

Youth and Road Crashes

Magnitude, Characteristics and Trends



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April 2008

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ISBN: 978-0-920071-73-1

Youth and Road Crashes: Magnitude, Characteristics, and Trends

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Acknowledgements —●

Financial support for this project was provided by Toyota Canada, Inc.

Toyota Canada Inc.



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Executive Summary

OVERVIEW

- ◆ This report examines the involvement of young people (15-24) in serious road crashes in Canada. It confirms that they are overrepresented in such crashes; the magnitude of the problem underscores the need for effective solutions.
- ◆ The need is further emphasized by the fact that since the beginning of the new millennium, progress, so evident during the 1980s and 1990s, came to a halt, and in some instances, the positive trends were even reversed.

BACKGROUND

- ◆ Road crashes involving young people have long been recognized as a major health and safety problem in Canada and around the world.
- ◆ The overrepresentation of youth in serious collisions has led to numerous initiatives aimed at reducing their deaths and injuries on the highways.
- ◆ This report examines the current magnitude and characteristics of the problem in Canada and trends in it over the past several decades.

TRENDS

- ◆ There were significant and important declines in the magnitude of the problem during the 1980s and 1990s.
- ◆ However, these improvements halted and even reversed somewhat at the beginning of the new millennium; at a minimum, there has been no progress in the past 7 years, underscoring the need for new and improved prevention efforts.
- ◆ Despite the initial gains witnessed over several decades, the problem of youth and road crashes remains a significant one as attested to by the statistics reported below.

EXTENT OF THE PROBLEM

- ◆ Over 700 young people (15-24) are killed each year in road crashes in Canada and a further 50,000 are injured, many seriously. These totals include some 350 teens (aged 15-19) killed and 24,000 injured, as well as 350 20-24 year olds killed and 26,000 injured.
- ◆ These numbers make road crashes the leading cause of death among young people, outstripping suicide and other accidents.
- ◆ Indeed, 1/3 of the deaths as well as 1/3 of the injuries that occur to young people each year is the result of road crashes.
- ◆ Motor vehicle collisions are the leading cause of hospital admissions among youth and the second leading cause of emergency room visits.
- ◆ Young people have the highest death and injury rates (number of deaths/injuries per 100,000 population) of any age group.



- ◆ Not surprisingly, young people contribute substantially to the total number of deaths and injuries on the roads each year in Canada; they account for ¼ of all the deaths and injuries.

CHARACTERISTICS OF THE PROBLEM

- ◆ The statistics cited above include deaths and injuries to young people as drivers, passengers, pedestrians and bicyclists.
- ◆ However, the vast majority (some 80%) of their deaths and injuries occur when they are drivers or passengers.
- ◆ But these vary as a function of the age and gender of the young people: young males are more likely to be killed or injured as a driver; young females are more likely to be killed or injured as a passenger.

THE YOUNG DRIVER

- ◆ As described above, the vast majority of deaths and injuries occur to young people when they are drivers or passengers. And, research has consistently shown that when they are passengers, they are much more likely to be in a vehicle driven by another young person.
- ◆ The involvement of young drivers in serious road crashes vastly outweighs their representation in the driving population; they account for nearly 25% of the motor vehicle deaths and injuries but only 13% of the licenced driving population.
- ◆ Young drivers have a death rate (number killed per 100,000 licenced drivers) that is 3 times the rate among 35-44 year olds; their injury rate is double that of the comparison group of 35-44 year olds.

CONCLUSIONS

- ◆ Recent trends are not promising; there has been no improvement in the problem of youth and road crashes for several years and, in fact, what were promising trends have, in some cases, been reversed.
- ◆ Regardless of the trends, the problem persists at unacceptable levels.
- ◆ The challenge is to find new measures to deal with the problem and to enhance the effectiveness of more traditional ones like graduated driver licencing and driver education/training.



1.0 Introduction —●

This report examines the magnitude and characteristics of the problem of young people in road crashes. Young people are defined as teens aged 15 to 19 and young adults aged 20 to 24. The problem is examined from both public health and road safety perspectives.

The public health perspective asks how important road crashes are as a cause of death and injury to young people. An examination of the leading causes of death and injury among young and older age groups, as well as population age-based data (e.g., per capita death and injury rates) are used to determine the magnitude of the problem.

The road safety perspective examines the extent to which young people contribute to the total road toll (e.g., what percentage of all road deaths or injuries is accounted for by young people?). Their involvement as drivers and other road users is examined using various national motor vehicle collision and other databases.

The report also examines the specific problem of young drivers since they constitute a major part of the problem – the majority of young passengers are killed or injured in collisions involving young drivers (Mayhew and Simpson 1999; Mayhew, Simpson, Singhal, and Desmond 2006).

The final section of the report examines trends in the problem of young people and road crashes to determine if there have been changes in the extent of the problem over the past several decades.



2.0 Magnitude of the Problem

In 2006, the most recent year for which data are available, a total of 713 young people were killed in road crashes in Canada – this included 353 teens aged 15 to 19, and 360 young adults aged 20 to 24. An additional 51,324 were injured in motor vehicle crashes – 24,594 teens aged 15 to 19, and 26,730 young adults aged 20 to 24 (Transport Canada 2007).

713 young people were killed and over 50,000 were injured in road crashes in 2006.

These deaths and injuries, tragic and preventable, highlight the need for effective solutions.

2.1 Public Health Issue

Youth involvement in road crashes is a serious public health issue. Table 1 presents the leading causes of death among 15 to 24 year olds, compared to 25 to 34 year olds. As can be seen, motor vehicle collisions were the leading cause of death for Canadian youth aged 15 to 24 in 2004 (the most recent year for which these data are available; Statistics Canada 2004).

Motor vehicle collisions are the leading cause of death to young people in Canada.

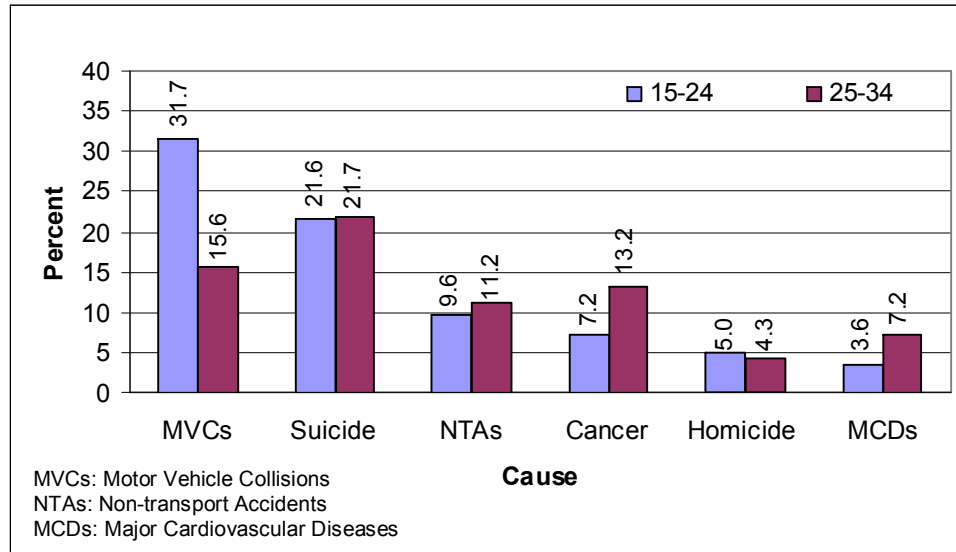
Table 1. Causes of Death for Ages 15-24 and 25-34, Canada, 2004

| Cause | Aged 15-24 | Aged 25-34 |
|-------------------------------|------------|------------|
| | Rank | Rank |
| Motor Vehicle Collisions | 1 | 2 |
| Suicide | 2 | 1 |
| Non-Transport Accidents | 3 | 4 |
| Cancer | 4 | 3 |
| Homicide | 5 | 6 |
| Major Cardiovascular Diseases | 6 | 5 |

In fact, road crashes were responsible for about *one third* of all the deaths to teens and young adults. This is shown in Figure 1, which displays the percentage contribution of each of the six leading causes of death in Canada for individuals aged 15 to 24 and 25 to 34. As can be seen, 31.7% of all deaths among 15 to 24 year olds were attributable to road crashes in 2004 (33.5% of all deaths among 15 to 19 year olds and 30.3% of all deaths of 20 to 24 year olds were attributable to road crashes in 2004; not shown in the Figure 1). In contrast, the leading cause of death in the next oldest group – those aged 25 to 34 – was suicide (21.7%).



Figure 1. Causes of Death for Ages 15-24 and 25-34, Canada, 2004



Road crashes are also the leading cause of traumatic injury for teens and young adults. The Canadian Institute for Health Information’s (CIHI) National Trauma Registry (2006) for the 2004-2005 fiscal year (the most recent data available)¹ shows that 55.7% of all traumatic injuries to teens and young adults were attributable to motor vehicle collisions – 55.9% of those to 15 to 19 year olds, and 55.5% to 20 to 24 year olds. These rates are substantially higher than those recorded for any other age group: for example, 46.5% of all traumatic injuries sustained by 25 to 34 year olds and 42.5% sustained by 35 to 44 year olds were due to motor vehicle collisions. Seniors aged 65 and older showed the lowest rate of traumatic injury due to motor vehicle collisions (only 23.1%).

More recent, hospital-based data for Ontario follow a similar pattern. In the 2005-2006 fiscal year, the most recent year for which data are available, motor vehicle collisions were the leading cause of hospital admissions among youth aged 15 to 24 (Smartrisk 2008). Motor vehicle collisions were also the second leading cause of emergency room visits for youth aged 15 to 24, after unintentional falls.

¹ CIHI records incidents of traumatic injury across eight provinces based on traumatic injury codes consistent with the International Classification of Diseases (Version 10). Cases were defined as “traumatic” based on Injury Severity Scores (ISS) greater than 12; the ISS is an anatomically-based scoring system designed to assess injuries in multiple areas.

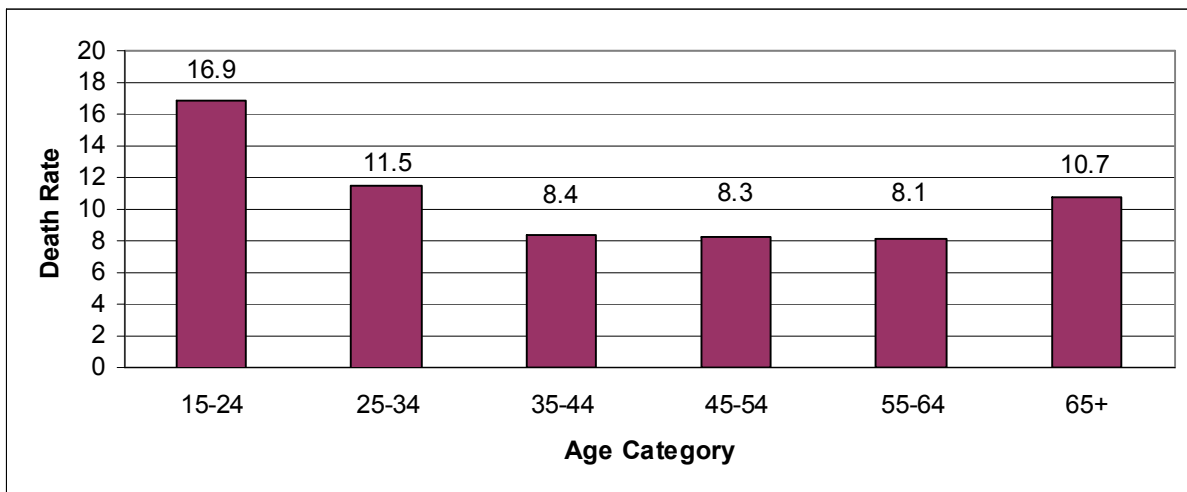


The fact that motor vehicle collisions are the leading cause of death and injury to teens and young adults underscores the significance of the problem. It might be argued that these statistics reflect changes in the youth population over the past several years; for instance, there were 3.8 million Canadians aged 15 to 24 in 1991 (Statistics Canada 1992); by 2006, this had increased to 4.2 million (Statistics Canada 2008).

This growth in the population of young people, however, does not explain their involvement in serious road crashes. Per capita estimates that control for population differences show that youth are overrepresented in road crashes. Relevant data are shown in Figure 2, which presents death rates (number of deaths per 100,000 population) from motor vehicle crashes for various age groups during 2006, the most recent data-year available. As can be seen, the highest death rate is among young people aged 15 to 24. Indeed, their death rate of 16.9 is 47% higher than the rate of 11.5 observed for 25 to 34 year olds, and more than *double* the rates observed among 35 to 64 year olds. When the data for young people were analysed by age category, teens aged 15 to 19 had a motor vehicle death rate of 16.5, while young adults aged 20 to 24 had a motor vehicle death rate of 17.3.

The motor vehicle death rates among young people are *double* those of other age groups.

Figure 2. Motor Vehicle Death Rates, Canada, 2006

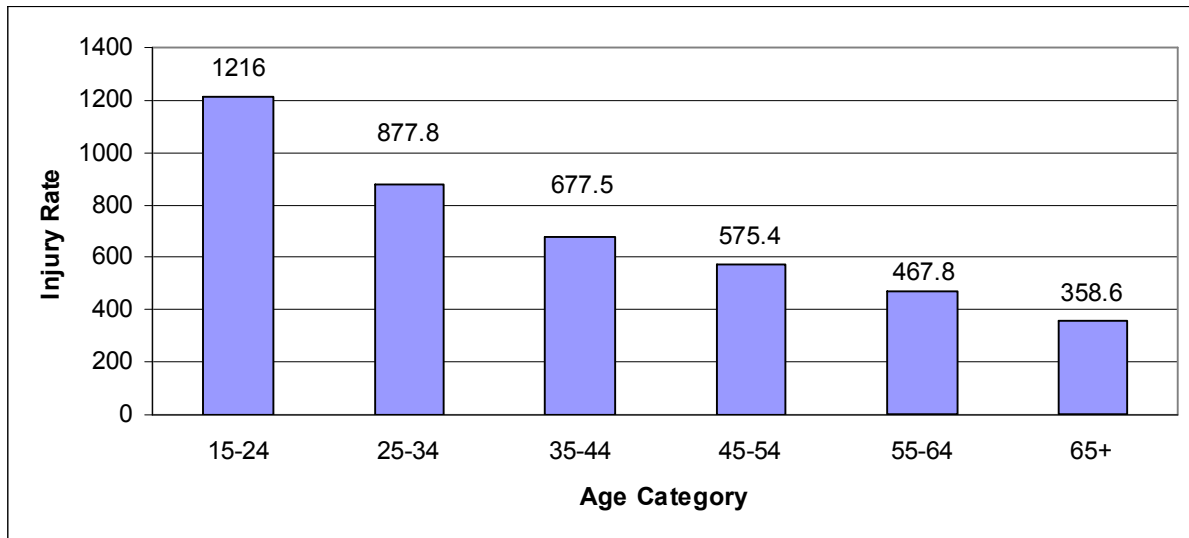


A similar situation is evident for injury rates (see Figure 3). In 2006, young people aged 15 to 24 had a motor vehicle injury rate that was almost 40% higher than the rate for 25 to 34 year olds and more than *three times* higher than the rate within the oldest age group, drivers aged 65 and older (rates of 1,216.0, 877.8, and 358.6, respectively). When the data for young



people were analysed more specifically by age group, individuals aged 15 to 19 and 20 to 24 had motor vehicle injury rates of 1,149.0 and 1,284.9, respectively.

Figure 3. Motor Vehicle Injury Rates, Canada, 2006



2.2 Road Safety Issue

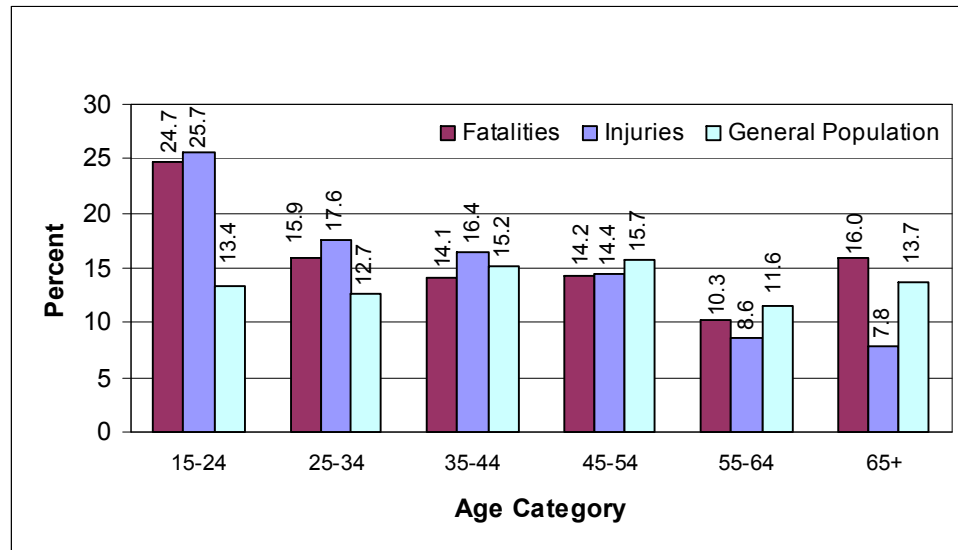
Youth involvement in road crashes is also an important road safety issue because a substantial portion of the deaths and injuries occurring on the roads each year involve 15 to 24 year olds. In 2006, youth aged 15 to 24 accounted for approximately *one quarter* of all road fatalities (24.7%) and injuries (25.7%) in Canada. Specifically, teens aged 15 to 19 and young adults aged 20 to 24 accounted for 12.2% and 12.5% of all road fatalities in 2006, and 12.3% and 13.4% of all road injuries, respectively.

Young people account for ¼ of all road fatalities and injuries.

As presented in Figure 4, although youth aged 15 to 24 accounted for nearly one quarter of those killed or injured, they represent only about 13% of the general Canadian population. Thus, young people are overrepresented in road crashes – their proportions are almost *double* their representation in the general population. By contrast, the next oldest reference group, that of 25 to 34 year old drivers, was involved in 15.9% of road deaths and 17.6% of road injuries – figures that more closely resemble their representation within the general Canadian population (12.7%).



Figure 4. Proportion of Fatalities and Injuries by Age Category, Compared to the General Population, Canada, 2006²



² Note: Values do not sum to 100% because Canadians under age 15 are not included, and age was not available for 43 fatalities and 6,509 injury cases. Sources: Statistics Canada; Transport Canada 2007.



3.0 Characteristics of the Problem

The preceding sections examined deaths and injuries to young people collectively as all types of road users – drivers, passengers, pedestrians and bicyclists. However, the distribution of deaths and injuries across the various classes of road user varies as a function of age and gender. Relevant data are presented in Figures 5 to 8, which show fatalities and injuries by single year of age for males and females by the four primary types of road user. In order to add reliability and stability to these estimates, data from Transport Canada's Traffic Accident Information Database (TRAID) were aggregated over the years of 2000 to 2005, inclusive.

As shown in Figure 5, a substantial proportion of the road fatalities among males aged 15 to 19 were passengers. This is not surprising within the younger years because of the typical minimum age of 16 for a licence or learner's permit. However, with increased age, a much larger proportion of fatalities within this group were driver fatalities. Indeed, among 18 and 19 year old males, 58.7% and 61.3% (respectively) of all their road deaths occurred as drivers.

The situation for females aged 15 to 19 is somewhat different. The majority of them are killed in road crashes as passengers at the ages of 15, 16, and 17; at age 18, the driver/passenger proportion almost becomes equal (see Figure 6).

Data on injuries are shown in Figures 7 and 8 for males and females, respectively. Males aged 15 and 16 sustained injuries in road crashes primarily as passengers; however, after age 17, males sustained injuries primarily as drivers (see Figure 7). For females aged 15 to 19, however, the majority of injuries were sustained as passengers, although the proportion of driver injuries surpassed those of passengers at age 18 (see Figure 8).

Figure 5. Road Fatalities by Road User Class, Males Aged 15-19, Canada, 2000-2005

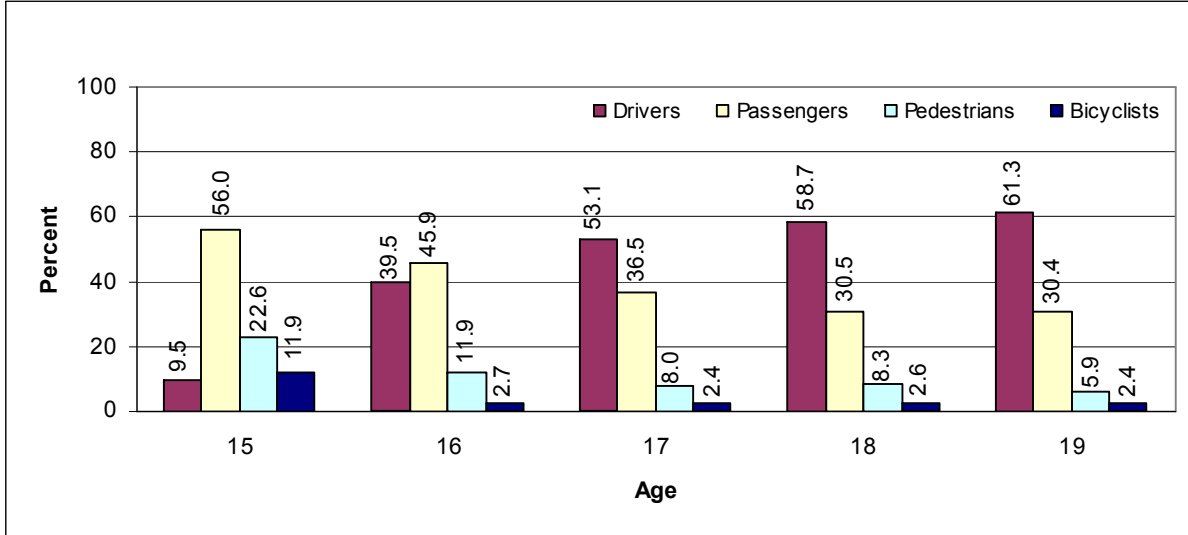


Figure 6. Road Fatalities by Road User Class, Females Aged 15-19, Canada, 2000-2005

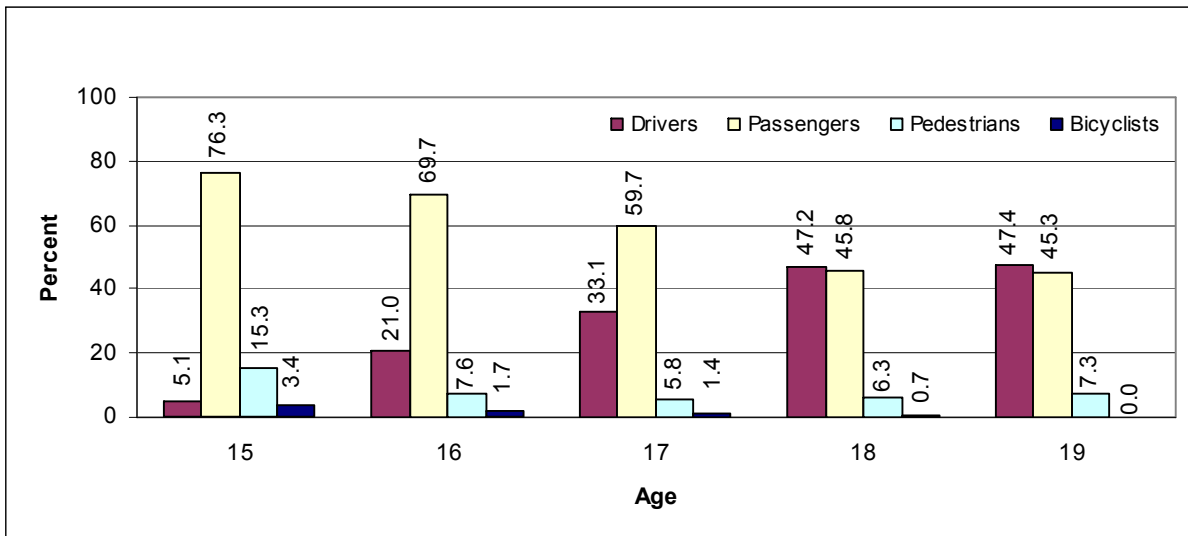


Figure 7. Road Injuries by Road User Class, Males Aged 15-19, Canada, 2000-2005

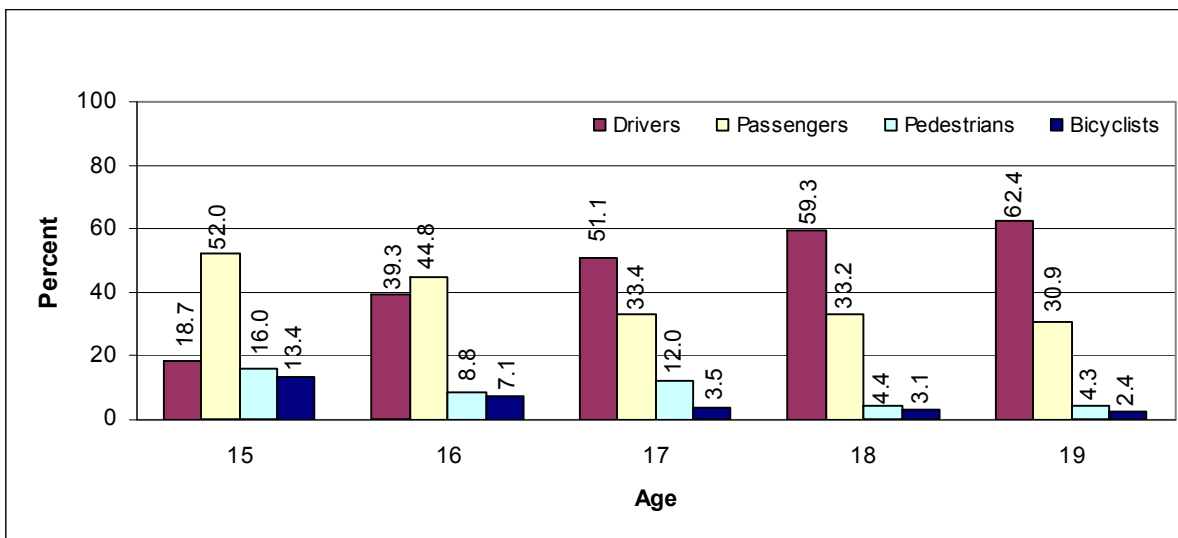
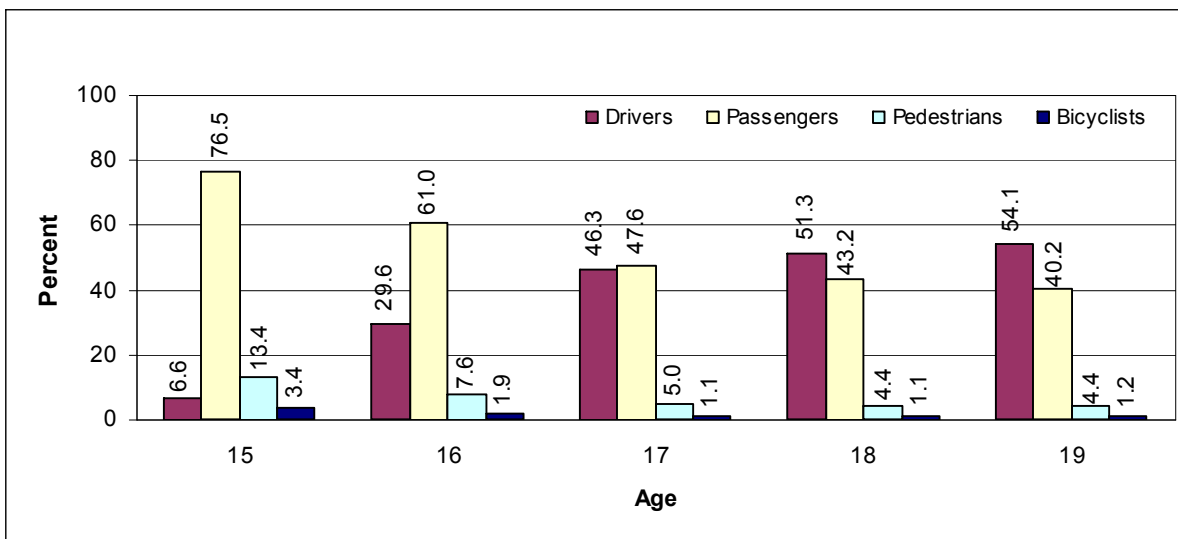


Figure 8. Road Injuries by Road User Class, Females Aged 15-19, Canada, 2000-2005



4.0 The Young Driver Problem

As highlighted in the previous section, the majority of deaths and injuries to young people in road crashes occur when they are drivers or passengers. Indeed, among 15 to 19 year olds, 47.0% of their deaths occurred as drivers, and a further 42.1% as passengers (Transport Canada TRRID database 2000-2005). Only 10.9% of their deaths occurred as pedestrians or bicyclists. And, since most young passengers are killed when being transported by a young driver (Mayhew and Simpson 1999; Mayhew et al. 2006), the following sections focus on young drivers.

4.1 Per-Driver Death and Injury Rates

In 2005, the most recent year for which detailed driver-related TRRID data are available, 404 *drivers* aged 15 to 24 were killed on Canadian roads. A further 28,428 were injured. These accounted for 23.9% of all the driver fatalities and 23.5% of all the driver injuries that year. By comparison, drivers aged 25 to 34 accounted for 18.4% and 21.0% of all driver fatalities and injuries, respectively.

To make comparisons between various age groups that control for the number of drivers in each age group, per-driver death rates are often used – i.e., the number of deaths per 100,000 licenced drivers. These are calculated by dividing the number of driver fatalities in a particular age group by the number of licenced drivers in that age group. The per-driver death rates for various age groups for 2005 are shown in Figure 9.

As can be seen, the per-driver death rate for Canadian youth aged 15 to 24 was 14.2. In contrast, the per-driver death rate for those aged 35 to 44 was almost *one third* that of the younger groups, at 5.7. A similar pattern holds for per-driver injury rates, where youth rates are almost *double* those for 35 to 44 year olds (rates of 997.3 and 546.2, respectively; see Figure 10). Clearly, even when the number of licenced drivers is controlled, teen and young adult drivers are overrepresented in road fatalities and injuries.

Figure 9. Per-Driver Death Rates by Age Category, Canada, 2005*

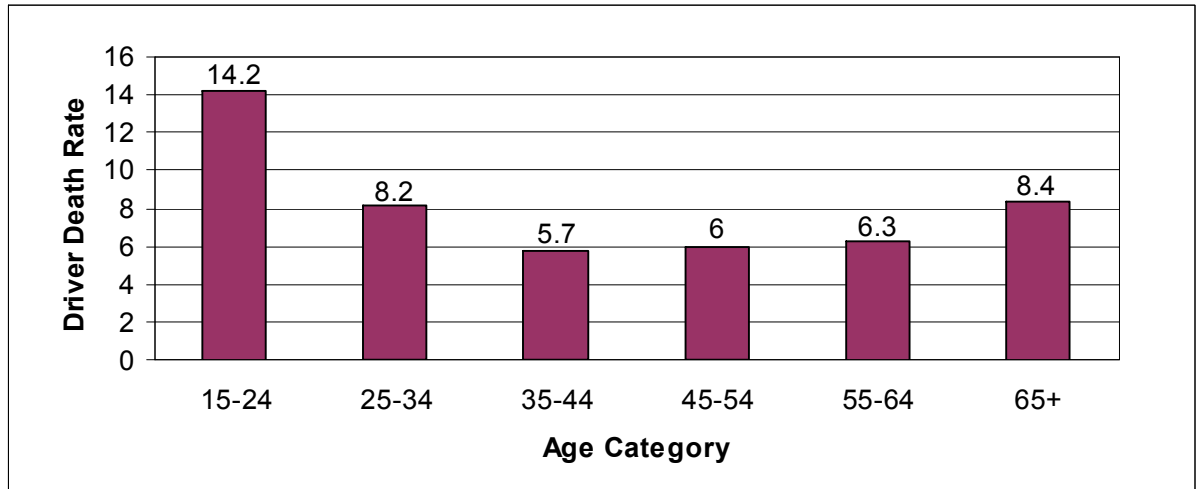
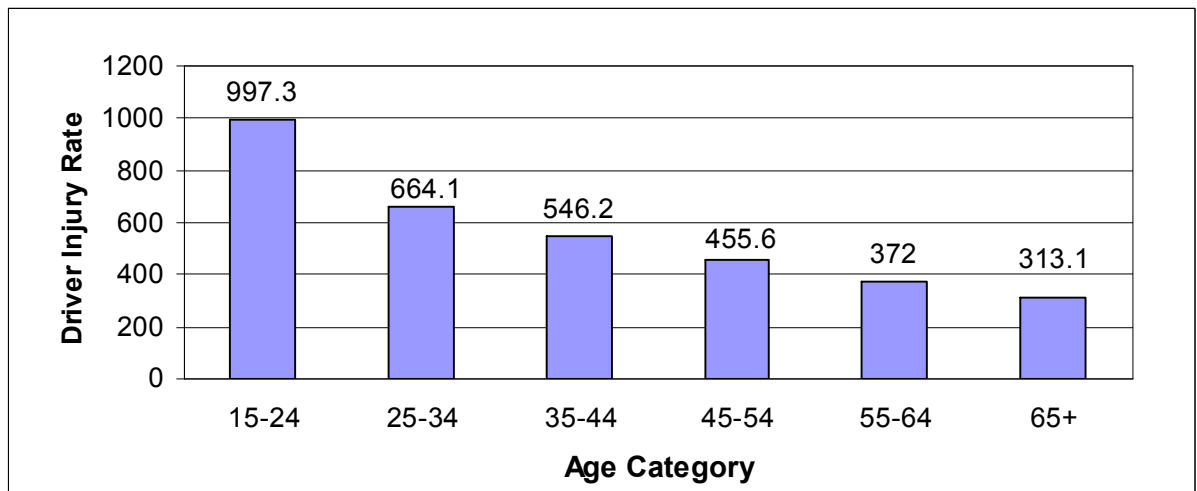


Figure 10. Per-Driver Injury Rates by Age Category, Canada, 2005 *



*Sources: Transport Canada TRRID database; Transport Canada 2007

4.2 Per-Distance Death Rates

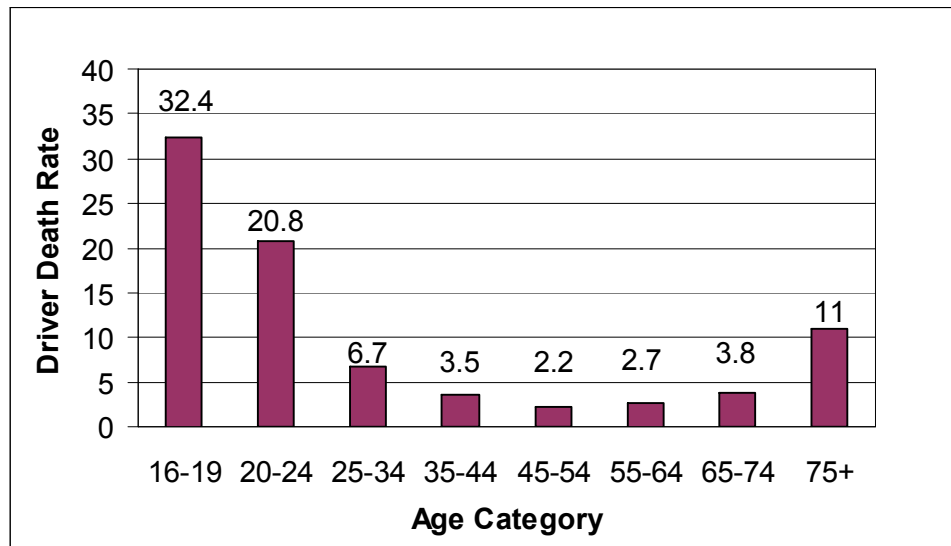
It is possible that youth are overrepresented in crash statistics because they drive more than older people. To investigate this, per-distance death rates are calculated by dividing the number of driver fatalities by the number of kilometres driven by that age group per year. These death rates are taken from a Transport Canada publication, which does not provide similar per-distance rates for injuries in Canada (Transport Canada 2006).



As can be seen in Figure 11, in 2004, the most recent year for which distance-related death rates are available, teens and young adults had substantially higher per-distance death rates (number of driver deaths per billion vehicle kilometres) than older age groups. In fact, the per-distance death rate for teens aged 15 to 19 (32.4) was almost *five times* the rate among 25 to 34 year olds (6.7) and *fifteen times* the rate among 45 to 54 year olds (2.2; Transport Canada 2006).

Controlling for distance travelled, teen drivers have a death rate that is *15 times* that among 45-54 year olds.

Figure 11. Per-Distance Driver Death Rates by Age Category, Canada, 2004*



*Source: Transport Canada 2006

In sum, teen and young adult drivers have death rates from motor vehicle collisions that are consistently higher than those among drivers of older age groups.



5.0 Trends in the Problem

As illustrated earlier, youth involvement in road crashes is a significant public health and road safety issue. However, important gains were made in the 1980s and 1990s, both in terms of the absolute numbers of young people killed and injured in road crashes, and in terms of their contribution to the overall death and injury toll on the highways. These gains have even occurred against a backdrop of an increased youth population.

As shown in this section, however, the significant gains achieved in the '80s and '90s in reducing the magnitude of the problem appear to have stalled, and even reversed, in more recent years.

5.1 Public Health

Motor vehicle collisions were the leading cause of death among Canadians aged 15 to 24 in 2004 (see Section 2.1). To evaluate trends in the problem, data on the leading causes of death for Canadian males and females in 2004 (the most recent data year) were compared to those from 1980 (Statistics Canada 1982). As presented in Figure 12, motor vehicle collisions were also the leading cause of death for Canadian males and females aged 15 to 24 in 1980.

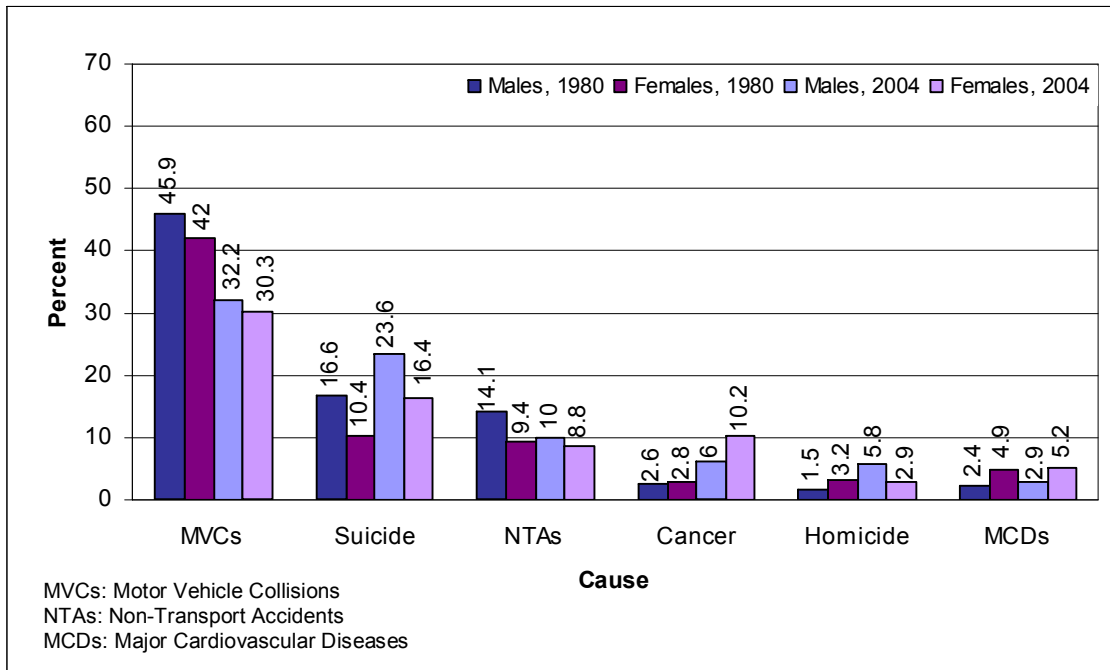
However, the proportion of deaths attributable to motor vehicle collisions has reduced substantially. In 1980, 45.9% of deaths among 15 to 24 year-old-males and 42% among 15 to 24 year-old-females were attributable to motor vehicle collisions; by 2004, these numbers had been reduced to 32.2% for males aged 15 to 24, and 30.3% for females of the same age. Thus, substantial progress has been made in terms of preventable road deaths to youth.

Substantial progress was made in preventing deaths and injuries among young people in the 1980s and 1990s.

Despite this progress, however, the problem remains significant. As described below, the rates have in fact *increased* or shown no improvement in recent years – i.e., progress of late has stalled, and the need for continued action is evident.



Figure 12. Causes of Death for Males and Females Aged 15-24, Canada, 1980 and 2004



Annual death and injury rates (per 100,000 population) are presented in Figures 13 and 14 for the years 1994 to 2006, inclusive, for ages 15 to 24 and 25 to 34. As can be seen in Figure 13, youth aged 15 to 24 experienced a decrease of approximately 20% in motor vehicle death rates, from 20.9 in 1994 to 16.9 in 2006. More specifically, the motor vehicle death rate for teens aged 15 to 19 was 21.3 in 1994; by 2006, this rate was 16.5, a decrease of 22.5%. For young adults aged 20 to 24, motor vehicle fatality rates went from 20.6 in 1994 to 17.3 in 2006, a decrease of 16%. By contrast, there was only a 6% decrease in road fatalities during the same period among the 25 to 34 year-old comparison group.

As shown in Figure 14, young adults aged 15 to 24 experienced about a 28% decrease in injuries, going from a motor vehicle injury rate of 1,700.4 in 1994, to 1,216.0 in 2006. Teens aged 15 to 19 had a motor vehicle injury rate of 1,750.7 in 1994; by 2006, this had decreased to 1,149.0, a decline of almost 35%. Young adults aged 20 to 24 had a motor vehicle injury rate of 1,651.9 in 1994; by 2006, this rate was 1,284.9, a decrease of about 22%. The older comparison group – 25 to 34 year olds – experienced a 20% decrease in road injuries during the same period.



Figure 13. Motor Vehicle Death Rates, Ages 15-24 and 25-34, Canada, 1994-2006

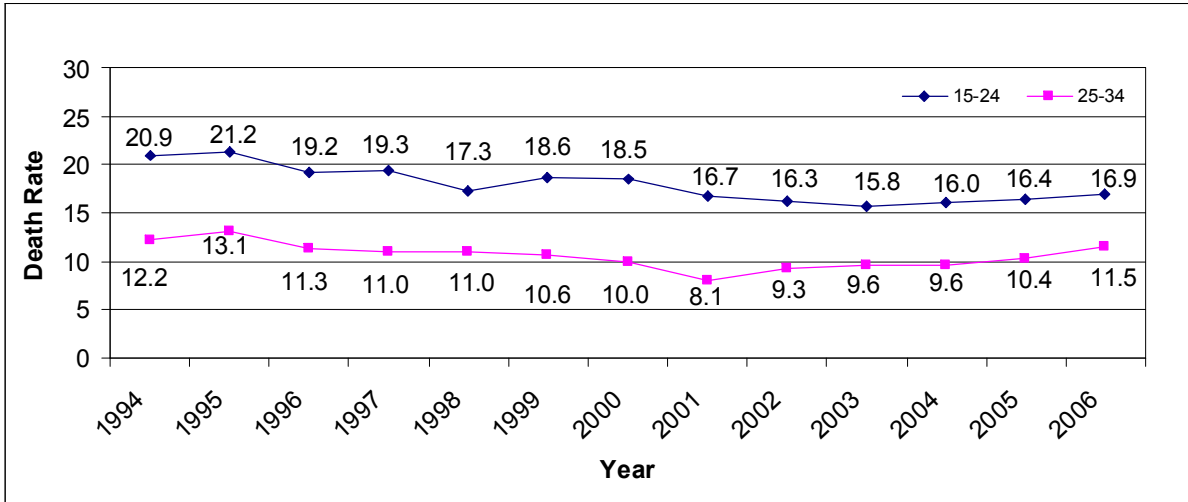
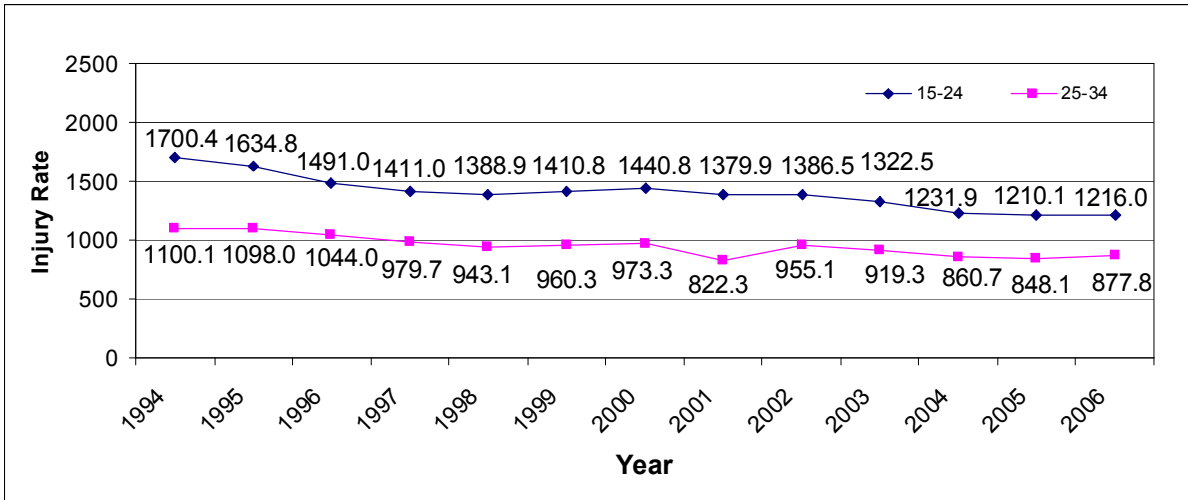


Figure 14. Motor Vehicle Injury Rates, Ages 15-24 and 25-34, Canada, 1994-2006



These improvements over this 18-year study period notwithstanding, a closer examination of the rates since the beginning of the new millennium shows that progress has halted, and, in the case of death rates, even *reversed*. For instance, from 1994 to 2003, there was a 25% decrease in motor vehicle death rates for youth aged 15 to 24, declining from 20.9 to 15.8. However, after 2003, an *increase* of 7% was recorded, from 15.8 to 16.9. Death rates remained lower among 25 to 34 year olds during the same time. However, they too experienced an increase after a

In recent years, death rates among young people have increased.

period of declining rates. From 1994 to 2001, motor vehicle death rates for this age group decreased by about a third, from 12.2 to 8.1. However, after 2001, the death rate increased by over 40%, to 11.5. The fact that general population-based death and injury rates have fluctuated for both age groups throughout recent years suggests that broader factors may also play a role – nevertheless, the continuing overrepresentation of youth in road crashes and the fact that improvements have declined in recent years highlight the need for further action.

5.2 Road Safety

Since 1979, the number of road deaths among teens and young adults has decreased; however, they remain overrepresented in serious collisions. Figures 15 and 16 present the respective proportions of road deaths and injuries accounted for by young adults and an older comparison group (15 to 24 versus 25 to 34) since 1979. As is evident, the proportion of deaths and injuries attributable to young people has decreased since 1979. There was a 32% decrease in the relative proportion of fatalities among 15 to 24 year olds during this period of time; specifically, there was a 33% decrease in the proportion of fatalities among 15 to 19 year olds, and a 31% decrease in the proportion of fatalities for 20 to 24 year olds from 1979 to 2006.

In terms of injuries, there was a 36% decrease among 15 to 24 year olds from 1979 to 2006. Specifically, injuries sustained by teens aged 15 to 19 showed a decrease of 41%, while young adults aged 20 to 24 showed a decrease of 31% from 1979 to 2006.

These long-term improvements notwithstanding, progress was mostly attributable to changes that occurred in the 1980s and early 1990s. Clearly, although substantial improvements have occurred within the past several decades, progress regarding youth and road crashes has reached a plateau, underscoring the need for renewed efforts to address youth involvement in road crashes.



Figure 15. Percent of Road Deaths Accounted for by Age Category, Canada, 1979-2006

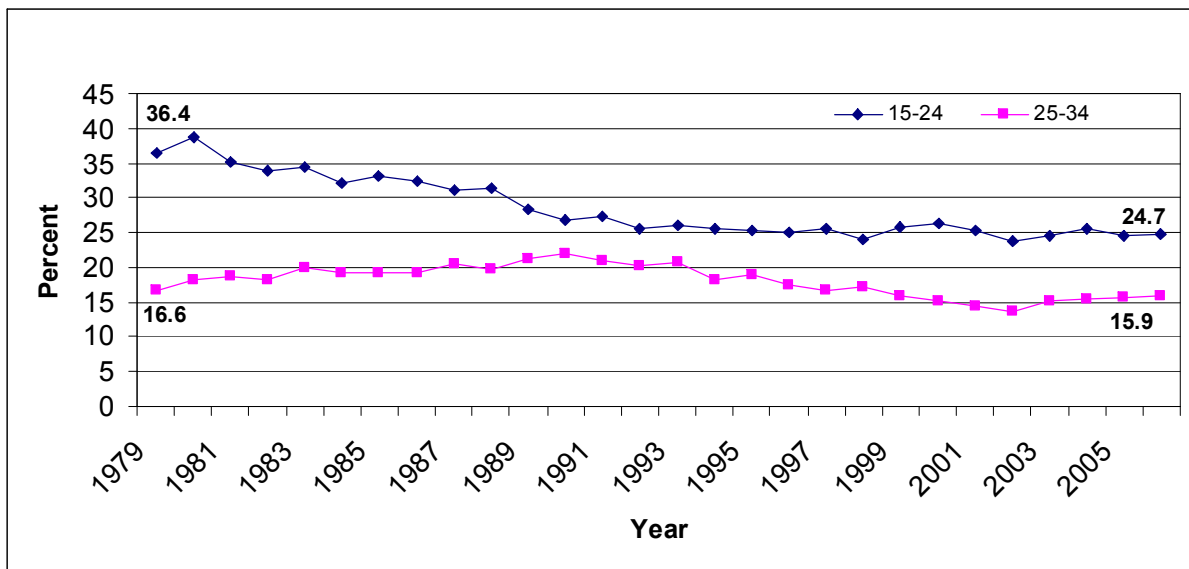
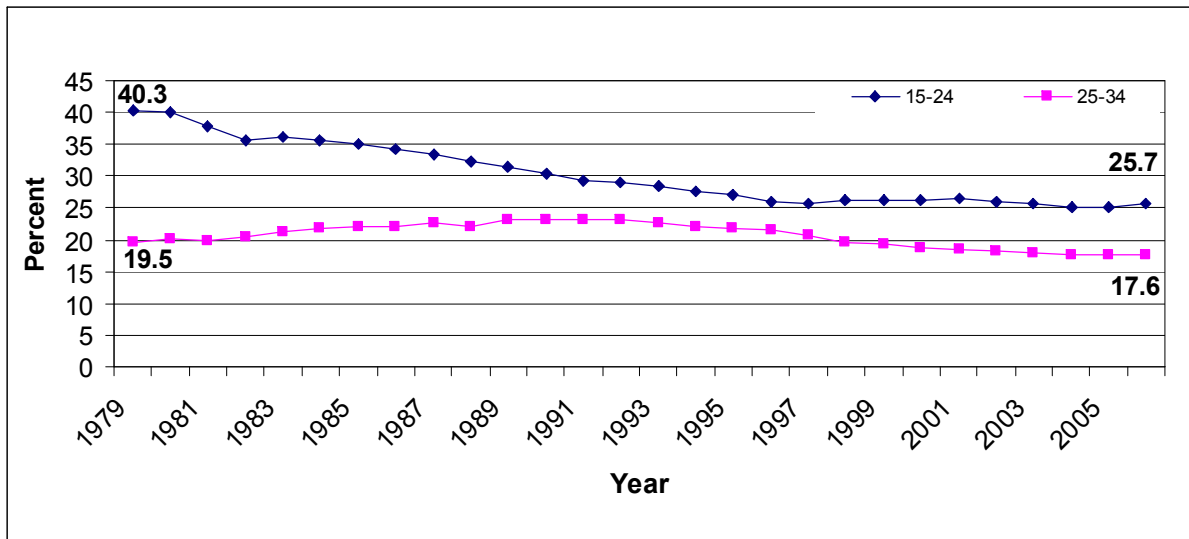


Figure 16. Percent of Road Injuries Accounted for by Age Category, Canada, 1979-2006



6.0 Conclusions —●

Although significant improvements were made in the 1980s and 1990s, progress in reducing the crash risk for teen and young adult drivers appears to have stalled in recent years, particularly since the beginning of the new millennium.

Motor vehicle collisions remain a significant public health and road safety issue for teens and young adults; young drivers continue to be a problem. The disproportionate numbers of deaths and injuries among teens and young adults highlight the need for new effective initiatives, and further underscore the importance of existing measures such as graduated driver licencing and driver education for novice drivers.



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