UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum 2000 JUN 27 P 12 51

DATE JUN 23 2000

TO The Commission
Sadye E Dunn, Secretary

THROUGH Michael S Solender, General Counsel MSS
Pamela Gilbert, Executive Director for PM

FROM Ronald L Medford, Assistant Executive Director RLM
Hazard Identification and Reduction
Susan Ahmed, Ph D , Associate Executive Director
Directorate for Epidemiology

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

Attached is the 1999 annual report for ATV-related deaths and injuries This report covers data available as of December 31, 1999

There was a statistically significant increase in the estimated number of injuries for 1999, up about 20 percent over the number for 1998 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 appears to have been a gradual increase in both Statistically significant increases in the number of injuries were found for the years 1997-98 and 1998-99

Attachment (1)

NOTE: This document has not been reviewed or accepted by the Commission.
Initial HL Date 6/27/00

CPSA 6 (b)(1) Cleared
6/27/00
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UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date June 13, 2000

TO : Russell H. Roegner, Director
Division of Hazard Analysis

FROM . Jo-Annette David, Division of Hazard Analysis

SUBJECT . Annual Report of ATV Deaths and Injuries

Deaths Reported to the Commission

On December 31, 1999, the Commission had reports of 3,716 ATV-related deaths that occurred since 1982 (Table 1). The reported deaths increased by 305 since the December 31, 1998 tabulation for the last report dated August 30, 1999

Table 1
Reported ATV[1]-Related Deaths by Year
January 1, 1982 - December 31, 1999

Year	Number of Deaths	Difference Since Last Update (12/31/1998)
Total	**3,716**	**+305**
1999[2]	153	+ 153
1998[2]	248	+ 111
1997	241	+ 41
1996	245	0
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 (EPHA)

[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 (240), Pennsylvania (214), New York (173), Michigan (168), and Texas (163)

Table 2
Deaths Associated With All Terrain Vehicles[1] by State
Reported for the Period January 1, 1982 Through December 31, 1999

State	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CALIFORNIA	240	6 5	240	6 5
PENNSYLVANIA	214	5 8	454	12 2
NEW YORK	173	4 7	627	16 9
MICHIGAN	168	4 5	795	21 4
TEXAS	163	4 4	958	25 8
WEST VIRGINIA	156	4 2	1114	30 0
FLORIDA	137	3 7	1251	33 7
TENNESSEE	133	3 6	1384	37 2
NORTH CAROLINA	128	3 4	1512	40 7
ARKANSAS	119	3 2	1631	43 9
WISCONSIN	115	3 1	1746	47 0
MINNESOTA	110	3 0	1856	49 9
KENTUCKY	106	2 9	1962	52 8
MISSISSIPPI	105	2 8	2067	55 6
OHIO	99	2 7	2166	58 3
MISSOURI	97	2 6	2263	60 9
ARIZONA	95	2 6	2358	63 5
GEORGIA	94	2 5	2452	66 0
ALABAMA	87	2 3	2539	68 3
LOUISIANA	85	2 3	2624	70 6
ALASKA	80	2 2	2704	72 8
ILLINOIS	77	2 1	2781	74 8
INDIANA	67	1 8	2848	76 6
UTAH	67	1 8	2915	78 4
VIRGINIA	66	1 8	2981	80 2
MAINE	60	1 6	3041	81 8
OREGON	58	1 6	3099	83 4
KANSAS	53	1 4	3152	84 8
IOWA	48	1 3	3200	86 1
OKLAHOMA	44	1 2	3244	87 3
IDAHO	42	1 1	3286	88 4
WASHINGTON	39	1 0	3325	89 5
NEW MEXICO	36	1 0	3361	90 4
MASSACHUSETTS	34	0 9	3395	91 4
COLORADO	33	0 9	3428	92 2
NEBRASKA	33	0 9	3461	93 1
NEW HAMPSHIRE	31	0 8	3492	94 0
VERMONT	30	0 8	3522	94 8
NEVADA	29	0 8	3551	95 6
NEW JERSEY	24	0 6	3575	96 2
NORTH DAKOTA	24	0 6	3599	96 9
MONTANA	21	0 6	3620	97 4
SOUTH CAROLINA	21	0 6	3641	98 0
SOUTH DAKOTA	21	0 6	3662	98 5
MARYLAND	18	0 5	3680	99 0
CONNECTICUT	14	0 4	3694	99 4
WYOMING	8	0 2	3702	99 6
DELAWARE	5	0 1	3707	99 8
RHODE ISLAND	3	0 1	3710	99 8
HAWAII	2	0 1	3712	99 9
DISTRICT OF COLUMBIA	2	0 1	3714	99 9
PUERTO RICO	2	0 1	3716	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 1,310 victims (35% of the 3,716 total) were under 16 years of age and 569 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 90 percent for 1999

Estimated ATV-Related Deaths from 1985 to 1998

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 1998 using a statistical approximation method. Table 3 shows the risk of death (per 10,000 4-wheel ATVs in use) by year from 1985 to 1998

Table 3
Annual Estimates of ATV[1]-Related Deaths
and Risk of Death for Four-Wheel ATVs
As of December 31, 1999

	NUMBER OF DEATHS			RISK OF DEATH
Year	**Total Reported**	**Total Estimated[2]**	**Estimated for 4-Wheel ATVs[3]**	**(per 10,000 4-Wheel ATVs in use)[4]**
1998[5]	248	317	270	1 0
1997	241	302	243	1 0
1996	245	263	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, 1999 Children under age 16 years accounted for about 40 percent of the total of estimated injuries from January 1, 1985 through December 31, 1999

Table 4
Annual Estimates of ATV-Related Hospital Emergency Room-Treated Injuries[1]
All Ages and Ages Less Than 16 Years
January 1, 1982- December 31, 1999
Adjusted Annual Estimates[2]

Year	All Ages	Age <16 Years
1999[3]	84,800	28,700
1998[3]	70,200	26,000
1997[3]	54,600	21,300
1996[3]	53,800	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[5]	77,900	[6]
1983[5]	32,100	[6]
1982[5]	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

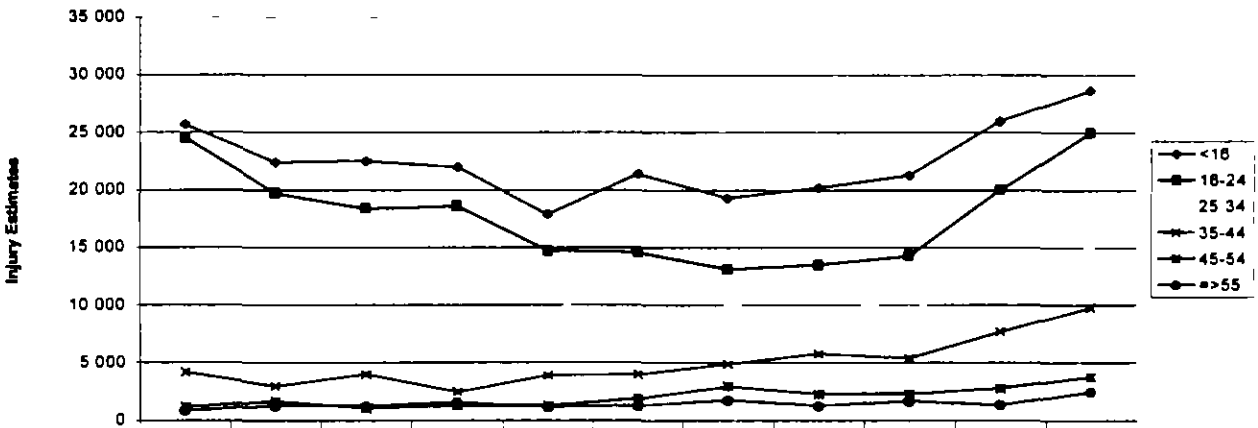
[4] Annual estimates for 1985 and 1989 are based on injury surveys

[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 eleven years. The total estimate for 1999 reflects a statistically significant increase of about 20 percent over the 1998 estimate (Table 4) All age groups contributed to the increase in injuries Statistically significant increases were found for the following age groups. 16-24, 25-34, and 35-44

Figure 1
Annual ATV-Related Injury Estimates
for Calendar Years 1989 - 1999



	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<16	25 700	22 400	22 500	22 000	17 900	21 400	19 300	20 200	21 300	26 000	28 700
16 24	24 500	19 700	18 400	18 600	14 700	14 600	13 100	13 500	14 300	20 000	25 000
25 34	13 800	11 400	10 800	12 100	10 700	7 600	10 000	10 500	9 600	12 200	15 100
35-44	4 200	3 000	4 000	2 500	3 900	4 000	4 900	5 800	5 400	7 700	9 800
45 54	1 200	1 700	1 100	1 300	1 300	1 900	3 000	2 300	2 300	2 800	3 800
=>55	900	1 300	1 300	1 600	1 200	1 300	1 600	1 300	1 700	1 400	2 500

Although the group aged 55 and older has the fewest number of injuries, it had the greatest percentage increase, which was approximately 80 percent more than the group's estimate for 1998. The age group 45-54 showed an increase of a little more than 35 percent The age group 35-44 increased by about 30 percent, while the 25-34 and 16-24 age groups increased by about 25 percent The under 16 age group had the smallest relative increase, 10 percent

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

Notes 1/Estimates have been adjusted retrospectively to account for NEISS sampling frame updates
2/Estimates for 1989 are based on the 1989 injury study

Table 5 shows four-wheel ATV-related injury and risk of injury estimates for January 1, 1985 through December 31, 1999, where risk is defined as the estimated number of injuries divided by the number of vehicles in use, multiplied by 10 000 The 8 percent increase in the risk of injury between 1998 and 1999 indicates that the 20 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, 1999

Year	Injury Estimate[1/2]	Risk Estimate per 10,000 ATVs
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

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 1992 through 1997, but showed statistically significant increases for the years 1997-98 and 1998-99

[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

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