



Canadian Society for Medical Laboratory Science
Société canadienne de science de laboratoire médical

Occupational Injury & Disease

A Decade in Review -
Accepted Lost Time Claims and Fatalities in the
Medical Laboratory Profession

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Dedication:

This report is dedicated to the medical laboratory professionals who have passed away and/or suffered from work-related injury or disease. Let us learn from their collective experience to foster a safer workplace within the laboratory and clinical environment.

Every claim accounted for in this report represents an individual with a story. No matter how small or how large the numbers are, each claim is important.

Acknowledgement:

The data within this report has been obtained, with permission, for reproduction from the Association of Workers' Compensation Boards of Canada (AWCBC). Any interpretation of the AWCBC data made by the Canadian Society of Medical Laboratory Science (CSMLS) is that of CSMLS only and not the AWCBC or any of its member Boards or Commissions.

Data Sources:

NOC 3211 and 3212 Data, Medical Laboratory Professionals
Association of Workers' Compensation Boards of Canada (AWCBC), National Work Injury/Disease Statistic Program (NWISP), extracted January 2017.

2015 National Level Data, All Industries
Association of Workers' Compensation Boards of Canada (AWCBC), National Work Injury/Disease Statistic Program (NWISP), February 2018 from http://awcbc.org/?page_id=14.

Companion Resource:

Canadian Society for Medical Laboratory Science (2017). Laboratory Safety Guidelines, 8th Edition. [Order Form](#)

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Executive Summary

This report provides a historical look and analysis of the national injury and disease data produced by the Association of Workers' Compensation Boards of Canada (AWCBC). Data from 2006-2015 associated with lost time claims and fatalities, as reported to the Canadian Workers' Compensation Boards/Commissions (WCBs), has been analysed and presented.

A lost time claim occurs for an injury where a worker is compensated by a WCB for a loss of wages following work-related injury (or exposure to a noxious substance), or receives compensation for a permanent disability with or without any time lost in his or her employment. For example, a laboratory worker is treated and compensated for exposure to a virus resulting in lost wages and time off work. For purposes of the current report and limitations in data extraction, the NOC codes 3211 and 3212, represents medical laboratory professionals which includes pathology assistants.

The total number of lost time claims for all Canadian industries resulted in a staggering 232,629 accepted claims in 2015. The health and social service industry held the greatest number of claims compared to any other industry (18%, 41,111/232,629). For medical laboratory professionals, the number of lost time claims between 2006 and 2015 equalled 2,904. The profession's national number of claims remained fairly consistent per year, with only slight improvement in the face of increased health and safety practice awareness. At the provincial level, change in claims between the first half of the dataset compared to the second found statistically significant differences for Alberta (increased), Manitoba (increased), Nova Scotia (decreased) and Saskatchewan (decreased).

Overall, there were 290 lost time claims annually by medical laboratory professionals on average (SD = 27), ranging from 242-326 per year. For each category discussed in this report, a lost time claim is most likely to include the following based on the collective dataset:

- Age: 45-49 years old followed closely by 50-54 years old
- Part of Body: 800 – Multiple Body System (alternatively, 'back/trunk/abdomen', when codes are grouped)
- Nature of Injury: 021 – Sprains, strains, tears
- Source of Event: 562 – Bodily motion or position of injured, ill worker
- Event: 131 – Fall to floor, walkway, or other surface

However, greater insight into claims can be found in the details of the code analysis in this report. There have been some differences between time periods and codes.

To respect the identity of medical laboratory professionals who have passed away because of work-related injury or disease recognized through WCB claims, the data is summarized and does not pinpoint specific occurrences. Nevertheless, some insight can be gained. There were a minimum of two and maximum of six medical laboratory professionals who passed away between 2006 and 2015 in Canada (localized in two provinces) because of work-related injury or disease.

This information is significant as occupational hazardous events (e.g., injuries, diseases and fatalities) can occur in laboratories and clinical environments. Workers and management need to collaborate to ensure a healthy work environment that will improve, protect, and promote the health and safety for all.

Background

Many health professionals are unaware of the potential hazards in their work environments, which makes them vulnerable. Occupational hazards, in the form of injuries, diseases and fatalities, can occur in laboratories and clinical environments, and have been recorded in Canada as well as around the world (1-3).

Medical laboratory professionals should be acutely aware that their laboratories and clinical environments represent high-risk settings, both in preanalytical and analytical phases. Workers are exposed to numerous potential hazards, including chemical, biological and even radioactive threats, in addition to other physical and psychological impactors, such as musculoskeletal and mental stressors. For example, prolonged standing, neck bending, focused attention on microscopes and pipettes, extensive sitting in front of computers and microscopes, and stress associated with dealing with ill patients and demanding health professionals are common activities involved in the profession that can cause physical and mental occupational hazard events (4). The work of medical laboratory professionals only allows for limited control over their environment, coworkers and patients, resulting in a workplace that can never be considered 100% safe. A review of the occupational health and safety literature for the medical laboratory profession highlights the potential hazards and events associated with workplace duties. Examples include:

- In 2016, a Supreme Court of Canada ruling upheld that breast cancer among hospital lab workers in British Columbia was an occupational disease. The risk for breast cancer was over eight times the expected rate, and the rate of all cancers was over four times the expected rate (5).
- In 2017, the Centers for Disease Control and Prevention (CDC) and public health officials in 16 states in the United States identified a multistate outbreak of *Salmonella* Typhimurium infections in 24 people linked to various clinical, commercial and college and university teaching microbiology laboratories (6).
- A historical review in Italy and France found that phlebotomy was involved in 30–50% of HIV and Hepatitis C cases following accidental blood exposures. In the lab, two-thirds of injuries were associated with management of sharps containers, recapping, needle disassembly by hand and blood transfer from syringes into tubes (7).
- A study of health care workers in British Columbia showed that laboratory assistants had the highest exposure rates from needle stick injuries and splashes, whereas licensed practical nurses had the highest exposure rate from sharps (8).
- Looking at the prevalence among 250 laboratory technicians, pathologists, microbiologists and biochemistry technologists, it was found that 21% of participants suffered from musculoskeletal symptoms (various body regions), 8% had neck pain and 7% suffered from lower back pain (9).
- A UK survey showed that 8% of participating laboratories reported technicians' health had suffered through coming into contact with dangerous chemicals or biological agents. Within the private sector, 15% of respondents reported that technicians had left or changed their positions due to stress (10).

According to the Canadian Centre for Occupational Health & Safety (CCOHS) (11), the main health and safety issues for laboratory technicians and technologists included:

- Toxic, corrosive, and flammable chemicals - chemical hazards.

- Compressed gases.
- Handling blood, body fluids and tissues which may contain infectious agents - biological hazards. Needlestick injuries are a special concern.
- Fires from flammable materials and electronic equipment.
- Physical hazards such as radioactive materials, ultraviolet light sterilizers and lasers.
- Cryogenic (ultra-cold) materials such as liquid nitrogen and dry ice (solid carbon dioxide).
- Working in awkward positions and standing for long periods of time - back and arm injuries.
- Repetitive motions.
- Working with electrical equipment and instruments - electrical hazards.
- Vacuum lines and pumps and vacuum systems.
- Slips, trips and falls from spilled liquids and congested work areas.
- Cuts and lacerations from broken glass.
- Burns and scalds from hot equipment.
- Working alone.

Safety Practices

Likely in line with other laboratory-based professions, scientists may have a false sense of security about the safety of their laboratories. According to preliminary results from the first international survey of researchers' workplace attitudes and practices, approximately 86% (~2,400) of participants responded said that they believe their labs are safe places to work; however, slightly under half of the participants experienced injuries (animal bites to chemical inhalation), and many noted working alone frequently, under-reporting of injuries and insufficient safety training on specific hazards (12). As noted by other researchers, safety practices, although boosted as a hallmark of health organizations, might be more permissive than expected (13). The following provides two examples found in the peer-reviewed literature regarding the medical laboratory profession's safety practices:

- A national Canadian study published in 2008 showed that 62% of respondents did not consistently wear gloves when handling blood and blood products, and 22% did not wear goggles or face shields when handling body fluids. Also, 19% did not report percutaneous exposures. In the study, the non-compliance rate for wearing gloves was only 8% (14).
- Another Canadian study, to assess determinants of health care workers self-reported compliance with infection control procedures, showed only 5% of respondents rated their training in infection control as excellent, and 30% felt they were not offered the necessary training. They concluded that compliance with infection control procedures is tied to environmental factors and organizational characteristics (15).

Reporting Occupational Hazard Events

Workers' Compensation is a provincial/territorial led system of no-fault mandatory insurance against injury to employees required of all employers in business and industry above a certain size (data represented in the analysis within this report). It was designed to promote fair compensation to injured workers as well as decrease the necessity of frequent lawsuits; however, it has long been recognized that work-related injuries are under-reported to workers' compensation boards. The extent of that under-reporting in Canada varies. For example, an older study by Shannon and Lowe's (2002) found that 40% of eligible claims were not submitted to a compensation board. A more recent study (2013) in Manitoba concluded that there was significant under-reporting, suggesting that 30% of injuries were not reported (16). There is no indication within the medical laboratory

literature to suggest that the profession doesn't also experience under-reporting. Unfortunately, the approximate value of this has not been published. Anecdotal information provided to CSMLS through discussions with members and the CSMLS occupational health and safety expert suggests that under-reporting is prevalent. Reasons for not reporting such occupational exposures have been cited as a lack of understanding of local procedures, training, recognition of significance in event, fear of punitive action and precarious employment status and the social stigma experienced for making a mistake.

Under-reporting has negative effects on preventive health and safety measures and can be considered more damaging than any financial consequence. The importance of recognizing and reporting occupational hazards and events can be found in three main concepts: 1) it can limit the affect of the hazard on the person, 2) it can help support the identification and creation of preventative measures to reduce exposure or impact in the future for others and 3) identification can lead to compensation for those effected and/or disabled by the hazard.

To support data collection efforts, Canada recently enacted legislation to authorize the voluntary submission of laboratory incidents data involving a biological agent.¹ Conducted by the Public Health Agency of Canada (PHAC), the data collection is part of a comprehensive national program that protects Canadians from the health and safety risks posed by human and terrestrial animal pathogens and toxins. Known as The Laboratory Incident Notification Canada (LINC), it is one of the first surveillance systems in the world to gather comprehensive data on laboratory incidents involving human pathogens and toxins (17). In its first year (2016), 46 exposure incidents were reported by holders of 835 active licences in Canada, representing 1,352 physical areas approved for work involving a biological agent, for an overall incidence of 3.4%. The number of incidents was highest in the academic (34.8%) and hospital (26.1%) sectors, while the number of reported incidents was relatively low in the private industry sector. An average of four to five incidents occurred each month; however, long-term data collection will shed light on the validity of information collected in the program's first year as the submission of events increases.

Current Report Analysis

This report provides a historical look and analysis of the national injury and disease data produced by the Association of Workers' Compensation Boards of Canada (AWCBC). Data from 2006-2015 associated with lost time claims and fatalities as reported to the Canadian Workers' Compensation Boards/Commissions (WCBs) has been analysed and presented for the medical laboratory profession (National Occupational Classification codes 3211 and 3212).

A lost time claim occurs for an injury where a worker is compensated by a WCB for a loss of wages following a work-related injury (or exposure to a noxious substance), or receives compensation for a permanent disability with or without any time lost in his or her employment example, a laboratory worker is treated and compensated for exposure to a virus resulting in time lost wages and time off from the workplace.

This information is significant as occupational hazards (injuries, diseases and fatalities) can occur in laboratories and clinical environments. Workers and management need to collaborate to ensure a healthy work environment that will improve, protect, and promote the health and safety for all.

¹ This data is not analysed within the current report.

Methodology

Data Source

The data used in this report comes from the Association of Workers' Compensation Boards of Canada (AWCBC), which produces statistics for the National Work Injury/Disease Statistic Program (NWISP). NWISP source data originates from data submitted to the AWCBC by the twelve Canadian Workers' Compensation Boards/Commissions (WCBs). NWISP publishes lost time claims and fatalities accepted for compensation by WCBs and excludes those claims with no time lost.

For more information regarding NWISP data considerations, please see the [website](#).

Data Time Period

Data has been extracted for 2006-2015, in calendar years. The data was extracted by AWCBC in January 2017. At the time of this report being constructed, more recent data was not available.

Profession Identification

The National Occupational Classification (NOC) is the nationally accepted taxonomy and organizational framework of occupations in the Canadian labour market. The NOC has been developed and maintained as part of a collaborative partnership between Employment and Social Development Canada and Statistics Canada (18). For purposes of the current report and limitation in data extraction, the NOC codes 3211 and 3212 represent medical laboratory professionals within this report.

3211	Medical laboratory technologists
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3212	Medical laboratory technicians and pathologists' assistants
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All tables, graphs and general commentary refer to the medical laboratory profession unless specifically noted as national data.

For a list of titles included in the 3211 and 3212 NOC classification system, please refer to Appendix A.

National and Provincial/Territories

Annual data was extracted at a national level in addition to the provincial and territory jurisdictions. Not all provinces and territories contributed data submissions for the dataset time period and, therefore, total national values throughout this report acknowledge such a limitation to the analysis (see Table 2 for information on data inclusion by jurisdiction across time). In the absence of another gold standard national dataset, the current dataset provides the greatest insight into the proposed topic.

Coding

For any of the tables and graphs provided, values of X represent three claims or less. Where aggregate data is provided across the entire 2006-2015 dataset, the grand total includes the true value of X (unless the grand total is equal to three or less, which is represented by an X). Therefore, the total values represent the entire calculation of all years combined, whereas a specific jurisdiction, year or code may not report the X value specifically.

If a jurisdiction, year or code does not appear at all (blank space in table), no claims were submitted for data inclusion.

The number zero represents a claim submission for the jurisdiction, year or code but no claims specific to the item were noted.

Where codes are structured in this format, “### - Written Text”, this represents the code number (###) as described by AWCBC and the description of the code (- Written Text). For example:

- A021 - Sprains, strains, tears (1355)
- 043 - Bruises, contusions (193)

Results

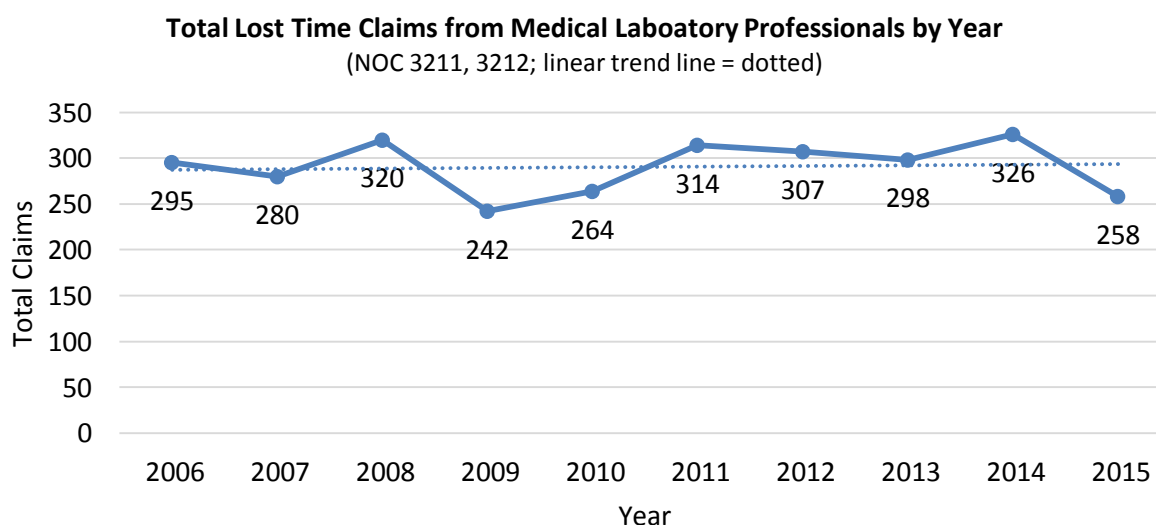
Lost Time Claims

A lost time claim occurs for an injury where a worker is compensated by a WCB for a loss of wages following a work-related injury (or exposure to a noxious substance), or receives compensation for a permanent disability with or without any time lost in his or her employment. Variation exists between provinces and territories in regard to how they define and collect lost time claims.

The total number of lost time claims for all Canadian industries resulted in a staggering 232,629 accepted claims in 2015. Examining the health and social service claim subtotal, this industry had the majority of claims compared to any other industry (18%, 41,111/232,629). With the medical laboratory profession only producing 0.6% (258/41,111) of the health and social service claims, it is apparent that the profession is shielded in comparison from potential injury events. As noted in other literature, a high occurrence of such claims is associated with front-line workers who interact directly with patients (19). Nonetheless, for every claim where lost time was recorded, the claim represents one of our medical laboratory colleagues and the potential to evaluate, learn and implement risk reduction plans.

For medical laboratory professionals, the number of lost time claims between 2006 and 2015 equalled 2,904. As is demonstrated in Graph 1, the national number of claims per year has remained fairly consistent and the linear trend (dotted line) has only slightly improved, even in the face of improved health and safety practices and awareness.

Graph 1: Lost Time Claims for Medical Laboratory Professionals in Canada



Further examination of yearly claims by jurisdiction (province and territory) provides greater insight into the pattern of claims across time as shown in Table 1. Prince Edward Island, Yukon, Northwest Territories and Nunavut did not provide submissions consistently for dataset inclusion.

Table 1: Lost Time Claims by Jurisdiction and Year

Jurisdiction	Calendar Year										Grand Total
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
AB	47	52	39	47	44	68	73	63	60	57	550
BC	96	100	113	76	81	99	113	91	110	98	977
MB	19	9	17	14	20	23	26	28	26	20	202
NL	14	5	9	9	11	13	14	12	16	11	114
NS	8	9	13	8	6	6	6	5	5	X	69
NT/NU	X	X			4	X		5	X		16
ON	75	76	100	65	59	76	58	77	82	50	718
PE								X	X	X	5
SK	34	28	28	23	39	28	17	16	23	16	252
YT			X								X
Grand Total	295	280	320	242	264	314	307	298	326	258	2,904

Note: See Coding section of report for table value definitions.

After reviewing the data for trends, a longitudinal analysis was conducted by breaking the dataset into two time periods, dividing the decade data into equal parts (2006-2010, 2011-2015), in addition to decade trend information. At the national level, there was a 7% increase in lost time claims between 2006-2010 and 2011-2015. At the provincial level, as shown in Table 2, three of the seven listed provinces showed a decrease in the total number of claims while four showed an increase between time periods. Of these, statistical differences in the number of claims were noted for Alberta (increased), Manitoba (increased), Nova Scotia (decreased) and Saskatchewan (decreased).

Table 2: Comparison of Lost Time Claim by Jurisdiction and Time Period

Jurisdiction **	2006-2010 vs. 2011-2015		2006-2010		2011-2015		T-Test*
	Count Change	% Change	Average	SD	Average	SD	P-Value
AB	92	40%	46	6	64	4	0.00
BC	45	10%	93	8	102	13	0.29
MB	44	56%	16	3	25	4	0.01
NL	18	38%	10	2	13	3	0.08
NS	-19	-43%	9	1	5	2	0.03
ON	-32	-9%	75	12	69	14	0.51
SK	-52	-34%	30	5	20	6	0.02
Grand Total	102	7%	280	23	301	27	0.28

*P-values equal to or less than 0.05 = statistical significant difference identified between 2006-2010 and 2011-2015 datasets (CI - 95%).

** NT/NU, PE and YT data excluded as the X values could not be interpreted; however, the grand total values represent their inclusion.

Given the longitudinal nature of the data and increase in health and safety promotion, the increase or decrease of claims within a specific jurisdiction between time periods should be regionally considered as the sheer number may only represent an increase in claims submitted and not the actual occurrences across time.

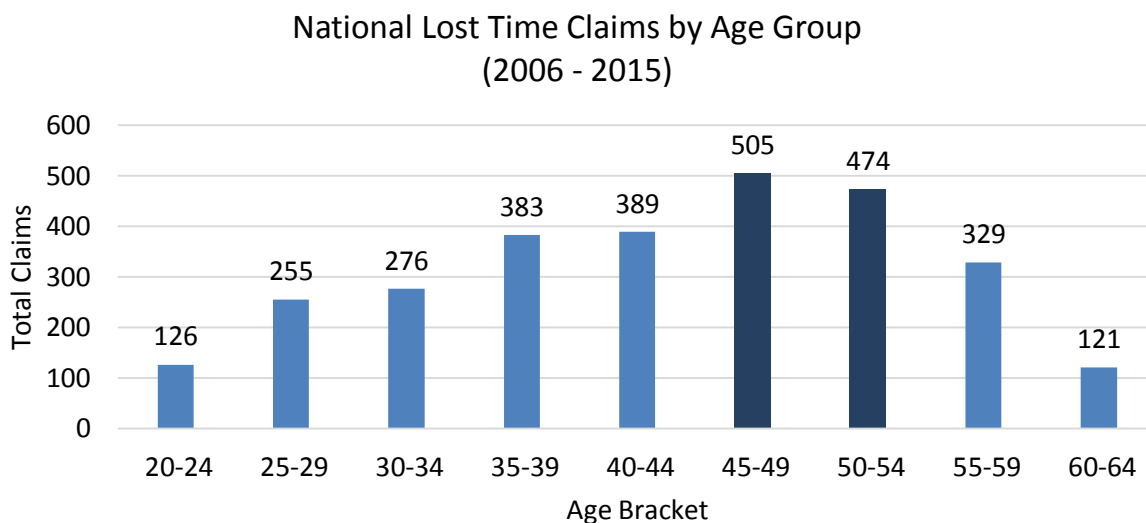
Given the changes in the medical laboratory profession (e.g., increased workload and testing complexity, advancing technology), the offset of this has likely hampered the nation's ability to reduce lost time claims; however, the direct cause can only be speculative as the report data does not provide conclusive evidence either way. Examination of the age, source of event, nature of event, part of body injured and the event itself does provide some insight, demonstrating that the cause of injuries in the medical laboratory profession is greatly associated with occurrences not specific or unique to the profession itself.

Age

Data was recorded in five-year periods for age groups starting at 15 years of age and ending with 65 and over. The most relevant age brackets of working adults are those between 20-64, which is the primary focus of the analysis in this section.

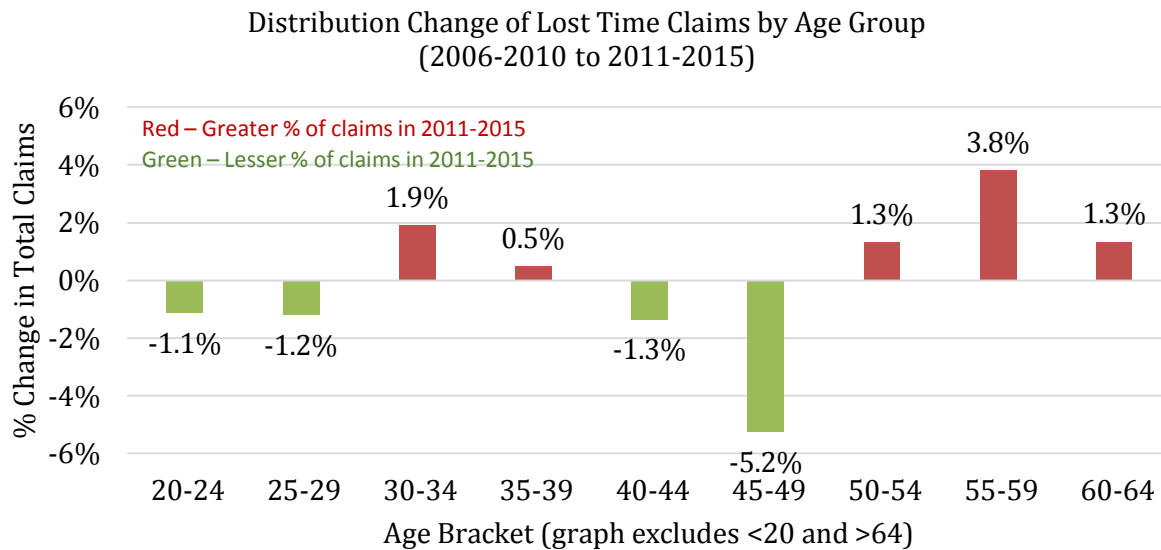
Canadian medical laboratory professionals ranged in their age for accepted lost time claims, with the majority within the ages of 45 and 54 across the entire dataset. This is consistent with the 2015 national data for all industries.

Graph 2: Lost Time Claims in Canada by Age Bracket (2006-2015)



Change across time can be identified when comparing the two halves of the dataset. For example, the percentage of lost time claims for the age bracket 45-49 was 15% of the total 2011-2015 claims (ages 20-64). This represents a decrease in the percentage of claims for the age bracket compared to 2006-2010, a drop of 5.2% of the total claims in that time period. Graph 3 shows the shift in age brackets with accepted lost time claims.

Graph 3: Distribution Change of Lost Time Claims in Canada (2006-2010 to 2011-2015)



Overall, between the two time periods, those who were 20-29 and 40-49 had a decrease in the total number of lost time claims, whereas those 30-39 and 50-64 saw an increase in the number of claims. For more detailed data associated with Age, see Appendix B.

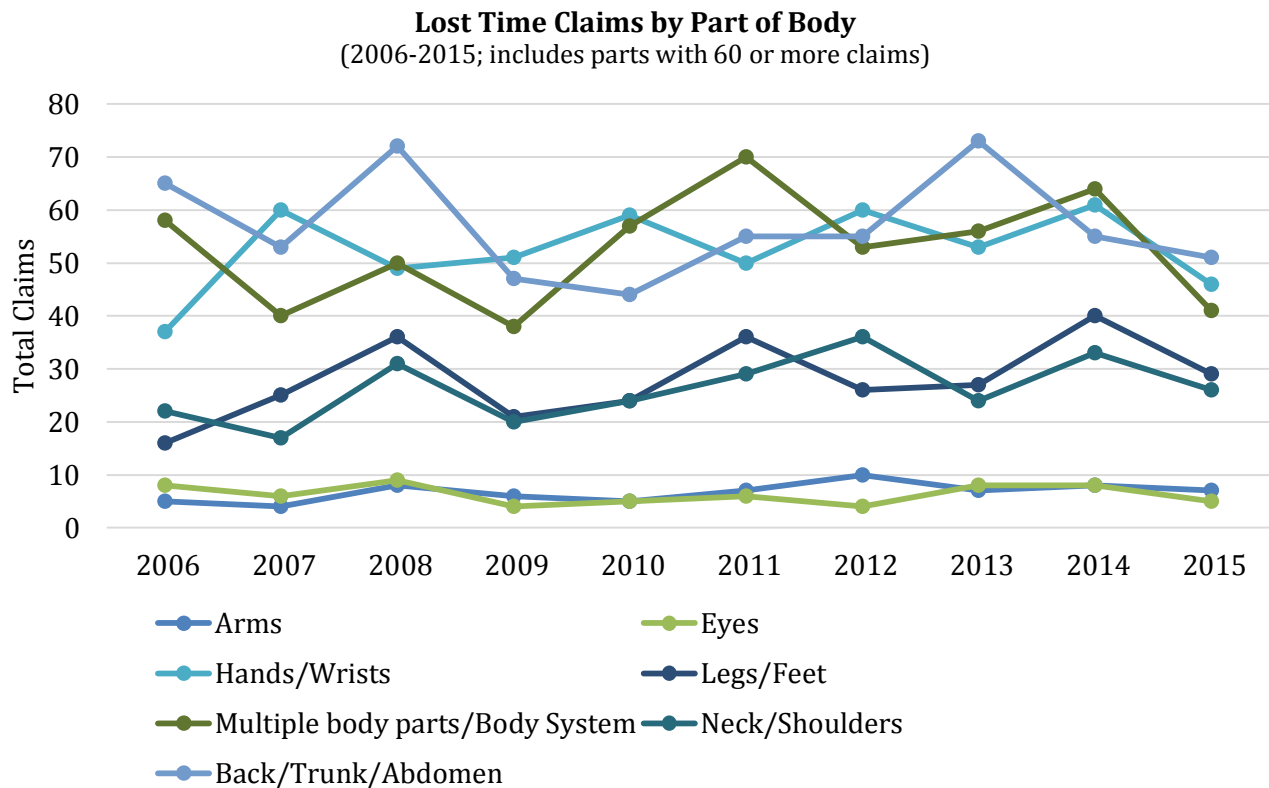
Part of Body

In each event, the part of the body that was injured or diseased has been recorded. The list of 78 body parts coded over the decade was evaluated for those with 60 claims or more. Detailed data can be found in Appendix C.

The highest number of claims was associated with codes: '800 – Multiple body parts' (346), '340 - Finger(s), fingernail(s)' (239) and '239 - Back, including spine, spinal cord n.e.c.' (227). These top three codes account for 28% of the total claims by medical laboratory professionals in Canada between 2006-2015.

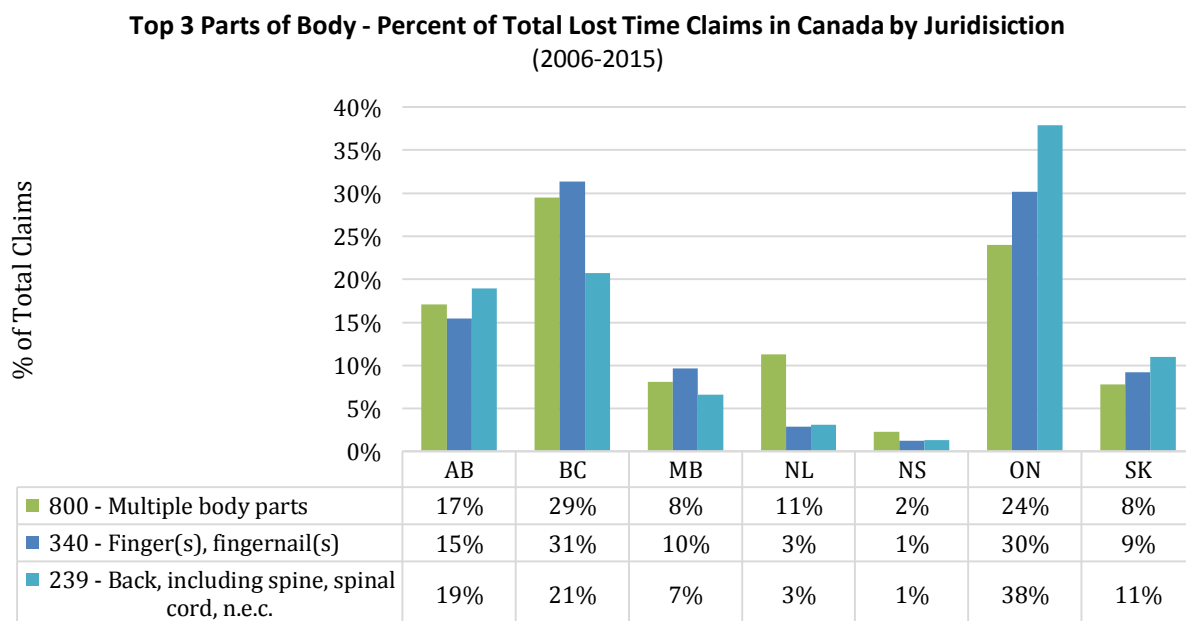
Graph 4 refines the dataset by grouping the claims with 60 or more claims into regions of the body. Using this evaluation, total lost time claims were most associated with back/trunk/abdomen (577), multiple body parts/body system (527) and hands/wrists (526). In the graph, there are three clear tiers of claims associated with body parts. The previous noted as the highest cluster of claims followed by legs/feet (280) and neck/shoulders (264) and the lowest cluster of eyes (63) and arms (67).

Graph 4: Lost Time Claims in Canada by Part of Body (2006-2015; 60 claims or more)



Data by jurisdiction for the top three codes is shown in Graph 5 and is broken down into jurisdictions across Canada. Differences between the provinces can be seen, with Ontario having 38% of the total back claims (code 239) in Canada, whereas British Columbia dominated at 29% with claims for 'multiple body parts' (code 800). British Columbia also had the greatest number of claims (31%) for finger(s) and fingernail(s) (code 340).

Graph 5: Lost Time Claims in Canada by Part of Body (Codes 800, 340, 239; 2006-2015; 60 claims or more)

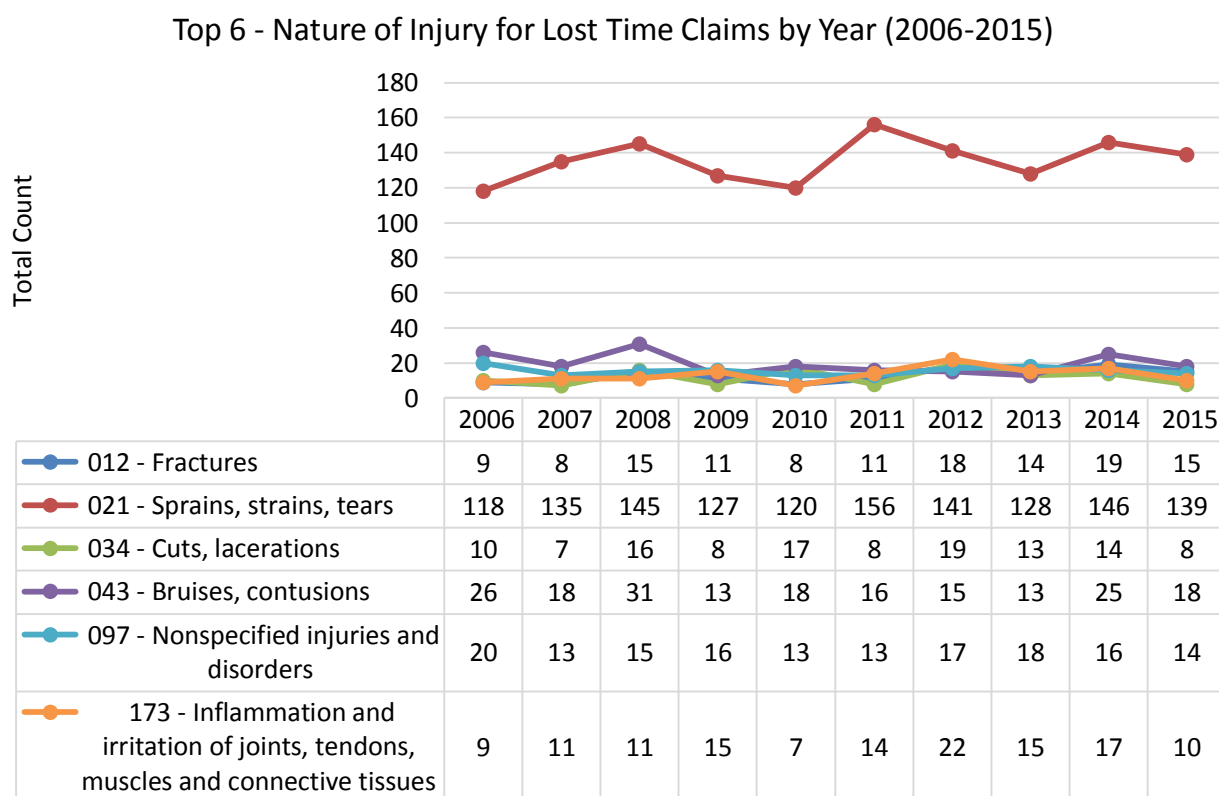


Nature of Injury

The nature of the injury or disease is the principal physical characteristic associated with it, whereas the part of the body is the location of the injury or disease. Lost time claims identified 75 different codes for nature, showing six nature of events that had over 100 claims between 2006-2015 (Top 6):

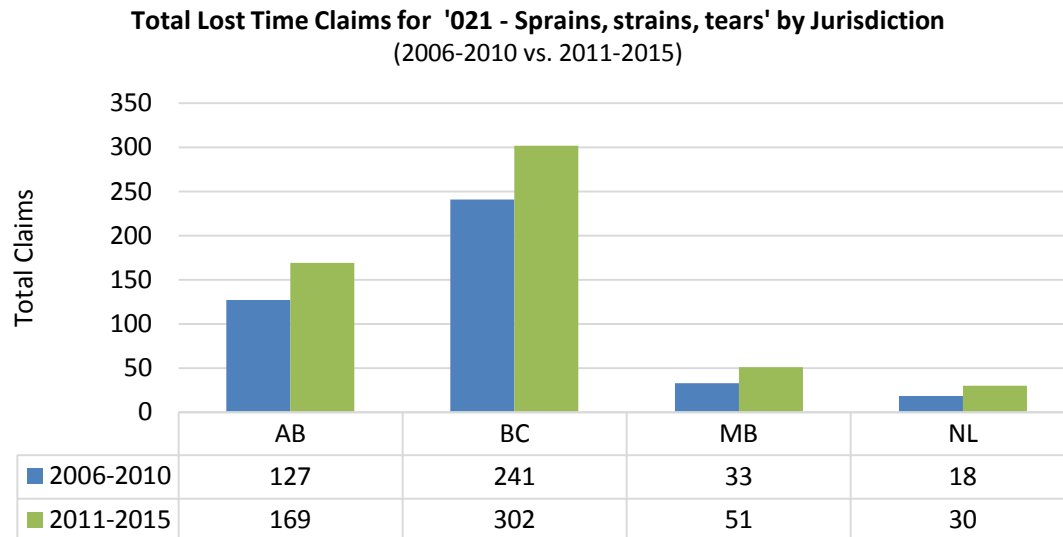
- 1) 021 - Sprains, strains, tears (1355)
- 2) 043 - Bruises, contusions (193)
- 3) 097 - Nonspecified injuries and disorders (155)
- 4) 173 - Inflammation and irritation of joints, tendons, muscles and connective tissues (131)
- 5) 012 - Fractures (128)
- 6) 034 - Cuts, lacerations (120)

Graph 6: Lost Time Claims in Canada by Nature of Injury (2006-2015; Top 6)



'021 - Sprains, strains, tears' had the majority of claims with 47% (1,355/2,904) and the top six representing 72% (2082/2904) of all claims, ranging from 40%-54% of claims per year (avg = 136 per year, SD = 12). This pattern was largely consistent across the entire time period as shown in Graph 6. There was an increase in '021 - Sprains, strains, tears' between the first and second half of the dataset, with the proportion of the code increasing from 46.0% to 47.2% of all claims between 2006-2010 and 2011-2015. Evaluation of jurisdiction differences shows the total increase in claims by province for those where data could be aggregated between time periods.

Graph 7: Lost Time Claims by Nature of Event and Jurisdiction for 'Sprains, strains, tears'



Excluded provinces and territories in Graph 7 had values that could not be broken down into the two time periods because of X values or lack of submissions. Nonetheless, for the provinces above, the 2006-2010 'sprains, strains, tears' claims represent 65% (419/645) of the total, which increased to 78% (552/710) of claims during 2011-2015.

Appendix D provides a detailed table of the nature of injury codes and their respective totals annually. Note that reporting of accepted claims for mental stressors is low compared to the prevalence of mental health burden in the profession (20). It is likely that there is identifiable under-reporting in this respect.

Source of Event

The object, substance, exposure or bodily motion that directly inflicted the injury/disease is called the source of the event (see Appendix E for dataset). A total of 195 codes for source of event were used within the dataset. Approximately a quarter of these were for '562 - Bodily motion or position of injured, ill worker'; however, only eight codes had more than 60 claims between 2006-2015 (shown in Table 3). This 3% of codes included 55% of all event sources.

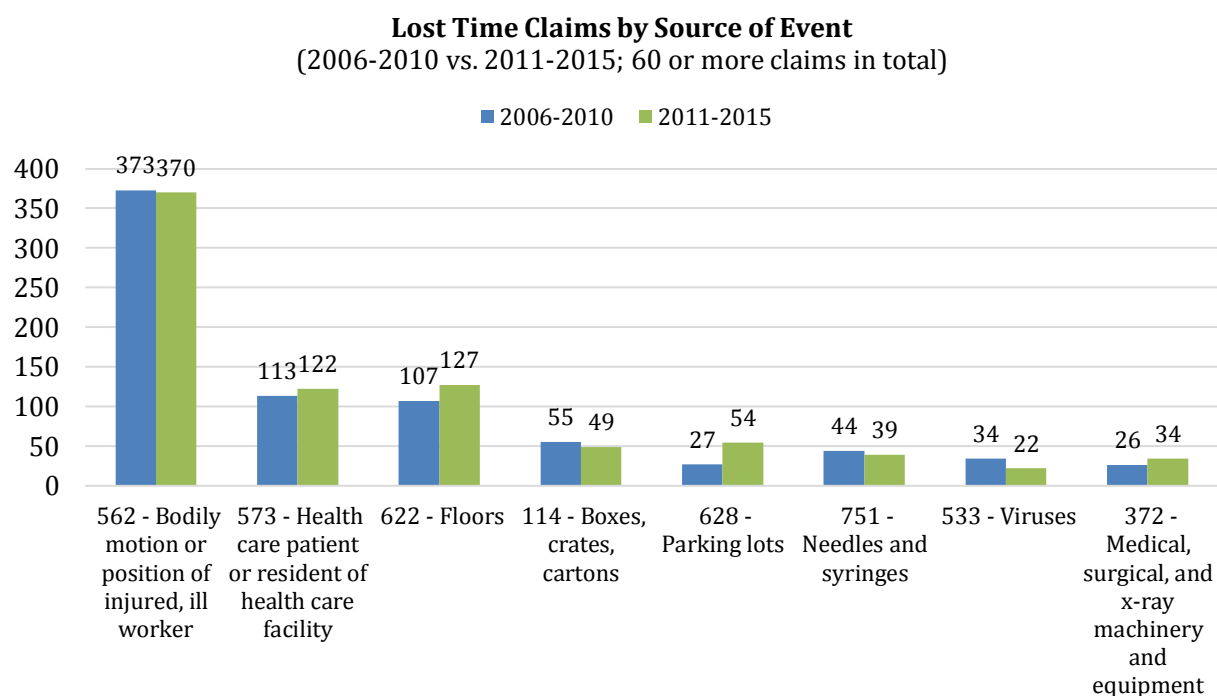
Table 3: Lost Time Claims in Canada by Source of Event (2006-2015; 60 or more claims)

Source of Event	Count of Claims	% of Total Claims
Grand Total	2,904	100%
562 - Bodily motion or position of injured, ill worker	743	26%
573 - Health care patient or resident of health care facility	235	8%
622 - Floors	234	8%
114 - Boxes, crates, cartons	104	4%
628 - Parking lots	84	3%
751 - Needles and syringes	83	3%
533 - Viruses	61	2%
372 - Medical, surgical, and x-ray machinery and equipment	60	2%

The codes represent four source groups: self (562), other person (573), environment (622, 114, 372) and work duty specific (751, 533). It is highly likely that the code '573 - Health care patient or resident of health care facility' is associated with medical laboratory assistant/technician positions (and similar titles) as they have patient-facing roles more often as compared to medical laboratory technologists or pathology assistants, on average. There were 24 events coded (SD =4) with a range of 17 to 28 annually.

A comparison of time periods did not show great change for event sources in Graph 8, only a decrease of 1% between time periods. Note that the code '533 - Viruses' had a disproportionate number of events in 2006 (n=22), which accounts for the difference between time periods.

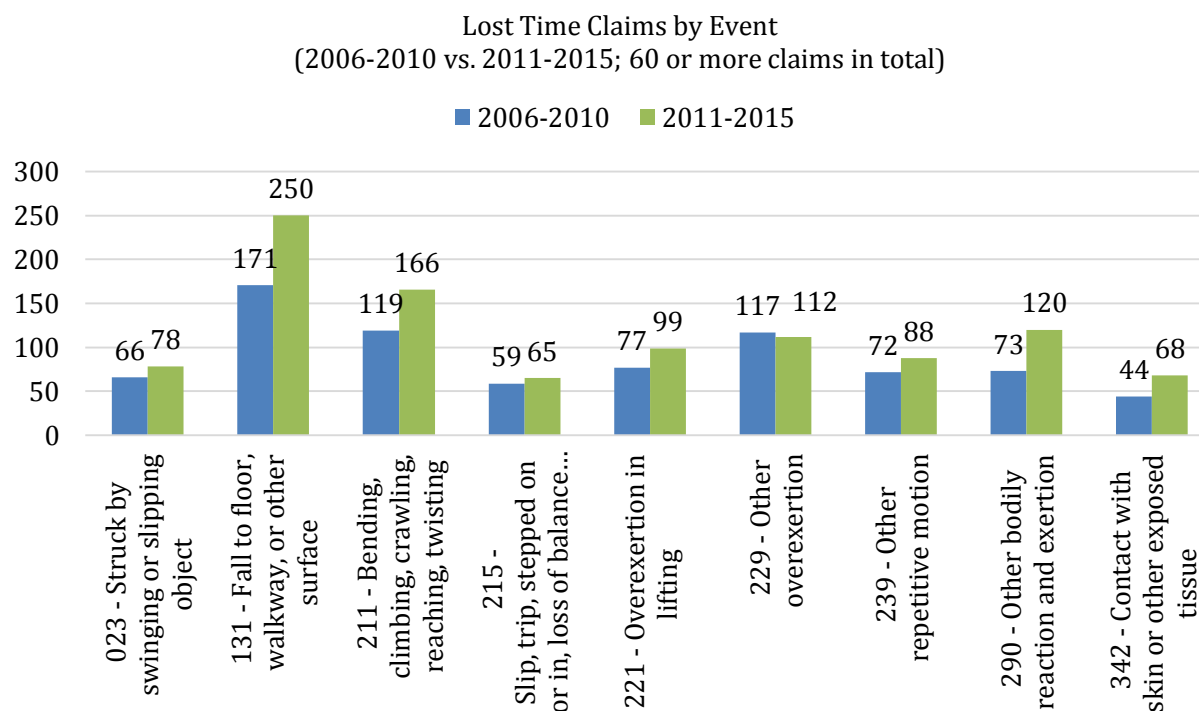
Graph 8: Lost Time Claims in Canada by Source of Event (2006-2010 vs. 2011-2015; 60 or more claims)



Event

A total of 91 events or exposures that directly resulted in injury/disease were recorded in the dataset. The predominant code was associated with fall to the floor, followed by bending and over exertion. With 14 codes with over 60 claims between 2006-2015, 70% of claims were covered. These top items included 798 claims during 2006-2010 but increased to 1,046 during 2011-2015, 56% to 59% of total lost time claims.

Graph 9: Lost Time Claims in Canada by Event (2006-2010 vs. 2011-2015; 60 or more claims)



Many codes are similar in nature with slight differences for coding purposes. For example, the codes can be grouped into external factors, such as being struck by an object, or physical factors, such as body reactions or motions. Considering the work duties of medical laboratory professionals, a few choice code groups were created to determine impact on the total number of lost time claims between 2006-2015.

From the total list, the extraction of any code with the word “repetitive” identified 236 claims, accounting for 8% of all claims. Words associated with exposure, inhalation or ingestion were also extracted and identified in 10% of all claims (n=299). In addition, given the number of source events associated with ‘573 – Health care patient or resident of health care facility’, event codes directly associated with a physical assault by another person were noted. These account for 2% of events or 51 claims in total. For further details of these codes, see Appendix F.

Fatalities

To respect the identity of the small number of medical laboratory professionals who have passed away because of work-related injury or disease recognized through WCBs claims, the data provided in this section will summarize and not pinpoint specific occurrences (X values in place within extracted dataset).

The data provides some insight. There were a minimum of two and maximum of six medical laboratory professionals who passed away between 2006 and 2015 in Canada (localized in two provinces) because of work-related injury or disease. The events are described with the following codes:

- Age: 60 years old or greater
- Part of Body: 500 – Body System
- Nature of Injury: 149 - Other respiratory system diseases, 319 - Malignant neoplasms and tumors, n.e.c.
- Source of Event: 551 – Asbestos, 034 – Aromatics
- Event: 341 - Inhalation of substance, 349 - Other exposure to caustic, noxious, or allergenic substances

In 2015, there were a total of 852 fatalities across Canada (all industries) and 11 within health and social services. At minimum, one of these fatalities was associated with the medical laboratory profession (max = 3, 0.12%-0.35% medical laboratory professional fatality occurrence within all 2015 claims).

Summary Description

Across the decade worth of data, there were 290 lost time claims annually (SD = 27), ranging from 242-326 per year. Although there have been some differences between time periods and codes, overall there is a clear picture of what a lost time claim would likely have included given the use of top codes used compared to the remaining ones. For each category, a claim is most likely to include the following based on the collective dataset:

- Age: 45-49 years old followed closely by 50-54 years old
- Part of Body: 800 – Multiple Body System (alternatively, 'back/trunk/abdomen', when codes are grouped)
- Nature of Injury: 021 – Sprain, strains, tears
- Source of Event: 562 - Bodily motion or position of injured, ill worker
- Event: 131 – Fall to floor, walkway, or other surface

Conclusion

Every claim accounted for in this report represents an individual with a story. No matter how small or how large the numbers are, each claim is important.

The retrospective investigation into the pattern of lost time claims and fatalities in Canada (2006-2015) has demonstrated some interesting results. In the face of improved health and safety awareness and practice since 2006, there has been a steady, and even slight increase, in the number of accepted claims across time by medical laboratory professionals. Significant increases and decreases in reporting were noted for several provinces; however, the reason for differences cannot be assumed as a singular answer. It is possible that increased awareness and social acceptance to submit claims, knowing that there is a tendency to under-report, may contribute to the answer. Also, it is possible that a province implemented specific measures across the time period that ultimately supported the change in claims. Nonetheless, the fact that there was not a consistent decrease or increase by all provinces demonstrates the impact that provincial health and safety programs and culture have on event reporting in the medical laboratory profession.

The report results are in line with previous research that demonstrates the potential negative impact of the clinical environment and lab on working professionals. It demonstrates the physical demands and workload on medical laboratory professionals as burdensome, contributing to strain on multiple regions of the body simultaneously, resulting in injury or disease. This suggests that greater ergonomic controls to support hazard reduction are integral within the laboratory and clinical environment. This recommendation does not lessen the indicators that also suggest greater engineering and administrative controls. Examples: 1) the large percentage of claims for 'exposure, ingestion, inhalation', which could be supported by the proper equipment, ventilation systems and processes that reduce the source of exposure and 2) the high number of claims for falls or injuries due to equipment that require improved work practices, such as standards and operating procedures (e.g., training, housekeeping and equipment maintenance).

As much as the nation has improved its efforts, the data in this report stands up to the testament that the medical laboratory profession has created safe work environments but there is still room for improvement. Occupational hazard events require immediate medical attention, and employers should listen and support their workers to report any occupational event or exposure. Without consistent and improved submission of claims for process, the ability from the profession to learn from such events will always be limited.

Suggested Resources

Canadian Centre for Occupational Health and Safety. <http://www.ccohs.ca/>

Canadian Society for Medical Laboratory Science (2017). Laboratory Safety Guidelines, 8th Edition. [Order Form](#)

Canadian Society for Medical Laboratory Science – [Learning Centre Catalog](#)

Public Health Agency of Canada, Canadian Biosafety Handbook. 2nd ed. Ottawa: 2016

Public Health Agency of Canada, Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. Ottawa: 2012

Occupational Safety and Health Administration - [Laboratory Safety Ergonomics for the Prevention of Musculoskeletal Disorders](#)

Definitions

AWCBC produces statistics for the National Work Injury/Disease Statistic Program (NWISP). NWISP source data originates from data submitted to the AWCBC by the twelve Canadian Workers' Compensation Boards/Commissions (WCBs). All variables are coded by the WCBs, not AWCBC. Coding practices may vary between jurisdictions. NWISP data is based on nationally accepted Definitions that may not be the same as statistics published in WCB annual reports. For related information, please see:

Definition Source: Association of Workers' Compensation Boards of Canada (AWCBC), *National Work Injury/Disease Statistic Program (NWISP) Definitions, February 2017.*

The following are the definitions provided by the NWISP:

Injury or Disease:

Any injury or disease resulting from a work-related event or exposure to a noxious substance. Disease, as distinct from a physical injury, results from conditions in the work environment.

Lost Time Claim:

An injury where a worker is compensated by a Board/Commission for a loss of wages following a work-related injury (or exposure to a noxious substance), or receives compensation for a permanent disability with or without any time lost in his or her employment (for example, if a worker is compensated for a loss of hearing resulting from excessive noise in the work place).

NOTE: Ontario and Newfoundland & Labrador do not include claims that receive compensation for a permanent disability without any time lost.

Fatality:

A death resulting from a work-related incident (including disease) that has been accepted for compensation by a Board/Commission.

NOTE: A lost time claim resulting in an accepted fatality is reported as a lost time claim and as a fatality. Fatalities that result from an accepted lost time claim and are accepted outside of the time loss reference period from 1993-2008 may be under-reported as not all jurisdictions captured these fatalities.

N.E.C:

Not elsewhere classified. N.E.C. codes are used within a code title when the information in the source documents does not fit any of the code descriptors provided.

Hazard Controls:

The main ways to control a hazard include:

- **Elimination (including substitution):** remove the hazard from the workplace, or substitute (replace) hazardous materials or machines with less hazardous ones.
- **Engineering Controls:** includes designs or modifications to plants, equipment, ventilation systems, and processes that reduce the source of exposure.
- **Administrative Controls:** controls that alter the way the work is done, including timing of work, policies and other rules, and **work practices** such as standards and

operating procedures (including training, housekeeping, and equipment maintenance, and personal hygiene practices).

- **Personal Protective Equipment:** equipment worn by individuals to reduce exposure such as contact with chemicals or exposure to noise.

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Appendix A - National Occupational Classification (3212, 3211)

3212 - Medical Laboratory Technicians and Pathologists' Assistants

- biochemical technician – medical laboratory
- biological technician – medical laboratory
- blood bank technician
- cancer research technician
- clinical laboratory technician
- combined laboratory and x-ray technician
- community health technician – medical laboratory
- cytology technician
- epidemiology worker – medical laboratory
- hematology technician – medical laboratory
- histology technician
- laboratory assistant – medical
- laboratory technician – medical
- medical laboratory aide
- medical laboratory assistant
- medical laboratory helper
- medical laboratory technical assistant
- medical laboratory technician
- morgue attendant supervisor
- pathology assistant
- phlebotomist
- phlebotomy aide
- renal technician
- technical assistant – medical laboratory
- technical assistant – pathology

3211 - Medical Laboratory Technologists

- advanced registered technologist – medical laboratory
- anatomical pathology technologist
- autopsy technologist – medical laboratory
- biochemistry technologist – medical laboratory
- blood bank technologist
- charge technologist – medical laboratory
- clinical immunology technologist
- clinical laboratory technologist
- combined laboratory and x-ray technologist
- cytogenetics technologist – medical laboratory
- cytology technologist
- cytotechnologist – medical laboratory
- electron microscopy technologist – medical laboratory
- hematology technologist – medical laboratory
- histology technologist
- histology technologist – medical laboratory
- histopathology technologist

- histotechnologist – medical laboratory
- immunohematology technologist
- immunohematology technologist – medical laboratory
- immunology technologist – medical laboratory
- in-charge technologist – autopsy services
- medical laboratory supervisor
- medical laboratory technical supervisor
- medical laboratory technologist
- medical technologist
- medical technologist – medical laboratory
- medical technologists supervisor
- microbiology technologist – medical laboratory
- registered medical technologist
- registered technologist – medical
- serology technologist
- tissue technologist – medical laboratory

Appendix B – Age Bracket

Table 4: Total Lost Time Claims in Canada by Age Bracket and Year

Age	Grand Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Grand Total	2,904	295	280	320	242	264	314	307	298	326	258
15-19 years	11	X	X	X	X	X	0	1	X	1	0
20-24 years	126	13	16	17	13	10	10	13	7	13	14
25-29 years	255	27	23	34	18	30	22	28	29	21	23
30-34 years	276	17	34	23	23	23	36	20	31	36	33
35-39 years	383	37	45	39	27	34	42	33	46	48	32
40-44 years	389	56	42	36	34	30	36	38	39	44	34
45-49 years	505	68	42	70	46	56	52	47	41	53	30
50-54 years	474	50	45	42	42	41	57	60	49	43	45
55-59 years	329	18	23	38	25	28	33	48	36	47	33
60-64 years	121	6	7	17	12	7	20	12	15	12	13
65 years and over	34	X	X	X	X	X	6	7	X	7	1
Unknown	1	0	0	0	0	0	0	0	0	1	0

Table 5: Age Bracket Percent Distribution for Total Lost Time Claims in Canada

Age Bracket	2006-2010	2011-2015	% Change
20-24	4.99%	3.87%	-1.12%
25-29	9.54%	8.34%	-1.19%
30-34	8.67%	10.58%	1.91%
35-39	13.15%	13.64%	0.49%
40-44	14.31%	12.96%	-1.35%
45-49	20.38%	15.13%	-5.25%
50-54	15.90%	17.23%	1.34%
55-59	9.54%	13.36%	3.83%
60-64	3.54%	4.88%	1.34%
Total	100.00%	100.00%	100.00%

**Data exclude claims for individuals who are less than 20 years of age or greater than 64. Negative percent change scores indicate that the total percentage of the age bracket claims decreased compared to the total claims, a positive outcome across time.*

Appendix C – Part of Body

Table 6: Total Lost Time Claims in Canada by Part of Body and Year

Part of Body (60 or more claims)	Grand Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Grand Total	2,904	295	280	320	242	264	314	307	298	326	258
800 - Multiple body parts	346	28	21	32	28	42	47	35	29	50	34
340 - Finger(s), fingernail(s)	239	11	26	26	21	34	23	31	23	21	23
239 - Back, including spine, spinal cord n.e.c.	227	27	18	15	20	17	23	26	29	25	27
210 - Shoulder, including clavicle, scapula	193	16	17	25	14	16	18	27	16	25	19
231 - Lumbar region	183	23	25	28	11	12	15	15	23	12	19
320 - Wrist(s)	182	19	23	13	21	15	18	18	16	25	14
500 - Body systems	181	30	19	18	10	15	23	18	27	14	7
412 - Knee(s)	155	12	13	24	10	9	20	15	14	24	14
420 - Ankle(s)	125	4	12	12	11	15	16	11	13	16	15
230 - Back, including spine, spinal cord, uns.	106	10	10	14	12	11	9	14	14	11	X
330 - Hand(s), except finger(s)	105	7	11	10	9	10	9	11	14	15	9
100 - Neck, except internal location of diseases or disorders	71	6	X	6	6	8	11	9	8	8	7
312 - Elbow(s)	67	5	4	8	6	5	7	10	7	8	7
032 - Eye(s)	63	8	6	9	4	5	6	4	8	8	5
232 - Thoracic region	61	5	X	15	4	4	8	X	7	7	5

Table 7: Total Lost Time Claims in Canada by Part of Body and Year

Part of Body	2006-2010	2011-2015	Change	% Change
Grand Total	1,401	1,503	102	7.3%
800 - Multiple body parts	151	195	44	29.1%
340 - Finger(s), fingernail(s)	118	121	3	2.5%
239 - Back, including spine, spinal cord n.e.c.	97	130	33	34.0%
210 - Shoulder, including clavicle, scapula	88	105	17	19.3%
231 - Lumbar region	99	84	-15	-15.2%
320 - Wrist(s)	91	91	0	0%
500 - Body systems	92	89	-3	-3.3%
412 - Knee(s)	68	87	19	27.9%
420 - Ankle(s)	54	71	17	31.5%
230 - Back, including spine, spinal cord, uns.	57	49	-8	-14.0%
330 - Hand(s), except finger(s)	47	58	11	23.4%
100 - Neck, except internal location of diseases or disorders	28	43	15	53.6%
312 - Elbow(s)	28	39	11	39.3%
032 - Eye(s)	32	31	-1	-3.1%
232 - Thoracic region	Not calculated due to X values			

Appendix D – Nature of Injury

Table 8: Total Lost Time Claims in Canada by Nature of Injury and Year

Nature of Injury (>15 claims)	Grand Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Grand Total	2,904	295	280	320	242	264	314	307	298	326	258
021 - Sprains, strains, tears	1,355	118	135	145	127	120	156	141	128	146	139
043 - Bruises, contusions	193	26	18	31	13	18	16	15	13	25	18
097 - Nonspecified injuries and disorders	155	20	13	15	16	13	13	17	18	16	14
173 - Inflammation and irritation of joints, tendons, muscles and connective tissues	131	9	11	11	15	7	14	22	15	17	10
012 - Fractures	128	9	8	15	11	8	11	18	14	19	15
034 - Cuts, lacerations	120	10	7	16	8	17	8	19	13	14	8
029 - Traumatic injuries to musculoskeletal system with inflammation of muscles, tendons, ligaments, joints, etc., n.e.c.	64	X	7	X	4	9	X	6	14	9	7
037 - Punctures, except bites	62	4	11	8	8	8	4	4	6	X	6
020 - Traumatic injuries to muscles, tendons, ligaments, joints, etc., uns.	54	X	X	5	X	4	10	6	7	10	4
062 - Concussions	49	X	X	5	4	X	X	6	7	5	12
269 - Infectious diseases peculiar to intestines, n.e.c	49	18	5	5	X	0	4	11	X	X	0
491 - Contacts with or carriers of disease	49	7	X	X	X	6	4	6	10	6	X
095 - Other poisonings and toxic effects	41	4	4	X	4	5	4	4	5	7	X
051 - Chemical burns	37	5	6	4	4	X	X	X	X	6	X
096 - Traumatic complications	36	5	9	8	X	X	5	X	X	0	0
182 - Dermatitis	31	0	4	X	X	0	8	4	7	X	X
082 - Sprains or strains and bruises	30	X	X	X	X	4	4	X	X	5	X
053 - Heat burns, scalds	26	8	X	4	X	X	0	X	X	5	X
124 - Disorders of the peripheral nervous system	26	X	X	5	X	X	5	X	X	0	X

999 – Unknown	25	4	4	X	X	6	X	X	X	X	0
Nature of Injury (>15 claims) cont.	Grand Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
172 – Dorsopathies	24	X	4	5	X	4	X	X	4	0	X
521 - Anxiety, stress, neurotic disorders	18	4	X	0	0	X	X	X	X	X	X
089 - Multiple traumatic injuries and disorders, n.e.c.	16	X	X	X	X	5	X	X	0	X	0

Appendix E – Source of Event

Table 9: Total Lost Time Claims in Canada by Source of Injury and Year

Source of Injury (50 claims or more)	Grand Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Grand Total	2,904	295	280	320	242	264	314	307	298	326	258
562 - Bodily motion or position of injured, ill worker	743	73	77	70	78	75	85	92	67	65	61
573 - Health care patient or resident of health care facility	235	29	19	27	21	17	18	25	28	26	25
622 – Floors	234	17	25	27	16	22	32	16	25	29	25
114 - Boxes, crates, cartons	104	10	9	17	8	11	9	10	14	11	5
628 - Parking lots	84	4	9	9	X	5	10	10	9	15	10
751 - Needles and syringes	83	8	11	8	7	10	7	7	13	5	7
533 – Viruses	61	22	6	6	X	0	X	10	5	7	0
372 - Medical, surgical, and x-ray machinery and equipment	60	7	6	7	0	6	9	8	7	4	6
861 - Cart, dolly, hand truck	54	6	X	5	4	X	X	10	8	11	4
794 - Other health care and orthopedic equipment	53	X	X	X	7	6	5	X	8	9	6

Appendix F – Event

Table 10: Total Lost Time Claims in Canada by Event and Year

Event (50 claims or more)	Grand Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Grand Total	2,904	295	280	320	242	264	314	307	298	326	258
131 - Fall to floor, walkway, or other surface	389	29	35	47	28	32	43	34	46	56	39
211 - Bending, climbing, crawling, reaching, twisting	256	27	23	22	18	29	27	25	35	28	22
229 - Other overexertion	215	22	21	36	24	14	24	17	21	22	14
290 - Other bodily reaction and exertion	174	12	14	15	13	19	15	18	20	17	31
221 - Overexertion in lifting	158	15	15	16	13	18	18	17	15	19	12
239 - Other repetitive motion	152	12	17	16	19	8	22	21	16	14	7
023 - Struck by swinging or slipping object	130	12	16	13	11	14	10	15	15	11	13
215 - Slip, trip, stepped on or in, loss of balance – with or without twisting – without fall	112	11	14	11	11	12	10	13	8	14	8
342 - Contact with skin or other exposed tissue	105	7	12	10	8	7	16	9	12	17	7
222 - Overexertion in pulling or pushing objects	79	9	7	8	4	4	7	13	7	12	8
012 - Struck against stationary object	68	8	5	X	5	4	6	7	9	10	11
341 - Inhalation of substance	63	9	7	X	5	5	13	5	7	8	X
219 - Bodily reaction, n.e.c.	62	4	5	6	5	6	7	13	X	4	10
019 - Other struck against object	60	6	X	7	10	9	X	7	4	5	8
340 - Exposure to caustic, noxious, or allergenic substances, uns.	59	21	8	8	X	0	X	8	7	X	X
111 - Fall down stairs or steps	58	X	X	5	5	8	7	9	5	5	9
349 - Other exposure to caustic, noxious, or allergenic substances	56	13	10	8	X	5	10	X	0	X	X
029 - Other struck by object	51	5	5	4	4	5	6	6	7	5	4

Table 11: Lost Time Claims Codes in Canada by Event Code Groups (2006-2015)

Event Code	Count / Description
Repetitive	
239 - Other repetitive motion	152
233 - Repetitive placing, grasping, or moving objects, except tools	39
230 - Repetitive motion, uns.	30
232 - Repetitive use of tools	15
Total	236
% of total claims	8%
Exposure, Inhalation, Ingestion	
342 - Contact with skin or other exposed tissue	105
341 - Inhalation of substance	63
340 - Exposure to caustic, noxious, or allergenic substances, uns.	59
349 - Other exposure to caustic, noxious, or allergenic substances	56
344 - Ingestion of substance	16
Total	299
% of total claims	10%
Assault	
619 - Assaults, violent acts or harassment by person(s), n.e.c.	29
612 - Hitting, kicking, beating	22
Total	51
% of total claims	2%