



UNITED STATES
 CONSUMER PRODUCT SAFETY COMMISSION
 WASHINGTON, DC 20207

Memorandum

2001 JUN 14 10 07 AM

DATE: MAY 30 2001

TO : The Commission
 Sadye E. Dunn, Secretary

THROUGH: Michael S. Solender, General Counsel *(S.S.)*
 Thomas W. Murr, Acting Executive Director *TM*

FROM : Ronald L. Medford, Assistant Executive Director *R.L.M.*
 Hazard Identification and Reduction
 Susan Ahmed, Ph.D., Associate Executive Director *S.A.*
 Directorate for Epidemiology

SUBJECT : **Annual Report: All-Terrain Vehicle (ATV)-Related Deaths and Injuries**

Attached is the annual report of ATV-related deaths and injuries for the year 2000. This report covers data available as of December 31, 2000.

There was a statistically significant increase in the estimated number of injuries for 2000, up about 12 percent over the number for 1999. The increase occurred across all age categories and is not explained by an increase in ATVs in use.

ATV-related deaths and injuries showed a general decline from the late 1980s through the early 1990s. Since then, however, there has been a gradual increase in both. Statistically significant increases in the estimated number of injuries were found for the last three years.

Attachment (1)

NOTE: This document has not been reviewed or accepted by the Commission.
 Initial RLM Date 6/15/01

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United States
 CONSUMER PRODUCT SAFETY COMMISSION
 WASHINGTON, DC 20207

Memorandum

Date: May 14, 2001

TO : Susan Ahmed, Ph.D
 Associate Executive Director
 Directorate for Epidemiology

THROUGH : Russell H. Roegner, Director **RR**
 Division of Hazard Analysis
 Directorate for Epidemiology

FROM : Jo-Annette David **JAD**
 Division of Hazard Analysis
 Directorate for Epidemiology

SUBJECT : Annual Report of ATV Deaths and Injuries

Deaths Reported to the Commission

On December 31, 2000, the Commission had reports of 4,082 ATV-related deaths that occurred since 1982 (Table 1). The reported deaths increased by 366 since the December 31, 1999 tabulation for the last report dated June 13, 2000.

Table 1
 Reported ATV¹-Related Deaths by Year
 January 1, 1982 - December 31, 2000

<u>Year</u>	<u>Number of Deaths</u>	<u>Difference Since Last Update (12/31/1999)</u>
Total	4,082	+366
2000 ²	218	-218
1999 ²	296	-143
1998	251	-3
1997	241	0
1996	247	+2
1995	199	0
1994	198	0
1993	183	0
1992	221	0
1991	230	0
1990	234	0
1989	230	0
1988	250	0
1987	264	0
1986	299	0
1985	251	0
1984	156	0
1983	85	0
1982	29	0

Source: U.S. Consumer Product Safety Commission (CPSC), Directorate for Epidemiology, Division of Hazard Analysis (EPIA)

¹ 3, 4, and unknown number of wheels.
² Reporting is incomplete.

Table 2 is a listing of ATV-related deaths for each state, the District of Columbia, and Puerto Rico. The highest numbers of incidents were reported for California (262), Pennsylvania (232), New York (184), Michigan (183), and Texas (179).

Table 2
Deaths Associated With All Terrain Vehicles¹ by State
Reported for the Period January 1, 1982 Through December 31, 2000

State	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CALIFORNIA	262	6.4	262	6.4
PENNSYLVANIA	232	5.7	494	12.1
NEW YORK	184	4.5	678	16.6
MICHIGAN	183	4.5	861	21.1
TEXAS	179	4.4	1040	25.5
WEST VIRGINIA	170	4.2	1210	29.6
FLORIDA	153	3.7	1363	33.4
TENNESSEE	153	3.7	1516	37.1
NORTH CAROLINA	146	3.6	1662	40.7
KENTUCKY	140	3.4	1802	44.1
ARKANSAS	136	3.3	1938	47.5
MINNESOTA	123	3.0	2061	50.5
WISCONSIN	118	2.9	2179	53.4
MISSISSIPPI	117	2.9	2296	56.2
OHIO	109	2.7	2405	58.9
GEORGIA	100	2.4	2505	61.4
MISSOURI	99	2.4	2604	63.8
ARIZONA	98	2.4	2702	66.2
LOUISIANA	90	2.2	2792	68.4
ALABAMA	89	2.2	2881	70.6
ALASKA	82	2.0	2963	72.6
ILLINOIS	80	2.0	3043	74.5
UTAH	79	1.9	3122	76.5
VIRGINIA	77	1.9	3199	78.4
INDIANA	75	1.8	3274	80.2
OREGON	64	1.6	3338	81.8
MAINE	63	1.5	3401	83.3
KANSAS	57	1.4	3458	84.7
IOWA	56	1.4	3514	86.1
IDAHO	46	1.1	3560	87.2
OKLAHOMA	44	1.1	3604	88.3
WASHINGTON	42	1.0	3646	89.3
NEBRASKA	40	1.0	3686	90.3
NEW MEXICO	39	1.0	3725	91.3
COLORADO	37	0.9	3762	92.2
MASSACHUSETTS	34	0.8	3796	93.0
NEW HAMPSHIRE	34	0.8	3830	93.8
VERMONT	31	0.8	3861	94.6
NEVADA	30	0.7	3891	95.3
NEW JERSEY	28	0.7	3919	96.0
SOUTH CAROLINA	28	0.7	3947	96.7
SOUTH DAKOTA	25	0.6	3972	97.3
NORTH DAKOTA	24	0.6	3996	97.9
MARYLAND	22	0.5	4018	98.4
MONTANA	22	0.5	4040	99.0
CONNECTICUT	17	0.4	4057	99.4
WYOMING	11	0.3	4068	99.7
DELAWARE	5	0.1	4073	99.8
RHODE ISLAND	3	0.1	4076	99.9
DISTRICT OF COLUMBIA	2	0.0	4078	99.9
HAWAII	2	0.0	4080	100.0
PUERTO RICO	2	0.0	4082	100.0

Source: U.S. Consumer Product Safety Commission (CPSC), Directorate for Epidemiology, Division of Hazard Analysis (EPhA).

Note: Due to rounding, the numbers in the percent column may not add to exactly 100 percent.

¹ 3, 4, and unknown number of wheels

Characteristics of ATVs and Fatalities

A review of the fatalities indicated that 1,409 victims (35% of the 4,082 total) were under 16 years of age and 602 victims (15% of the total) were under 12 years of age.

The percent of fatalities reported that involved four-wheel ATVs has increased from 7 percent or less prior to 1985 to about 90 percent for 2000, based on current reporting for 2000. However, reporting for this year is not yet complete. This percent increase is expected since production of the three-wheel vehicle ceased in the mid 1980s.

Annual Estimated and Reported Number of ATV-Related Deaths and Risk of Death from 1985 to 1999

The deaths reported to the Commission represent a minimum count of ATV-related deaths. To account for deaths not reported to the Commission, estimates of the annual deaths were calculated for 1985 through 1999 using a statistical approximation method. Table 3 contains the annual reported and estimated numbers of ATV-related deaths for all ATV types, in addition to the annual estimates and risk of death (per 10,000 in use) for four-wheel ATVs from 1985 to 1999.

Table 3
Annual Estimates of ATV¹-Related Deaths
and Risk of Death for Four-Wheel ATVs
As of December 31, 2000

Year	NUMBER OF DEATHS			RISK OF DEATH (per 10,000 4-Wheel ATVs in use) ⁴
	Total Reported	Total Estimated ²	Estimated for 4-Wheel ATVs ³	
1999 ⁵	296	376	346	1.2
1998	251	287	270	1.0
1997	241	291	243	1.0
1996	247	265	204	0.9
1995	199	274	212	1.0
1994	198	244	168	0.8
1993	183	211	144	0.7
1992	221	241	158	0.8
1991	230	255	152	0.8
1990	234	250	151	0.9
1989	230	258	153	0.9
1988	250	286	152	1.1
1987	264	282	126	1.1
1986	299	347	95	1.3
1985	251	295	55	1.5

Source: U.S. Consumer Product Safety Commission (CPSC), Directorate for Epidemiology, Division of Hazard Analysis (EPHA).

¹ 3, 4, and unknown number of wheels.

² The procedure for estimating ATV-related deaths has two parts. For public road fatalities, the count was the number of reports received. For incidents occurring on terrain other than public roads, the Capture-Recapture Method was used to estimate deaths by matching and determining the overlap between the CPSC Death Certificate and the Injury, Potential Injury Incident data files (reports from newspapers, consumers, lawyers, etc.). The two parts were combined for the annual estimate of deaths. Estimates may change as additional reports are received.

³ The estimated number of deaths associated with four-wheel ATVs was obtained by first dividing the reported number of deaths for four-wheel ATVs by the combined reported number of deaths for three- and four-wheel ATVs, then multiplying this quotient by the estimated number of deaths for all ATVs (three wheels, four wheels, and unknown number of wheels).

⁴ The number of ATVs in use is based on ATV sales and operability rates data provided by industry. Because reliable operability rates data are not available for three-wheel ATVs, risk of death is shown only for four-wheel ATVs.

⁵ Reporting is incomplete.

Estimated Hospital Emergency Room-Treated Injuries

Table 4 shows estimates of ATV-related injuries treated in hospital emergency rooms nationwide between January 1, 1982 and December 31, 2000. Children under age 16 years accounted for about 40 percent of the total of estimated injuries from January 1, 1985 through December 31, 2000.

Table 4
Annual Estimates of ATV-Related Hospital Emergency Room-Treated Injuries¹
All Ages and Ages Less Than 16 Years
January 1, 1982- December 31, 2000
Adjusted Annual Estimates²

Year	All Ages	Age <16 Years
2000 ³	95,300	33,000
1999 ³	85,000	28,700
1998 ³	70,200	26,000
1997 ³	54,600	21,300
1996 ³	53,600	20,200
1995 ³	52,200	19,300
1994 ³	50,800	21,400
1993 ³	49,700	17,900
1992 ³	58,200	22,000
1991 ³	58,100	22,500
1990 ³	59,500	22,400
1989 ⁴	70,300	25,700
1988 ³	74,600	28,500
1987 ³	93,600	38,600
1986 ³	106,000	47,600
1985 ^{4,5}	105,700	42,700
1984 ³	77,900	⁵
1983 ³	32,100	⁵
1982 ³	10,100	⁶

Source: U.S. Consumer Product Safety Commission (CPSC), Directorate for Epidemiology, Division of Hazard Analysis (EPHA).

¹ 3, 4, and unknown number of wheels.

² Estimates have been adjusted retrospectively to account for NEISS sampling frame updates.

³ Estimates adjusted by factors to account for out of scope (non-ATV) cases based on injury surveys in 1985, 1989, and 1997. The adjustment factors were 0.93 for 1986 through 1988, 0.95 for 1990-96, and 0.935 (amended from 0.984) for 1997 onward.

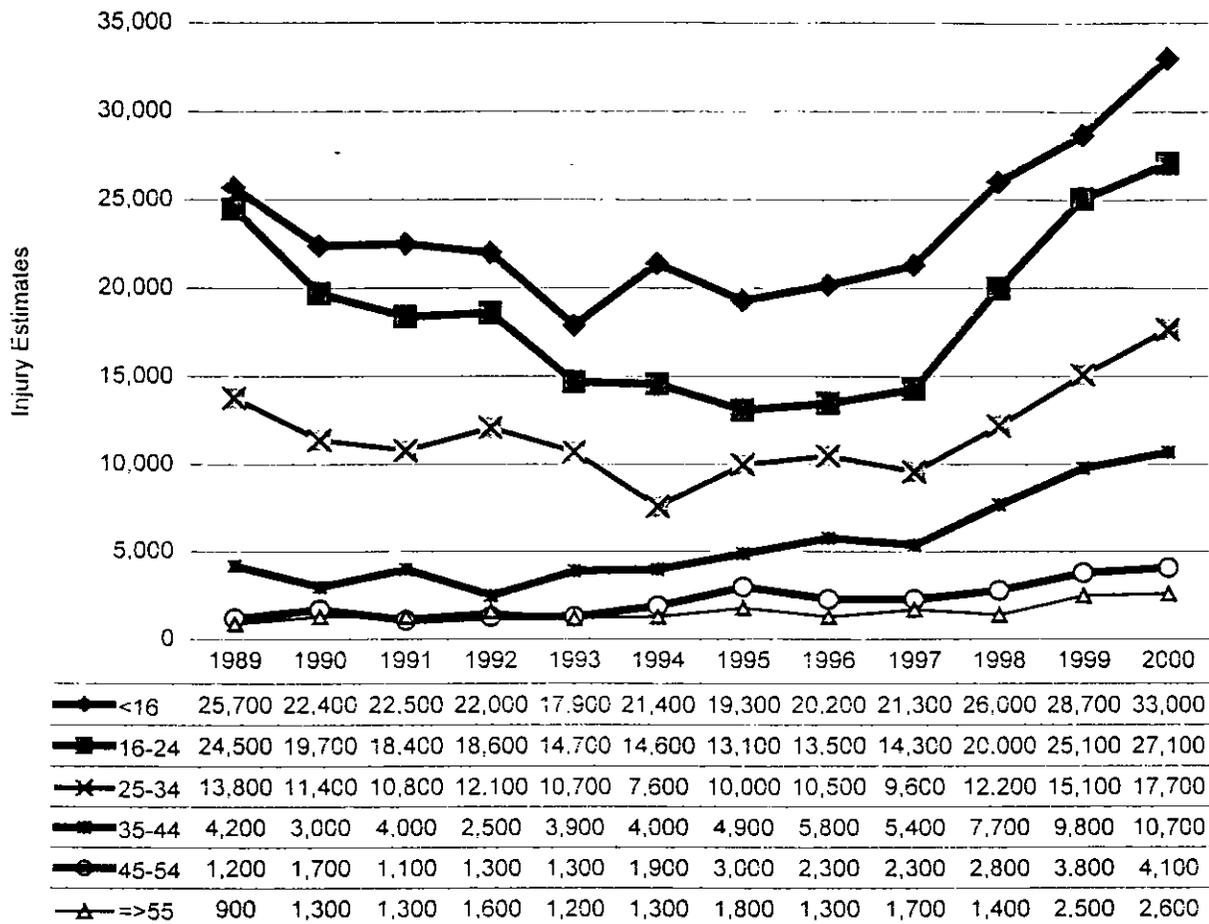
⁴ Annual estimates for 1985 and 1989 are based on injury surveys.

⁵ Estimates adjusted due to revisions in the NEISS Coding Manual in March 1985. Estimates for 1982 through 1985 were adjusted based on a review of NEISS comments to exclude dune buggies and identify ATVs classified as mini or trail bikes.

⁶ Adjusted estimates for children under 16 years old were not computed prior to 1985.

Figure 1 presents annual estimates by age group for ATV-related injuries treated in hospital emergency rooms over the past twelve years. The total estimate for 2000 reflects a statistically significant increase of about 12 percent over the 1999 estimate (Table 4). All age groups contributed to the increase in injuries. A marginal statistically significant increase was found for the 15 and under, and the 25-34 age groups.

Figure 1
Annual ATV-Related Injury Estimates
for Calendar Years
1989 - 2000



Source: U.S. Consumer Product Safety Commission (CPSC). Directorate for Epidemiology, Division of Hazard Analysis (EPA).

Notes: ¹Estimates have been adjusted retrospectively to account for NEISS sampling frame updates.

²Estimates for 1989 are based on the 1989 injury study.

The age group 25-34 had the greatest percentage increase, which was about 17 percent more than the group's estimate for 1999. The age group 15 and under showed an increase of about 15 percent. The 35-44 age group increased by approximately 9 percent, while both the 16-24 and 45-54 age groups increased by about 8 percent. The 55 and older age group had the smallest relative increase, 4 percent.

Table 5 shows four-wheel ATV-related injury and risk of injury estimates for January 1, 1985 through December 31, 2000, where risk is defined as the estimated number of injuries divided by the number of vehicles in use, multiplied by 10,000. The 4 percent increase in the risk of injury between 1999 and 2000 indicates that the 19 percent increase in the estimated number of injuries is not explained solely by the increase in the number of products in use.

Table 5
Annual Injury and Risk of Injury Estimates
Associated With Four-Wheel ATVs
January 1, 1985-December 31, 2000

Year	Injury Estimate ^{1/2}	Risk Estimate per 10,000 ATVs ³
2000	84,900	256.3
1999	71,300	245.3
1998	59,200	227.9
1997	41,000	171.3
1996	40,700	181.5
1995	36,200	172.0
1994	33,300	165.7
1993	32,000	164.7
1992	33,000	175.2
1991	34,400	188.1
1990	30,800	175.1
1989 ⁴	35,700	217.7
1988	39,400	275.8
1987	33,900	306.1
1986	23,400	319.2
1985 ⁴	14,700	391.1

Source: U.S. Consumer Product Safety Commission (CPSC), Directorate for Epidemiology, Division of Hazard Analysis (EPHA), National Electronic Injury Surveillance System (NEISS), and the Directorate for Economic Analysis (EC).

Note: Estimates have been adjusted retrospectively to account for NEISS sampling frame updates and to account for out of scope cases based on 1985, 1989 and 1997 CPSC injury studies.

¹ Annual estimates are adjusted by factors to account for out of scope cases. Adjustment factors are 0.93 for 1986 through 1988, 0.95 from 1990 through 1996, and 0.935 for 1997 onward.

² Occupation-related cases are not included.

³ Calculations are based on 1999 ATV use tables developed by CPSC's Directorate for Economic Analysis, from sales and operability rates data provided by industry. Because reliable operability rates data are not available for three-wheel ATVs, risk of injury is given for four-wheel ATVs only.

⁴ Estimates are based on CPSC Injury Surveys.

Discussion

Estimated numbers of deaths and injuries for all ATVs generally declined from the late 1980s through the early 1990s; thereafter, there is a gradual increase in the number of deaths. Injuries were relatively stable from 1993 through 1997, but showed statistically significant increases for the years 1997-98, 1998-99 and 1999-2000.

The use of three-wheel ATVs has declined; therefore ATVs are predominantly four-wheel vehicles. Estimated numbers of deaths for four-wheel vehicles were generally constant from the late 1980s through the early 1990s; thereafter, estimated numbers of deaths increased. The estimated numbers of injuries for four-wheel vehicles were also relatively constant for the late 1980s through the early-to-mid 1990s; thereafter the numbers of injuries also increased.

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