial trucks in New York City be equipped with cross-over mirrors. These mirrors, commonly seen on school buses, increase a vehicle operator's ability to see in front of the vehicle.
- Pursue state legislation authorizing use of speed-enforcement cameras and expanded use of red-light enforcement cameras.

4. Data Collection, Analysis and Reporting

- Improve data sharing and data reconciliation related to child fatalities among New York State and New York City Departments of Transportation, New York Police Department and the New York City Department of Health and Mental Hygiene.
- Conduct a more detailed study of child and adult pedestrian fatalities and serious injuries in New York City.

The Child Fatality Review Team also made recommendations for continued efforts of the Team.

- Include an update on above recommendations within the 2008 annual committee report.
- Apply to become a New York State-approved local Child Fatality Review Team.
- Consider future case reviews of non-transportation deaths and undetermined deaths.
- Include content experts as needed to bolster future reviews of specific types of deaths.

Key Safety Messages

Certain strategies and safety practices on the part of all road users have been shown to increase child safety in traffic environments. Organized into four categories, these strategies and practices are detailed below.

Pedestrian Safety

- Tell and show children to always look left, then right, then left again before crossing the street.
- Stop, look and listen before crossing any street.
- It is best to cross at crosswalks, where drivers expect to see people crossing. Stop, look and listen for traffic before crossing even if the white walking figure is visible on the pedestrian signal.
- Emerging from between parked cars can be especially dangerous. Children should use caution when playing on streets with large amounts of parked cars.
- Talk to children about important traffic signs and signals such as one- and two-way streets, pedestrian signals, stop signs and stop lights. Help children understand how these signs and signals function for drivers and pedestrians.
- Children under 10-years-old should only cross the street with a responsible adult. Young children should hold an adult's hand while crossing.
- Children need to wear light or bright colored clothing and retro-reflective materials so they can be seen.
- Children should never wear headphones or talk on cell phones while walking as these can be dangerous distractions.
- Look at the driver of a turning vehicle before you cross. Make eye contact with the driver before you step off the curb and pass in front of a car.

Safety on Wheels (Bicycles, Skates, Skateboards and Scooters)

- Children should always wear a properly fitted helmet and proper attire such as bright clothing and sneakers.
- Vehicles should have safety equipment such as reflectors and bells.
- Ensure that bicycles function properly (inflated tires, working brakes and a tight and straight seat).
- In New York City, children aged 12 and under can ride their bicycles on the sidewalk.
- Children should be encouraged to walk their bicycles across intersections.

Passenger Safety

- Children need to be restrained in a car safety seat or booster seat until they are at least 4'9". Parents and caregivers should ensure that child safety seats are properly installed.
- Children should ride in a rear-facing car seat until they are at least one-year-old and weigh at least 20 lbs. For the best protection, keep babies in rear-facing car seats as long as possible.
- Children and adults should wear a safety belt every time they are a passenger in a car.
- It is safest for children to ride in the back seat.
- Children and adults should always exit vehicles on the curb side of the street.

Driver Safety

- Be attentive at to all road users (pedestrians, bicyclists and other motorists) when driving.
- Maintain slower speeds near parks, schools and other locations frequented by children and be especially alert for sudden dart-outs and mid-block crossings.
- If you are driving a larger vehicle with a limited front site line, be especially cautious at intersections as you may not be able to see small children directly in front of your vehicle.
- Give pedestrians enough space to cross. Stop before the crosswalk, not in it.
- When making a turn, look for both vehicle traffic and pedestrians.

Source: DOT

Ongoing City Initiatives to Improve Child Safety

Almost every New Yorker must navigate the City's streets and sidewalks at some point during his or her day. To ensure the safety of its residents, New York City has undertaken a number of measures to make transportation as safe as possible, particularly for children.

Educational Initiatives

School-Focused Programs

Safety City: This program provides interactive lessons and hands-on practice to third grade students at one of six Safety City locations. Each location is equipped with a simulated city street intersection where students learn how to make safe choices when walking outside, riding in a car, riding a bicycle, or skating.

Traffic Safety Education: Safety educators visit elementary and intermediate schools and present interactive traffic safety lessons.

Traffic Safety Curriculum: Developed by the NYC Department of Transportation (DOT) and the Department of Education, this curriculum has been used in selected elementary schools in Region 11. The curriculum is currently being expanded.

Targeted Outreach to Schools in High Risk Areas: NYC DOT's Safety Education division developed a plan to target elementary and intermediate schools within high risk precincts for outreach. All 145 schools selected for the 2005/2006 school year were served.

Theater Programs: Two theatre programs for elementary school children and teenagers present engaging programs that emphasizing traffic safety.

Community-Focused Programs

Safe Kids New York City: An award-winning coalition led by DOT's Safety Education division. Members from hospitals, safety and health care organizations, government agencies, community organizations, and corporations work together to prevent unintentional injuries.

Youth Educating for Safety (YES): Through the YES program, students are trained to educate their peers about traffic safety.

Car Seat Education Program: DOT operates six car seat fitting stations and promotes the use of child safety seats.

Bicycle Helmet Fittings: The City hosts events to distribute and fit free bicycle helmets. DOT also provides free helmets and fittings at the six Safety City locations.

STOP-DWI: Coordinated by DOT, the program focuses on counter-measures to reduce drunken driving.

Educational Materials: A Traffic Safety Calendar, magazines, bookmarks, growth charts, brochures and flyers are prepared by NYC DOT and distributed in conjunction with other City agencies and elected officials.

Engineering Initiatives

Infrastructure and Traffic Calming

DOT selects locations for study based on NYS accident data, as well as suggestions from communities, elected officials, and the Police Department. The DOT develops and implements mitigation measures to improve safety at these locations, if feasible.

Pedestrian and Traffic Safety Improvements: Recent projects have targeted the Grand Concourse in the Bronx, the Henry Hudson Parkway at 95th and 96th Streets in Manhattan, Queens Boulevard, the Ocean Parkway corridor in Brooklyn, and intersections across Staten Island. A full report on safety improvements can be found at www.nyc.gov/dot.

Pedestrian Bridges: In 2004, DOT completed a study of all 122 City pedestrian bridges. Slalom fencing and experimental pedestrian activated traffic signals have been added at locations where the bridge does not terminate on a sidewalk.

School-Focused Programs

Safe Routes to School: The City has focused on the safety of children where they are most prevalent: in the vicinity of schools. DOT identified 135 schools with the highest accident rates and issued comprehensive reports that provided short and long-term recommendations for infrastructure improvements. Traffic safety maps were also produced for and distributed to all elementary and middle schools (available online at www.nyc.gov/saferoutes). DOT is in the process of selecting and targeting an additional 135 elementary and middle schools for safety improvements. Staff will also examine accident data around the City's 400 high schools and select 40 with the highest accident rates for comprehensive study.

Other School Programs: DOT regularly installs speed reducers in the vicinity of schools with 60% of the city's speed reducers near schools. Additionally, DOT prioritizes replacement and repair of sidewalks around school facilities.

Technical Appendix

Data Sources

Injury deaths: Death certificates of all persons who died in NYC are collected and maintained by the DOHMH Bureau of Vital Statistics. For the years 2001 through 2005, 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.

Motor vehicle-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 70 motor vehicle transportation deaths among NYC children 1-12 years of age between 2001 and 2005. Motor vehicle-related child deaths were identified using the following International Classification of Disease 10 Codes: V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, and V89.2. Based on the Medical Examiner number found on the death certificate, OCME files were then 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 (MV-104, AIS, Supplemental Case Information and precinct reports); hospital reports; and ambulance call reports.

DOT Fatality Database: This database is initially updated from daily logs received from the NYPD Accident Investigation Squad (AIS). The log lists the fatalities by location and time of day, as well as the name, sex and age of the victim. Shortly thereafter, the AIS report and MV-104 police report is received. Additional key data (demographic information on person killed, and vehicle, environment and human factors contributing to the accident) from these reports are entered into the database. Approximately once a month, the total fatality numbers, by mode, are reconciled with NYPD to ensure that the numbers agree. Select fields from the database were used to describe the child fatalities studied in this report.

SAFETeam Reports: Fatal accidents are investigated by the DOT Severe Accident Forensic Evaluation Team (SAFETeam). SAFETeam is dispatched to fatal accident sites to expedite priority regulatory repairs and recommend other corrective measures that may prevent future incidents. SAFETeam investigations examine fatality locations to determine how and why the accident occurred. For this report, CFRT staff provided DOT with a list of the fatal accident locations. DOT then did a query on recommendations made as a result of SAFETeam investigations of these fatalities. Recommendations included addressing environmental improvements at many of the accident sites.

Police Accident Reports: The NYPD Highway Patrol District Accident Investigation Squad (AIS) investigates vehicle, bicycle, and pedestrian accidents in which a person is killed or seriously injured and likely to die. Police officers record information about fatal or non-fatal accidents on a two-page Police Accident Report. Fields on this form reflect the State Department of Motor Vehicle accident reporting requirements. Time and date of accident, demographic information on person killed or injured, and vehicle, environmental and human factors contributing to the accident are key fields on this form. Officers also write evaluative summaries detailing the accident.

US comparison data: National data on child fatalities come 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 accessed December 2006-April 2007.

Matching Files on Motor Vehicle-Related Child Deaths

Cases of motor-related child deaths between 2001 and 2005 identified by DOT and NYPD were matched with those recorded by the DOHMH's Bureau of Vital Statistics. Motor vehicle-related deaths were identified by underlying Cause of Death with the following International Classification of Disease 10 Codes: V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, and V89.2. Six deaths identified in the DOT Fatality Database did not have a clear death certificate match to the DOHMH Bureau of Vital Statistics. In these cases the accidents occurred in NYC but involved a non-NYC child resident; and therefore were not included in the CFRT review. Through these multiple matches, a total of 70 motor vehicle-related deaths were included in the final analysis.

Mapping Procedures

Locations of fatalities 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. Fatalities that denoted something other than a geocoded street intersection or street address (i.e. 250' from corner of Broadway and Worth St.) were first geocoded to the intersection and then offset the approximate distance noted in the table. Buffer distances were calculated at a specified distance of the location to identify nearby facilities (i.e. schools, parks). Elementary schools, middle schools, and junior and senior high schools located within 700 feet of the site of a fatal motor vehicle accident were also identified.

Additional Information

Data analysis: Rate calculations conducted by the DOHMH Bureau of Vital Statistics were conducted using SAS 9.1. Analysis by dedicated CFRT staff were performed with Microsoft Excel 2003. 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.