The Prevalence of Road Rage

Estimates from Ontario

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ABSTRACT

Background: "Road rage" has increasingly generated public concern, however, the prevalence of this behaviour has not been available. We examine the prevalence and demographic correlates of road rage victimization and perpetration based on a population survey of adults in Ontario.

Methods: Data are based on the CAMH Monitor, a repeated cross-sectional telephone survey of Ontario adults (n=1,395). The contribution of demographic factors to road rage was examined with logistic regression analysis.

Results: About half of respondents (46.6%) were shouted at, cursed at or had rude gestures directed at them in the past year, and 7.2% were threatened with damage to their vehicle or personal injury. Nearly a third of respondents (31.7%) admitted to shouting, cursing, etc. at someone, and 2.1% threatened to hurt someone or damage their vehicle. Being a Toronto resident, being younger, and earning a higher income were associated with greater likelihood of being a victim of shouting, cursing and rude gestures; however, income was not associated with being threatened with vehicle damage or injury. The likelihood of admitting to shouting, etc. at someone was greater for males, younger respondents, Toronto residents, higher income earners, and never married respondents; however, threatening someone was associated with younger age and lower education level.

Conclusion: These results provide a first indication of the prevalence of road rage in Ontario. Road rage, in its milder forms, appears to be common, involving between a third and a half of respondents as either a victim or a perpetrator. Nearly 1 in 10 Ontario residents were threatened with damage or personal injury.

La traduction du résumé se trouve à la fin de l'article.

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Road rage is a term we apply to attempts that drivers make to threaten, injure or even kill other drivers during or after unpleasant driving experiences. While the term is relatively new, it has generated substantial public concern and discussion.¹ Injuries from motor vehicle collisions (MVCs) are the 10th leading cause of death in Canada.² MVCs kill a disproportionate number of young people, and account for nearly 40% of all deaths of persons between the ages of 15 and 24 in Canada,³ with similar figures from other countries. Injuries are the third largest source of costs to the Canadian health care system, and in 1993, they cost this country an estimated \$14.3 billion.⁴ Even if road rage accounts for a modest portion of the health and economic problems resulting from MVCs, it may be an important public health problem.

To date, few studies have appeared on the topic of road rage, and only one published study has reported Canadian data.¹ While it has been suggested that road rage could exert an important impact on traffic safety, the research evidence to support that contention is weak.¹ In an investigation of Canadian Press reports of road rage incidents between 1998-2000, 58 separate incidents were reported and nearly all involved a death or serious injury.¹ Fong et al. have reported a study of road rage experiences in a small sample of general practice patients in England.⁵ Also, some studies have been made of aggressive driving behaviour.⁶ However, no population-based data on the experience of road rage, either as a victim or a perpetrator, are available. In this paper we provide prevalence estimates for the less severe and more severe forms of road rage, both as a victim and as a perpetrator and for several demographic groups in a population survey of Ontario adults. We also examine the association between demographic factors and road rage through logistic regression analyses.

METHOD

Our data are based on the 2001 cycle of the CAMH Monitor, a repeated cross-sectional telephone survey of Ontario adults, conducted by the Centre for Addiction and Mental Health and administered by the Institute for Social Research, York University. The survey employed random-digit-dialling methods via Computer

TABLE I

Prevalence of Road Rage Victimization and Perpetration by Demographic Characteristics: 2001 Ontario CAMH Monitor Data

	Sample Characteristics	Road Rage Victimization by Demographics		Road Rage Perpetration by Demographics	
		Someone shouted, cursed or made rude gestures at you	Someone threatened to hurt you or damage your vehicle	You shouted, cursed or made rude gestures at someone	You threatened to hurt someone or damage their vehicle
	%	%	%	%	%
Total sample	N=1395	46.6	7.2	31.7	2.1
Gender	N=1395	*		***	**
Male	46.0	50.3	7.3	39.2	3.4
Female	54.0	43.3	7.0	25.4	1.0
Age	N=1356	***	***	***	***
18-34	32.3	53.3	11.8	44.2	4.7
35-54	42.1	49.0	6.3	32.2	1.1
55+	25.5	35.7	3.6	17.1	0.3
Region	N=1395	***	***		*
Toronto	23.5	53.4	14.1	37.2	2.0
Central East	19.6	50.0	6.4	29.4	1.5
Central West	19.7	49.4	6.0	33.5	4.5
West	13.1	43.2	2.9	31.4	0.0
East	13.9	40.9	4.8	28.3	1.6
North	10.2	31.6	4.3	26.3	2.2
Income	N=1141	***	*	***	
<\$30,000	16.5	34.9	4.6	19.3	1.2
\$30,000-49,999	22.6	39.7	7.4	21.6	1.2
\$50,000-79,999	28.6	53.6	7.1	37.9	3.8
\$80,000+	32.3	56.9	11.5	44.5	2.9
Education	N=1377	***		**	
<High school	13.2	36.1	6.3	22.1	4.0
Completed high school	27.9	42.5	7.7	32.3	1.9
Some post-secondary	32.3	48.1	7.6	36.9	2.3
University degree	26.6	55.6	6.8	30.6	1.1
Marital status	N=1383			***	***
Never married	24.1	52.3	10.1	47.3	6.0
Married/partner	63.4	46.9	6.4	27.4	0.9
Previously married	12.4	35.8	6.3	25.6	0.6

Statistical significance * p<0.05 ** p<0.01 *** p<0.001

Assisted Telephone Interviewing. Each cycle consists of 12 independent monthly samples with about 200 completions each (monthly effective response rate ranged from 56% to 61%) (see ref. 7 for sampling design details).

The interviewer began the road rage items with "Now some questions about things that might have happened when you are driving or are a passenger in a car, van, truck or motorcycle." Two items measured being a victim of road rage: "During the past 12 months, how many times has someone in another vehicle shouted, cursed, or made rude gestures at you or others with you?" "During the past 12 months, how many times has someone in another vehicle threatened to hurt you or others with you, or threatened to damage the vehicle you were in?" Two items measured perpetrator behaviour: "During the past 12 months, how many times have you shouted, cursed, or made rude gestures at a driver or passenger in another vehicle?" "During the past 12 months, how many times have you threatened to hurt a driver or passenger in another vehicle, or threatened to damage their vehicle?" These items were included between July and December

2001 (total sample=1,395). Data for these items were recoded (yes=1, no=0). The results in this paper are based on "valid" responses (n's) such that missing data (i.e., "don't know" responses and refusals) were excluded from analyses. The percentages reported are based on the weighted sample size and are considered representative for the population surveyed. The sample characteristics are presented in Table I.

Data on prevalence of road rage victimization and perpetration by demographics (gender, age, region, income, education, marital status) were examined through chi-square analyses. Logistic regression analyses were performed with demographic factors as independent variables. Contrasts for region were made to Toronto residents, household income level was compared to those earning less than \$30,000, education level was compared to those with less than high school, and those never married were the comparison group for marital status. To evaluate the overall goodness of fit, we used the Hosmer and Lemeshow test, which assesses the correspondence between the observed and predicted values and tests whether the specified model differs significantly from a perfect model.⁸ Non-

significant p-values indicate a good fit to the data.

RESULTS

Table I presents data on the prevalence of victimization of road rage and perpetration of road rage in the last 12 months by demographic factors. It can be seen that nearly half of the respondents (46.6%) were shouted at, cursed at or had rude gestures directed at them in the past year, however only 7.2% were threatened with damage to their vehicle or personal injury. Cursing, swearing and rude gestures were more common for males (50.3% vs. 43.3%) than females (p<0.05) and for younger than older people (53.3% of 18-34 years old, 35.7% for those over age 54, p<0.001). Rates were higher in Toronto, central east and central west, i.e., the areas closest to Toronto (p<0.001). Being a victim of shouting, etc. was more common among higher income households and higher education levels (p<0.001), however marital status did not differ among victims of shouting, cursing and rude gestures.

For threats of hurting or car damage, there was no difference in rates for males

TABLE II

Road Rage Victimization and Perpetration by Demographic Characteristics:
Logistic Regression Analyses, 2001 Ontario CAMH Monitor Data

	Road Rage Victimization				Road Rage Perpetration			
	Someone shouted, cursed or made rude gestures at you OR 95%CI		Someone threatened to hurt you or damage your vehicle OR 95%CI		You shouted, cursed or made rude gestures at someone OR 95%CI		You threatened to hurt someone or damage their vehicle OR 95%CI	
Gender (male=1)	0.96	0.89, 1.02	1.07	0.95, 1.20	0.89**	0.83, 0.96	0.78	0.61, 1.01
Age	0.98***	0.97, 0.99	0.98**	0.96, 0.99	0.98***	0.96, 0.99	0.95*	0.90, 0.99
Region (Toronto=1)	**		***					
Central East	1.00	0.68, 1.47	0.38**	0.20, 0.72	0.65*	0.43, 0.99	0.94	0.24, 3.69
Central West	0.79	0.54, 1.17	0.43**	0.23, 0.80	0.83	0.55, 1.26	2.54	0.83, 7.76
West	0.78	0.49, 1.22	0.16***	0.06, 0.47	0.76	0.46, 1.24	0.14	0.01, 3.13
East	0.63*	0.41, 0.96	0.21***	0.09, 0.49	0.75	0.48, 1.18	1.14	0.27, 4.91
North	0.43***	0.26, 0.71	0.20**	0.07, 0.57	0.65	0.38, 1.10	1.62	0.33, 8.04
Income (<\$30,000=1)	*				***			
\$30,000-49,999	0.98	0.63, 1.53	1.32	0.54, 3.21	1.07	0.64, 1.80	0.85	0.11, 6.42
\$50,000-79,999	1.46	0.95, 2.25	1.10	0.45, 2.65	2.08**	1.27, 3.41	1.79	0.30, 10.64
\$80,000+	1.64*	1.05, 2.54	2.12	0.91, 4.96	3.14***	1.90, 5.18	2.12	0.35, 12.88
Education (<high school=1)							*	
Completed high school	1.00	0.63, 1.59	1.03	0.44, 2.40	1.08	0.64, 1.82	0.20*	0.06, 0.71
Some post-secondary	1.12	0.71, 1.75	0.86	0.37, 1.99	1.13	0.68, 1.88	0.28*	0.09, 0.91
University degree	1.36	0.85, 2.17	0.59	0.24, 1.41	0.79	0.47, 1.35	0.12**	0.03, 0.54
Marital status (never married=1)					*			
Married/partner	1.15	0.81, 1.65	1.19	0.65, 2.19	0.67*	0.46, 0.98	0.44	0.14, 1.39
Previously married	0.98	0.59, 1.64	1.25	0.47, 3.29	1.19	0.68, 2.07	0.73	0.10, 5.21
Constant	1.76		0.34		1.75		0.98	
Hosmer & Lemeshow test	11.0 (8df)		11.93 (8df)		10.20 (8df)		4.38 (8df)	
	p=0.20		p=0.15		p=0.25		p=0.82	

Statistical significance * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

and females. Rates were substantially greater, however, for the 18-34 age group than for those 55+ (11.8% vs. 3.6%, $p < 0.001$). Also, prevalence was much lower in all regions of the province when compared to Toronto (14.1%, $p < 0.001$). Rates were also greater for higher income earners (\$80,000+) compared to those with <\$30,000 (11.5% vs. 46%, $p < 0.05$). Education level and marital status were not significantly related to experiencing threats in the last year.

Nearly a third of respondents (31.7%) admitted to shouting, cursing or making rude gestures at someone, however only 2.1% threatened to hurt someone or damage their vehicle. Shouting, cursing and making rude gestures was far more common for males than females (39.2% vs. 25.4%, $p < 0.001$) and for the youngest age groups compared to the oldest (44.2% vs. 17.1%, $p < 0.001$). Shouting, cursing, etc. was more common among higher income households than the lowest income households (44.5% vs. 19.3%, $p < 0.001$), and those who had never been married compared to those who were previously married (47.3% vs. 25.6%, $p < 0.001$), but less common among those who hadn't completed high school (22.1%) and more common among those who had some post-secondary education (36.9%, $p < 0.01$).

However, there was no significant difference by region.

The less common form of road rage, i.e., threatening to damage vehicles and hurt people, varied by sex ($p < 0.01$), age ($p < 0.001$), region ($p < 0.05$) and marital status ($p < 0.001$). However, the numbers are small in many of the cells and the results may be unreliable.

Multivariate analyses on road rage items with age (continuous variable), sex, region, income level, education and marital status as independent variables are presented in Table II. The logistic regression analysis of being a victim of shouts, curses or rude gestures within the last 12 months revealed that age, region and income were significant contributors. The likelihood of having experienced this type of victimization was lower as age increased. The likelihood of being a victim was lower outside the Toronto region, and lowest in the northern region (OR=0.43) followed by the east region (OR=0.63). In comparison to the lowest income earners, the likelihood of experiencing this type of road rage was greatest for those earning \$80,000+ (OR=1.64).

Similarly, having experienced someone's threatening to hurt you or damage your vehicle within the last 12 months was significantly associated with age and region.

The likelihood of having experienced this type of victimization was lower with increased age and lower in all regions compared to Toronto. No significant relationships were found for income, education and marital status.

The model predicting road rage perpetration by shouting, cursing or making rude gestures at someone within the last 12 months was significantly associated with gender, age, region, income and marital status. The likelihood of this type of road rage behaviour was lower with increased age. In comparison to Toronto, road rage perpetration was lower in the central east region (OR=0.65). Also, as household income increased, the likelihood of this type of road rage behaviour increased, with significantly greater likelihood found for the two highest income groups (OR=2.08, OR=3.14). The likelihood of this behaviour was also significantly lower for married/partnered (OR=0.67) versus never married respondents.

Having threatened to hurt someone or damage someone's vehicle within the last 12 months was significantly associated with age and education. The likelihood of this road rage behaviour was lower as age increased and was lower among those with a higher education level compared to those who did not complete high school.

DISCUSSION

Being a victim of road rage is a common experience in Ontario. About half of the respondents experienced shouting, cursing or rude gestures and nearly 7.2% were threatened with injury or damage to their vehicles. Victimization for this serious type of road rage was more common for males, young people, those in the greater Toronto area and those with higher education and income levels. For the less serious form of victimization there was no gender difference, but it was more common among younger people, those in Toronto and higher income earners. Road rage perpetrators were more commonly young and, for the less serious type, males. There are more victims than perpetrators, as expected in aggressive acts.

The results indicate that being either a victim or a perpetrator in road rage incidents is usually more common for males and young people. These groups are more often involved in other aggressive behaviours and typically have more convictions for dangerous driving and speeding (e.g., refs. 9-11). Their driving is probably faster and more aggressive than for other groups. They may, therefore, feel more frustrated when other people get in their way. They may also drive faster cars, which when blocked in traffic causes them some frustration. Also, the overlap between being a victim and being a road rage perpetrator should be investigated. We would expect a substantive overlap based on our review of road rage incidents.

The results clearly indicate that road rage is more common in the Toronto area, the most heavily populated part of Ontario, with the largest number of vehicles. Traffic congestion is heavier there than elsewhere in Ontario and hence there are more opportunities to be blocked or frustrated by other drivers. Although good epidemiological data are not available, reports on road rage in the Canadian press have increased over the past few years.¹ If road rage is increasing, it may be a reaction to the increased pressures and stress people

experience in modern life. The observation that Toronto residents experience more road rage appears to offer some support for that hypothesis. However, Toronto residents may be exposed to more driving in general, and this exposure may account for the elevated levels of road rage they experience. Later research efforts should try to take account of these and other social factors in driving in Ontario.

Some kinds of road rage were more common among higher income earners than others. Reasons for this are unclear at this time. High income earners may be rushed, have more appointments to meet or get frustrated more easily. Thus, these results may also be accounted for by the hypothesis that road rage is related to the stress and pressures of modern life.

Clearly much remains to be done to clarify all social and demographic factors in road rage. These results give a first indication of the major factors and provide evidence that road rage may be more than a modern "urban legend". Instead, this phenomenon may be experienced by, and may exert important effects on, a substantial proportion of the Ontario population.

RÉSUMÉ

Contexte : La « rage au volant » préoccupe de plus en plus le public. On manque toutefois de chiffres sur la prévalence de ce comportement. Nous examinons ici la prévalence de la victimisation due à la rage au volant et ses corrélats démographiques en nous basant sur un sondage auprès d'adultes ontariens.

Méthode : Les données sont fondées sur l'Indicateur du CTSM, une enquête transversale annuelle effectuée auprès d'adultes ontariens (n=1 395). Le rôle des facteurs démographiques dans le phénomène de la rage au volant a été examiné à l'aide d'une analyse de régression logistique.

Résultats : Environ la moitié des répondants (46,6 %) ont été la cible de cris, d'insultes ou de gestes obscènes au cours de l'année écoulée, et 7,2 % des répondants ont été menacés de dommages à leur véhicule ou de blessures. Presque le tiers des répondants (31,7 %) ont avoué, entre autres, avoir insulté une autre personne ou avoir crié contre elle, et 2,1 % des répondants ont menacé un autre conducteur de blessures ou de dommages à son véhicule. Le fait de résider à Toronto, d'être relativement jeune ou d'avoir un revenu relativement élevé étaient tous des facteurs associés à une plus grande tendance à être l'objet d'insultes, de cris ou de gestes obscènes. Toutefois, le revenu n'était pas associé au fait d'être menacé de dommages à son véhicule ou de blessures. Les hommes, les répondants relativement jeunes, les résidents de Toronto, les personnes ayant un revenu relativement élevé et les personnes n'ayant jamais été mariées étaient plus susceptibles d'avouer, entre autres, avoir crié contre quelqu'un. Cependant, le fait de proférer des menaces était associé à un plus jeune âge et à un moindre niveau d'instruction.

Conclusion : Ces résultats donnent une idée de la prévalence de la rage au volant en Ontario, phénomène qui, dans ses formes plus bénignes, semble être répandu et touche entre le tiers et la moitié des répondants, à titre de victimes ou d'agresseurs. Près d'un résident de l'Ontario sur dix s'est fait menacer de dommages à son véhicule ou de blessures.

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