

## Public auto insurance: A mortality warning for motorists

### Introduction

Many Canadians see motor vehicle ownership and operation as a necessity of modern life. For example, usages rates (the ratio of drivers to population) are very high, averaging over 90 percent for most driving age groups.

However, driving a vehicle is also a relatively dangerous activity.

Though only 1.4 per cent of all deaths in Canada are attributed to vehicle collisions, more than one-third of accidental deaths are

caused by such collisions. These rates rise to one-third of all deaths, and over 70 percent of accidental deaths, for young people aged 15 to 24. The odds of a death by collision are 30 times higher for these young people than for the rest of the population.

Collisions are the leading cause of severe injuries for Canadians under the age of 65, typically requiring surgery and time in an intensive care unit. While the number of collisions is down 11 percent over the past decade—owing to better driving habits, tougher drunk driving laws and safer vehicle design—there are still over 220,000 injuries and over 28,000 acute care hospital injury admissions every year.

Vehicle collisions also create a substantial economic and financial cost.

The very fact that over half of property and casualty insurance premiums come from the auto sector—a total of \$11 billion in 2001—is a measure of the economic significance of the risk of driving. There were over three-quarters of a million collision claims that year, worth nearly \$7 billion, that were

### Main Conclusions

- Provinces with public auto insurance have higher auto collision, death, injury and property damage rates than those with market-based insurance
- Death, injury and property damage rates are even higher for young drivers in these provinces, and highest for males between 16 and 25 years old
- Unique provincial characteristics do not account for the greater deaths and damage. The likeliest explanation is that public systems produce too many subsidized higher risk drivers.
- Ontario could be faced with 50 more deaths and 3,900 more personal injuries to young people, and overall property damage collisions could rise by one-fifth, if the government adopted a public insurance system with social risk pricing



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paid by private insurers in Alberta, Ontario, and the Atlantic provinces. A national calculation including the other four provinces and their claims costs would be proportionately higher.

Finally, in the only Canadian study, Insurance Bureau of Canada (IBC) researchers estimate that the overall direct and indirect burden of vehicle collisions amounts to 1.9 percent of the British Columbia economy, a number in line with other international studies. An extrapolation of that impact, as a percentage of Canadian GDP, would come to \$23 billion nationally. For comparative purposes, this is equivalent to more than one-quarter of Canada's entire public health care spending.

The human and economic costs of motor vehicle collisions are therefore quite significant. In the public policy context where there is ongoing debate over the costs and benefits of government ownership, operation, and regulation of auto insurance, this huge burden prompts an important question. That is, what is the impact, if any, of public insurance systems on the incidence of motor vehicle collisions? In starker terms, is it the case, as cited in academic studies, that public insurance kills and injures more motorists?

## Comparing Public and Private Insurers

Canada has an excellent policy environment within which to pose these questions.

Three provinces (British Columbia, Saskatchewan, and Manitoba) have public insurance systems, Quebec has a public no-fault system for first person bodily injury, and the other provinces operate on a private market basis. Government

regulation is rather extensive in all provinces, with close monitoring or control over service offerings and pricing changes. Government policy also has a major role to play in the impact of medical costs on insurance markets.

This study places together the three provinces with public insurance and examines them as a group compared to the others. Though there are significant variations in policy across provinces, the one common element in the three public systems is that they price risk on a social basis. This means that there is little if any variation in premiums according to age or gender (or sometimes marital status or location), even

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though the insurance risk of certain groups (for example, urban young males) is much higher than others. The other provinces price risk on a market basis, with higher premiums for higher risk drivers.

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An example of the first effect comes from the home page for SGI

([www.sgi.sk.ca](http://www.sgi.sk.ca)), the Saskatchewan public insurer, which highlights a 22-year-old named Ryan. SGI compares his insurance premiums—based on one prior accident, six years of driving experience and a ten year old vehicle—with averages surveyed from Calgary, Toronto, and Vancouver. Net conclusion: Ryan drives for between one-sixth and one-half of the cost he would pay in these other places. What is left unsaid is that other Saskatchewan drivers are paying for his relative subsidy, with the greatest price paid by those involved in the additional collisions caused by too many of Ryan's peers.

The second effect, too many risky drivers, is an empirical issue, examined most recently by IBC (2003). That study shows that the provinces with public insurance have proportionately more than four times as many young drivers (as principle vehicle operators) as the rest of Canada, excluding Quebec.

## What is the Evidence?

So, public insurance systems have pricing incentives that encourage more risky drivers. Furthermore, data show that these incentives are being acted upon. What about the collision rates themselves?

As the top part of table 1 shows, the evidence here is equally compelling. Fatality rates by population are 18 percent higher in provinces with public insurance, with rates based on kilometres travelled being even higher.

Injury rates are also relatively high, though suspiciously low Saskatchewan numbers (the ratio of fatalities to injuries is twice as high as the other provinces) suggest that reporting quality is suspect there. The quality of hospital admissions data for collision injuries is more

reliable and this shows the most dramatic differences between the two insurance systems. For example, young male admission rates are 59 percent higher in provinces with public insurance.

More detailed data by driver age and gender come from provincial

ministry sources. This analysis has not been able to obtain information for all provinces, but the largest ones excluding Quebec are available in varying degrees of detail.

Figure 1 on the next page shows that fatality and personal injury

rates per young driver are much higher in Saskatchewan and Manitoba than in Alberta, Nova Scotia, and Ontario. Collision rates for young drivers, especially for teenagers, are more than a full percentage point higher in the two provinces with public insurance. Figure 2 shows property damage collisions for four of these provinces (as Alberta data were unavailable). The differences here are even more dramatic, especially for young male drivers.

**Table 1: Differences between public and market insurance provinces**

<i>Characteristic</i>	<i>Public Insurance Provinces</i>	<i>Market Insurance Provinces</i>	<i>Percent Difference</i>
<b>Collisions</b>			
Fatalities per 100,000	11.4	9.7	18%
Male fatalities per 100,000	15.7	13.4	17%
Fatalities per billion vehicle-km	11.3	8.3	35%
Injuries per billion vehicle-km	784	701	12%
Collision hospital admissions	130	89	46%
Males 16 to 24 collision admissions	303	190	59%
<b>Potential Explanations</b>			
Median age	37.8	37.5	1%
Males-to-females	96.6%	96.0%	1%
Age 15 to 24	13.5%	13.3%	2%
Males age 15 to 24	6.9%	6.8%	2%
Urban population	79.0%	80.0%	-1%
Major urban population (>100,000)	61.3%	67.1%	-9%
Capital city density (% of Toronto)	61.6%	82.7%	-26%
University education	22.2%	22.6%	-2%
Household income (% of Ontario)	83.5%	89.8%	-7%
Unemployment rate (past 5 years)	7.2%	7.6%	-6%
Vehicles per person	0.61	0.61	1%
Vehicle-km per person	9,821	10,706	-8%
Commuting distance (km)	6.0	7.6	-22%
Percent of heavy trucks	4.8%	3.5%	36%
Percent of heavy truck-km	6.7%	8.3%	-19%
New model vehicles	4.4%	6.1%	-27%
Capital city precipitation (mm)	913	862	6%
Capital city snowfall (cm)	75	173	-57%
Capital city average temperature	7	7	3%
Capital city temperature variation	9	9	4%
Violent crime per 100,000	1,382	843	64%
Property crime per 100,000	6,074	3,415	78%
Motor vehicle theft per 100,000	873	423	106%
Heavy drinkers (% of drinkers)	20.9%	19.9%	5%
Physicians per 100,000	187	188	-1%
Premium variation *	34.1%	56.3%	-39%

\* Alberta and Ontario only for market insurance provinces

Sources: Statistics Canada, 2001 Census, Canadian Vehicle Survey 2002, The State of Labour Markets 2003, Canadian Community Health Survey, Canadian Institute for Health Information, Consumers' Association of Canada (BC), author's calculations.

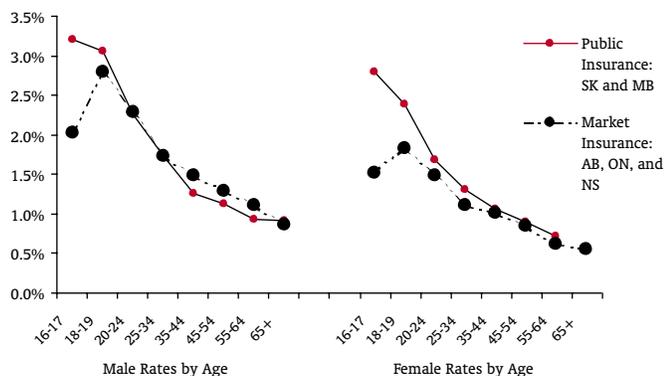
## Provincial Comparisons

Some might say that it is inappropriate to compare provinces in this way. How can one compare the mountainous driving of British Columbia, or the flat rural roads of Saskatchewan, with the urban congestion of greater Toronto or the winter conditions of Newfoundland and Labrador?

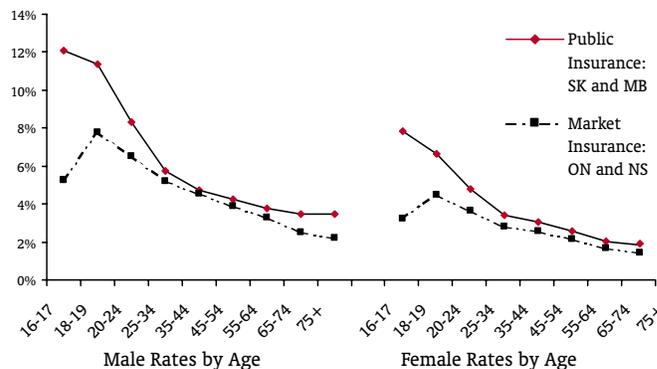
The first response to this criticism is to look at age or gender collision rate differences within each province. By comparing rates for these different groups within one province, there is less of a role for jurisdiction-specific effects. Whether looking at fatalities, personal injuries, or property damage collisions, the conclusion is the same: the provinces with public insurance have relatively more young driver collisions than older driver collisions of either gender.

The second response is to examine the potential factors that can cause collision rates to vary by province and see if these can account for any differences in collision rates. The bottom portion of table 1 undertakes just such an exercise, using variables that are highlighted in the academic literature on collision incidence (see the "Want to Know More?" section on the last page of this report).

## Fatality and Injury Collision Rates Per Driver



## Property Damage Collision Rates Per Driver



These commonly-cited studies consistently show that jurisdictions have more collisions if they have younger populations, have more males, are more urbanized (though there are more fatalities on rural highways), have denser traffic, have less educated residents with lower incomes, see more kilometres driven, have more heavy trucks on the road, have more inclement weather, have more crime, have more drunk driving, and have poorer access to medical services. The table displays these measures or available proxies.

The table shows that there are no significant differences in the demographic profiles of the two groups. There are almost exactly the same population proportions by age and gender. Urbanization—whether measured by all cities, only those major ones over 100,000 residents, or by density relative to Toronto—actually points to lower, not higher, collision rates for provinces with public insurance.

Education levels are comparable and, while household incomes in provinces with public insurance are relatively lower than the Ontario average, this is partly offset by equivalently lower unemployment rates.

Likewise, vehicle ownership shows little difference between provinces.

Distances travelled and commuted work in the direction of lower, not higher, collision rates for public insurers.

The proportion of heavy trucks in provinces with public insurance is a potential cause of higher collision rates, but this is more than reversed by the shorter average distances travelled there. It is interesting to note that though Saskatchewan has a high proportion of heavy trucks and rural distances travelled, it actually has the highest provincial proportion of non-highway fatalities, pointing to an urban explanation for the higher collision rates there.

The smaller proportion of newer vehicles is one potential explanatory factor, as older fleets might be related to higher collision rates. However, of provinces that collect such data, there is no significant correlation between the two. As well, vehicle defects typically play a part in less than 2 per cent of all fatal or personal injury collisions, suggesting that older vehicles are not a significant factor.

All of the measures of inclement and variable weather are not consistent with higher collision rates for public insurers, while the crime measures work in favour. It is hard to believe, however, that a higher prevalence of crime is

closely related to traffic fatalities, especially since the persons and circumstances involved are so different. The proxy for drunk driving (proportion of heavy drinkers) and the access to health services measures show no differences between the groups.

Finally, a direct measure of the mismatch between pricing and risk comes in the premium variation factor. This is calculated as the coefficient of variation of premiums across 30 driver categories, as compiled by the Consumers' Association of Canada (BC branch). A low number indicates little pricing difference across risk profiles, the very definition of social pricing. This factor is consistent with higher collision rates in provinces with public insurance.

Other characteristics, like traffic legislation and enforcement and driving attitudes, have not been examined here owing to data inadequacies. An important difference, insurance legislation (especially concerning no-fault provisions and access to tort law and legal aid), will not explain the provincial differences. This is because such provisions vary significantly across all provinces and are not the same within each risk pricing group.

In summary, there is little in the provincial characteristics that

explains the collision differences, aside from crime rates and premium variation. Of these two, social risk pricing is by far the more likely explanatory factor. As well, many factors suggest even higher collisions in provinces with public insurance after adjustment for such differences.

## Social Pricing Impact

What would be the impact of moving risk pricing in Ontario to a social pricing structure? Alberta, Saskatchewan, Manitoba, Ontario and Nova Scotia provide the most detailed collision data for making an estimate.

There are three caveats to such a calculation.

First, setting collision rate differences from these provinces to Ontario data is an unsophisticated approach. Any results should be seen only as an approximation.

Second, relative to the other province with public insurance (British Columbia), Saskatchewan and Manitoba have a lower standard of living, a higher proportion of older vehicles and trucks, and the weather is more inclement. An offsetting factor is lower urbanization numbers. The impact on collision rates is therefore ambiguous.

Three, as noted before, there is some question that the Saskatchewan injury numbers are under-

stated. If so, then this analysis will also tend to understate the potential rise in Ontario collisions under public insurance conditions. This is an offset against the magnitude of the second caveat effect noted above.

Having noted these points, moving Ontario collision rates by age and gender to the levels of the two provinces with public insurance is estimated to raise the number of vehicle collisions by 17 percent. Property damage collisions rise by 21 percent. Collisions for young people aged 16 to 24 rise by 41 percent. The total number of fatalities rises by 50, and personal injuries by 3,900, for these younger drivers.

These numbers are consistent with other findings and are actually below the IBC (2003) estimate for British Columbia, whereby a move away from social risk pricing implies a one-third drop in collision injuries.

These calculations are the explicit answer to supporters of social risk pricing who do not wish to discriminate against drivers by age or gender (or other attributes). The unintended costs of mispricing risk are more deaths, injuries, and property damage, especially for young drivers. It seems a steep price to pay for equal access to the privilege of driving.

## Would You Like to Reach Us?

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Other relevant resources:

- [www.abc.ca](http://www.abc.ca)
- [www.ontarioinsurance.com](http://www.ontarioinsurance.com)
- [www.insurance-canada.ca](http://www.insurance-canada.ca)
- [www.fraserinstitute.ca](http://www.fraserinstitute.ca)

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