

PUBLIC HEALTH AGENCY *of* CANADA  
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**Emergency Department Surveillance**

**Injuries associated with  
Motorized Recreational Off-Highway Vehicles**

The Canadian Hospitals Injury Reporting and Prevention Program  
(CHIRPP), All ages, 1990-2007

**Injury and Child Maltreatment Section  
Health Surveillance and Epidemiology Division**



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## Background and Methods

- Motorized recreational off-highway vehicles (ROV) come in a variety of models and sizes and for a number of uses
- The speed potential coupled with loosely enforced regulations (if they exist) and stability concerns (particularly for ATVs and snowmobiles) can expose Canadian children, youth and young adults to serious injury
- The CHIRPP database was searched for cases involving the *use* of ROVs
- All ages (1,934,235 total records searched)
- 1990-2007

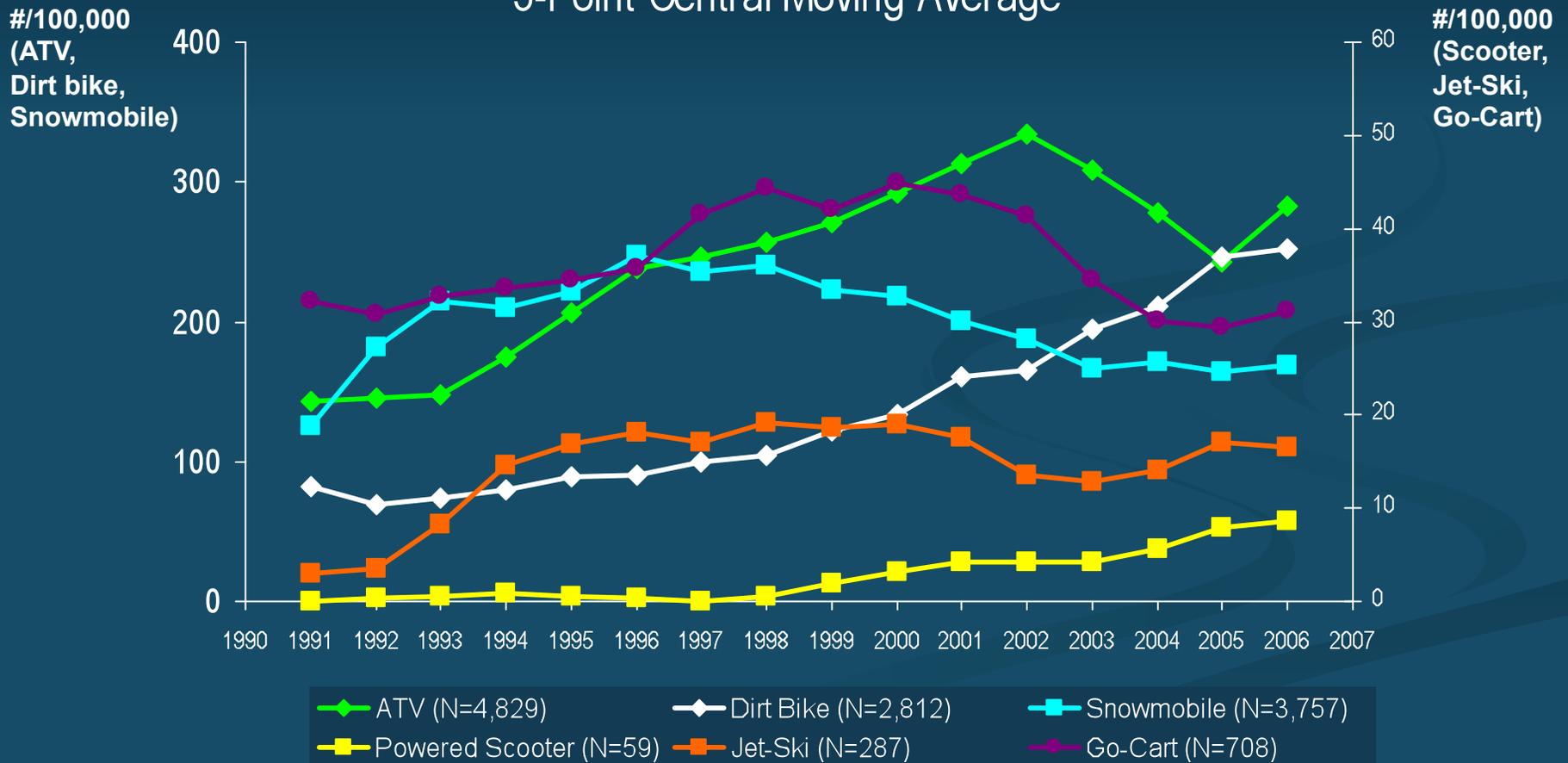
# Results and Highlights

- Figure 1 shows the adjusted proportion by year, as a moving average, for each type of ROV
  - In the database, the adjusted proportion of ATV injuries had been increasing linearly until about 2002 and has since decreased and levelled off
  - Dirt biking and motocross-related injuries have been showing a steady increase in the proportion of cases presenting to CHIRPP emergency departments
- Table 1 details various characteristics for each type of ROV
  - Go-carts and powered scooters are associated with the lowest median ages while snowmobiles and jet skis are associated with the highest median ages
  - The median age for ATV cases is less than the legal driving age
  - Jet-ski-related cases show the lowest proportion of fractures and the highest percentage of closed head injuries
  - Patients involved in go-cart related scenarios were admitted to hospital only slightly more frequently than the CHIRPP average. All other ROVs were associated with admission rates of between 2.4 (powered scooters) and 5.2 (ATVs) times the CHIRPP average
  - Dirt biking is associated with the highest reporting and usage rates for helmets
- In 5% of snowmobiling cases the patient was being towed behind the snowmobile (on a sled, skis or a snowboard); The median age of those being towed was 13.2 years compared to 23.3 for riders, although the injury profile was similar (in terms of % admitted, % fractures, % CHI)
- In about 5% of snowmobiling incidents, alcohol use was reported
- These results provide guidance for continuing research into ROV-related injuries

## Emergency Department Surveillance

### Injuries associated with motorized recreational off-highway vehicles (ROV) CHIRPP, 1990-2007, all ages

Proportion of cases per 100,000 CHIRPP cases in the given year  
3-Point Central Moving Average



**Figure 1.** Three-point central moving average of ED presentations associated with motorized recreational off-highway vehicles , CHIRPP, 1990-2007, all ages

**Table 1.** Emergency department surveillance of presentations due to injuries associated motorized recreational off-highway vehicles (ROV), CHIRPP database, 1990-2007, all ages

Characteristic	Recreational Off-Highway Vehicle					
	ATV <sup>A</sup>	Dirt Bike <sup>B</sup>	Scooter <sup>C</sup>	Go-Cart <sup>D</sup>	Snowmobile <sup>E</sup>	Jet-Ski <sup>F</sup>
N	4,829	2,812	59	708	3,757	287
Median age (yr)	15.0	14.4	12.3	11.9	22.6	20.0
IQR <sup>7</sup>	11.8 – 22.3	12.2 – 16.9	9.8 – 14.6	9.7 – 14.5	14.1 – 35.5	14.4 – 28.8
% males	73.9	91.4	55.9	72.1	71.8	65.9
% CHI <sup>8</sup>	8.5	6.6	8.5	5.8	5.6	9.8
% Fractures <sup>9</sup>	40.1	44.6	44.1	20.8	34.7	17.4
% Internal injury <sup>10</sup>	3.1	1.3	0.0	1.6	2.5	1.7
% Admitted <sup>11</sup>	33.6	25.7	15.3	8.2	32.4	18.8
% MVC <sup>12</sup>	1.4	1.8	6.8	0.7	3.2	0.0
% other ROV <sup>13</sup>	4.3	8.8	0.0	16.2	4.6	15.7
% helmet use <sup>14</sup>	71.0	87.3	61.1	82.2	56.9	9.1
% reporting (n)	48.3 (2,332)	73.6 (2,070)	61.0 (36)	26.1 (185)	41.2 (1,547)	3.8 (11)

<sup>A</sup> All Terrain Vehicle, 3- and 4-wheeled, *includes* smaller children’s models, dune buggies and cases involving pedestrians and towing

<sup>B</sup> *Includes* mini bikes and incidents occurring at motocross tracks as well as other informal areas (fields, back roads); *excludes* motorcycles and mopeds

<sup>C</sup> Motorized or powered scooters (standing); *excluding* transport devices for the disabled

<sup>D</sup> Mostly related to commercial recreational facilities (tracks), but also *includes* “home made” units as well

<sup>E</sup> Also called “Ski-Doo”; *excludes* cases involving pedestrians; *includes* towing

<sup>F</sup> Also called Personal Powered Watercraft (PPW)

<sup>7</sup> Interquartile range: 25<sup>th</sup> to 75<sup>th</sup> percentiles

<sup>8</sup> Percentage of all cases where the primary injury was a Closed Head Injury (minor closed head injury, concussion, intracranial); overall in the CHIRPP database, 7.7% of all primary injuries are CHIs

<sup>9</sup> Percentage of all cases where the primary injury was a fracture; overall in the CHIRPP database, 19.9% of all primary injuries are fractures

<sup>10</sup> Percentage of all cases where the primary injury was an injury to an internal organ; overall in the CHIRPP database, 0.3% of all primary injuries were internal

<sup>11</sup> Percentage of all cases where the patient was admitted to hospital; overall in CHIRPP, 6.5% of all patients were admitted to hospital

<sup>12</sup> Percentage of all cases involving collision with a non-ROV motor vehicle in traffic (excluding parked vehicles)

<sup>13</sup> Percentage of all cases involving collision with another ROV of the same type or different. In the case of Jet-Skis, the other ROV includes Jet-skis and other watercraft

<sup>14</sup> Percentage of patients wearing a helmet (where helmet status was reported - % reporting)