Partnership for Work, Health and Safety

Research BRIEF

COVID-19 and Workplace Community Transmission—Identifying At-risk Occupations

September 2020

Background

Workers in many occupations face the risk of exposure to the COVID-19 virus as a result of work that cannot be done from home, that is essential, and/or that involves direct contact with the public. Health care workers in particular are at risk of infection due to close contact with patients with COVID-19 and exposure to high viral loads. Other workers, such as those in food processing plants, are at risk of exposure to the COVID-19 virus as a result of close physical proximity to large groups of co-workers. Exposure to the COVID-19 virus and the risk of workplace community transmission may also be exacerbated by physical conditions at work, such as colder temperature that is favourable to virus persistence,[1] as well as by broader social determinants of work, such as employment standards related to paid sick-leave benefits.

Understanding the risk of exposure to the COVID-19 virus in working environments and the determinants of workplace community transmission is part of an overall effective public health strategy. As work and health researchers, we have an opportunity to contribute evidence and insights to the emerging risk of exposure to infectious agents and workplace community transmission during the unprecedented COVID-19 global pandemic.[2]

Beyond workers' compensation data, it is rare to have data that links occupation or work characteristics with infectious disease outcomes. Currently within British Columbia (BC), occupation is only collected for COVID-19 case reports for health care workers. As a result, novel and innovative approaches are required to identify other workers and occupations at increased risk of exposure to the COVID-19 virus and workplace community transmission.

We surveyed media reports to identify COVID-19 cases among workers by occupation (a case-based surveillance method[3-6]). To identify new or emerging occupational risk groups, occupations with reported COVID-19 cases were compared with occupations in a COVID-19 risk assessment tool and with workers' compensation claims. Experts in the field of occupational health and hygiene were invited to review the occupations with COVID-19 cases to provide their opinions on the determinants of risk for workplace community outbreaks and transmission.

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What we did

Published media articles were used to identify workers and workplaces with COVID-19 cases.[3-6] Media articles (in English) from Canada and the United States, published between February 1, 2020 and July 10, 2020, were collected using the database Factiva.[7] The search terms [workers or workplace or occupation*] AND [outbreak] AND [COVID or coronavirus] identified 921 media articles that were reviewed by three researchers with occupational health and hygiene training. Of the 921 articles, 396 reported COVID-19 cases among workers and were retained for further analysis and data extraction. The 396 articles represented 220 unique COVID-19 outbreaks among workers.

The following data was extracted and recorded from the 396 articles for the 220 unique occupational COVID-19 outbreaks: job title(s), industry, geographic location, number of workers infected if specified, immigrant or temporary foreign workers status if mentioned, and sex/gender if mentioned.

Job titles were coded to the National Occupational Classification (NOC, four-digit unit groups, 2016 v1.38) and industries to the North American Industry Classification System (NAICS, two-digit sectors, 2017 v3.09), by expert occupational hygienists. Occupations (at the NOC unit group level) for workers with COVID-19 cases identified in media articles were compared with the risk rankings for these same occupation in the Vancouver School of Economics (VSE) Risk Tool for COVID-19;[10] and to the occupations (NOC unit group level) and industries (NAICS sector level) recorded for accepted and disallowed claims submitted to date to the workers' compensation system in BC (WorkSafeBC).[11]

Finally, the occupations with COVID-19 cases as reported in media articles were reviewed by scientists (PhD trained) in the fields of occupational epidemiology and hygiene. The occupations with COVID-19 cases were reviewed independently and a meeting convened to solicit expert opinions on the determinants of workplace community transmission (beyond health care occupations). These expert opinions are incorporated into the discussion of the findings.

Surveillance methodology

The media, event-based surveillance methodology successfully identified COVID-19 outbreaks among high-risk occupations, including nursing and assisting occupations in health care; and industrial butchers and meat cutters, poultry preparers and related workers. This provides face validity for the methodology and for the identification of occupations at risk of exposure to the COVID-19 virus. While the methodology is sensitive to capturing known high-risk occupational groups, it lacks specificity as it did not capture 'licensed practical nurses' as distinct from 'nurse aides' or 'registered nurses', for example. Also, the methodology did not capture other high-risk health care occupations beyond nursing-related occupations. However, neither of these two preceding limitations negates the occupations that were identified as at-risk for exposure to COVID-19 using the events-based methodology.

What we found

The number of unique COVID-19 outbreaks among workers reported in media articles are presented in Table 1 by NOCS unit groups (four-digit level) as the finest level of occupational classification. Supplemental tables are provided at the end of this brief for the major and minor occupational groups (i.e. two- and three-digit levels) for further reference.

Of 500 national occupations, 43 occupations were associated with a total of 220 unique, work-related COVID-19 outbreaks during the study period (Table 1). The most frequently occurring occupations with 10 or more outbreaks during the study period were:

- Industrial butchers and meat cutters, poultry preparers and related workers;
- Nurse aides, orderlies and patient service associates;
- Registered nurses and registered psychiatric nurses;
- Material handlers (combined across warehousing and storage and food and beverage sectors);
- Correctional service officers;
- Cashiers (in food and beverage settings);
- Process control and machine operators, food and beverage processing;
- Agricultural and horticultural workers in crop production (combining general farm workers and nursery and greenhouse workers); and
- Motor vehicle, electronics and mechanical assemblers.

This was followed by bus drivers, subway operators and other transit operators; motor vehicle assemblers, inspectors and testers; and cooks, with three to four unique COVID-19 outbreaks reported in media articles. The remaining occupations (see Table 1 for full list) with one to two unique work-related COVID-19 outbreaks included, for example, inspectors in public and environmental health and occupational health and safety; early childhood educators and assistants; hairstylists and barbers; security guards and related security service occupations; police officers and bailiffs/sheriffs; airline ticket and service agents; and janitors, caretakers and building superintendents. The 43 occupations with COVID-19 cases reported in the media spanned 15 of 20 industrial sectors (Table 2).

Comparison to occupational risk in the VSE COVID-19 Risk/Reward Assessment Tool

With the exception of a) nurse aides, orderlies and patient service associates; b) registered nurses and registered psychiatric nurses; c) correctional service officers, and police officers and bailiffs/sheriffs; d) hairstylist and barbers; and e) cashiers in food and beverage stores, the remaining occupations with COVID-19 outbreaks reported in media articles were assessed as low risk (encompassing very low and low) or medium risk (encompassing medium-low and medium-high) in the VSE COVID-19 Risk/Reward Assessment Tool (Table 3). The occupations with multiple COVID-19 outbreaks categorized as very low and low risk in the VSE tool were agricultural and horticulture workers in crop production, including general farm workers, and nursery and greenhouse workers. Occupations with work-related COVID-19 outbreaks reported in media articles were assessed

Table 1 | Media reports of COVID-19 outbreaks among workers (February-July, 2020) by occupation

National Occupational Classification NOC four-digit unit groups – 500 categories	No. unique outbreaks
Industrial butchers and meat cutters, poultry preparers and related workers	57
Nurse aides, orderlies and patient service associates	39
Registered nurses and registered psychiatric nurses	18
Material handler	14
Cashiers	10
Correctional service officers	10
Process control/machine operators, food and beverage processing	10
General farm workers	7
Bus drivers, subway operators and other transit operators	4
Motor vehicle assemblers, inspectors and testers	4
Nursery and greenhouse workers	4
Cooks	3
Central control and process operators, petroleum, gas, and chemical processing	2
Early childhood educators and assistants	2
Inspectors in public and environmental health and OHS	2
Other labourers in processing, manufacturing and utilities	2
Security guards and related security service occupations	2
Police officers	1
Airline ticket and service agents	1
Bartenders	1
Construction trades helpers and labourers	1
Electronics assemblers, fabricators, inspectors, testers	1
Firefighters	1
Fish and seafood plant workers	1
Food technician	1
Ground/water transport ticket agents, cargo service reps	1
Hairstylists and barbers	1
Janitors, caretakers and building superintendents	1
Labourers in mineral and metal processing	1
Mechanical assemblers and inspectors	1
Mechanical engineering technologists and technicians	1
Mine labourer	1
Oil and gas drilling, servicing and related labourers	1
Other service support occupations, not elsewhere classified	1
Power engineers and power systems operators	1
Program officers unique to government	1
Public works and maintenance labourers	1
Securities agents, investment dealers and brokers	1
Sheriffs and bailiffs	1
Transport truck driver	1
Missing – could not be coded to this level of detail	7
Total number of unique COVID-19 outbreaks	220

Table 2 | Media reports of COVID-19 outbreaks among workers (February-July, 2020) by industry, and comparison with claims submitted to WorkSafeBC

North American Industry Classification System NAICS two-digit sectors – 20 categories	No. unique outbreaks	WorkSafeBC claims*
Manufacturing	78	31
Health care and social assistance	63	484
Public administration	19	36
Transportation and warehousing	18	13
Agriculture, forestry, fishing and hunting	11	34
Retail trade	10	21
Accommodation and food services	4	29
Mining, quarrying, and oil and gas extraction	4	1
Admin. & support, waste management & remediation services	3	-
Other services (except public administration)	3	**
Wholesale trade	3	***
Construction	1	13
Educational services	1	47
Finance and insurance	1	-
Utilities	1	-
Unknown	7	67
Information and cultural industries	-	-
Real estate, and rental and leasing	-	-
Professional, scientific and technical services	-	-
Management of companies and enterprises	-	-
Arts, entertainment and recreation	-	-
Total	220	776

* Accepted, disallowed, pending, suspended or rejected claims.

** Recorded with educational services.

*** Recorded with retail trade.

as very low, low or medium-low risk in the VSE tool because their standard job descriptions (Occupational Information Network (O*NET) database[12]) scored lower for a) exposure to disease, b) contact with others including customers/the public, c) tasks involving care or personal assistance, and/or d) proximity with others.

Comparison with claims submitted to WorkSafeBC for COVID-19

The occupations and industries associated with COVID-19 outbreaks reported in media articles were compared with the occupations (Table 4) and industries (Table 2) of workers in BC who submitted claims to WorkSafeBC for COVID-19 exposure, illness or work disability. The following 12 occupations were identified in both data sources for risk of COVID-19 exposure:

- Food and beverage servers (bartenders);
- Firefighters;
- Sheriffs and bailiffs;
- Police officers;
- Security guards and related security service occupations;

Table 3 | Media reports of COVID-19 outbreaks among workers (February-July, 2020) by occupation, and comparison to Vancouver School of Economics COVID-19 Risk Assessment Tool

National Occupational Classification | NOC four-digit unit groups – 500 categories	No. unique outbreaks	VSE Risk Assessment (index out of 100)
General farm workers	7	Very Low (24)
Nursery and greenhouse workers	4	Low (31)
Program officers unique to government	1	Low (32)
Fish and seafood plant workers	1	Low (34)
Labourers in mineral and metal processing	1	Low (34)
Other service support occupations, not elsewhere classified	1	Low to Med-High (33-58)*
Transport truck driver	1	Medium-Low (35)
Food technician	1	Medium-Low (40)
Process control/machine operators, food and beverage processing	10	Medium-Low (37)
Central control and process operators, petroleum, gas, and chemical processing	2	Medium-Low (38)
Electronics assemblers, fabricators, inspectors, testers	1	Medium-Low (40)
Inspectors in public and environmental health and OHS	2	Medium-Low (41)
Securities agents, investment dealers and brokers	1	Medium-Low (41)
Mechanical engineering technologists and technicians	1	Medium-Low (42)
Material handler	14	Medium-Low (42)
Janitors, caretakers and building superintendents	1	Medium-Low (44)
Mechanical assemblers and inspectors	1	Medium-Low (44)
Other labourers in processing, manufacturing and utilities	2	Medium-Low (44)
Construction trades helpers and labourers	1	Med Low to Med (43-51)*
Oil and gas drilling, servicing and related labourers	1	Medium (45)
Power engineers and power systems operators	1	Medium (46)
Cooks	3	Medium (48)
Motor vehicle assemblers, inspectors and testers	4	Medium (49)
Industrial butchers & meat cutters, poultry preparers & rel.	57	Medium (51)
Mine labourer	1	Medium (51)
Public works and maintenance labourers	1	Medium (51)
Airline ticket and service agents	1	Medium-High (55)
Early childhood educators and assistants	2	Medium-High (59)
Security guards and related security service occupations	2	Medium-High (59)
Bartenders	1	Medium-High (62)
Bus drivers, subway operators and other transit operators	4	Medium-High (64)
Police officers	1	High (65)
Correctional service officers	10	High (70)
Firefighters	1	High (70)
Sheriffs and bailiffs	1	High (70)
Cashiers	10	High (71)
Hairstylists and barbers	1	High (72)
Nurse aides, orderlies and patient service associates	39	Very High (76)
Registered nurses and registered psychiatric nurses	18	Very High (80)
Ground/water transport ticket agents, cargo service reps	1	Not found
Missing – could not be coded to this level of detail	7	
Total number of unique COVID-19 outbreaks	220	

* Range dependent upon industry sector.

Table 3 Notes

Occupations assessed as very high risk in the VSE Tool that did not appear in media articles for COVID-19 outbreaks (primarily specific occupations in health services with the exception of pursers and flight attendants): medical radiation technologists, medical laboratory technicians and pathologists' assistants, medical sonographers, medical radiation technologists, respiratory therapists and cardiopulmonary technologists, other professional occupations in health and diagnosing and treating, other assisting occupations in support of health services, physiotherapists, occupational therapists, other technical occupations in therapy and assessment, licensed practical nurses, nursing coordinators and supervisors, practitioners of natural healing, chiropractors, pharmacists, paramedical occupations, general practitioners and family physicians, specialist physicians, dentists, dental assistants, optometrists, allied primary health practitioners, veterinarians, animal health technologists and veterinary technicians.

- Correctional service officers;
- Janitors,
- Caretakers and building superintendents (light duty cleaners);
- Nursery and greenhouse workers;
- General farm workers;
- Industrial butchers and meat cutters, poultry preparers and related workers;
- Nurse aides, orderlies and patient service associates; and
- Registered nurses and registered psychiatric nurses.

Conversely, 10 occupations with submitted claims to WorkSafeBC for work-related exposure to the COVID-19 virus were not identified in media articles of work-related COVID-19 cases, in particular six specific occupations related to health care or social services (licensed practical nurses, nursing coordinators and supervisors, social and community service workers, medical laboratory technician, paramedical occupations, respiratory technicians), two office related occupations (general office worker, receptionist), and the occupation of heavy equipment operators (except crane). Within the airline industry, airline ticket agents were identified with COVID-19 cases in media articles, whereas pursers and flight attendants were identified as at risk for exposure to the COVID-19 virus in the claims data.

A total of 28 occupations with COVID-19 cases reported in media articles were not identified in claims submitted to WorkSafeBC (to date). Many of these 28 occupations represented labourers across sectors (e.g. construction, oil and gas, processing/ manufacturing, mining, public workers, mineral and metal processing), operators across sectors (food and beverage processing, transportation, power systems, oil and gas), or inspectors across sectors (e.g. motor vehicle, environmental and OHS, mechanical, electrical).

Of 20 industry sectors, 15 had workers with COVID-19 cases as reported in media articles (Table 2). The five industry sectors without COVID-19 cases were information and cultural industries; real estate, and rental and leasing; professional, scientific and technical services; management of companies and enterprises; and arts, entertainment and recreations. These five industry sectors were also not found in claims submitted to WorkSafeBC, including accepted, submitted/pending, disallowed, rejected or suspended claims. Occupations in the following three industry sectors had COVID-19 cases identified in media articles but not in the claims data: waste management and remediation services; finance and insurance; and utilities.

Table 4 | Media reports of COVID-19 outbreaks among workers (February-July, 2020) by occupation, and comparison to occupations for claims submitted to WorkSafeBC

National Occupational Classification NOC four-digit unit groups – 500 categories	No. unique outbreaks	WorkSafeBC claims
Industrial butchers and meat cutters, poultry preparers and related workers	57	13
Nurse aides, orderlies and patient service associates	39	106
Registered nurses and registered psychiatric nurses	18	130
Correctional service officers	10	12
General farm workers	7	5
Nursery and greenhouse workers	4	24
Security guards and related security service occupations	2	8
Police officers	1	9
Bartenders	1	6
Firefighters	1	15
Janitors, caretakers and building superintendents	1	5
Sheriffs and bailiffs	1	6
Material handler	14	
Cashiers	10	
Process control/machine operators, food and beverage processing	10	
Bus drivers, subway operators and other transit operators	4	
Motor vehicle assemblers, inspectors and testers	4	
Cooks	3	
Central control and process operators, petroleum, gas, and chemical processing	2	
Early childhood educators and assistants	2	
Inspectors in public and environmental health and OHS	2	
Other labourers in processing, manufacturing and utilities	2	
Airline ticket and service agents	1	
Construction trades helpers and labourers	1	
Electronics assemblers, fabricators, inspectors, testers	1	
Fish and seafood plant workers	1	
Food technician	1	
Ground/water transport ticket agents, cargo service reps	1	
Hairstylists and barbers	1	
Labourers in mineral and metal processing	1	
Mechanical assemblers and inspectors	1	
Mechanical engineering technologists and technicians	1	
Mine labourer	1	
Oil and gas drilling, servicing and related labourers	1	
Other service support occupations, not elsewhere classified	1	
Power engineers and power systems operators	1	
Program officers unique to government	1	
Public works and maintenance labourers	1	
Securities agents, investment dealers and brokers	1	
Transport truck driver	1	
Total number of unique COVID-19 outbreaks in media articles	214	
Licensed practical nurses		36
Social and community service workers		28
Medical laboratory technicians		15
Paramedical occupations		10
Respiratory therapists		10
General office workers		9
Heavy equipment operators (except crane)		8
Nursing coordinators and supervisors		8
Pursers and flight attendants		6
Receptionists		6
Total number of WorkSafeBC claims for occupations with at least 5 claims		475

What do the findings tell us?

Expert opinions of occupational hygienists and epidemiologists

The occupations with COVID-19 cases represent three broad exposure pathways:

1. Workers with recognized pathways of exposure to infection through assisting and supporting activities in direct contact with patients, such as for nurses, and in essential services in direct contact with the public, such as for police officers;
2. Workers with pathways to exposure via contact with the public during a global pandemic, such as for cashiers, transit workers, and correctional officers; and
3. Workers not in direct contact with patients or the public but who are in close proximity to groups of co-workers and the risk of exposure through workforce or workplace community transmission, such as for butchers and poultry workers.

It is the latter group, documented in the media articles, that warrant further surveillance as they are not readily identified as high risk for exposure to the COVID-19 virus in risk assessment tools or in workers' compensation claims data. Tables 1, 3 and 4 provide a full list of the specific occupations with COVID-19 cases, including those not assessed as high risk in the VSE Assessment Tool and/or that have not yet been captured in workers' compensation claims data.

Collectively, the occupations independently identified in media articles with COVID-19 cases tended to be labourers across sectors (e.g. construction, oil and gas, processing, manufacturing, mining, public workers, mineral and metal processing), operators across sectors (food and beverage processing, transportation, power systems, oil and gas), or assemblers/inspectors across sectors (e.g. motor vehicle, environmental and OHS, mechanical, electrical). Labourers, operators and inspectors are more likely to work in larger working environments (i.e. factories, plants, warehouses) with close proximity to co-workers, and where there may be emerging challenges implementing physical distancing measures or barriers, and personal protective equipment, given structural or operational processes and the physical demands of the job.

The occupations with COVID-19 cases identified in media articles also highlight the social determinants of health as compounding risk factors for workplace community transmission. Occupations such as labourers are more likely to have lower incomes and precarious employment relationships, and less likely to have employer-paid benefits such as paid sick-leave.[13-15] These occupations are also more likely to report job strain (a combination of high job demands and low job control) where workers are less likely to refuse unsafe work because of fear of job loss.[16-17] Further, approximately one-quarter of all of the media articles mentioned immigrant or temporary foreign workers as part of the reported COVID-19 outbreak.

The combination of close proximity to large groups of co-workers and the aforementioned social determinants of health likely increase the risks of exposure to the COVID-19 virus and workplace community transmission. The COVID-19 pandemic has illuminated and magnified the intersection of public health and occupational health where exposure for workers is exacerbated by working conditions that are socially determined. These social determinants of health, and not simply close proximity, likely explain the breadth of occupations across sectors with COVID-19 outbreaks reported in the media and beyond those captured by other risk assessment indicators. There is a need to recognize this intersection in order to interrupt workplace community transmission as part of broader public health measures.

In the words of Nancy Krieger,[18] "social epidemiology is distinguished by its insistence on explicitly investigating social determinants of population distributions of health, disease, and wellbeing, rather than treating such determinants as mere background to biomedical phenomena." (pg 693). Understanding the risk of workplace community transmission of the COVID-19 virus as part of an overall effective public health response requires more and better surveillance data on the work characteristics of COVID-19 cases.

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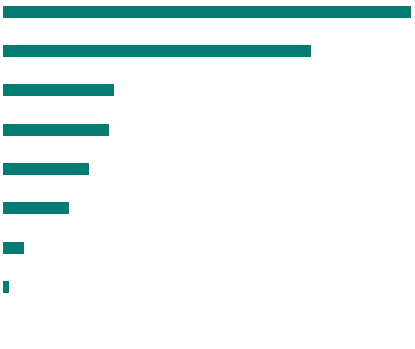
Supplemental tables: Media reports of COVID-19 outbreaks among workers by occupation and industry classifications

Media reports of COVID-19 outbreaks among workers (February-July, 2020) by National Occupational Classification broad groups

National Occupational Classification | NOC broad groups – 10 categories	No. unique outbreaks
Occupations in manufacturing and utilities	81
Health occupations	61
Sales and service occupations	22
Trades, transport and equipment operators and related occupations	21
Occupations in education, law and social, community and government services	17
Natural resources, agriculture and related production occupations	13
Natural and applied sciences and related occupations	4
Business, finance and administration occupations	1
Total number of unique COVID-19 outbreaks	220



Media reports of COVID-19 outbreaks among workers (February-July, 2020) by National Occupational Classification major groups

National Occupational Classification | NOC major groups – 46 categories	No. unique outbreaks
Processing and manufacturing machine operators & related production workers	65
Assisting occupations in support of health services	39
Professional occupations in nursing	18
Other installers, repairers and servicers and material handlers	14
Care providers and educational, legal and public protection support occupations	11
Workers in natural resources, agriculture and related production	11
Sales support occupations	10
Labourers in processing, manufacturing and utilities	7
Assemblers in manufacturing	6
Service representatives and other customer and personal service occupations	5
Transport and heavy equipment operation and related maintenance	5
Service supervisors and specialized service occupations	4
Technical occupations related to natural and applied sciences	4
Processing, manufacturing and utilities supervisors & central control operators	3
Professional occupations in law and social, community and government services	3
Harvesting, landscaping and natural resources labourers	2
Paraprofessional occupations in legal, social, community and education services	2
Service support and other service occupations, not elsewhere classified	2
Trades helpers, construction labourers and related occupations	2
Occupations in front-line public protection services	2
Professional occupations in health	1
Missing (could not be coded to this level)	4
Total number of unique COVID-19 outbreaks	220

Media reports of COVID-19 outbreaks among workers (February-July, 2020) by National Occupational Classification minor groups

National Occupational Classification | NOC minor groups – 140 categories	No. unique outbreaks
Machine operators and related workers in food, beverage products processing	69
Assisting occupations in support of health services	39
Professional occupations in nursing	18
Longshore workers and material handlers	14
Agriculture and horticulture workers	11
Legal and public protection support occupations	11
Cashiers	10
Mechanical, electrical and electronics assemblers	6
Motor vehicle and transit drivers	5
Chefs and cooks	3
Labourers in processing, manufacturing and utilities	3
Central control and process operators in processing and manufacturing	2
Harvesting, landscaping and natural resources labourers	2
Occupations in travel and accommodation	2
Other technical inspectors and regulatory officers	2
Paraprofessional occupations in legal, social, community and education services	2
Occupations in front-line public protection services	2
Security guards and related security service occupations	2
Auditors, accountants and investment professionals	1
Cleaners	1
Occupations in food and beverage service	1
Other service support and related occupations, not elsewhere classified	1
Physicians, dentists and veterinarians	1
Policy and program researchers, consultants and officers	1
Public works and other labourers, not elsewhere classified	1
Secondary and elementary school teachers and educational counsellors	1
Specialized occupations in personal and customer services	1
Technical occupations in civil, mechanical and industrial engineering	1
Technical occupations in physical sciences	1
Trades helpers and labourers	1
Utilities equipment operators and controllers	1
Missing (could not be coded to this level)	4
Total number of unique COVID-19 outbreaks	220

Media reports of COVID-19 outbreaks among workers (February-July, 2020) by North American Industry Classification System sub-sectors

North American Industry Classification System NAICS sub-sectors – 102 categories	No. unique outbreaks
Food manufacturing	70
Nursing and residential care facilities	38
Hospitals	19
Crop production	10
Federal government public administration	10
Warehousing and storage	10
Food and beverage stores	9
Provincial and territorial public administration	7
Transportation equipment manufacturing	5
Food services and drinking places	4
Transit and ground passenger transportation	4
Oil and gas extraction	3
Admin and support, waste management and remediation	2
Food, beverage and tobacco merchant wholesalers	2
Personal and laundry services	2
Social assistance	2
Local, municipal and regional public administration	2
Air transportation	1
Computer and electronic product manufacturing	1
Construction of buildings	1
Educational services	1
Machinery manufacturing	1
Machinery, equipment and supplies merchant wholesalers	1
Mining and quarrying (except oil and gas)	1
Non-metallic mineral product manufacturing	1
Securities, commodity contracts, and other financial investment	1
Support activities for transportation	1
Truck transportation	1
Utilities	1
Waste management and remediation services	1
Water transportation	1
Missing (could not be coded to this level)	7
Total number of unique COVID-19 outbreaks	220

About us

The Partnership for Work, Health and Safety (PWHS), between WorkSafeBC and the University of BC, is an innovative research unit that combines rigorous work and health research with effective knowledge translation.

PWHS brings together policy-makers, researchers and data resources from national and international organizations to address current and emerging issues of work-related health in Canada. Our research is aimed at improving understanding of the causes and consequences of injuries and illness, identifying high-risk industries and occupations, and investigating the effectiveness of interventions that improve worker health, prevent occupational illness and injury, and reduce work-related disability.

Our collaboration, based on best practices of knowledge transfer, enables researchers and decision-makers to work together to identify relevant questions, understand data, and produce useful information to effectively inform policy and practice.

This study was completed in collaboration with Alberta Health Services.

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More information

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