ORIGINAL ARTICLE

ATVs: motorized toys or vehicles for children?

N L Yanchar, R Kennedy, C Russell

Injury Prevention 2006;**12**:30–34. doi: 10.1136/ip.2005.008466

See end of article for authors' affiliations

Correspondence to: Dr N L Yanchar, Dalhousie University, Division of Pediatric General Surgery, Medical Director, IWK Trauma Care, IWK Health Centre, 5850 University Ave, Halifax, NS, B3K 6R8, Canada; natalie.yanchar@iwk.nshealth.ca

Accepted 5 December 2005

Objectives: To compare the nature of injuries from all-terrain vehicles (ATVs) to those from bicycling, dirtbikes/motocross, and motor vehicle crashes.
Design: Data on injuries from the mechanisms outlined above were obtained through CHIRPP (the Canadian Hospitals Injury Reporting and Prevention Program) and hospital records.
Setting: A Canadian tertiary pediatric center.
Subjects: Cases presenting to the emergency department over a 10 year period.
Main outcome measures: Comparison between demographics, mechanisms and natures of injuries sustained, disposition from the emergency department, and lengths of hospital stay.
Results: Contrary to bicycling, ATV related injuries occurred among older ages and appeared to result less often from loss of control. Severe injuries resulting in deep soft tissue trauma and fracture/dislocations were 1.7 and 1.5 times, respectively, more frequent among ATV trauma than bicycling ($p<0.01$). In addition, ATV related injuries were located more frequently in the trunkal, hip, lower extremity, and spinal regions. Conversely, ATV related trauma bore significant similarities regarding body part and nature of the injury to both motor vehicle crash (MVC) and dirtbike related injuries. Akin to dirtbike and MVC related trauma, ATV related injuries more frequently required admission to the ward or intensive care unit compared to bicycling injuries (30.8% *v* 9.6%, $p<0.0001$), and used a proportionally larger amount of hospital resources with respect to overall in-hospital and intensive care unit days.
Conclusions: Although ATVs may be considered recreational for children, their associated injury patterns, severity, and costs to the healthcare system more closely resemble those from motorized vehicles and are more significant than bicycling. Strict policy to reflect this must be developed and acknowledged by the public, industry, and legislative bodies.

The advantage of being a child is the opportunity to play. Recreation for children and youth is promoted as a means to stay physically active, enjoy the outdoors, spend time with family and friends, and foster development towards adulthood. Over the last 20 years, all-terrain vehicles (ATVs) have become increasingly popular as a recreational activity for both adults and children (fig 1). The growth of this ''sport'', however, has become distinguished not only by an exceptional rise in ATV sales, but by a similar rise in ATV related injuries among all ages.[1–4] In Canada, a 50% increase in the number of hospitalizations due to these injuries marked the period from 1996/97 to 2000/01, with 36% occurring in children between the ages of 5 and 19 years.[2] Similar increases have been shown by others.[5–8] Despite overwhelming evidence that children sustain a higher proportion of ATV associated injuries compared to adults, both industry and off-highway vehicle ''sporting'' groups continue to promote this activity as recreation for children and adolescents.[3 9]

Unlike other recreational equipment such as bicycles, ATVs can be large and powerful, weighing over 600 lbs with engine displacements up to 750 cc.[10] Industry has recommended that children under the age of 16 years not use vehicles with engine displacements over 90 cc. However, even such smaller ''youth models'' can weigh over 240 lbs, and the risks of injury on them still exceed that experienced by adult operators on any sized vehicle.[8 11] In any case, except for three states in the US and legislation recently introduced in the Canadian province of Newfoundland and Labrador, North American jurisdictions have not regulated this guideline.[12–14]

Relative to other non-motorized recreational activities, such as bicycling, ATV related injuries have been documented to occur at higher rates and be more severe in nature.[5 15] Being motorized vehicles, we hypothesized that the injury patterns from ATVs may be more similar to those seen from motor vehicle crashes (MVCs). We investigated this by comparing the nature of pediatric ATV related injuries to those resulting from bicycling, other motorized recreational activities, such as dirtbiking and motocross, and motor vehicle crashes.

METHODS

Data comparing injuries from bicycling, dirt/motocross bikes, ATVs, and MVCs presenting to the emergency department of the IWK Health Centre in Halifax, Nova Scotia, between 1 January 1993 and 31 December 2002, and entered into the database of the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP), were analyzed.[16] The IWK Health Centre is a tertiary pediatric institution and trauma center serving the Maritime Provinces of Canada, with over 2000 annual admissions through the emergency department of children up to age 15 years (inclusive), of which approximately 20% are due to unintentional injuries (poisonings, foreign bodies, and medical errors not included). Information from these cases related to the circumstances of the event, the injuries incurred, and the treatments required are obtained in the form of a questionnaire filled out by both the patient or accompanying adult and the emergency physician at the time of emergency department assessment. Responses regarding circumstances around the injury are reported in textual form, with categorization done at the national CHIRPP center. Participation is voluntary with

Abbreviations: ATV, all-terrain vehicle; CHIRPP, Canadian Hospitals Injury Reporting and Prevention Program; ISS, Injury Severity Score, LOS, length of stay; MVC, motor vehicle crash; PICU, pediatric intensive care unit.

Inj Prev: first published as 10.1136/ip.2005.008466 on 3 February 2006. Downloaded from http://injuryprevention.bmj.com/ on December 8, 2021 by guest. Protected by copyright.

a capture rate into the database of 90% of all injuries seen in the emergency department. Specific data fields analyzed included age group, sex, circumstances (location, mechanism), body parts and nature of the injuries, and disposition. When sufficient linkage data from the CHIRPP database were available (date of birth, date of admission), hospital and pediatric intensive care unit (PICU) lengths of stay (LOS) were obtained from the hospital administrative database. Comparisons between injuries related to ATVs and the other activities were examined using χ^2 analyses and Student's *t* tests. All analyses were done using SAS statistical software, Version 8, (Cary, NC, USA). Ethical approval for the study was obtained through the Research Ethics Board of the IWK Health Centre.

RESULTS

CHIRPP data were available on 3145 injury cases including 2326 from bicycling, (74.0%), 79 from dirtbikes, (2.5%), 130 from ATVs (4.1%), and 610 due to MVCs (19.4%).

Circumstances around the incident varied among the four mechanisms. Most ATV related injuries were found in the older age groupings, with 75% occurring in children aged 10–15 years, comparable to those from dirtbikes (table 1). Bicycling injuries tended to occur in the mid-age ranges, and MVCs had a more uniform age distribution. Compared to bicycling, ATV related trauma was less often reported to be due to ''loss of control'' and more often to a collision with another object or falling off of the vehicle (table 2). ''Collisions'' also dominated as the mechanism behind the majority of MVC trauma. Twenty nine percent of those injured on ATVs were riding as passengers, contrasting to bicycling, where all but one patient was the ''driver'', and MVCs, where all but 11% were involved as passengers (data not shown).

The types of injuries sustained and the body areas injured are depicted in tables 3 and 4. Head and neck areas were involved in about one third of those on ATVs and bicycles, significantly less often than the 50% of cases from MVCs. However, head injuries, specifically, were comparable among all mechanisms. Hip and lower extremity injuries were two- to fourfold more frequent from ATV related trauma than from bicycling or MVCs.

Spinal injuries, although uncommon, were significantly more frequent from ATV related incidents than bicycling, while bicycling and dirtbiking resulted in comparatively higher rates of upper extremity trauma. Compared to ATVs, bicycling resulted in 1.6-fold fewer deep soft tissue and bony injuries (fractures/dislocations), and 1.4-fold more ''cuts and bruises''. The frequencies of trunkal, internal organ, and multisystem trauma were similar between ATV and MVC related incidents, and two- to sixfold higher than seen with bicycling. Overall, ATV related trauma bore more similarities to MVC and dirtbike/motocross related injuries with respect to body part, type, and seriousness, while differing significantly from injuries due to bicycling.

Figures 2 and 3 depict forms of treatment required and resource utilization. Like dirtbike cases, a significantly higher proportion of ATV related injuries required admission to the ward or PICU compared to bicycling (30.8% *v* 9.6%, $p<0.0001$). A significant proportion (64%) of MVC related events seen in the emergency department did not require any

Figure 1 12 year old child on an all-terrain vehicle.

Table 1 Age distribution of injuries

Age grouping (years)	Proportion (%) injured from: Bicycle	Dirtbike	ATV	MVC
<2	0.6	0	0	13.6
2–5	16.7	2.5	6.9	25.2
6–9	35.2	15.2	16.2	18.8
10–13	35.6	41.8	33.8	21.3
14–15	11.6	39.2	42.3	20.5

ATV, all-terrain vehicle; MVC, motor vehicle crash.

Table 2 Circumstances of injury

Circumstance	Proportional distribution of circumstances (%) Bicycle	Dirtbike	ATV	MVC
Lost control	73***	83.5	60	13.4***
Collision	11.8***	13.9	15.4	81.8***
Fall	3.9***	0	6.2	0.2
All others	11.3***	2.5	18.4	4.8***

***p<0.001 compared to ATV related injuries.
ATV, all-terrain vehicle; MVC, motor vehicle crash.

Table 3 Body part injured

Body part	Proportional distribution of body part injured (%) Bicycle	Dirtbike	ATV	MVC
Head/neck	33.8	12.7*	26.1	50.0****
Spine	0.1****	1.3	2.3	1.8
Shoulder/arm	48.2***	50.6*	36.2	12.1****
Hip/leg	24.2****	45.6	42.3	9.8****
Trunk	6.3***	10.1	12.3	17.4
Multiple injuries	1.0****	2.5	4.6	1.8

Injuries from other sources were compared with ATV associated injuries:
*p<0.05, ***p<0.001, ****p<0.0001.
ATV, all-terrain vehicle; MVC, motor vehicle crash.

Table 4 Types of injuries sustained

Nature of injury	Proportional distribution of nature of injury (%) Bicycle	Dirtbike	ATV	MVC
Cuts and bruises	56.6***	38.0	40.0	43.0
Deep soft tissue injury	10.4**	24.0	17.7	18.4
Fracture/dislocation	31.3****	43.0	47.7	9.3****
Amputation	0.2	1.3	0.8	0.2
Head injury†	9.5	8.8	10.0	14.1
Facial injury	4.2	0.0	0.8	1.6
Internal organ injury	0.6****	1.3	3.8	1.6

Injuries from other sources were compared with ATV associated injuries:
**p<0.01, ***p<0.001, ****p<0.0001.
†Includes concussion and intracranial injuries.
ATV, all-terrain vehicle; MVC, motor vehicle crash.

Inj Prev: first published as 10.1136/ip.2005.008466 on 3 February 2006. Downloaded from http://injuryprevention.bmj.com/ on December 8, 2021 by guest. Protected by copyright.

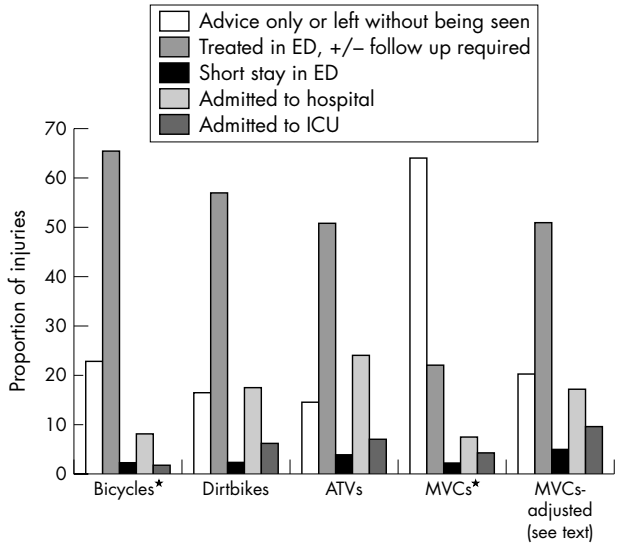

Figure 2 Disposition. *p<0.0001 compared to ATVs.

treatment. This may have been due to the practice of emergency medical services bringing most children involved in an MVC to hospital for assessment, regardless of status at the scene. This would falsely decrease the proportion of children requiring treatment and/or hospitalization from MVC related injuries relative to those injured from recreational activities. Making the assumption that if this practice were not to happen, and that only 20% of MVC related visits to the emergency department resulted in discharge without requiring treatment, similar to that seen for the three recreational activities, then the results can be adjusted as seen in figure 2. That is, by excluding 44% of the cases in the MVC group, all from the subset discharged from the ED without treatment, this leaves 20% discharged without treatment while 80% required treatment at some level, with an overall pattern of treatment required resembling that of the ATV related cases. Of the two emergency department deaths, in the entire dataset, both were the result of MVCs (data not included in the figures).

In-hospital LOS could be obtained from 87%, 89%, 95%, and 87% of those cases requiring admission for bicycling, dirtbike/motocross, ATV, and MVC trauma, respectively, with a mean of 3.3 (SD 2.5–4.1), 9.7 (SD 2.4–16.9), 8.3 (SD 2.5–14.2), and 10.4 (SD 5.0–15.8) days, respectively. For those requiring admission to the PICU, the mean LOS was 2.0 (SD 1.1–2.9), 4.0 (SD 6.8–14.8), 2.1 (SD 0.3–4.0), and 2.9 (SD 1.3–4.6) days, respectively. When compared to ATV related injuries, there were no statistically significant differences in LOS for the various mechanisms (p>0.05 for all comparisons).

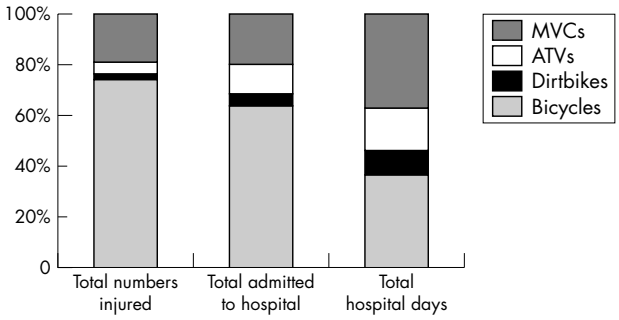

Figure 3 In-hospital resource utilization.

Applying these values to all cases admitted to hospital in the entire dataset, the total number of hospital days used over the study period by the various mechanisms of injury is depicted as a comparison to the overall numbers of children and youth injured (fig 3). Relative to the total numbers injured, those resulting from ATVs and MVCs used a proportionally larger amount of hospital resources than those related to bicycling.

DISCUSSION

In many ways, ATVs are both similar to and different from other motor vehicles. In most Canadian jurisdictions, including Nova Scotia, ATVs have few regulations in the context of age limits to ride and mandatory training and testing.[17 18] Motor vehicles, however, are strictly regulated as drivers must demonstrate competency and follow the rules of the road in order to maintain a safe environment for themselves and others.[19] Increased occupant protection is a priority, with ongoing development of vehicle restraints, airbag systems, and crash worthiness.[20] Advances in ATV development are consumer driven, based primarily on increasing power and versatility.[21] Although both are marketed on a basis of performance and enjoyment of the driving experience, their uses differ. Motorized vehicles are primarily used as a form of transportation. ATVs, although utilitarian on farms and ranches, are increasingly used as recreational vehicles, especially among children.[22] Fundamentally, automobiles and ATVs are distinctly different forms of ''motorized activity''.

Despite this, ATV related injuries more closely resemble those associated with MVCs than bicycling. As is common to MVCs, collisions with other objects, both stationary and moving (such as a motor vehicle), are more frequent with ATVs than bicycling, as has been found by others.[1] Although ''loss of control'' is associated to some degree with most injuries, a specific mechanism could be discerned more often for ATV incidents and MVCs than bicycling. This may partly be due to ATV incidents tending to occur among older children and that identifiable risk taking behaviors by youth are recognized to occur with these vehicles as often occurs in MVCs.[22] Also, many of these children were riding as passengers, and thus were never ''in control'' of the vehicle at the time of injury, mirroring what happens in the case of a MVC.

The higher speeds and greater mass of ATVs, like motor vehicles, can result in greater transference of kinetic energy, resulting in more severe injury patterns compared to bicycling. Accordingly, more bicycle related trauma resulted in superficial cuts and bruises rather than the deep tissue injuries and bony fractures/dislocations seen more commonly with ATV, dirtbike, and MVC cases. Both bicycling and dirtbiking resulted in more upper extremity injuries compared to ATVs. This may be due to riders being thrown from or falling off the bike more frequently as a mechanism, with a natural instinct to land on and protect themselves with their arms. In contrast, the higher incidence of spinal and trunkal injuries seen with ATVs may be related to the vehicles flipping or rolling as a result of loss of control. Such injuries have been found previously to be associated with this mechanism among children.[1] Like MVC and dirtbike related injuries, those associated with ATVs were more likely to require hospitalization, and proportionally used greater amounts of hospital resources than bicycle related trauma.

Many of the arguments supporting the safety of childhood ATV use emulate those promoting bicycling as a sport. These include promoting it as a fun, family oriented form of recreation.[25] Others contend that more children are injured during seemingly ''benign'' activities, such as playing basketball or bicycle riding.[26] Such claims, however, fail to

Inj Prev: first published as 10.1136/ip.2005.008466 on 3 February 2006. Downloaded from http://injuryprevention.bmj.com/ on December 8, 2021 by guest. Protected by copyright.

acknowledge that far more children play basketball or ride bicycles than ATVs, and that the majority of these injuries are minor, do not require hospitalization, use fewer medical resources, and do not result in death.[5 15 27–29] As in this study, others have shown the increased severity of injuries from ATVs compared to bicycling. Hargarten reported that ''per vehicle'', ATV related hospitalization and fatality rates were six- and 12-fold higher, respectively, than those from bicycling[15] Brown *et al* found that the mean Injury Severity Score (ISS) for hospitalized pediatric ATV related injuries was statistically higher than seen with bicycling, with a twofold greater proportion of cases with an ISS>15.[5]

ATVs may actually impart a greater risk of injury than riding in a motor vehicle. Recognizing that most children involved in MVCs may be brought to the emergency department for assessment, these would only be crashes to which emergency medical services are called to the scene, not just simple ''fender-benders''. Intuitively, these would result in some vehicular damage and possibly other injury victims. The fact that almost two thirds of children ''injured'' in an MVC in this study required no treatment reflects the inherent safety features of motor vehicles and use of safety devices such as child safety seats. Although it is unknown what proportion of ATV crashes would result in emergency department visits not requiring treatment, should the majority of such cases be seen in the emergency department, the lack of analogous safety features associated with ATVs makes it unlikely to be as substantial. In 2001, 3851 Canadian children aged 5–14 years required some form of treatment at a medical facility or died from injuries related to a MVC while riding in vehicles for an estimated 29.86×10^9 passenger kilometers.[30 31] Assuming a mean vehicle speed of 80 km per hour, the computed rate of 10.3 injuries per 10^6 passenger hours is 5.6 times lower than the injury risk estimated for ATV riders under the age of 16 years, of 57.6 per 10^6 rider hours.[8]

Limitations must be considered when interpreting these results. Because only 90% of trauma cases are captured into the CHIRPP database at this institution, the most severe cases may be underrepresented in as they usually arrive by emergency transport without an accompanying adult, and are treated by the trauma team or directly admitted to the PICU, effectively bypassing the emergency physician and subsequent CHIRPP enrollment. In a similar manner, fatalities may be underrepresented as has been recognized by others.[23] Therefore the differences in proportions of more severe injuries between the mechanisms may actually be greater than these results depict. In addition, some centers have found that adolescents are under-enrolled into the CHIRPP database relative to younger children.[24] If such were the case with this study, then ATV related injuries may be underrepresented compared to bicycling, as proportionally, the former is practiced more by adolescents whereas younger children tend to participate more in bicycling.

The fact that this study and other data indicate that children are at increased risk of injury is incongruent with the reality that children are still permitted to operate these motorized vehicles. Although promoted as recreational, even the manuals of the smaller youth ATV models state: ''*AN ATV IS NOT A TOY AND CAN BE HAZARDOUS TO OPERATE. An ATV handles differently from other vehicles including motorcycles and cars. A collision or rollover can occur quickly, even during routine maneuvers such as turning and driving on hills or over obstacles, if you fail to take proper precautions.*''[32] A warning label is also affixed directly to all ATVs stating: ''*Improper use of ATVs can result in SEVERE INJURY or DEATH*''.[26] Even though bicycling is not without its own risk, it is not so significant that the bicycling industry feels it necessary to affix such explicit warnings.

Key points

- All terrain vehicles are promoted as a recreational activity for children.
- Pediatric injuries from all terrain vehicle trauma are more severe in nature and more closely resemble those from motor vehicle collisions than bicycling.
- Pediatric injuries from all terrain vehicle trauma more frequently result in hospitalization and use in-hospital resources to a greater extent than those from bicycling.
- Strict policy to reflect this must be developed and acknowledged by the public, industry, and legislative bodies.

Numerous health and safety organizations, including the Canadian Paediatric Society and the American Academy of Pediatrics, have raised concerns about ATV related injuries and deaths among children and youth, stating that children under the age of 16 years should not operate ATVs, of any size.[12 33–35] However, despite evidence indicating the high risk and severity of childhood ATV related trauma and the positions taken by the medical profession, policy makers have not firmly and consistently addressed ATVs as motorized vehicles which are unsafe for children. The injury risks to children riding these vehicles are just too high. Strict policy to reflect a change in mindset and prevent injuries and unnecessary use of healthcare resources among children and youth must be developed and acknowledged by the public, industry, and legislative bodies.

ACKNOWLEDGEMENTS

This project was funded by a grant from the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP).

Authors' affiliations

N L Yanchar, Division of Pediatric General Surgery, IWK Health Centre, Halifax, Canada
R Kennedy, Canadian Hospitals Injury Reporting and Prevention Program, IWK Health Centre, Halifax, Canada
C Russell, Department of Community Health and Epidemiology, Dalhousie University, Halifax, Nova Scotia, Canada

Competing interests: none declared.

REFERENCES

1 **Murphy N**, Yanchar NL. Yet more pediatric injuries associated with all-terrain vehicles. Should kids be using them? *J Trauma* 2004;**56**:1185–90.
2 **Canadian Institute for Health Information**. ''All terrain vehicle (ATV) injuries resulting in hospitalization on the rise, reports Canadian Institute for Health Information''. Available at http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=media_05feb2003_e (accessed March 2003).
3 **Canadian all-terrain vehicle distributors council, retail ATV sales**. Available at http://www.mmic.ca/CATV/stats2003catv.pdf (accessed February 2005).
4 **Sibley AK**, Tallon JM. Major injury associated with all-terrain vehicle use in Nova Scotia: a 5-year review. *Can J Emerg Med* 2002;**4**:263–6.
5 **Brown RL**, Koepplinger ME, Mehlman CT, *et al*. All-terrain vehicle and bicycle crashes in children: epidemiology and comparison of injury severity. *J Pediatr Surg* 2002;**37**:375–80.
6 **Lynch JM**, Gardner MJ, Worsey J. The continuing problem of all-terrain vehicle injuries in children. *J Pediatr Surg* 1998;**33**:329–32.
7 **Bernard AC**, *et al*. The adolescent trauma vehicle (ATV): A review of 849 all-terrain vehicle crash victims. Presented at the Trauma Association of Canada: Annual Scientific Meeting, March 27–29, 2003, Banff, Canada).
8 **US Consumer Product Safety Commission**. All-terrain vehicle 2001 injury and exposure studies. Available at http://cpsc.gov/library/foia/foia03/os/atvex2001.pdf (accessed March 2004).
9 Kawasaki transforms ATV lineup for 2003. Available at http://www.off-road.com/atv/press/kawasaki/2003lineup/intro.html (accessed January 2005).
10 **Kawasaki Brute ForceTM Sport/Utility ATV specifications**. Available at http://www.kawasaki.com/

Inj Prev: first published as 10.1136/ip.2005.008466 on 3 February 2006. Downloaded from http://injuryprevention.bmj.com/ on December 8, 2021 by guest. Protected by copyright.

product_detail.asp?product=118&category=1&tag=atv (accessed June 2005).
11 Honda Cycles, 2004 Honda Sportrax 90 Pictures & Specs. Available at http://www.honda-motorcycles.org/Sportrax90.php (accessed June 2005).
12 **The Canadian Paediatric Society Injury Prevention Committee**. Preventing injuries from all-terrain vehicles. *Paediatrics and Child Health* 2004;**9**:337–40.
13 **Specialty Vehicle Institute of America**. State all-terrain vehicle requirements. Available at http://www.atvsafety.org/InfoSheets/StateReq_0803.pdf (accessed June 2005).
14 **Government introduces safety measures for ATVs**. Press release. Available at: http://www.releases.gov.nl.ca/releases/2005/gs/0517n01.htm (accessed June 2005).
15 **Hargarten SW**. All-terrain vehicle mortality in Wisconsin: a case study in injury control. *Am J Emerg Med* 1991;**9**:149–52.
16 **CHIRPP**. A unique source of child injury information. Available at http://www.hc-sc.gc.ca/pphb-dgspsp/injury-bles/chirpp/index.html (accessed January 2004).
17 **Injury Prevention Committee, Canadian Paediatric Society**. Preventing Injuries from all-terrain vehicles. *Paed Child Health* 2004;**9**:337–40.
18 **Government of Nova Scotia**. Off Highway Vehicles Act. 1989. Available at http://www.gov.ns.ca/legi/legc/statutes/offhighw.htm (accessed January 2005).
19 **Government of Nova Scotia**. Motor Vehicle Act. 1989. Available at http://www.gov.ns.ca/legi/legc/statutes/motorv.htm (accessed January 2005).
20 **National Highways and Traffic Safety Administration**. Research and development. Available at http://www-nrd.nhtsa.dot.gov (accessed January 2005).
21 **Bombardier ATV: media center**. ''Consumer satisfaction, horsepower and added features highlight 2005 Bombardier ATV line-up.'' June 2004. Available at http://www.bombardier-atv.com/en/Media.Center/Press.Releases/1/10.06.2004.htm (accessed January 2005).
22 **Aitken ME**, Graham CJ, Killingsworth JB, *et al*. All-terrain vehicle injury in children: strategies for prevention. *Inj Prev* 2004;**10**:303–7.
23 **Mackenzie SG**, Pless IB. CHIRPP: Canada's principal injury surveillance program. *Inj Prev* 1999;**5**:208–13.
24 **Macarthur C**, Pless IB. Sensitivity and representativeness of a childhood injury surveillance system. *Inj Prev* 1999;**5**:214–16.
25 ''The kids are all right'', Port Boat House advertisement for 2005 Yamaha Raptor 80. Available at http://www.portboathouse.com/view_product.cfm?prodid=28641 (accessed February 2005).
26 **Canadian All Terrain Vehicle Distributors Association**. ''Less likely to be injured riding an ATV than riding a bicycle. '' Available at http://www.mmic.ca/CATV/atvinjury.html (accessed January 2005).
27 **United States Consumer Product Safety Commission**. National Electronic Injury Surveillance System (NEISS) On-Line. Available at http://www.cpsc.gov/library/neiss.html (accessed June 2005).
28 **Mummery WK**, Spence JC, Vincenten JA, *et al*. A descriptive epidemiology of sport and recreation injuries in a population-based sample: results from the Alberta Sport and Recreation Injury Survey (ASRIS). *Can J Pub Health* 1998;**89**:53–6.
29 **Mummery WK**, Spence JC. Rate and frequency of sport and recreational injuries: Results from the 1995 Alberta Sport and Recreation Injury Survey. *Research Update*, 1996;**4**(1). Available at http://www.centre4activeliving.ca/Research/ResearchUpdate/1996/WellBeing_sept_96.htm (accessed January 2005).
30 **Transport Canada**. Road Safety and Motor Vehicle Regulation, Traffic Accident Information Database (TRAID).
31 **Transport Canada**. Canadian Vehicle Survey, Annual, 2001. Document # TP 13628E. Available at http://www.tc.gc.ca/pol/en/cvs/files/2001_Annual%20Averages.pdf (accessed June 2005).
32 **Canadian All-Terrain Vehicle Distributors Council**. Voluntary standards. Available at http://www.catv.ca (accessed April 2004).
33 **American Academy of Pediatrics Committee on Injury and Poison Prevention**. All-terrain vehicle injury prevention: two-, three-, and four-wheeled unlicensed motor vehicles. *Pediatrics* 2000;**105**:1352–4.
34 **American Academy of Orthopedic Surgeons**. Position statement: All-terrain vehicles. Available at http://www.aaos.org/wordhtml/papers/position/1101.htm (accessed April 2004).
35 **Safe Kids USA**. ''Safe Kids Worldwide urges: no children under 16 on ATVs''. July, 2005. Available at http://www.usa.safekids.org/tier2_rl.cfm?folder_id=300 (accessed September 2005).

Editor's note: Three days after this manuscript was accepted, the Nova Scotia Government changed its proposed policy on all-terrain vehicle (ATV) use by children from one with few restrictions to one with strict limitations. Although many believe the new legislation still does not go far enough , it is to the credit of the researchers that the evidence – including findings from this work – was used to bring this change about. Strong lobbying by the authors to the press and politicians played a pivotal role in bringing about this policy shift from one focused on politics and personal interests to one intent on childhood safety.

This paper was the Editor's Choice because of the events that followed. It illustrates well that doing solid research is only the first and perhaps easiest step towards achieving preventive objectives. As Yanchar noted in our correspondence, ''taking a stand on restricting children from operating motorized vehicles, in a forum such as this Journal, is relatively easy. Translating this for policy-makers and the public, is much tougher. Politics, personal rights, and the interests of industry are forces that compete tenaciously with any scientific evidence in guiding public policy development. Researchers must use their work not only to disseminate evidence but also to influence those that can take that knowledge to the next level. Presenting the evidence works. Researchers and professionals need to move beyond the pages of Journals to advocate on behalf of our communities for what the evidence shows.''

Inj Prev: first published as 10.1136/ip.2005.008466 on 3 February 2006. Downloaded from http://injuryprevention.bmj.com/ on December 8, 2021 by guest. Protected by copyright.