Determinants of Injury and Death in Canadian Police Officers

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Executive Summary

This research note examined the nature and causes of injuries and fatalities among Canadian police officers through an analysis of the Association of Workers' Compensation Boards of Canada injury and fatality time loss claims databases.

The data for this research note derived from the Association of Workers' Compensation Boards of Canada injury and fatality time loss claims databases from 2006 to 2015 inclusive. The data included gender, age, year, province, the cause of the fatality or injury, the nature of the event that resulted in a fatality or an injury with an accepted time loss claim, which part(s) of the body were injured, the source of the injury, and whether the fatality or accepted time loss claim was for a commissioned or non-commissioned officer.

Between 2006 and 2015, in this database, Alberta, British Columbia, Ontario, and Quebec combined for 45 fatalities of a police officer or a rate of 0.7 fatalities per 1,000 police officers. In total, 40 of these fatalities were of a male police officer.

In terms of accepted time loss claims, between 2006 and 2015, there was a total of 22,394 accepted claims for police officers. In total, 92% of all accepted time loss claims derived from just Ontario, Quebec, Alberta, and British Columbia.

The rate per 1,000 police officers of accepted claims declined substantially over time from a high of 37 accepted time loss claims per 1,000 police officers in 2006 to a low of 30.6 accepted time loss claims per 1,000 police officers in 2015.

The most common cause of a fatality or accepted time loss claim for a police officer was a traumatic injury or disorder. The precipitating event leading to the fatality or accepted time loss claim was most commonly a violent act or a transportation incident most likely involving either a vehicle or a person. In terms of basic demographics, police officers who are injured or die are most often males under the age of 40. When female police officers are the victim, they tend to be even younger.

Given this, additional research should continue to explore ways to make police work safer, while better understanding the risks associated with being a police officer.

Introduction

This research note examines the nature and causes of injuries and fatalities among Canadian police officers through an analysis of the Association of Workers' Compensation Boards of Canada injury and fatality time loss claims databases. As one of the only 24/7 first responder agencies in every community and municipality in Canada, police work can routinely place officers in harm's way and expose them to a wide range of potential physical and psychological risks. The main duties of police officers include responding to all types of calls for service, attending emergency situations, providing first aid and medical assistance, interacting with offenders and people who are suffering from a wide range of mental health issues and addictions, and addressing the full range of crime and social issues in a community. Given this, there is an increased risk among police officers for physical and psychological injuries as a result of the frequency and intensity of their interactions with the public, the physical nature of their duties, the requirement to spend long periods of time in their vehicles or engaging in stressful activities involvement in dangerous or traumatic events, and the nature of shift work. As such, this report highlights the main nature and cause of police officer fatalities and accepted time loss claims over a period of 10 years to highlight areas of caution for police leaders and areas that may require additional attention in order to ensure that police officers remain physically and mentally safe and well throughout their policing careers.

Methods

The data for this research note derived from the Association of Workers' Compensation Boards of Canada injury and fatality time loss claims databases. The timeframe used in this research note was from 2006 to 2015 inclusive. The data included several key variables, such as gender, age, year, province, the cause of the fatality or injury, the nature of the event that resulted in a fatality or an injury with an accepted time loss claim, which part(s) of the body were injured, the source of the injury, and whether the fatality or accepted time loss claim was for a commissioned or non-commissioned officer. Each of five distinct databases was separated by whether the incident resulted in the death of the police officer or an accepted time loss claim. Of note, to be included in the sample, the incident must have been reviewed and accepted by the Workers' Compensation Board, involved a police officer as the victim, and occurred or accepted in 2006 through 2015. In other words, the data presented in this report does not include all workplace injuries or fatalities, just accepted claims for time loss injuries and fatalities.

The Association of Workers' Compensation Boards of Canada databases included the time loss claims for all provinces and territories in Canada, with the exception of the Yukon, and fatality data for just British Columbia, Alberta, Ontario, and Quebec. It is important to note that in the Association of Workers' Compensation Boards of Canada data, as a matter of practice, when the number of accepted claims or fatalities for any variable in the databases was three or less, to protect the privacy of individual claimants, the number was suppressed and replaced with an X. For this report, the authors used two approaches to deal with this 'missing' data. First, a randomly generated number between 1 and 3 was inserted into the databases for every instance where the databases contained an X. This allowed the researchers to conduct analyses without having to consider every variable with an X as missing data, thus excluding the variable from analysis. The

random assignment of a 1, 2, or 3 to replace an X did not affect the overall totals, as these were provided by the Association of Workers' Compensation Boards of Canada. The second approach used was to examine each variable with an X to determine whether it was possible to deduce whether the X represented a 1, 2, or 3. Only in cases where it was absolutely clear what the X had to represent was that number used in the analysis to allow for cross-tabulated statistical analysis. Once these two procedures were completed, the data was analysed to provide descriptive and cross-tabulated statistics related to police officers time loss claims and fatalities. In some cases, such as in the calculate of rates of police officers, it was necessary to know the number of sworn police officers in a particular year and in a specific province. For this data, the authors accessed and downloaded police officer data from Statistica.

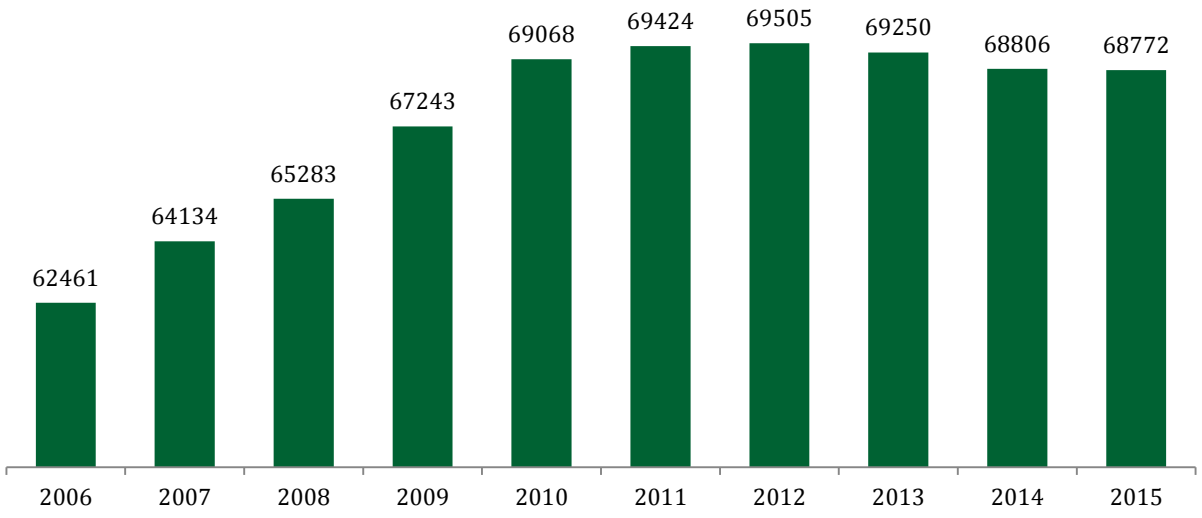
(https://www.statista.com/statistics/436119/number-of-total-personnel-in-canada/).

It is important to note that the data used in this report did not come from a single database, but five distinct databases that each looked at one aspect of the context of fatality and accepted time loss claims. As such, while each database included the total number of fatalities and accepted time loss claims for each year and for each province, in addition to gender and age categories, it was not possible to link the databases in any way by each fatality case or accepted time loss claim. Instead, the provided databases provided aggregate data and each one contained part of the overall picture of fatality and accepted time loss claims.

Data Analysis

As demonstrated in Figure 1, according to the website Statistica, the total number of police officers in Canada increased over the years 2006 to 2010 by 11% from 62,461 to 69,068 members, and then remained relatively stable to 2015.

FIGURE 1: TOTAL NUMBER OF POLICE OFFICERS IN CANADA (2006 – 2015)



Using data from 2015, Table 1 provides the number of police officers in each province. The provinces with the most police officers were Ontario (n = 26,205), Quebec (n = 16,012), and British Columbia (n = 8,672).

TABLE 1: TOTAL NUMBER OF POLICE OFFICERS BY PROVINCE AND TERRITORY (2015)

Canada	NL	PEI	NS	NB	QC	ON	MB	SK	AB	BC	YU	NWT	NU
68,772	889	226	1,855	1,278	16,012	26,205	2,602	2,286	7,155	8,672	130	201	131

As mentioned above, when it comes to fatalities, the Association of Workers' Compensation Boards of Canada data was only available for British Columbia, Alberta, Ontario, and Quebec. Between 2006 and 2015, in this database, these four provinces combined for a total of 45 fatalities of a police officer or a rate of 0.7 fatalities per 1,000 police officers. The mean number of fatalities did not vary substantially as 2007 and 2008 had three or less fatalities and 2012 had the most with seven fatalities. Of all the fatalities in the database, 40 (89 per cent) were male. While it was not possible to determine the mean age of those in the database given how the data was coded, all of the female fatalities were for police officers between the ages of 20 to 29 years old, while the most common age category for male police officer fatalities was between 30 to 39 years old (45 per cent) (see Table 2). It was very surprising that all of the female fatalities and a large proportion of the male police officer fatalities would be for people so young.

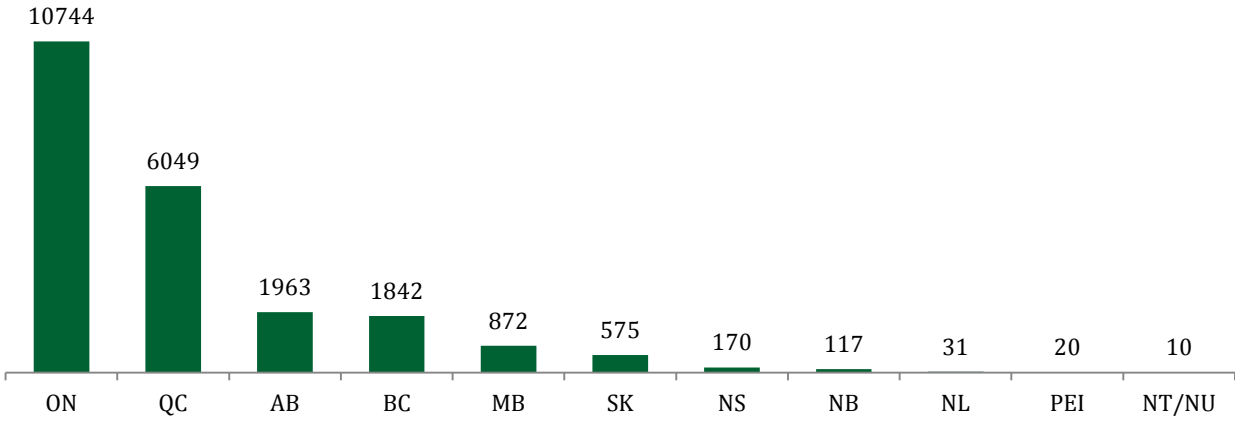
As outlined above, whenever the raw numbers in any category or variable was three or less the Association of Workers' Compensation Boards of Canada replaced the actual number with an X in all the databases. Given that a random number replacement could have substantial effects on the percentages presented below because the total numbers were so small, the X's are retained in Table 2 so as to not misrepresent the data. Still, as mentioned above, a deeper examination of the data made it possible to determine that, for example, for female police officer fatalities, two of the victims were between the ages of 20 and 24 years old and two were for those between the ages of 25 and 29 years old. However, it was not possible to determine which age category the other female police officer fatality belonged, so the X's are presented in the Table.

TABLE 2: AGE CATEGORIES FOR ACCEPTED FATALITY BETWEEN 2006 AND 2015

	Total (n = 45)	Male (n = 40)	Female (n = 5)
20-24 Years Old	4	X	X
25-29 Years Old	4	X	X
30-34 Years Old	9	9	0
35-39 Years Old	9	9	0
40-44 Years Old	5	5	0
45-49 Years Old	X	X	0
50-54 Years Old	4	4	0
55-59 Years Old	X	X	0
60-64 Years Old	X	X	0
65 Years and Older	X	X	0

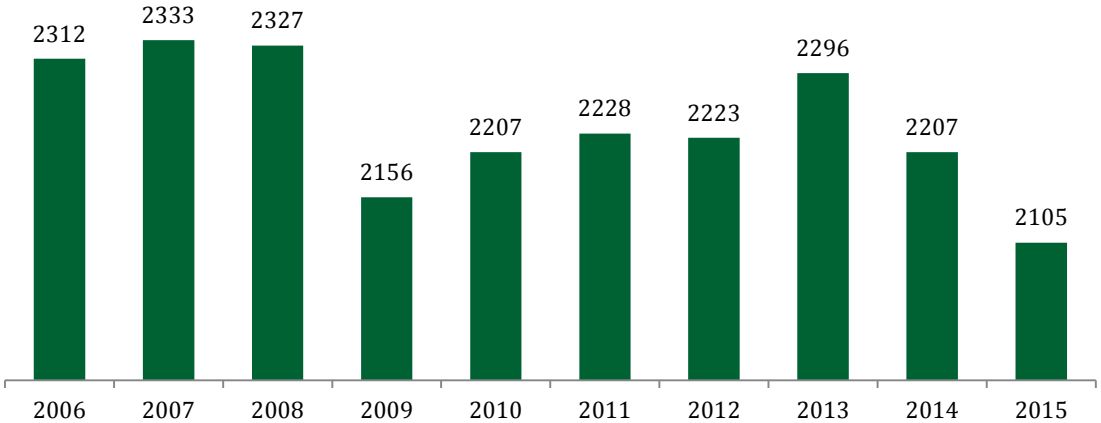
In terms of accepted time loss claims, the Association of Workers' Compensation Boards of Canada data was available for all of Canada's provinces and territories, with the exception of the Yukon. Between 2006 and 2015, there was a total of 22,394 accepted time loss claims for police officers. The total number of accepted time loss claims by province and territory is presented in Figure 2. Of note, 92% of all accepted time loss claims derived from just Ontario, Quebec, Alberta, and British Columbia. Given this, most of the analyses to follow focused exclusively on these four provinces.

FIGURE 2: DISTRIBUTION OF ACCEPTED TIME LOSS CLAIMS BY PROVINCE BETWEEN 2006 AND 2015 (N = 22,394)



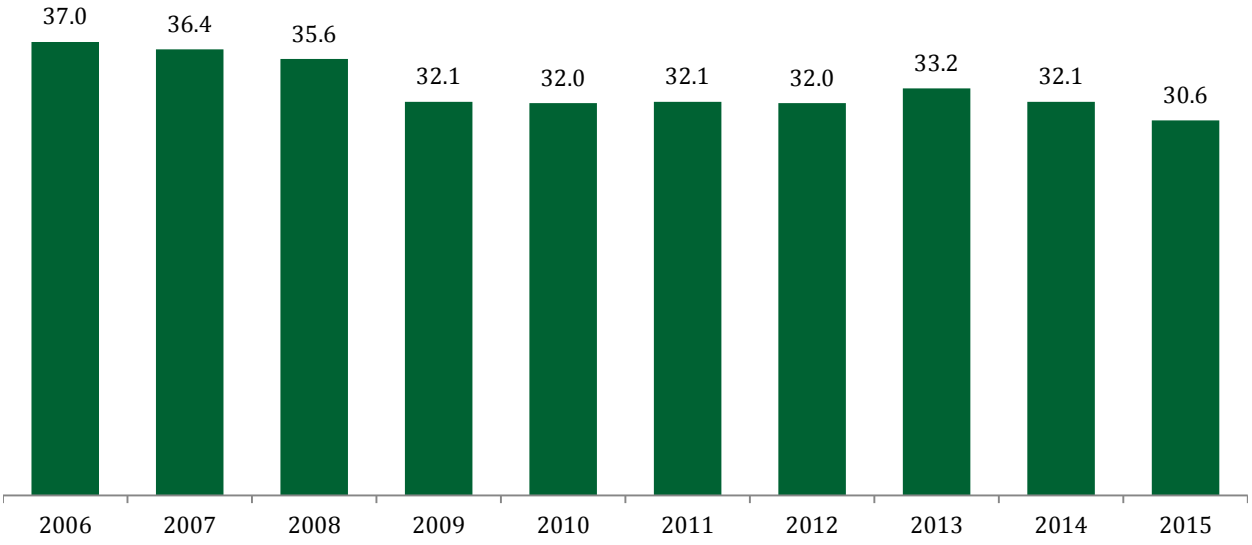
In terms of the distribution of claims over time, as demonstrated in Figure 3, the raw number of accepted claims did not mirror the trend of increases to the number of police officers to the year 2010 or the leveling off the number of police officers from 2010 to 2015. In effect, while the percentage of police officers increased by 10% from 2006 to 2015, the number of accepted time loss claims actually decreased by 9%. It is also interesting to note that there was a substantial decrease in the number of accepted time loss claims in 2009 from the previous three years, and while 2009 remained the second lowest year for the number of accepted claims in the database, the subsequent six years never reached the level of the first three years. It is also noteworthy that the last year in this study, 2015, had the fewest number of accepted time loss claims for police officers.

FIGURE 3: TOTAL NUMBER OF ACCEPTED TIME LOSS CLAIMS FOR POLICE OFFICERS IN CANADA BETWEEN 2006 AND 2015 (N = 22,394)



While not as dramatic as the raw number of accepted time loss claims per year presented above, as demonstrated in Figure 4, the rate per 1,000 police officers of accepted claims declined substantially over time from a high of 37 accepted time loss claims per 1,000 police officers in 2006 to a low of 30.6 accepted time loss claims per 1,000 police officers in 2015. Again, 2015 had the lowest rate per 1,000 of accepted time loss claims of the ten years in the databases.

FIGURE 4: RATE PER 1,000 POLICE OFFICERS OF ACCEPTED TIME LOSS CLAIMS IN CANADA BETWEEN 2006 AND 2015 (N = 22,394)



In terms of gender distribution, 79% of all accepted time loss claims were for male police officers. To put that into context, in 2006, 81% of all accepted time loss claims were for male police officers and males made up 82% of all police officers in Canada that year. Similarly, in 2015, 78% of all accepted time loss claims were for males who comprised 79% of all police officers in Canada. As with the fatality data, it was not possible to determine the mean age of those in the databases; however, as demonstrated in Table 3, the most common age for the sample was between 30 and 34 years old (20 per cent) and between 35 and 39 years old (19 per cent). While this pattern was the same for the males in the databases, which is because they comprised nearly four-fifths of the sample, female police officers with accepted time loss claims were a bit younger, as their most common age range categories were 25 to 29 years old (21 per cent) and 30 to 34 years old (19 per cent). In effect, while 38% of all male police officer accepted time loss claims were for those under the age of 35 years old, the proportion of females under the age of 35 years old with an accepted time loss claim was 48%.

TABLE 3: AGE CATEGORIES FOR ACCEPTED TIME LOSS CLAIMS BETWEEN 2006 AND 2015 (N = 22,394)

	Total	Male	Female
20-24 Years Old	4.5%	3.7%	7.8%
25-29 Years Old	15.8%	14.5%	20.8%
30-34 Years Old	19.5%	19.6%	19.0%
35-39 Years Old	19.4%	19.7%	18.2%
40-44 Years Old	16.8%	17.2%	15.5%
45-49 Years Old	12.5%	12.9%	11.1%
50-54 Years Old	7.3%	7.8%	5.6%
55-59 Years Old	2.8%	3.2%	1.6%
60-64 Years Old	1.0%	0.9%	<1.0%
65 Years and Older	1.0%	0.6%	<1.0%

In terms of the nature of the injury that resulted in an accepted time loss claim, the overwhelming majority of cases were the result of a traumatic injury or disorder (89 per cent). This was followed far behind by a systemic disease or disorder (4 per cent) and 'other' diseases, conditions, and disorders (4 per cent) (see Table 4). Similar to the fatality data presented above, 79% of time loss claims as a result of a traumatic injury or disorder were for a male police officer. As expected, this high proportion of males compared to females was found for all of the various causes of accepted time loss claims in the database and excepted given the general gender distribution of the sample. Importantly, as traumatic injuries and disorders were the most common cause of an accepted time loss claim, it is critical to note that, while the proportion of police officers increased by 10% from 2006 to 2015, the proportion of accepted time loss claims decreased by 11%. While there are a number of possible reasons for the reduction, it is possible that changes in police policies with respect to wellness and health have played a role in decreasing the number of accepted time loss claims. Still, it is interesting that the overall decrease in traumatic injuries and disorders resulting in an accepted time loss claim was not equal by gender. While males had a 12.8% decrease between 2006 and 2015, females only had a 1.2% decrease.

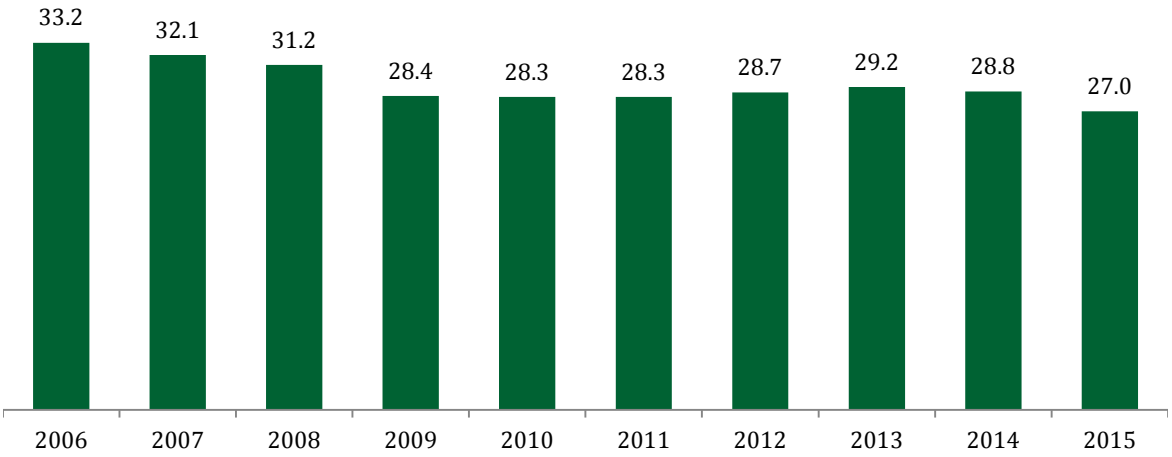
TABLE 4: CAUSE OF ACCEPTED TIME LOSS CLAIMS BETWEEN 2006 AND 2015 (N = 22,394)

	Total
Traumatic Injuries or disorders	88.9%
Systemic Disease or Disorder	3.8%
Infectious and Parasitic Diseases	1.0%
Neoplasms, Tumors or Cancer	0.1%
Symptoms, Signs and Ill-Defined Conditions	1.5%
Other Diseases, Conditions and Disorders	3.8%
Multiple Diseases, Conditions and Disorders	0.5%

Another way to consider the traumatic injuries or disorders data is to consider the rate per 1,000 at which police officers had a time loss claim accepted each year. As demonstrated in Figure 5, the rate per 1,000 at which traumatic injury or disorder claims were accepted decreased from a high of 33.2

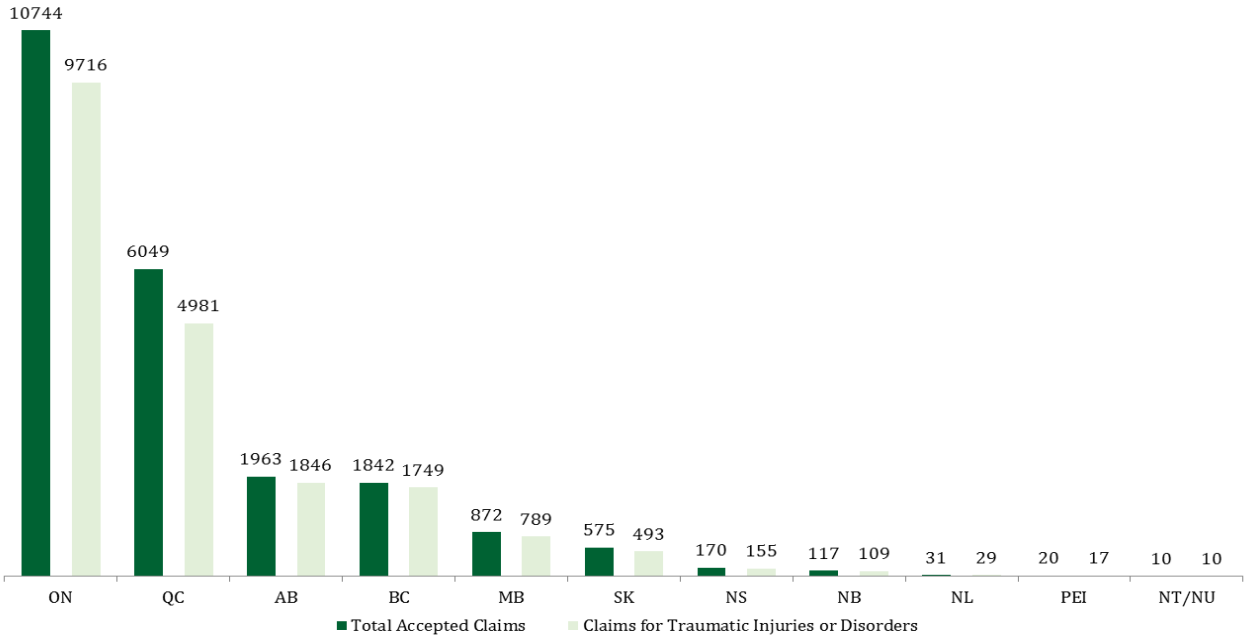
per 1,000 police officers in 2006 to a low of 27 per 1,000 in 2015. In effect, while the primary cause of accepted time loss claims among police officers was overwhelmingly traumatic injuries or disorders, by 2015, there were five less accepted claims per 1,000 police officers compared to 2006 and 2015 had the lowest rate per 1,000 compared to the previous nine years.

FIGURE 5: RATE OF ACCEPTED TRAUMATIC INJURIES OR DISORDERS TIME LOSS CLAIMS 2006 TO 2015 (N = 19,899)



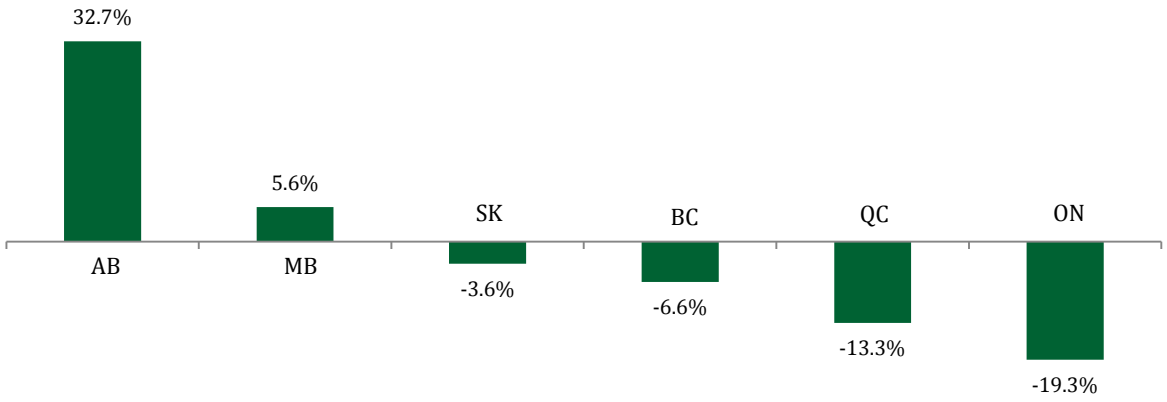
In terms of the geographic distribution of accepted time loss claims, it was expected that the largest number of accepted claims would come from Ontario, Quebec, Alberta, and British Columbia, and that the overwhelming majority of accepted loss claims would be related to a traumatic injury or disorder (see Figure 6).

FIGURE 6: DISTRIBUTION OF ACCEPTED TIME LOSS CLAIMS BY POLICE OFFICERS BY PROVINCE IN CANADA BETWEEN 2006 AND 2015 (N = 22,394)



Given that the overall proportion of accepted time loss claims decreased from 2015 compared to 2006, it was somewhat unexpected that several provinces had substantial increases in their proportion of accepted claims (see Figure 7). Of note, New Brunswick was not included in Figure 7 because they had a 500% increase in their number of claims from three or less accepted claims for a traumatic injury or disorder in 2006 to just 12 claims in 2015. Similarly, Nova Scotia had 15 accepted claims in 2006 and 21 accepted claims in 2015. Moreover, the Northwest Territories and Nunavut had a total of 10 accepted claims for a traumatic Injury or disorder over the entire 10 years under study, Prince Edward Island had 17, and Newfoundland had just 27. Given these very small numbers, it was not informative to present their percentage change in the number of accepted claims over the 10 year period. When looking at those provinces with a substantial number of accepted claims for a traumatic injury or disorder, it is interesting to note that Saskatchewan (-4 per cent), British Columbia (-7 per cent), Quebec (-13 per cent), and Ontario (-19 per cent) all saw decreases in the number of accepted loss time claims between 2006 and 2015, but Alberta had a substantial increase (+33 per cent) and Manitoba experienced a more moderate increase (+6 per cent). In considering the Alberta data, it appears that, over the 10 year period, there was an increase in all age categories for males (+31 per cent) with substantial increases for those between 20 and 24 years old (+133 per cent), 40 to 44 years old (+50 per cent), and 45 to 49 years old (64 per cent). Among female police officers in Alberta, there was an overall 42% increase among accepted time loss claims for a traumatic injury or disorder between 2006 and 2015, but the number of females having accepted claims was too small to identify any specific age-related trends.

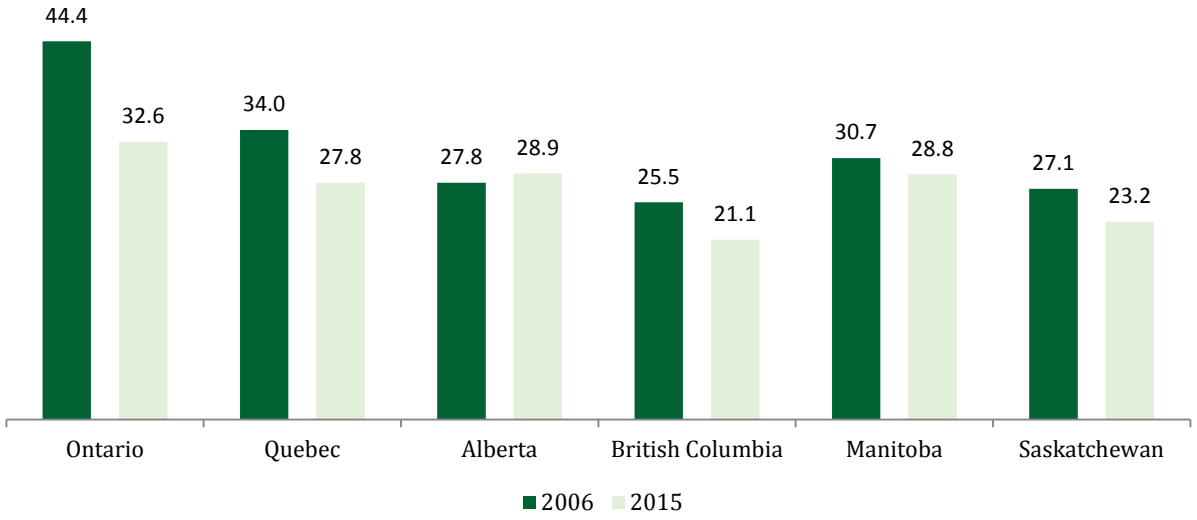
FIGURE 7: OVERALL PERCENT CHANGE IN ACCEPTED TIME LOSS CLAIMS FOR TRAUMATIC INJURIES OR DISORDERS FOR POLICE OFFICERS BY PROVINCE BETWEEN 2006 AND 2015 (N = 19,899)



To provide additional context to the data presented above, the six provinces in Figure 7 were compared using rates per 1,000 police officers for traumatic injuries and disorders for 2006 and 2015 (see Figure 8). Each province, with the exception of Alberta, had a reduction in the number of accepted claims. For example, in 2006, Ontario had a rate of 44.4 accepted time loss claims for a traumatic injury or disorder per 1,000 police officers, but reduced this to 32.6 claims per 1,000

police officers by 2015; a reduction of 27%. In British Columbia, there was a 17% reduction over that time period from 25.5 claims per 1,000 police officers to 21.1 claims, and there was an 18% reduction in Quebec from 34 claims per 1,000 officers in 2006 to 27.8 claims in 2015.

FIGURE 8: RATES OF TRAUMATIC INJURIES AND DISORDER ACCEPTED TIME LOSS CLAIMS BY PROVINCE FOR 2006 AND 2015



In terms of who these police officers were, of the 45 fatalities, only two were commissioned officers, both were male, both occurred in Ontario, one was between 30 and 34 years old, the other was between 50 and 54 years old, one fatality occurred in 2009 and the other occurred in 2012. Given the nature of the work, it was unsurprising that the vast majority of fatalities were associated to non-commissioned police officers. Similarly, with respect to accepted time loss claims, the overwhelming majority (99 per cent) were for non-commissioned members. Given this, when it comes to accepted fatality and loss time claims, the Association of Workers' Compensation Boards of Canada data suggests that these types of claims are much more commonly found in Ontario, Quebec, British Columbia, and Alberta, the police officers are much more commonly male, under the age of the 45 years old, and serving in a non-commissioned role.

In terms of the specific nature of the events result in a fatality, given that the most common cause was a traumatic injury or disorder, it was not surprising that the most common type of event was an assault, violent act, attack, or harassment (42 per cent) (see Table 5). Overwhelmingly, the fatalities involved a male police officer and the most common age category was between 35 and 39 years old (33 per cent), although all age categories were represented. The one female police officer fatality as a result of an assault, violent act, attack, or harassment was between the ages of 25 to 29 years old and the incident occurred in Quebec in 2006. Of these types of fatalities, the majority (68 per cent) occurred in Ontario. The second most common event was a transportation accident (33 per cent). Again, the majority of fatalities involved a male police officer (73 per cent) and, in nearly half of male transportation fatalities (46 per cent), the police officers were between the ages of 30 and 34 years old. The four female fatalities related to a transportation accident were between 20

and 29 years old and occurred in Ontario and Quebec. Similarly, 10 of the 11 male police officer transportation accident fatalities occurred in Ontario and Quebec and largely involved members between 25 and 39 years old. While the numbers were very low for most of the events, as there were 45 fatalities in the entire database, there were no female police officer fatalities for falls, bodily reaction and exertion, exposure to harmful substances or environments, fires or explosions, or other events or exposures (see Table 5).

TABLE 5: NATURE OF THE EVENT FOR A FATALITY BETWEEN 2006 AND 2015 (N = 45)

	Total	Male	Female
Falls	1	1	0
Bodily Reaction and Exertion	3	3	0
Exposure to Harmful Substances or Environments	5	5	0
Transportation Accidents	15	11	4
Fires and Explosions	1	1	0
Violent Acts	19	18	1
Other Events or Exposures	1	1	0

The most common events associated with an accepted time loss claim were bodily reaction and exertion (30 per cent) and an assault, violent act, attack, or harassment (23 per cent) (see Table 6). The overall pattern for accepted loss time claims was somewhat different from the pattern for fatalities as transportation accidents were somewhat less common in accepted time loss claims (23 per cent) compared to fatalities (33 per cent). Nonetheless, given the nature of non-commissioned police work, it was not unexpected that two-thirds of all accepted time loss claims were for the three categories of bodily reactions and exertion, a violent act, or a transportation accident.

TABLE 6: CAUSE OF ACCEPTED TIME LOSS CLAIMS BETWEEN 2006 AND 2015 (N = 22,394)

	Total
Contact with Objects and Equipment	11.2%
Falls	15.7%
Bodily Reaction and Exertion	29.7%
Exposure to Harmful Substances or Environments	6.2%
Transportation Accidents	13.8%
Fires and Explosions	0.3%
Violent Acts	22.5%
Other Events or Exposures	0.5%

Importantly, as stated above, while there was a 10% increase in the number of police officers from 2006 to 2015, there was substantial variation in the percentage change in the number of accepted time loss claims by event type (see Table 7). While there have been substantial reductions in the number of accepted time loss claims for contact with objects or equipment (-15 per cent) and transportation accidents (-34 per cent), for the two most common events leading to an accepted

time loss claim, there has also been a reduction in the number of claims for violent acts (-10 per cent), while the number of claims for bodily reaction and exertion has remained very consistent. Although there are fewer accepted claims overall, there has been a substantial increase over the 10 years in the number of accepted claims for exposure to harmful substances or environments (+39 per cent). In terms of the rate per 1,000 police officers of these claims, in 2006, the rate of a police officer having a claim accepted for bodily reaction and exertion was 10.4 per 1,000 police officers, but this was reduced to 9.4 in 2015; a reduction of 10%. In 2006, the rate for a violent act was 8.8 per 1,000, which declined to 7.2 in 2015; a reduction of 18%. Finally, with respect to transportation accidents, in 2006, the rate was 5.5 per 1,000, but this was reduced to 3.3 in 2015 resulting in a 40% reduction over ten years.

TABLE 7: PERCENT CHANGE BETWEEN 2006 AND 2015 BY EVENT TYPE (N = 22,394)

	Number of Cases	Total
Contact with Objects and Equipment	2,516	-15.1%
Falls	3,509	-8.5%
Bodily Reaction and Exertion	6,650	+0.3%
Exposure to Harmful Substances or Environments	1,388	+39.4%
Transportation Accidents	3,085	-34.1%
Fires and Explosions	59	-44.4%
Violent Acts	5,046	-9.8%
Other Events or Exposures	122	-23.8%

As demonstrated in Table 8, the overall changes in the percentage of accepted time loss claims was not equal by gender. With the exception of transportation accidents, there has been an increase in the number of accepted time loss claims for female police officers, while there have been substantial declines among male police officers. While the data provides no insight into the causes of this, there are two related reasonable explanations. First, as more women enter the police force, the number of female police officers who are hurt on the job likely increases. Second, and related to the first point, as the number of female police officers in the sample is rather low, small changes can result in large percentage changes. For example, the 14% increase in accepted time loss claims related to contact with objects or equipment among female police officers represents, in real numbers, an increase from 49 instances in 2006 to 56 instances in 2015. Conversely, the 21% decrease in these claims among male police officers is based on a reduction from 229 instances in 2006 to 180 instances in 2015.

TABLE 8: PERCENT CHANGE BETWEEN 2006 AND 2015 BY EVENT TYPE BY GENDER (N = 22,394)

	Males	Females
Contact with Objects and Equipment	-21.4%	+14.3%
Falls	-12.9%	+4.7%
Bodily Reaction and Exertion	-1.3%	+9.0%
Exposure to Harmful Substances or Environments	+25.3%	+88.9%
Transportation Accidents	-31.6%	-41.1%
Fires and Explosions	-44.4%	---
Violent Acts	-12.0%	+2.4%
Other Events or Exposures	-36.6%	-50.0%

Given the overall provincial patterns presented above with respect to the percentage change in the number of accepted time loss claims in 2015 compared to 2006, it was expected that Quebec and Ontario would have substantial decreases in their proportion of accepted claims and that Alberta would have some substantial increases (see Table 9). However, there were some interesting finding when considering the specific nature of the event in terms of change over time. For example, while Ontario experienced substantial decreases in the number of accepted time loss claims for contact with objects or equipment, falls, bodily reaction and exertion, transportation accidents, fire or explosions, and violent acts when comparing 2006 to 2015, Ontario also had a large increase in the number of exposures to harmful substances or environments, albeit this type of event was not very common (see Table 9). Similarly, Quebec demonstrated a somewhat similar pattern to Ontario; however, they had a substantially larger decrease in transportation accidents that resulted in an accepted time loss claim. Interestingly, while Ontario had a 28% decrease in accepted time loss claims for an assault, attack, violent acts, or harassment, Quebec had a 13% increase. Alberta's pattern was nothing like Ontario's or Quebec's. Alberta had substantial increases in falls, bodily reaction and exertion, exposure to harmful substances or environments, and violent acts, but like Ontario and Quebec, had a large decrease in the number of transportation accidents. British Columbia had substantial increases in contact with objects or equipment and bodily reaction and exertion, but saw large decreases in falls, exposure to harmful substances or environments, and transportation accidents that resulted in an accepted time loss claim. British Columbia also saw a small reduction in the number of accepted time loss claims for a violent act, such as an assault or an attack (see Table 9).

TABLE 9: PERCENT CHANGE BETWEEN 2006 AND 2015 BY EVENT TYPE BY PROVINCE (N = 22,394)

	Alberta	British Columbia	Ontario	Quebec
Contact with Objects and Equipment	+8.3%	+30.0%	-14.7%	-30.5%
Falls	+41.7%	-16.7%	-14.3%	-10.4%
Bodily Reaction and Exertion	+68.1%	+25.0%	-11.3%	-11.5%
Exposure to Harmful Substances or Environments	+112.5%	-37.5%	+79.3%	+7.5%
Transportation Accidents	-17.9%	-15.8%	-30.8%	-41.3%
Fires and Explosions	---	---	-55.6%	---
Violent Acts	+16.7%	-5.3%	-27.6%	+13.2%
Other Events or Exposures	---	---	-50.0%	+50.0%

As for the rate per 1,000 police officers for the three main event types over time by province, as above, rates were calculated for the four largest contributing provinces using 2006 and 2015 data. As demonstrated in Table 10, for the most part, the rate per 1,000 police officers declined in each province. For example, for bodily reaction and exertion, the rate per 1,000 police officers declined in Alberta slightly from 11.6 to 11.0 and reduced to a slightly greater extent in both Ontario and Quebec; however, British Columbia experienced a slight increase of 10% from 6.3 claims per 1,000 police officers in 2006 to 6.9 claims by 2015. For accepted time loss claims as a result of an assault, an attack, a violent act, or harassment per 1,000 officers, Alberta (+27 per cent) and Quebec (+7 per cent) experienced increases from 2006 to 2015, while British Columbia (-28 per cent) and Ontario (-36 per cent) had rate decreases. Of note, by 2015, the province with the highest rate of accepted claims as a result of a violent act or harassment was Ontario (9.5 per 1,000) followed by British Columbia (8.2 per 1,000).

TABLE 10: PERCENT CHANGE BETWEEN 2006 AND 2015 BY EVENT TYPE BY PROVINCE

	Alberta		British Columbia		Ontario		Quebec	
	2006	2015	2006	2015	2006	2015	2006	2015
Bodily Reaction and Exertion	11.6	11.0	6.3	6.9	13.8	11.1	12.1	10.0
Transportation Accidents	5.0	3.2	2.5	1.8	6.1	3.9	8.0	4.4
Violent Acts	5.5	7.0	9.8	8.2	14.5	9.5	4.5	4.8

In terms of the specific body part that was injured resulting in either a fatality or an accepted time loss claim, given the nature of the databases, it was not possible to link this information to the aforementioned events or the context of the occurrence. Given this, there is limited value to the analyses of body parts. Still, with respect to fatalities, the most commonly injured body part was coded as 'multiple body parts' (n = 17) followed by the head (n = 10) and the trunk (n = 10) (see Table 11). For accepted time loss claims, the most common body parts were the trunk (26 per cent) and the lower extremities (26 per cent) followed by the upper extremities (19 per cent).

TABLE 11: DISTRIBUTION OF BODY PART INJURED RESULTING IN A FATALITY OR AN ACCEPTED TIME LOSS CLAIM (2006 TO 2015)

	Fatalities	Accepted Time Loss Claims
Head	10	1,467
Neck	0	983
Trunk	10	5,917
Upper Extremities	0	4,203
Lower Extremities	2	5,879
Body Systems	3	1,441
Multiple Body Parts	17	2,450
Other Body Parts	3	50

In considering change over time, as demonstrated by Table 12, for all of Canada, comparing 2006 and 2015, there was a substantial increase in accepted time loss claims associated to injuries of the body system (+68 per cent) and other body part (+67 per cent); however, these body locations were associated with an overall low number of claims. Body locations associated with the largest number of claims all experienced decreases, such as the trunk (-14 per cent) and the upper extremities (-14 per cent). When considering each of the body locations by the four largest contributors to accepted time loss claims in Canada, no clear patterns emerged. For example, while the average number of head injuries that resulted in an accepted time loss claim between 2006 and 2015 was 147 per year, every province analysed, with the exception of Ontario, had an increase over this ten year period. Of note, the large percentage increase in Alberta for head injuries was based on 11 claims in 2006 that increased to 28 claims in 2015. While a bit less common, neck injuries decreased in each province, with the exception of British Columbia. Of note, over the ten years, British Columbia only recorded 73 total accepted time loss claims related to a neck injury. With the largest number of claims, injuries to the truck decreased slightly in British Columbia (-5 per cent), substantially in Ontario (-27 per cent), and moderately in Quebec (-12 per cent), but increased substantially in Alberta (+18 per cent). Of note, while multiple body parts were the largest contributors to fatalities, in terms of accepted time loss claims, this body area's representation in the database decreased in all provinces (see Table 12).

TABLE 12: PERCENT CHANGE BETWEEN 2006 AND 2015 BY BODY TYPE BY PROVINCE FOR ACCEPTED TIME LOSS CLAIMS (N = 22,394)

	Canada	Alberta	British Columbia	Ontario	Quebec
Head	+13.4%	+154.6%	+40.0%	0%	+22.6%
Neck	-34.6%	-8.3%	+75.0%	-50.0%	-34.8%
Trunk	-14.2%	+17.8%	-4.6%	-27.1%	-12.2%
Upper Extremities	-14.4%	+5.4%	+1.8%	-25.1%	-15.5%
Lower Extremities	-5.0%	+42.5%	-4.5%	-9.1%	-17.2%
Body Systems	+67.9%	+1,900%	+133.3%	+88.9%	-2.4%
Multiple Body Parts	-28.3%	-4.6%	-57.1%	-27.3%	-33.3%
Other Body Parts	+66.7%	---	---	-100.0%	+66.7%

The final database focused on the source of the injury. The 45 fatalities were mainly associated with vehicles (n = 16) or the category of person, plant, animal, or mineral (n = 10). A smaller number of fatalities were associated to 'other' sources (n = 8) and tools, instruments, and equipment (n = 6) (see Table 13). Of note, four of the five female fatalities occurred as the result of a vehicle and the other one was associated to a person, plant, animal, or mineral. In term of accepted time loss claims, the most frequent source of injury was a person, plant, animal, or mineral (52 per cent) followed by structures and surfaces (17 per cent) and vehicles (16 per cent).

TABLE 13: DISTRIBUTION OF SOURCE OF INJURY RESULTING IN A FATALITY OR AN ACCEPTED TIME LOSS CLAIM (2006 TO 2015)

	Fatalities	Accepted Time Loss Claims
Chemical and Chemical Product	2	162
Containers	0	346
Furniture and Fixtures	0	176
Machinery	0	67
Parts and Materials	1	381
Person, Plants, Animals or Minerals	10	11,608
Structures and Surfaces	2	3,875
Tools, Instruments and Equipment	6	952
Vehicles	16	3,609
Other Sources	8	1,197

When considering increases or decreases in the number of accepted time loss claims by gender based on the source of the injury from 2006 to 2015, several of the results are not helpful due to low raw numbers, such as the findings related to machinery, chemical and chemical products, furniture and fixtures, and parts and materials. However, there are some interesting findings when examining the most common sources of injury (see Table 14). For example, with the exception of the category of tools, instruments, and equipment, males experienced a decrease in the frequency of accepted time loss claims in all other categories. This was not the cause among female police officers. Moreover, the two main sources of injury that likely pose the greatest risk to police officers due to frequency are from vehicles, people and animals, and structures and surfaces. Given the large amount of time that non-commissioned officers spend on the road, in their cars, at potential dangerous and unfamiliar locations, and interacting with the public, it was not surprised that these were the main sources of accepted time loss claims. While there was a very minor decrease for male police officers (-9 per cent) and a slight increase for female police officers (+1 per cent) related to the change in the number of accepted time loss claims for injuries related to structures and surfaces over the ten years, there were substantial reductions for both genders in vehicle injuries. This is extremely important given that general duty officers likely spend a considerable amount of time each shift in their vehicles. It is possible that improved vehicle safety and changes in police policies around pursuits has contributed somewhat to this decline. It is also interesting to note that, on the issue of injuries caused by a person, plant, animal, or mineral, males saw a slight decline in the number of accepted time loss claims (-8 per cent), while females experienced an increase (+16 per cent). The data does not provide any insight into why this might be the case; however, it must be noted that this 16% increase is based on 205 accepted time loss claims in 2006 and 237 in 2015.

TABLE 14: PERCENT CHANGE BETWEEN 2006 AND 2015 BY SOURCE OF INJURY AND GENDER (N = 22,394)

	Male	Female
Chemical and Chemical Product	-26.3%	+200%
Containers	-37.5%	+83.3%
Furniture and Fixtures	-7.7%	-62.5%
Machinery	-28.6%	-50.0%
Parts and Materials	-66.8%	-33.3%
Person, Plants, Animals or Minerals	-7.8%	+15.6%
Structures and Surfaces	-9.0%	+1.1%
Tools, Instruments and Equipment	+24.3%	+30.8%
Vehicles	-25.0%	-40.2%
Other Sources	-2.0%	+92.9%

As the data is dominated by male police officers, given the results presented in Table 14, it was not surprising that when considering changes in the number of accepted time loss claims by the source of injury for all of Canada, there were reductions in all of the categories with the exception of tools, instruments, and equipment and 'other' sources. It is also important to note that several of the results presented in Table 15 suffer from extremely low number of cases. For example, the percentage change in British Columbia for the categories of chemical and chemical products, containers, furniture and fixtures, and machinery is based on less than 15 accepted time loss claims in any year, thus making inferences based on the percent change over time extremely uninformative. However, on the three most frequent categories, there are some interesting findings. For accepted time loss claims related to injuries caused by a person, plant, animal, or mineral, Ontario (-17 per cent) and Quebec (-15 per cent) experienced substantial decreases, while Alberta (+88 per cent) and British Columbia (+14 per cent) experienced increases. The increase in Alberta can be explained by the fact that, in 2006, Alberta had just 67 accepted time loss claims, which increased to 126 in 2015. By way of comparison, Ontario had 645 claims in 2006 and 537 in 2015. Similarly, British Columbia did not have a large number of claims for this source of injury in 2006 (n = 114) or 2015 (n = 130). It was interesting to note that all four provinces experienced a reduction in the number of accepted time loss claims related to vehicle injuries.

TABLE 15: PERCENT CHANGE BETWEEN 2006 AND 2015 BY SOURCE OF INJURY BY PROVINCE FOR ACCEPTED TIME LOSS CLAIMS (N = 22,394)

	Canada	Alberta	British Columbia	Ontario	Quebec
Chemical and Chemical Product	-9.1%	+50.0%	-100.0%	+33.3%	0%
Containers	-18.4%	-25.0%	+300.0%	-34.8%	+14.3%
Furniture and Fixtures	-28.6%	---	+100.0%	-36.4%	-85.7%
Machinery	-12.5%	---	-100.0%	-20.0%	---
Parts and Materials	-60.4%	-100.0%	-66.8%	-75.0%	-52.4%
Person, Plants, Animals or Minerals	-4.0%	+88.1%	+14.0%	-16.7%	-15.0%
Structures and Surfaces	-6.6%	+65.4%	-3.5%	-8.0%	-23.5%
Tools, Instruments and Equipment	+25.3%	+17.7%	+25.0%	+39.0%	-7.7%
Vehicles	-28.8%	-18.8%	-18.5%	-27.3%	-29.4%
Other Sources	+9.8%	-14.3%	0%	-10.4%	+67.6%

Conclusion

The findings in this research note provide support for the notion that police work can be a dangerous job. Between 2006 and 2015, the most common cause of a fatality or accepted time loss claim for a police officer was a traumatic injury or disorder. While the databases do not provide additional insight into the nature of the traumatic injury or disorder, in many cases, the precipitating event leading to the fatality or accepted time loss claim was a violent act or a transportation incident most likely involving either a vehicle or a person. In terms of basic demographics, police officers who are injured or die are most often males under the age of 40. When female police officers are the victim, they tend to be even younger. Given this, additional research should continue to explore ways to make police work safer, while better understanding the risks associated with being a police officer. This is critically important because the fatality rate among police officers in Canada in the databases used for this research note was 0.7 per 1,000 and the accepted time loss rate was 31 per 1,000 officers in 2015.

Given the limitations of how the databases are organized, it is recommended that police leaders consider developing a national police officer injury database in order to alleviate some of the methodological and analytical challenges identified in this research note. Much greater insight and preventative policy development could occur if the data could be linked to provide a single database containing all of the necessary variables and information to conduct detailed analyses on the nature, context, frequency, and severity of injuries and fatalities suffered by police officers at the individual and aggregate level.

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