

## Understanding Child Injury Deaths: 2010-2015 Child Fatality Review Advisory Team Report

Child health and safety is a priority in New York City (NYC). Injuries are the leading cause of death among children ages 1 to 12 years<sup>a</sup> in NYC and the United States (U.S.). In NYC, fatal injuries disproportionately burden Black children. Health inequities, including injuries resulting from violence, are rooted in historical and contemporary injustices.

Understanding patterns of fatal injuries is essential for educating communities about injury risks, equitably directing prevention resources and enacting policies to protect all children. These data inform strategies for ensuring all

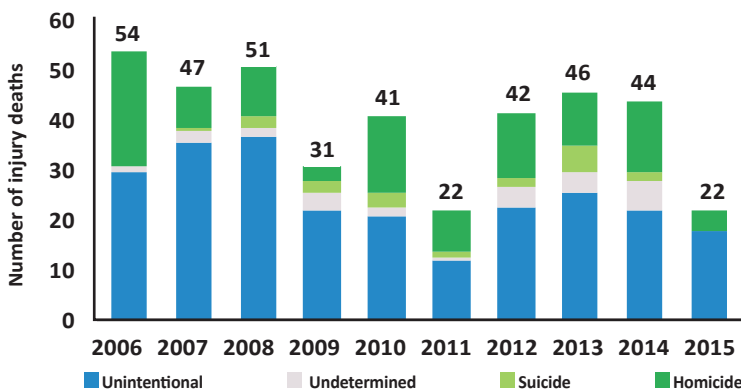
children can grow up in a safe and nurturing environment.

This report describes demographic patterns and leading causes of injury deaths among NYC children ages 1 to 12 years in 2010-2015. Trend information for child injury deaths from 2006 to 2015 is also included. A special section, using data newly available from the National Violent Death Reporting System (NVDRS), describes circumstances related to infant and child homicides in 2015.

Recommendations for preventing child injury deaths are provided on page four.

### New York City child injury deaths have declined since 2006

Trend in injury deaths among New York City children ages 1 - 12 years, 2006 - 2015



Source: NYC DOHMH Bureau of Vital Statistics, 2006 - 2015.

- The number of injury deaths among NYC children declined from 54 in 2006 to 22 in 2015, corresponding to a rate of 4.6 and 1.8 per 100,000 children, respectively.
- Child injury death rates in NYC are consistently lower than U.S. rates. The decline in NYC mirrors national patterns (see supplemental Table 1).
- In nearly every year from 2006 to 2015, unintentional injury deaths in children ages 1 to 12 years were the most common type of injury death, followed by homicides.
- Of the 22 injury deaths in 2015, 18 were unintentional and four were homicides.
- While there were no suicides among NYC children in 2015, a small but concerning increase in suicides among children ages 9 to 12 years was observed in 2013, similar to national patterns in recent years.

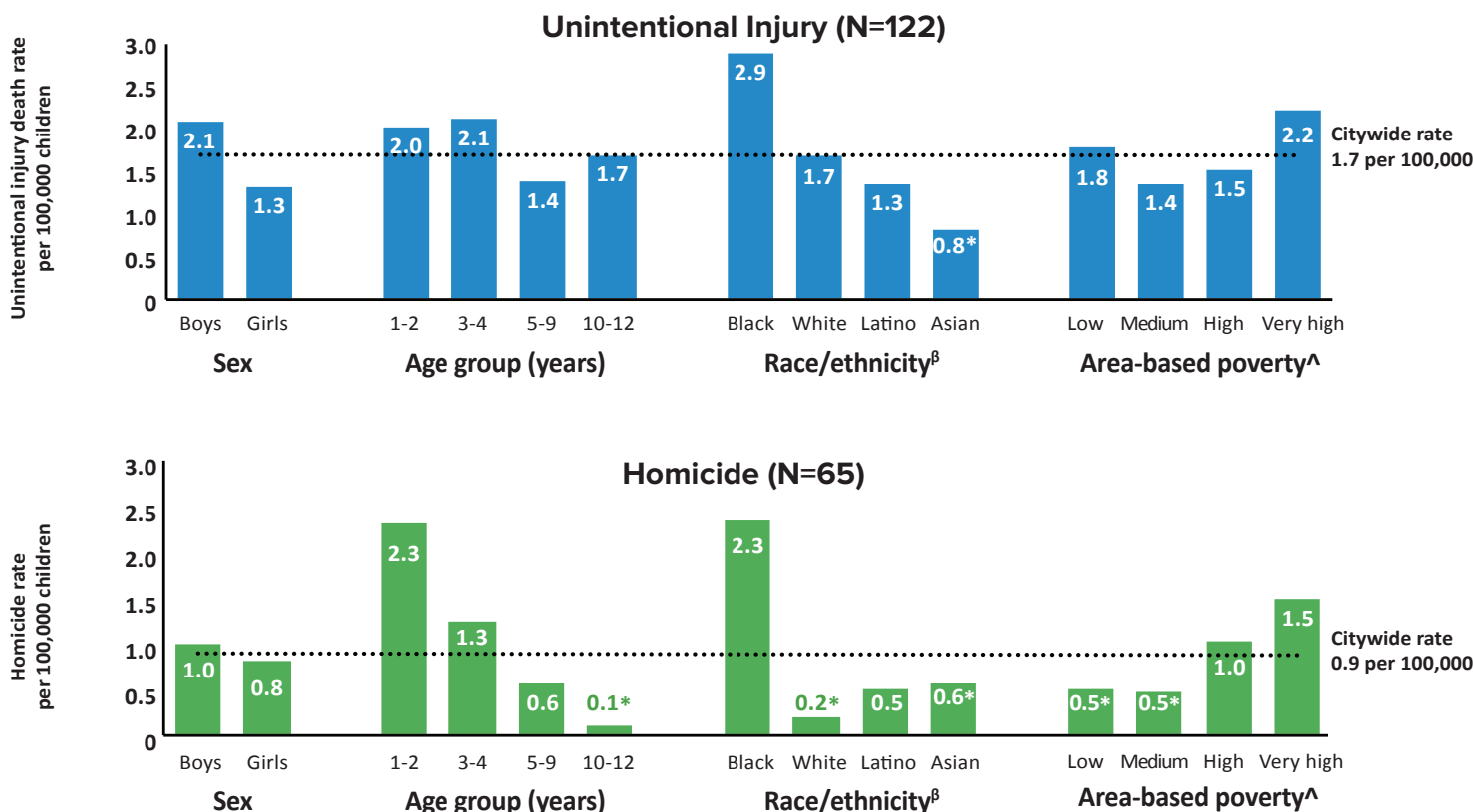
This report uses the following terms to describe the intent of actions that lead to injury deaths:

- **Unintentional** – Injury death that occurred without intent to cause harm, also known as “accident.”
- **Intentional** – Injury death that occurred with the intent to cause harm. Intentional deaths are further classified as:
  - o **Homicide** – Intentional death resulting from injuries inflicted by another person.
  - o **Suicide** – Intentional injury death resulting from self-harm.
- **Undetermined** – Injury death for which the intent cannot be determined.

<sup>a</sup>New York City Child Fatality Review Advisory Team (CFRAT) reports focus on children 1 to 12 years of age. CFRAT reports sometimes include other age groups as part of a special feature. See the [report archive](#). This report includes infants in the special feature section.

## Injury death rates were highest among younger children, Black children and children living in very high poverty areas

**Injury death rates among children ages 1 to 12 years by intent and demographic factors, New York City, 2010-2015**



Source: NYC DOHMH Bureau of Vital Statistics, 2010 – 2015

\*Estimate should be interpreted with caution. Estimate's relative standard error (a measure of estimate precision) is greater than 30%, making the estimate potentially unreliable.

<sup>β</sup>Black, White and Asian race categories exclude Latino ethnicity. Latino includes Hispanic or Latino of any race.

<sup>^</sup>Area-based poverty defined as proportion of residents in a ZIP code with incomes below 100% of the Federal Poverty Level (FPL) per the American Community Survey (2010-2014) in four categories: Low (<10% FPL), Medium (10%-<20% FPL), High (20%-<30% FPL) and Very High Poverty (≥30% FPL).

- Racial/ethnic disparities were apparent in fatal unintentional injury and homicide rates. Unintentional injury death rates were highest among Black children (2.9 per 100,000). The homicide rate among Black children (2.3 per 100,000) was three to 11 times higher than the rate among children of other racial/ethnic groups.
- The rate of unintentional injury death was higher among boys than among girls (2.1 vs. 1.3 per 100,000). Rates were also higher among younger children (ages 1 to 4 years).
- The homicide rate was highest among children ages 1 to 2 years compared with older age groups (2.3 vs. 1.3, 0.6 and 0.1 per 100,000).
- Homicide rates increased with poverty level; the rate among children living in very high poverty areas was three times that of children living in low- and medium-poverty areas (1.5 vs. 0.5 per 100,000).

## Homicide was a leading cause of child injury death in New York City

### Leading causes of injury deaths among children ages 1 to 12 years, New York City, 2010-2015

Rank**	2010	2011	2012	2013	2014	2015	2010-2015
1	Homicide (15)	Homicide (8)	Homicide (13)	Homicide (11)	Homicide (14)	Fire-related (7)	Homicide (65)
2	MVT (9)	MVT (4)	MVT (11)	MVT (10)	MVT (7)	MVT (6)	MVT (47)
3	Fire-related (4)	Fire-related (2) Suffocation (2) Nat/Env (2)	Nat/Env (3)	Fire-related (5)	Fire-related (5)	Homicide (4)	Fire-related (25)
				Suicide (5)			

\*\* Ranking excludes undetermined injury deaths. Multiple causes shown with same number are tied in rank.

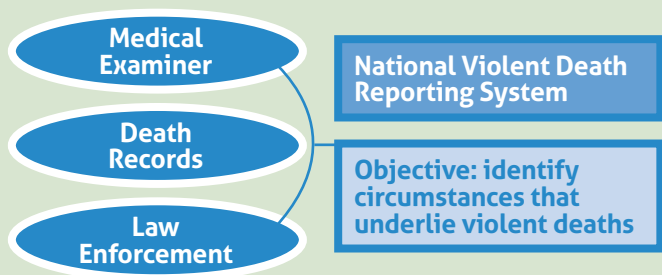
MVT=Motor-vehicle-traffic Nat/Env=natural/environmental causes, such as exposure to excessive heat or elements caused by natural disasters.

Source: NYC DOHMH Bureau of Vital Statistics, 2010 - 2015

**KEY**  
■ Unintentional  
■ Homicide  
■ Suicide

- In 2010-2015, most child injury deaths were from unintentional injuries. However, when homicides and suicides are compared with specific causes of unintentional injury death (motor-vehicle crashes, fire-related injuries, etc.), homicide ranked as the most common cause of injury deaths.
- Motor-vehicle-related injuries were the second leading cause of child injury death and the leading cause of unintentional child injury death in 2010-2015.
- In 2015, there was a single fire that resulted in multiple fatalities; this contributed to the high rank of this cause in 2015.

In 2015, the **National Violent Death Reporting System (NVDRS)** was implemented in NYC. This innovative surveillance system incorporates information from death certificates, medical examiner records and law enforcement reports to provide a comprehensive description of circumstances related to violent deaths.



- There were no homicides among NYC children ages 8 to 12 years in 2015.
- There were 12 homicides among NYC children 7 years and younger.
- Eight of the 12 infants and children were Black.
- Circumstances in homicide among NYC children include child abuse and neglect.

**Data Sources:** NYC DOHMH Bureau of Vital Statistics death certificates. Intent and cause of injury deaths were classified following the National Center for Health Statistics ICD-10 external cause of injury matrix. U.S. data from Centers for Disease Control and Prevention (CDC) Wonder accessed May 8, 2017. For the purpose of this publication, Latino includes people of Hispanic origin based on ancestry reported on the death certificate, regardless of reported race; Latino excludes reported ancestry from non-Spanish speaking Central/South American countries, and non-Spanish speaking Caribbean islands. Black, White and Asian race categories do not include people of Latino origin. Area-based poverty is defined as proportion of residents in a ZIP code with incomes below 100% of the Federal Poverty Level (FPL) per the American Community Survey (2010-2014) in four categories: Low (<10% FPL), Medium (10%-<20% FPL), High (20%-<30% FPL), and Very High Poverty (≥30% FPL).

**National Violent Death Reporting System (NVDRS)** is a CDC-funded state-based surveillance system linking information from Vital Statistics, medical examiner and law enforcement records. The New York City Health Department partnered with the New York State Department of Health to build and implement this surveillance system.

More information on data sources and population estimates for rate calculations can be found in the appendix.

## Recommendations



### Parents and Caregivers:

- Every parent needs support. For information and resources check out [Growing Up NYC](#), [Our Littlest New Yorkers](#) and the CDC's [Positive Parenting Tips](#).
- Help build resilience in children to reduce suicide risk. Focus on strengthening coping skills, improving school connectedness, and building peer, family and community supports. Call 1-888-NYC-WELL or visit [nyc.gov/nycwell](http://nyc.gov/nycwell) for more information.
- Be sure your household has working smoke alarms and carbon monoxide detectors and an evacuation plan.
- Be role models for [safe walking](#). Teach children to cross the street at crosswalks, follow signals, look both ways and keep scanning, and listen for car and truck engines.



### Educators, Health Care Providers and Clergy:

- Everyone can and should report suspicions of child abuse or neglect. Some professionals such as physicians and teachers are legally required to do so. Call 1-800-635-1522 or 311.
- Recognize risk factors for mental health problems in parents and children. Get training in [Youth and Adult Mental Health First Aid](#).
- [NYC WELL resources for providers](#) and [Project TEACH](#) can help health care providers address mental health issues and make referrals.



### Policy-Makers:

- Support programs such as the [Newborn Home Visiting Program](#) and [Nurse-Family Partnership](#) that help parents provide a safe and nurturing environment for their children.
- Expand social, emotional and mental health resources for parents and children, particularly those who have pre-existing mental health needs and/or have experienced adverse life events, as described in [ThriveNYC: A Mental Health Roadmap for All](#).
- Promote safe streets initiatives that pursue [Vision Zero](#) goals and encourage responsible driver behavior, more speed enforcement cameras and additional targeted enforcement.
- Promote health equity by supporting racial justice initiatives and investing in neighborhoods impacted by a history of structural racism. Search "CHE" at [nyc.gov](http://nyc.gov) to learn more about [health equity](#).

**The New York City Child Fatality Review Advisory Team (CFRAT)** — a multidisciplinary committee of representatives from City agencies and child welfare and medical experts appointed by the Mayor, the City Council Speaker and the Public Advocate for the City of New York — was formed in 2006 by Local Law 115 to review and report on injuries as preventable causes of death among New York City children under the age of 13.

**Appointees:** **Stephen Ajl, MD** Brooklyn Hospital Center; **Jocelyn Brown, MD** New York-Presbyterian/Columbia; **Stephanie Gendell, Esq.** Citizens' Committee for Children; **Zvi Gluck, Amudim;** **Donna Lawrence, MA** "I Have a Dream" Foundation.

**City Agency Representatives:** **Catherine Stayton (Chair)** Department of Health and Mental Hygiene; **Ancil Payne** Administration for Children's Services; **Cheryl A. Hall** Department of Education; **Paula Gannon** Department of Transportation; **Melissa Pasquale-Styles, MD** Office of Chief Medical Examiner; **Detective Anthony West** NYC Police Department



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# Vital Signs Data Tables

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## Understanding Child Injury Deaths: 2010-2015 Child Fatality Review Advisory Team Report

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### Data Sources

**NYC DOHMH Bureau of Vital Statistics death certificates.** For the purpose of this publication, Latino includes persons of Hispanic origin based on ancestry reported on the death certificate, regardless of reported race; Latino excludes reported ancestry from non-Spanish speaking Central/South American countries, and non-Spanish speaking Caribbean islands. Black, White, and Asian, race categories do not include persons of Latino origin. Intent and cause of injury deaths were classified following the National Center for Health Statistics ICD-10 external cause of injury matrix. Area-based poverty defined as proportion of residents in a ZIP code with incomes below 100% of the Federal Poverty Level (FPL) per American Community Survey (2010-2014) in four categories: Low (<10% FPL), Medium (10%-<20% FPL), High (20%-<30% FPL), and Very High Poverty (≥30% FPL). available at: [http://www.cdc.gov/nchs/injury/injury\\_tools.htm](http://www.cdc.gov/nchs/injury/injury_tools.htm). The following ICD-10 codes were used to identify injury deaths: V01-X59, X85-Y09, X60-X84, Y10-Y34.

**US Mortality Data:** National data were obtained from the Centers for Disease Control's (CDC) **Wide-ranging Online Data for Epidemiologic Research (WONDER)**. Data were accessed 5/8/2017 at: <http://wonder.cdc.gov/>.

**DOHMH Population Estimates:** Age-specific population rates were calculated using NYC DOHMH population estimates, modified from U.S. Census Bureau interpolated intercensal population estimates from 2010-2015 updated August, 2016.

**Table 1. Annual injury deaths, children ages 1 to 12 years, New York City vs. United States, 2000-2015***Sources: DOHMH Bureau of Vital Statistics, CDC WONDER*

Year	NYC		US	
	Number	Rate <sup>1</sup>	Number	Rate <sup>1</sup>
2000	64	4.9	4814	9.9
2001*	58	4.5	4592	9.5
2002	56	4.4	4455	9.2
2003	48	3.8	4293	8.9
2004	47	3.8	4264	8.9
2005	55	4.6	4155	8.7
2006	54	4.6	4027	8.4
2007	47	4.1	3887	8.1
2008	51	4.4	3612	7.5
2009	31	2.7	3507	7.2
2010	41	3.5	3366	6.9
2011	22	1.9	3372	6.9
2012	42	3.5	3271	6.7
2013	46	3.8	3216	6.6
2014	44	3.6	3111	6.4
2015	22	1.8	3184	6.5

<sup>1</sup>Rate per 100,000

\*excludes 18 NYC deaths from a single unintentional plane crash event

US from CDC Wonder accessed 5/8/2017 (excludes legal intervention deaths)

**Table 2. Annual injury deaths by intent, New York City children ages 1 to 12 years, 2000-2015**

Sources: DOHMH Bureau of Vital Statistics

Year	Unintentional		Homicide		Suicide		Undetermined	
	Number	Rate <sup>1</sup>	Number	Rate <sup>1</sup>	Number	Rate <sup>1</sup>	Number	Rate <sup>1</sup>
2000	43	3.3	19	1.4	1	0.1 *	1	0.1 *
2001**	37	2.9	17	1.3	1	0.1 *	3	0.2 *
2002	44	3.4	8	0.6 *	0	0.0	4	0.3 *
2003	29	2.3	13	1.0	0	0.0	6	0.5 *
2004	39	3.2	7	0.6 *	1	0.1 *	0	0.0
2005	34	2.8	15	1.3	2	0.2 *	4	0.3 *
2006	30	2.6	23	2.0	0	0.0	1	0.1 *
2007	36	3.1	8	0.7 *	1	0.1 *	2	0.2 *
2008	37	3.2	10	0.9 *	2	0.2 *	2	0.2 *
2009	22	1.9	3	0.3 *	2	0.2 *	4	0.3 *
2010	21	1.8	15	1.3	3	0.3 *	2	0.2 *
2011	12	1.0	8	0.7 *	1	0.1 *	1	0.1 *
2012	23	1.9	13	1.1	2	0.2 *	4	0.3 *
2013	26	2.2	11	0.9 *	5	0.4 *	4	0.3 *
2014	22	1.8	14	1.2	2	0.2 *	6	0.5 *
2015	18	1.5	4	0.3 *	0	0.0	0	0.0

<sup>1</sup>Rate per 100,000

\*Estimate should be interpreted with caution. Estimate's Relative Standard Error (a measure of estimate precision) is greater than 30%, making the estimate potentially unreliable.

\*\*excludes 18 NYC deaths from a single unintentional plane crash event

**Table 3. Demographics of injury deaths among New York City children ages 1 to 12 years: Age, sex, race/ethnicity, borough of residence, and area-based poverty by intent, 2010-2015**

Source: DOHMH Bureau of Vital Statistics

	Unintentional			Homicide			Suicide			Undetermined			Total		
	Number	%	Rate <sup>1</sup>	Number	%	Rate <sup>1</sup>	Number	%	Rate <sup>1</sup>	Number	%	Rate <sup>1</sup>	Number	%	Rate <sup>1</sup>
<b>Age group</b>															
1 to 2 years	27	22	2.0	31	48	2.3	0	0	0.0	10	59	0.8 *	68	31	5.1
3 to 4 years	27	22	2.1	16	25	1.3	0	0	0.0	5	29	0.4 *	48	22	3.8
5 to 9 years	40	33	1.4	16	25	0.6	2	15	0.1 *	0	0	0.0	58	27	2.0
10 to 12 years	28	23	1.7	2	3	0.1 *	11	85	0.7 *	2	12	0.1 *	43	20	2.6
<b>Sex</b>															
Boys	76	62	2.1	37	71	1.0	7	54	0.2 *	8	57	0.2 *	128	59	3.5
Girls	46	38	1.3	28	29	0.8	6	46	0.2 *	9	43	0.3 *	89	41	2.5
<b>Race/ethnicity<sup>2</sup></b>															
Black	48	39	2.9	39	60	2.3	5	38	0.3 *	9	53	0.5 *	101	47	6.1
White	32	26	1.7	4	6	0.2 *	2	15	0.1 *	4	24	0.2 *	42	19	2.2
Latino	34	28	1.3	13	20	0.5	3	23	0.1 *	1	6	0.0 *	51	24	2.0
Asian/Pacific Islander	7	6	0.8 *	5	8	0.6 *	1	8	0.1 *	3	18	0.3 *	16	7	1.9
<b>Borough of residence</b>															
Bronx	37	30	2.5	18	28	1.2	4	31	0.3 *	7	41	0.5 *	66	30	4.5
Staten Island	9	7	2.1 *	5	8	1.2 *	0	0	0.0	0	0	0.0	14	6	3.3
Brooklyn	40	33	1.6	26	40	1.1	2	15	0.1 *	7	41	0.3 *	75	35	3.1
Manhattan	9	7	0.9 *	7	11	0.7 *	3	23	0.3 *	1	6	0.1 *	20	9	2.1
Queens	27	22	1.4	9	14	0.5 *	4	31	0.2 *	2	12	0.1 *	42	19	2.2
<b>Area-based Poverty<sup>3</sup></b>															
Low	18	15	1.8	5	8	0.5 *	0	0	0.0	1	6	0.1 *	24	11	2.4
Medium	31	25	1.4	11	17	0.5 *	4	31	0.2 *	4	24	0.2 *	50	23	2.2
High	28	23	1.5	19	29	1.0	3	23	0.2 *	4	24	0.2 *	54	25	2.9
Very High	45	37	2.2	30	46	1.5	6	46	0.3 *	8	47	0.4 *	89	41	4.4
<b>Total</b>	<b>122</b>	<b>56</b>	<b>1.7</b>	<b>65</b>	<b>30</b>	<b>0.9</b>	<b>13</b>	<b>6</b>	<b>0.2</b>	<b>17</b>	<b>8</b>	<b>0.2</b>	<b>217</b>	<b>100</b>	<b>3.0</b>

<sup>1</sup>Rate per 100,000

<sup>2</sup>Black, White and Asian race categories exclude Latino ethnicity. Latino includes Hispanic or Latino of any race.

<sup>3</sup>Area-based poverty defined as proportion of residents in a ZIP Code with incomes below 100% of the Federal Poverty Level (FPL) American Community Survey (2010-2014), in four categories: Low (<10% FPL), Medium (10%-<20% FPL), High (20%-<30% FPL), and Very High Poverty (≥30% FPL)

Percents may not sum to 100% due to rounding. Other race/ethnicity not displayed due to small numbers.

\*Estimate should be interpreted with caution. Estimate's Relative Standard Error (a measure of estimate precision) is greater than 30%, making the estimate potentially unreliable.



**Table 4. Leading causes of injury deaths, New York City children ages 1 to 12 years, 2010-2015**

Sources: DOHMH Bureau of Vital Statistics

Cause	2010-2015		2010		2011		2012		2013		2014		2015	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Homicide	65	30%	15	37%	8	36%	13	31%	11	24%	14	32%	4	18%
Motor Vehicle Traffic <sup>1</sup> (Unintentional)	47	22%	9	22%	4	18%	11	26%	10	22%	7	16%	6	27%
Fire/flare (Unintentional)	25	12%	4	10%	2	9%	2	5%	5	11%	5	11%	7	32%
Suffocation (Unintentional)	13	6%	2	5%	2	9%	2	5%	4	9%	1	2%	2	9%
Suicide	13	6%	3	7%	1	5%	2	5%	5	11%	2	5%	0	0%
Drowning (Unintentional)	9	4%	1	2%	0	0%	2	5%	2	4%	3	7%	1	5%
Fall (Unintentional)	7	3%	1	2%	0	0%	1	2%	2	4%	2	5%	1	5%
Poisoning (Unintentional)	6	3%	3	7%	1	5%	0	0%	0	0%	2	5%	0	0%
Natural/Environmental (Unintentional)	6	3%	0	0%	2	9%	3	7%	1	2%	0	0%	0	0%

<sup>1</sup>Motor vehicle (MV) traffic-related, 80% of which are pedestrians struck by motor vehicles

See appendix glossary for more information about classification of injury mechanisms

Note: excludes injuries of undetermined intent

**Table 5. Trends in leading causes of injury deaths, New York City children ages 1 to 12 years, 2000-2015***Sources: DOHMH Bureau of Vital Statistics*

Cause	2000-2004		2005-2009		2010-2015	
	Rank	%	Rank	%	Rank	%
Homicide	2	25%	1	26%	1	33%
Motor Vehicle Traffic <sup>1</sup> (Unintentional)	1	27%	1	26%	2	24%
Fire/flame (Unintentional)	3	20%	3	20%	3	13%
Suffocation (Unintentional)	5	5%	4	10%	4	7%
Suicide	8	1%	6	3%	4	7%
Drowning (Unintentional)	6	3%	7	2%	6	5%
Fall (Unintentional)	4	8%	5	6%	7	4%
Poisoning (Unintentional)	7	2%	8	0%	8	3%
Natural/Environmental (Unintentional)	9	1%	9	0%	8	3%

<sup>1</sup>Motor vehicle (MV) traffic-related, 80% of which are pedestrians struck by motor vehicles

See appendix glossary for more information about classification of injury mechanisms

Note: Excludes undetermined intent. N's cannot be compared because of differing numbers of years between the time periods. Relative rank and percents may be compared.

## Appendix: Glossary of injury intent and mechanism terminology

This report uses the following terms to describe the intent of actions that lead to the injury death:

<b>Unintentional:</b>	Injury death that occurred without intent to harm or cause death, also called "accident."
<b>Homicide:</b>	Death resulting from injuries inflicted by another person, with the intent to cause harm.
<b>Suicide:</b>	Injury death resulting from self-harm.
<b>Undetermined:</b>	The intent of the injury death cannot be determined.

This report uses the following terms to describe the mechanism that cause the injury death:

<b>Cut/pierce:</b>	death resulting from an incision, slash, penetration, or puncture of sharp instrument, weapon, or object.
<b>Drowning:</b>	death resulting from submersion in water or other liquid.
<b>Fall-related:</b>	death from any injury received when someone descends abruptly as a result of the force of gravity and strikes a surface at the same or lower level.
<b>Fire/flame related:</b>	death caused by an injury resulting from severe exposure to flames, heat or smoke inhalation.
<b>Firearm:</b>	death resulting from penetrating force injury from a bullet or other projectile shot from a powder-charged gun.
<b>Hot object/scald:</b>	death resulting from contact with heat, hot substances, or hot objects.
<b>Natural/environmental:</b>	death resulting from exposure to adverse natural and environmental conditions (e.g., severe heat, severe cold, lightning, tornadoes, and natural disasters), as well as lack of food or water.
<b>Not Elsewhere Classified:</b>	death resulting from an injury not classifiable in another category.
<b>Not specified:</b>	death from an injury missing either the manner (e.g., intentional, unintentional) or mechanism (e.g., motor vehicle, firearm) of the injury.
<b>Other land transport:</b>	death resulting from other land transportation-related crashes, excluding injuries to pedal cyclists and pedestrians.
<b>Other pedal cyclist:</b>	death caused by injuries to a pedal cyclist from a non-motor vehicle transportation-related crash.
<b>Other pedestrian:</b>	death caused by injuries to a pedestrian from a non-motor vehicle transportation-related crash.
<b>Other specified:</b>	death from an injury associated with any other specified cause that does not fit another category.
<b>Motor vehicle-related:</b>	death caused by injuries from a motor vehicle collision including injuries to a motor vehicle occupant, pedestrian, or pedal cyclist.
<b>Poisoning:</b>	death resulting from ingestion, inhalation, absorption through the skin, or injection of so much of a drug, toxin, or other chemical that a harmful effect results (e.g., drug overdoses). This category does not include harmful effects from normal therapeutic drugs (i.e., unexpected adverse effects to a drug administered correctly to treat a condition) or bacterial illnesses.
<b>Struck by/against:</b>	death resulting from being struck by (i.e., hit) or crushed by a human, animal, or inanimate object or force other than a vehicle or machinery.
<b>Suffocation:</b>	death from injuries due to inhalation, aspiration, or ingestion of food or other object (e.g., choking), and mechanical suffocation (e.g., hanging). Note: most suffocation deaths among younger children (aged 1 to 9) were unintentional choking and among older children (aged 10 to 12) were suicide by hanging.

**Note:** The above mechanisms are based on the International Classification of Diseases (ICD) Injury matrices, which are frameworks designed to organize ICD coded injury data into meaningful groupings for national and international comparability. Source: NCHS. ICD-10: External cause of injury mortality matrix.

Available from: [http://www.cdc.gov/nchs/injury/injury\\_matrices.htm](http://www.cdc.gov/nchs/injury/injury_matrices.htm)