Ride-Related Fatalities

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Numbers and Causes of Fatalities.

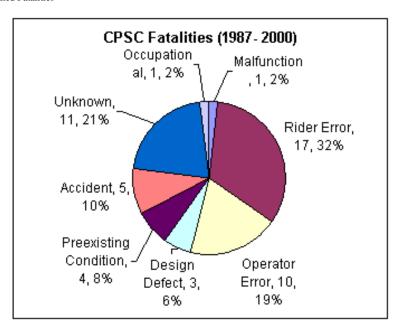
According to the most recent report of the U.S. Consumer Product Safety Commission (CPSC), between 1987 and 2000 there were 51 amusement park ride fatalities in the United States. This is a very, very small number. As discussed below, many common activities are more likely to cause fatalities.

The total of 51 fatalities itself is misleading as an indication of ride safety. Of these 51 fatalities, about one-third were due to rider error and another 10 percent were due to pre-existing medical conditions of the riders.

In order to understand the data, the 51 fatalities are individually listed below. There are links to the press articles describing the accidents. This paper assigns causes to the fatalities as falling into one or more of eight categories. The causes can then be summarized as follows:

Cause of fatality	Number
Rider error	17
Operator error	10
Pre-existing medical condition	4
Design defect	3
Accident	5
Unknown	11
Occupational death of worker	1

This can be shown in percentage form as follows:

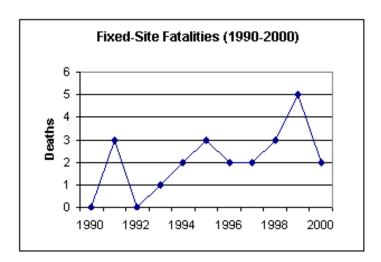


Causes of Fatalities

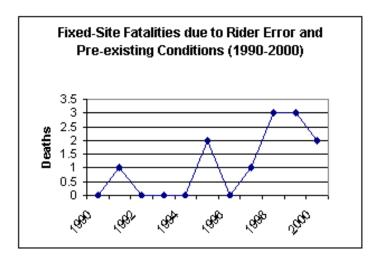
MF	Accident caused by a ride which malfunctioned
RE	Accident caused by rider error.
OE	Accident caused by operator error
DD	Accident caused by a design defect.
PC	Accident caused by preexisting condition, for which the ride may or may not have been the primary aggravating factor.
AC	Accident when ride design, operation, rider and operator behaved properly.
UN	Cause cannot be ascertained with current information.
ОС	Occupational Death

Numbers of fatalities per year

The numbers of fatalities varied from a low of zero in 1990 and 1992, to a high of five in 1999. Thus, although the numbers are very small, there is a slightly increasing trend.



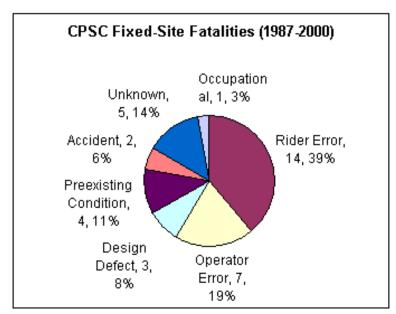
The number of fatalities caused by rider error or pre-existing medical conditions tracks roughly with the number of fatalities:

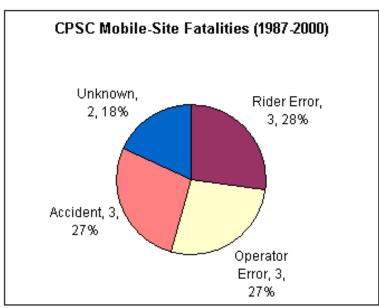


Thus, there have been a small number of fatalities, increasing slightly over the period studied. The increase is in part due to the increase in fatalities caused by rider error and by pre-existing medical conditions.

Fixed versus Mobile Amusement Parks

There were more fatalities at fixed-site amusement parks than at mobile parks. The graphs below show that the incidents at fixed-site parks are more likely to be caused by rider error and pre-existing medical conditions.





2. Fatalities Due to Accidents: Comparison of Amusement Park Rides with Other Activities

The National Center for Health Statistics, a division of the CDC, estimates that every year 97,860 people die from accidental injury (35.9 per 100,000 people), making accidental injury the fifth leading cause of death in the country. If one assumes 1 billion rides per year, conservatively equivalent to four rides per visitor, and 2.5 deaths per year at fixed-site rides, the amusement-ride mortality rate would be 1 in 400 million. Otherwise put, one is significantly less likely to sustain a fatal injury while riding a roller coaster than not.

Studies also show that one is safer on a roller coaster than at school. A study published by the Journal of the American Medical Association found 105 school related deaths over the period of 1992-1994, equivalent to a .09 per 100,000 per student-year (or 1 in 1,111,111).

In 1998, the CPSC published a study estimating the number of annual electrocutions from consumer products:

Electrocutions Involving Consumer Products, 1998, CPSC (<u>link</u>)				
Product Type	Total			
Radio, Television, Stereo	4			
Equipment				
Extension cords	12			
Refrigerator	2			
Microwaves	12			
Fans	4			
Battery chargers	12			

3. New Jersey Fatalities

Date/CPSC#	Park	Description	Туре	Cause
8/28/1999 (49)	Wild Wonder Ride, Gillian's Water Wonderland, Ocean City, NJ	Kimberly Bailey and her daughter were killed when a braking mechanism failed on the coaster. Man Whose Wife, Daughter Died in Coaster Ride Seeking \$275M Fines Appealed in Roller Coaster Deaths, 3/10/2000 Complaints about ride follow crash Killer coaster may have been faulty for days Fatal Ocean City roller coaster crash caused by faulty replacement Tears and Memories at Service for Coaster Pair	F	MF

6/11/1999 (45)	Super Himalaya, Coney Island, NY	Nadine Caban, 17, was visiting the boardwalk at Coney Island with her sisters Elsie, 19, and Nagalie, 23, when a piece of wooden scenery fell from the roof of a bobsled-type ride called the Super Himalaya, causing the car in which Nadine was riding alone to jump the tracks. She was thrown 15 feet in the air before being pinned between the track and a car. Caban later died of internal injuries. After an investigation, the city fined Norman Kaufman who could produce neither a maintenance log, nor a manufacturer's manual for the ride. Only three months earlier, the ride had passed an inspection by the Department of Buildings. Coney Island Visitors are Sparse and Careful After Fatal Accident on a Ride Ride Death Spurs Inspection Changes In New York City	F	OE
7/11/1997 (36)	New Jersey	According to CPSC: Struck head while on roller coaster-ride - Complications of subdural hematoma: Head Injury - Autopsy A 49 year old male allegedly suffered a head injury on an amusement park ride which cause injury to the brain with no external signs. On his way home, he deteriorated and was taken to a hospital where he died the next day. Official cause of death was complications of subdural hematoma	U	UN
6/17/1987 (3)	Six Flags-Great Adventure, Lightnin' Loops, Jackson, NJ	Karen Anne Marie Brown of Chester, Pa., died because her harness had not been secured. The state Department of Labor fined the park \$1,000 because the ride operator failed to secure the harness. Harness Blamed in Rider's Death Coaster Rider Unharnessed 6 Flags fined \$1,000 in coaster death	F	OE
5/11/1987 (Not CPSC)	Haunted House, Six Flags Great Adventure, Jackson, NJ	A fire at a haunted house killed 8. Park executives were arraigned on manslaughter charges then allowed to avoid a trial, without admitting guilt (New Jersey law allows this for first time offenders). The fire was caused by a 14 year old who used a lighter to find his way in the dark, other safety violations were also present. Amusement Park Executives Arraigned On Manslaughter Charges Judge Allows Amusement Park Executives to Avoid Trial	F	RE/OE

4. National Fatalities

Date/CPSC#	Park	Description	Туре	Cause
	Disney World, Orlando, FL	William Pollack, 37, died when he fell out of his seat in mid-ride and was struck by another "log." He died from "blunt-force trauma to the chest" Disney ride had a record of trouble Disney reopens 1 day after fatal accident	F	RE

7/3/2000 (50)	Lake Plunge, Lake Compounce, Hartford, CT	Deven Alexander, 6, died after his step-father sent his son, who could not swim on a ride marked "Strong swimmers only. Deep Water. Strong Current." The boy's body was found 25 minutes later by park lifeguards. 5-year old Critically Injured in Amusement Park Accident Police, park investigate incident	F	RE
8/23/1999 (47)	Shockwave, Kings Dominion, Hanover, VA	Timothy Fan, 20, was ejected from the car after he freed himself from the shoulder and waist harnesses in mid-ride. Man who fell had partially taken off restraints Theme park cites witness reports of rider misconduct	F	RE
8/22/1999 (46)	Drop Zone, Paramount's Great American Park, Santa Clara, CA	Joshua Smurphat, 12, was ejected from the coaster though his restraints seemed to be operating properly. Park investigation shows harness was locked before boy's death Questions raised about whether disabled boy should have been allowed on ride	F	RE
6/25/1999	Indiana Jones Adventure, Disneyland, Anaheim, CA	Cristina Moreno died when an aneurysm burst while she was on an amusement ride. Dead Woman's Kin Sue Disney Over Indiana Jones Ride	F	PC
6/11/1999 (45)		See "New Jersey Accidents"	F	OE
3/21/1999 (44)	Roaring Rapids, Six Flags Over Texas, Arlington, TX	Valeria Cartwright died when a water ride craft flipped over due to defective rubber bladders. While Six Flags paid \$4 million to settle the suit, both parties are now pursuing Canyon Manufacturing, the manufacturer of parts for the ride. Woman dies on Six Flags boat ride; 10 others hurt when raft flips Six Flags to Pay \$4 Million in 'Roaring Rapids' Death	F	DD
12/31/1998 (43)	Las Vegas, NV	Woman, 46, died of a subdural hematoma with bleeding into the brain 7 days after she as riding a roller coaster.	U	UN
12/24/1998 (42)	Frontierland, Disneyland, Anaheim, CA	Luan Phi Dawson, 33, died when a mooring cleat on a boat struck him after being ripped out of place. Autopsy report details how accident occurred Coroner's report blames ship operator for Disneyland death	M	OE

8/30/1998 (41)	[kiddie train], West Side Youth Carnival, Mendota, CA	Isasas Torres, 13 months, died when he fell of a train ride. According to reports, the boy was standing and not seated at the time of the accident. According to reports, the toddler was unsupervised at the time of the accident, with the mother sitting at the back of the train while the boy was in front. NOTE: CPSC incorrectly lists this accident as also killing a female toddler as well, all reports point to a single boy; however, in a similar but separate incident, the same operator, B&B Amusements, was indicted in the death of a female toddler. According to the CPSC, the ride had been banned because officials felt it did not provide an adequate restraint system. Facts sought in boy's death on kiddle ride 2 companies cleared in toddler's death in Mendota	M	RE
8/13/1998 (40)	Screaming Yellow Eagle, Knott's Camp Snoopy, Bloomington, MN	Clarissa Robinson, 8, suffered a fatal heart-attack on the roller coaster. At age 3, she had been diagnosed with a heart condition, but prior to the accident had received a clean bill of health. The ride's warning sign stated: "You must be in good health to take this fast-moving ride (free from heart and nervous disorders, weak back, neck or other physical limitations)." Girl with heart condition dies after ride at Mall of America	F	PC
8/01/1998 (39)	Mall of America, MN	David Craig, 12 died when he stood up and tried to get off of a water log ride. Boy dies after accident on Mall of America ride Manufacturer says belts wouldn't have prevented death; consultant disagrees	F	RE
3/19/1998 (38)	The Himalaya,	Leslie Lane, 9, was thrown from a roller coaster car when her lap restraint broke off. (B&B) Fatal Ride Returned to Owner Chronology of the Case Guilty plea in death on amusement ride	M	OE
9/7/1998 (37)	Top Gun, Paramount's Great American Park, Santa Clara, CA	Hector Mendoza, 25, died when he was struck in the head by the foot of a passenger on a high-speed roller coaster. Police and park officials stated that Mr. Mendoza climbed a chain link fence, and passed through a door marked "Employees only" in order to retrieve a lost cap. Coaster Victim's Death Witnessed by Family Man dies in coaster accident Bizarre Coaster Accident Kills Hayward Man at Great America	F	RE
7/11/1997 (36)	New Jersey	See "New Jersey Accidents"	U	UN
5/23/1997 (35)	Geauga Lake Amusement Park, Aurora, OH	A 14 year-old girl died after she suffered a severe asthma attack on a roller coaster. Teen dies after amusement ride	F	PC

(34)	The Wildcat, Bell's Amusement Park, Tulsa, OK	Patrick Kurek, 14, was ejected from his seat when the coaster's chain broke, and the anti-rollback device malfunctioned. After an investigation, the Oklahoma Labor department concluded" Bell's personnel substituted the plastic material [Nylatron] used by the Wildcat's manufacturer with a plastic which is not recommended for use in an anti-rollback device," according to the Tulsa World. A subsequent law suit was settled out of court. Boy killed in roller coaster clash Bell's probe moves ahead Amusement park ordered shut as probe starts Wildcat Material Faulted OC Engineering Firm Joins Probe Joe and Jane Kurek discuss safety at amusement parks Bell's Accident Settlement Reached	F	DD
2/22/1997 (33)	[merry go round], Pistol Pete's Pizza, Las Vegas, NV	Myesha Roberson, 3, died when she fell off of a merry go round. The death was declared accidental by police and there was no investigation. Girl killed in fall identified	U	AC
8/19/1996 (32)	Vernon/Staten Island, NY	CPSC A 52 year-old man injured his knee at an amusement park and died 5 days later or a pulmonary thromboembolism.	F	AC
8/16/1996 (31)	Kamikaze, Illinois State Fair, Springfield, IL	Tamara Terrell, 14, developmentally disabled and a ward of the state, died when she fell out of a pendulum-life ride. According to reports, Ms. Terrell tried to get out of her seat when the ride was inverted. Authorities discovered the existence of a 16-inch wide gap that existed after the cage door was closed; they believe the gap was large enough for a girl her age to fall through. Authorities did not choose to prosecute the operator. Girl's panic led to fall from ride Teen killed in ride at state fair Police say fair ride not defective	М	RE
8/11/1996 (30)	Old Indiana Family Fun 'N Water Park, OH	Nancy Jones, 57 died when a miniature train derailed (her 4 year-old granddaughter was paralyzed). Park owners admitted negligence and filed for bankruptcy after it was shown that the ride had derailed 79 times in the two months prior to the accident. The ride of your life	F	OE
11/25/1995 (29)	Jacksonville or Tallahassee, FL	According to the CPSC A 2 year-old girl died when she slipped and fell on the steps leading to a ride.	М	AC

6/30/1995 (28)	Timberwolf, Worlds of Fun, Kansas City, MO	Ryan Bielby, 14, died when she fell out of her roller coaster seat. At the time of the accident, Missouri did not have any laws regulating roller coaster rides at the time of the accident. Fatality sparks closer look at belts on roller coaster Lawyers say coaster riders are speculating Police rule out accounts of roller coaster accident; Detective agrees with experts on Timber Wolf bar, seat belt. Mother gets \$ 200,000 settlement in girl's death	F	RE
6/14/1995 (27)	PA	According to the CPSC: A 77 year old male was at an amusement park with his grandchildren. The victim's head was bumped by a roller coaster ride. He did not seek medical treatment. 4 days later, the victim became ill and lapsed into a coma. He was admitted to the hospital with a brain hemorrhage. The victim was placed on life support and died within 24 hours of the removal of life support.	F	UN
6/9/1995 (26)	Kumba, Busch Gardens, Tampa Bay, FL	Lacey Ingram, 13, died from a seizure while on a roller coaster (she had a history of seizures). Her sister, who also had a congenital heart condition, died as well; officials with the Florida Department of Children and Families said in October that the parents did not administer two prescription heart medications for three weeks before LaDawn's heart failure. Despite these facts, a jury awarded the Ingram family a \$350,000 settlement. Girl who died after roller coaster ride identified "I shouldn't have gone on this ride" Nurse: Aid to Kumba rider slow to arrive Lawyer hired to probe girl's Kumba death Park won't fight Kumba death award Sister of heart attack victim herself dies of heart attack	F	PC
8/14/1994 (25)	Twister Ride, Quassy Amusement Park, Middlebury, CT	Michael Mills, a 6 year-old, died when the start button was pushed between rides. A witness stated that several kids had been standing near the button when the accident happened. 6-Year-Old Boy Struck and Killed by Amusement Park Ride Boy killed by amusement park ride Accident on Quassy Park ride kills boy, 6	F	OE
7/9/1994 (24)	Spartanburg, NC	According to the CPSC: A 6 year old female drowned when an amusement ride into water and her shirt got caught in a propeller on the ride.	F	UN
9/11/1993 (23)	Lackland AFB	Fell off carnival ride struck on head.	М	UN

6/10/1993 (22)	Candy Cane Sleigh Ride, Santa's Village, East Dundee, IL	Jean Matranza, 67, died when a pony-pulled sleigh jumped its tracked and flipped. Woman Dies in Amusement Park Accident Woman Killed in Accident On Ride at Santa's Village	F	AC
6/09/1993 (21)		According to the CPSC: A female died and a male and female were injured when apparently an a musement [sic] ride was stop [sic] abruptly.	U	
4/13/1993 (20)	[Ferris wheel], Dallas, TX	John Wagner, 32, of Stillwater, Okla., and Leon Burrell, 22, of Birmingham, Ala., were killed when a cable on a giant Ferris wheel they were constructing snapped. 2 workers die when carnival ride crumples Cable snaps as crew assembles Ferris wheel U.S. investigators to test ride's cable in carnival accident	M	AC
8/09/1992 (19)	Eden, NY	According to CPSC: An 11 year old female was found dead after the amusement ride she was on stopped.	M	UN
7/25/1992 (18)	Himalaya, America West Carnival, Taos, NM	Yvonne Mascarenas, 22 died, and three others injured, when she was ejected from the ride. A "torpedo latch" on her safety restraint was damaged, and a similar accident was reported on the same ride two years prior. <u>USA Today article</u> <u>Carnival rides now require state OK</u>	M	OE
8/11/1991 (17)	[Ferris Wheel], Fantasy Island, Grand Island, NY	Kenneth Margerum, 14, did when a Ferris wheel he his seat came loose from its axel stem. The seat was one of two that park workers had removed and replaced the previous night. Boy Killed in Fall from Ferris Wheel Teen slips from Ferris wheel to his death at New York park Ferris Wheel Death	F	OE
1/1/1991 (16)	[Ferris Wheel], Pavilion, Myrtle Beach, SC	Ronal Turner, 17, "who apparently ignored warnings not to rock his cab on a Ferris wheel fell out, striking another cab carrying two girls, and all three dropped about 30 feet to the ground" witnesses and authorities said. His companion climbed down the ride and fled, but eventually claimed that the safety bar gave way. The CPSC concludes that a faulty safety bar was at fault. Ferris Wheel Terror Teen rocks ferris wheel, falls and dies; 8 hurt One dies in ferris wheel accident in South Carolina N. Carolina teen dies after Ferris wheel fall	F	RE

6/9/1991 (15)	Flight Commander ride, Kings Island Amusement, Kings Mills, OH	Candy Taylor, 32, died when a defective restraint system allowed her to slide in her seat and fall out of the ride's gondola. Three die in amusement park accidents Fatal accidents at Kings Island under investigation Report: Defect in Ride Restraint Led to Amusement Park Death Knott's closes its XK-1 ride after park death in Ohio Family sues over death at Kings Island [settles]	F	DD
7/3/89 (14)	Logger's Run, Paramount's Great America, Santa Clara, CA	Michael Dorsey, 9, died when he tried to jump off of a log flume ride (the ride did not restrain riders). Boy killed on park ride	F	RE
6/9/1989 (12 and 13)	Farmington, UT	According to the CPSC: A 6-year old boy was killed when he was struck by an amusement ride that he had fallen from. The CPSC lists two separate accidents in Farmington, UT in a 5 week period (one 6-year-old boy and one 13 year-old-female), both of which entailed a rider getting hit by a ride.	F	UN
11/23/1988 (11)	The Spider, Broward County Fair, Hallandale, FL.	Christy Schafale, 17, died when a steel arm with a micro-defect broke and fell. The ride had been inspected by 4 different states in the preceding months, with no related problems found. Girl, 17, dies in accident on carnival ride in Florida Ride's Paint-Covered Crack Cause of Carnival Accident, Investigators Say Fair Re-Opens, Deadly Accident Probed Family settles suit over death of girl at fair	U (M)	AC
8/23/1988 (10)	Cyclone, Coney Island, NY	Peter Ellis, 26, died when he wriggled out of the rides restraints and stood up. Mr. Ellis was a park employee, but was not working at the time. Man Dies In Plunge From Coney Island Thrill Ride Park Employee Dies in Roller-Coaster Fall Cyclone Fall Kills Worker	F	RE
8/10/1988 (9)	Hurricane, Peony Park, Omaha, NE	Byron James Conant, 31, fell out of the coaster car. Witnesses reported that the man had kneeled outside of the restraint, the ride operator tried to stop the ride within 20 seconds of the start, but it was too late. Man Killed In Fall From Amusement Park Ride	F	RE
5/15/1988 (8)	Nashville, TE	According to CPSC: [w]as thrown from car of 'tilt-wheel' ride. Respiratory failure and thracheal stenosis. Accident - Autopsy no	U	UN

5/15/1998 (7)	Atlanta, GA	According to CPSC: A 4-year old female received a fractured skull and a lacerated forehead after she slipped off an amusement ride at a local fair in a public area. She was admitted for hospitalization at a local hospital. Victim died on January 12th, 1989 from her injuries.	F	AC
3/26/1988 (6)	Lauderdale Lakes, FL	According to CPSC: At about 9:15 PM on 3/26/88 a 15 year old male [Demetrick Welch] was ejected from a mobile amusement ride while attempting either to change seats with his younger sister or stand up. The victim, 5'6" & 126 pounds was physically and mentally handicapped & apparently coaxed to ride by his parents. The victim later died from injuries received in his fall from the ride. Carnival Fall Kills Youth	M	RE
1/1/1988 (5)	Broward County, FL According to CPSC: A teenage girl was killed when an amusement ride malfunctioned. A teenager killed in an amusement ride. Metal fatigue blamed.* *This report is very similar to CPSC case no. 11 (a teenage girl who died in Broward county.)		U	MF
7/18/1987 (4)	Holyoke, MA	According to CPSC: Riding on small train at park which derailed and overturned - multiple injuries of chest and abdomen	F	UN
6/17/1987 (3)		See "New Jersey Accidents"	F	OE
7/09/1987		See "New Jersey Accidents"	F	RE/OE
4/19/1987 (1)	Amarillo, TX	Miguel Moreno Peres, 15, died after he got into a coaster car which was supposed to be out of service and the safety restraint opened. Boy jumped into broken car, official says Boy Dies When Restraining Bar In Roller Coaster Gives Way	F	OE/RE

5. Other Accidents (Unreported by the CPSC)

Date/CPSC#	Park	Description	Туре	Cause

7/1989	Z-Force, Six Flags, Atlanta, GA	William Brett Pope, 11, died when, according to the medical examiner, he suffered from "seizurelike episode." The examiner stated: "Somehow, I feel that the ride, through the acceleration or the G-forces, lowered his seizure threshold" (Mr. Pope had suffered two previous similar episodes, during one he almost drowned). Medical Examiner Says Boy Died of Seizurelike Episode at Theme Park Six Flags reopens Z-Force after death	F	PC
9/21/2001	Perilous Plunge, Knott's Berry Farm,	Lori Mason-Larez, 292 lbs., 5'8", fell off of a log flume ride (a T-bar restraint, and lap belt failed to restrain her). The state's report concluded that her weight, the ride's motion, and the positioning of the restraints contributed to her death. The coroner concluded it would be "difficult, if not impossible" for the restraints to hold a woman of her size. Intamin AG, has had two other similar incidents in the last 3 years (one involved Michael Dwaileebe, 300 lbs, the other Joshua Smurphat) Knott's Ride Blamed in Death Ride manufacturer says woman who fell to her death was too big for ride Ride safety not equal	F	DD/OE
8/2001	Montezuma's Revenge, Knott's Berry Farm,	Justine Dedele Bolia, 20 (AKA Gafundi Mekanisi) died when her brain aneurysm burst. State investigators determined that the coaster did not contribute to her death. Knott's Coaster Stays Closed After Death Woman on roller coaster had pre-existing condition	F	PC
6/2001	Goliath, Six Flags Magic Mountain, Valencia, CA	Pearl Santos died when a brain aneurysm burst during the ride. Upon investigating, state officials concluded that the ride did not contribute to her death. Roller coaster is blamed for death Dead Fontana woman was an aspiring teacher	F	PC
9/2000	The Roger Rabbit Ride, Disneyland, Anaheim, CA	Brandon Zucker's body was trapped under the car and as a result he has become severely brain damaged, though he did not die. Disney estimates 20 million people use the ride without reported injury. The ensuing law suit was complicated because park officials, upon discovering Brandon, called their supervisor not 911. Also, the operators didn't do anything to help the boy, and tried to stop bystanders from help the boy. CalOSHA, quoted in the LA Times, concluded after an investigation that he had been seated in the wrong place. CNN Transcript Family Settles Suit CalOSHA conclusion	F	RE
3/3/2000	Manhattan Express, New York, New York, Las Vegas, NV	According to Congressman Edward J. Markey: FATALITY Acute Rupture of cerebral aneurysm	F	PC

	individuals. The schildren at once. children, others s Mayor of the city engineers and sa safe place to enjoy water slide collar water slide to recept the parents question Engineer: Slide by	oses, killing one teen, injuring 32 others open in wake of fatal accident safety of park's water slide	F	OE	
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