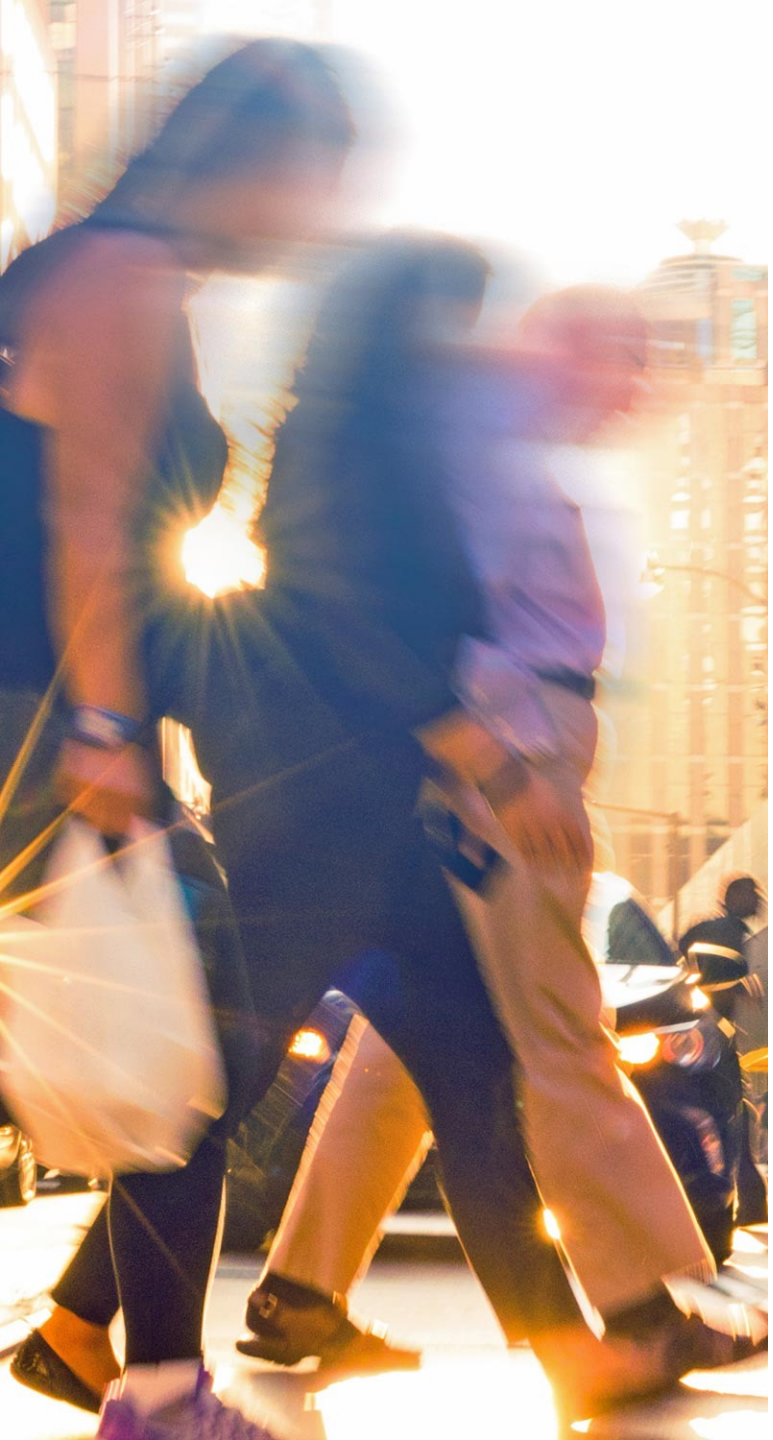


Opioid-related harms among workers: What we know and are striving to learn

Nancy Carnide, PhD
Associate Scientist, Institute for Work & Health

OHCOW May Day May Day 2023
May 3, 2023

Institute for Work & Health | Research Excellence Safe Work Healthy Workers

Today's presentation

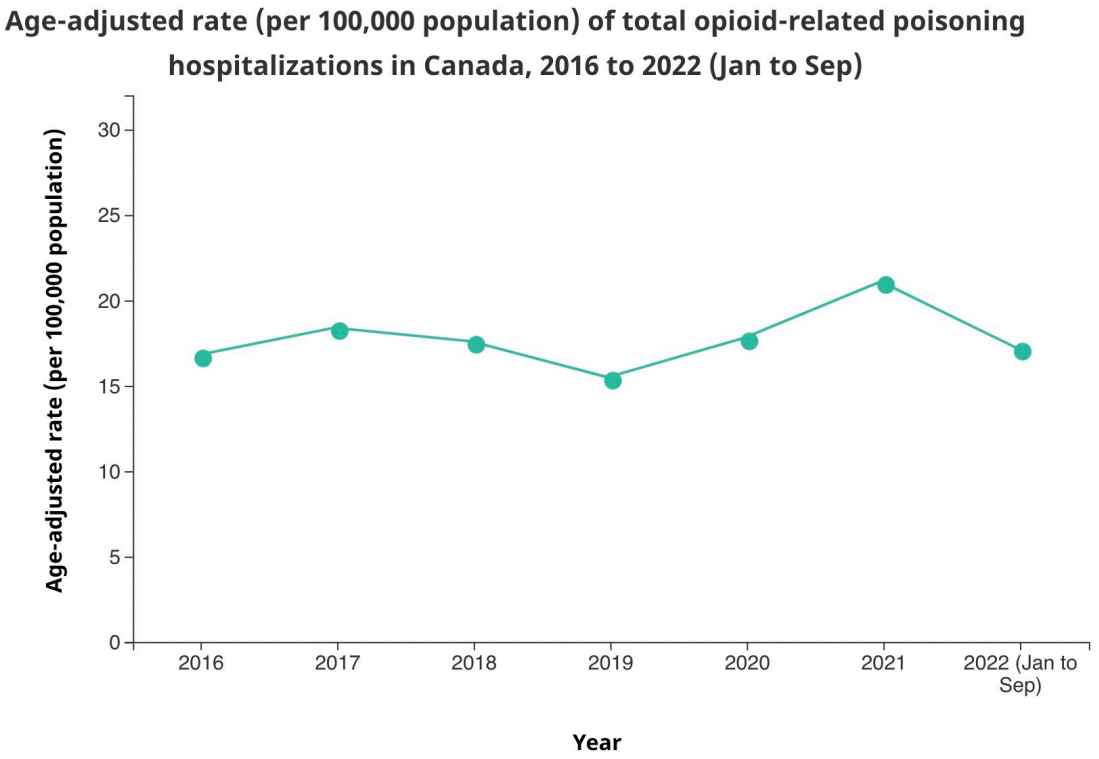
Objective:

To review what the research tells us about opioid-related harms among workers and the role of the workplace*

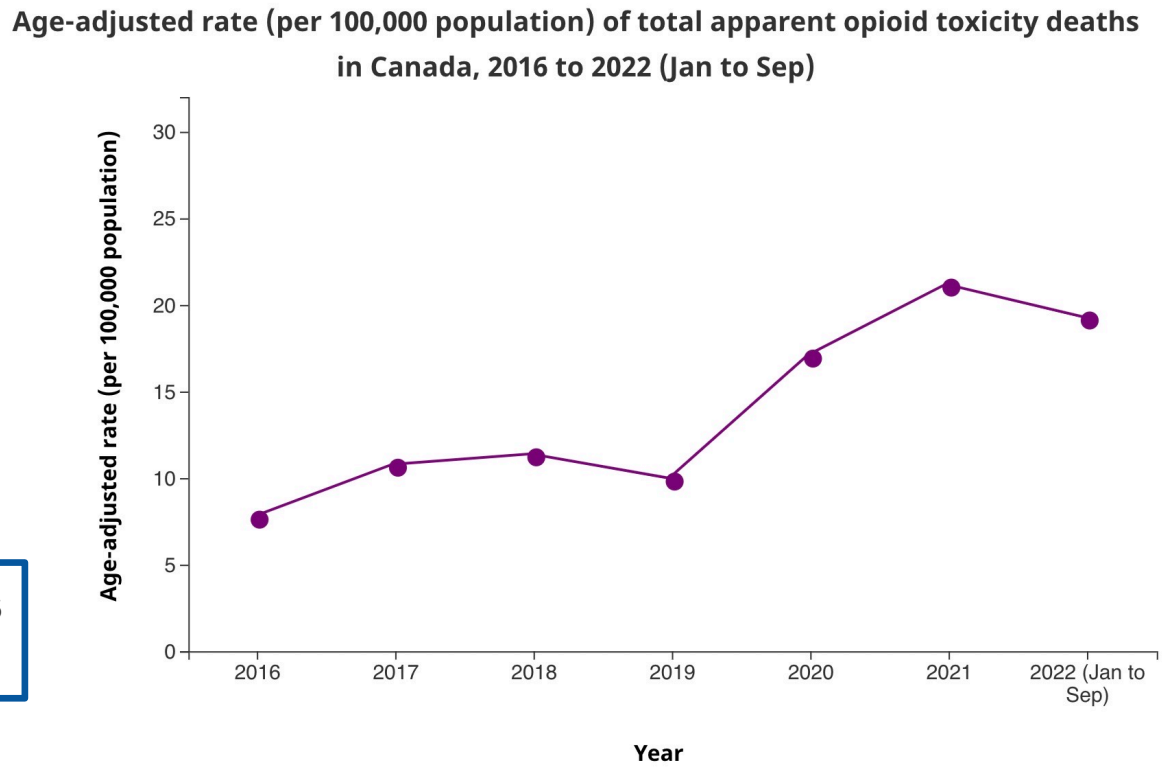
*Spoiler alert:

Still a work in progress…

Recent trends in the opioid toxicity crisis in Canada



Total of 34,455 apparent opioid toxicity deaths between January 2016 and September 2022



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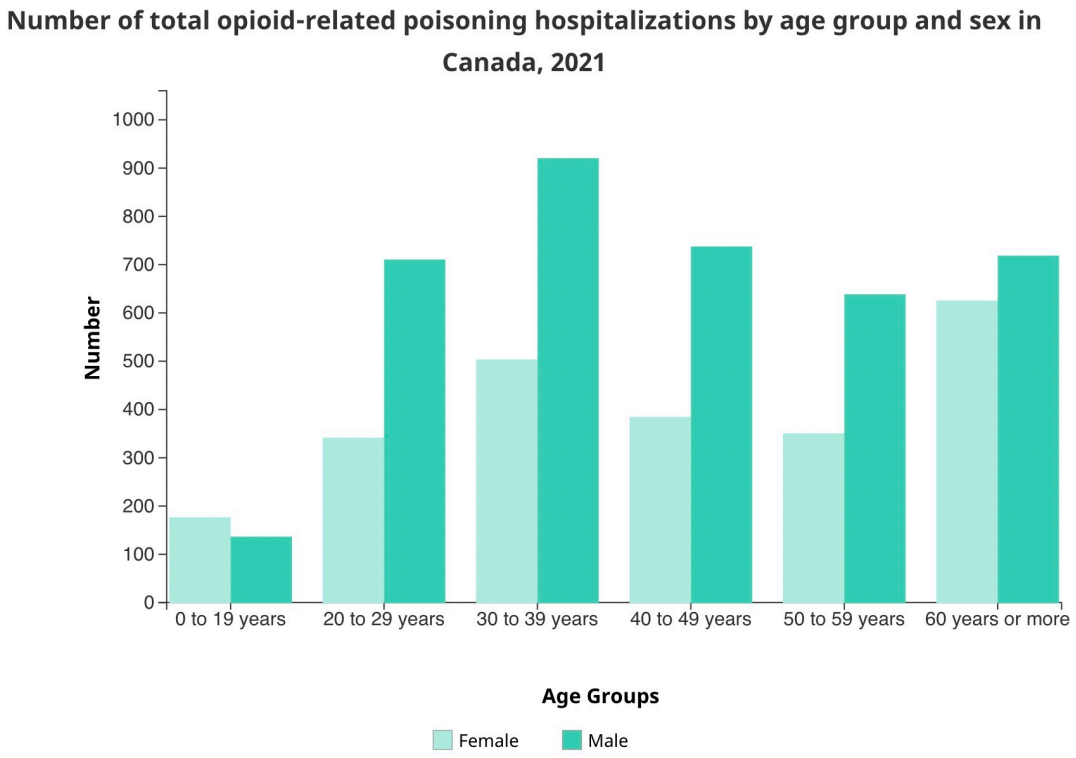
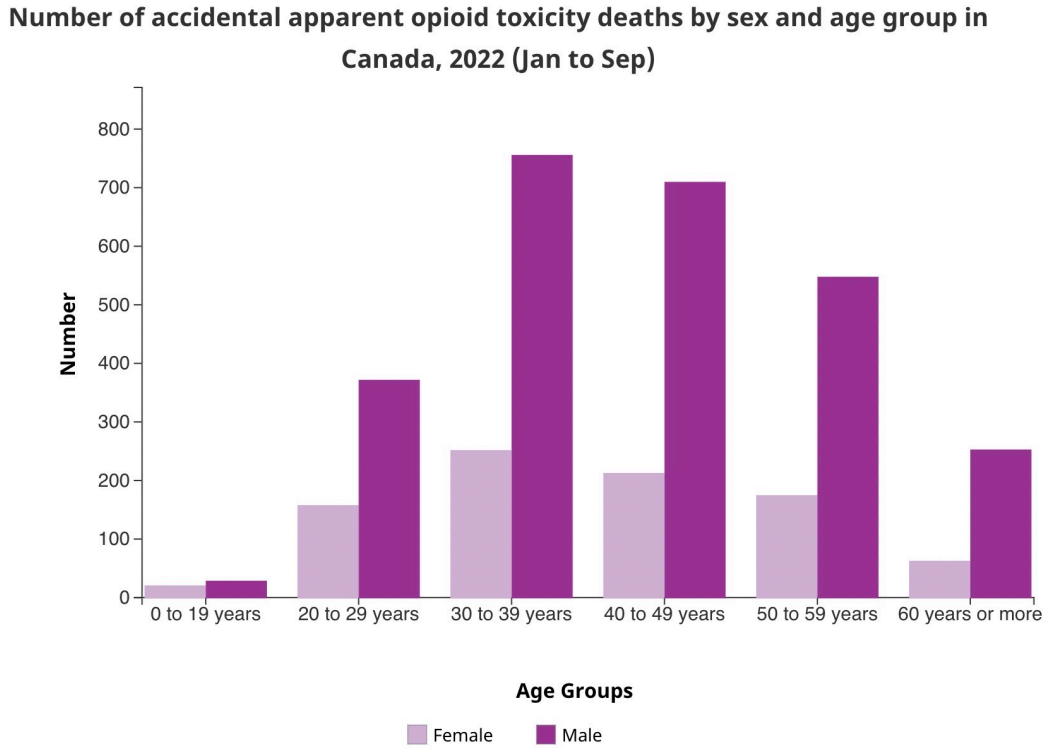
Source: Federal, provincial, and territorial Special Advisory Committee on the Epidemic of Opioid Overdoses. Opioid- and stimulant-related Harms in Canada. Ottawa: Public Health Agency of Canada; March 2023. https://health-infobase.canada.ca/substance-related-harms/opioids-stimulants

Males of working age disproportionately affected





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Source: Federal, provincial, and territorial Special Advisory Committee on the Epidemic of Opioid Overdoses. Opioid- and stimulant-related Harms in Canada. Ottawa: Public Health Agency of Canada; March 2023. https://health-infobase.canada.ca/substance-related-harms/opioids-stimulants

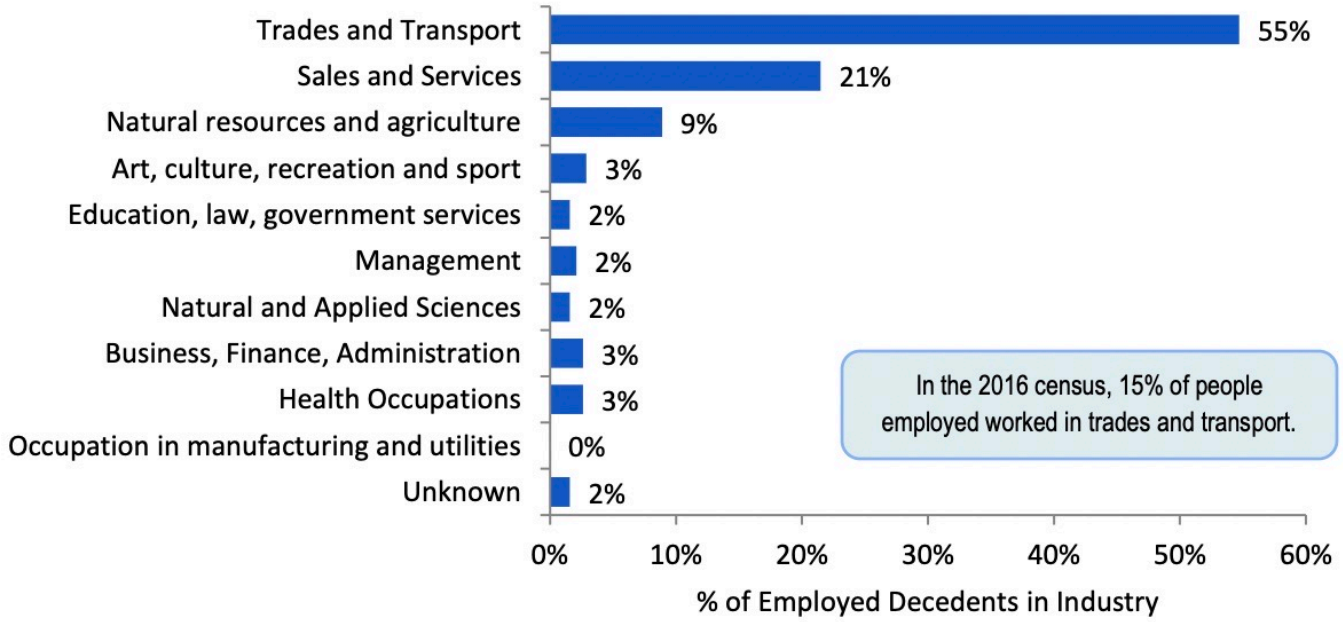
Occupational patterns in opioid-related harms

Opioid-related deaths in BC (2016-2017)

Table 3. Illicit drug overdose deaths by employment status and sex

Employment Status	Female		Male		Total	
	No.	%	No.	%	No.	%
Employed	39	24	343	49	382	44
Unemployed	117	71	330			
Unknown	9	5	34			
Total[1]	**165**	**100**	**707**			

Fig. 7. Illicit drug overdose deaths by industry of work



Source: Illicit Drug Overdose Deaths in BC: Findings of Coroners' Investigations. September 2018.
https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/statistical/illicitdrugoverdosedeathsinbc-findingsofcoronersinvestigations-final.pdf

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Opioid-related poisoning events (fatal and non-fatal) in BC (2014-2016)

Table 3

Employment and social assistance characteristics of people who overdosed in British Columbia, Canada, January 1, 2014, through to December 31, 2016

	Total overdose cohort		Non-fatal overdose cohort		Fatal overdose cohort	
	number	percent	number	percent	number	percent
Statistics Canada British Columbia Opioid Overdose Analytical File, total members	**13,318**	**100.0**	**11,843**	**100.0**	**1,475**	**100.0**
Cohort that could be linked to employment and social assistance data[‡]	**13,184**	**99.0**	**11,729**	**99.0**	**1,455**	**98.6**
Employment in calendar year of first overdose[‡]						
Employed[††]	4,450	33.8	3,925	33.5	525	36.1
Not employed	8,734	66.2	7,804	66.5	930	63.9
Industry of employment in calendar year of first overdose[§]						
Construction (NAICS 23)	951	21.4	830	21.1	121	23.0
Administrative and support, waste management and remediation services (NAICS 56)	542	12.2	476	12.1	66	12.6
Accommodation and food services (NAICS 72)	521	11.7	465	11.8	56	10.7
Retail trade (NAICS 44-45)	436	9.8	398	10.1	38	7.2
Manufacturing (NAICS 31-33)	324	7.3	281	7.2	43	8.2
Other industries	1,676	37.7	1,475	37.6	201	38.3

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Source: Understanding the socioeconomic profile of people who experienced opioid overdoses in British Columbia, 2014 to 2016. 2021. https://www150.statcan.gc.ca/n1/pub/82-003-x/2021002/article/00003-eng.htm

Opioid-related deaths in Ontario (2017-2018)

Table 5.1. Accidental opioid-related deaths by employment status, July 2017 to June 2018 (N=1,209)

Employment status	Number of deaths n (%)
Employed	219 (18.1)
	566 (46.8)
	26 (2.2)
	398 (32.9)

Table 5.2. Accidental opioid-related deaths by industry of employment (services), July 2017 to June 2018 (n=219)

Industry of employment: services	Number of deaths among those employed n (%)
Accommodation and food services	12 (5.5)
Retail trade	12 (5.5)
Professional, scientific and technical services	8 (3.7)
Art, entertainment and recreation	7 (3.2)
Health care and social assistance	7 (3.2)
Finance and insurance	6 (2.7)
Information and cultural industries	3 (1.4)
Public administration (i.e., police and military)	3 (1.4)
Real estate and rental and leasing	3 (1.4)
Other services[A]	30 (13.7)

[A]Other services included, but were not limited to, landscaping, hairdressing and tattoo artist.

Table 5.3. Accidental opioid-related deaths by industry of employment (trades), July 2017 to June 2018 (n=219)

Industry of employment: trades	Number of deaths among those employed n (%)
Construction	68 (31.0)
Transportation and warehousing	14 (6.4)
Manufacturing	16 (7.3)
Utilities	4 (1.8)
Other trades[A]	4 (1.8)

[A]Other trades include mining and forestry.

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Source: Opioid mortality surveillance report: analysis of opioid-related deaths in Ontario July 2017-June 2018. 2019. https://odprn.ca/wp-content/uploads/2019/06/Opioid-Mortality-Surveillance-Report-FINAL.pdf

Opioid-related deaths in the United States

Drug overdose mortality is associated with employment status and occupation in the National Longitudinal Mortality Study

Jonathan Aram, Norman J. Johnson, Mei-Ling Ting Lee & Natalie Slopen

Morbidity and Mortality Weekly Report

Occupational Patterns in Unintentional and Undetermined Drug-Involved and Opioid-Involved Overdose Deaths — United States, 2007–2012

Laurel Harduar Morano, PhD[1,2]; Andrea L. Steege, PhD[2]; Sara E. Luckhaupt, MD[2]

DOI: 10.1002/ajim.23029

RESEARCH ARTICLE

AMERICAN JOURNAL OF INDUSTRIAL MEDICINE | WILEY

Opioid-related overdose deaths by industry and occupation—Massachusetts, 2011-2015

Devan Hawkins MS[1] | Cora Roelofs ScD[2] | James Laing[3] | Letitia Davis ScD[3]

High-risk occupational groups:

- Construction and trades
- Natural resources (mining, extraction, forestry, fisheries)
- Transportation
- Maintenance
- Healthcare
- Services

How might the workplace play a role in these patterns?

The role of workplace injuries and pain

Workplace injuries and pain

Many high-risk groups in physically demanding jobs with high rates of injury

- Pain
- Functional interference
- Poor mental health

- Return to work challenges
  - Pressure to return
  - Availability of workplace accommodations
  - Availability of sick leave
  - Job precarity
  - Intermittent interruptions in employment

Opioid prescribing after work-related injuries

- Several studies document opioid prescribing to be common after injury
  - Includes prolonged opioid use
- Some data also suggest workers' compensation claimants more likely to receive opioids than those with other injuries

Injuries That Happen at Work Lead to More Opioid Prescriptions and Higher Opioid Costs

Abay Asfaw, PhD, Brian Quay, MS, Tim Bushnell, PhD, and Regina Pana-Cryan, PhD

FIGURE 1. Incidence of opioid prescription (2010–2014 vs 2015–2019) by reported type of injury.

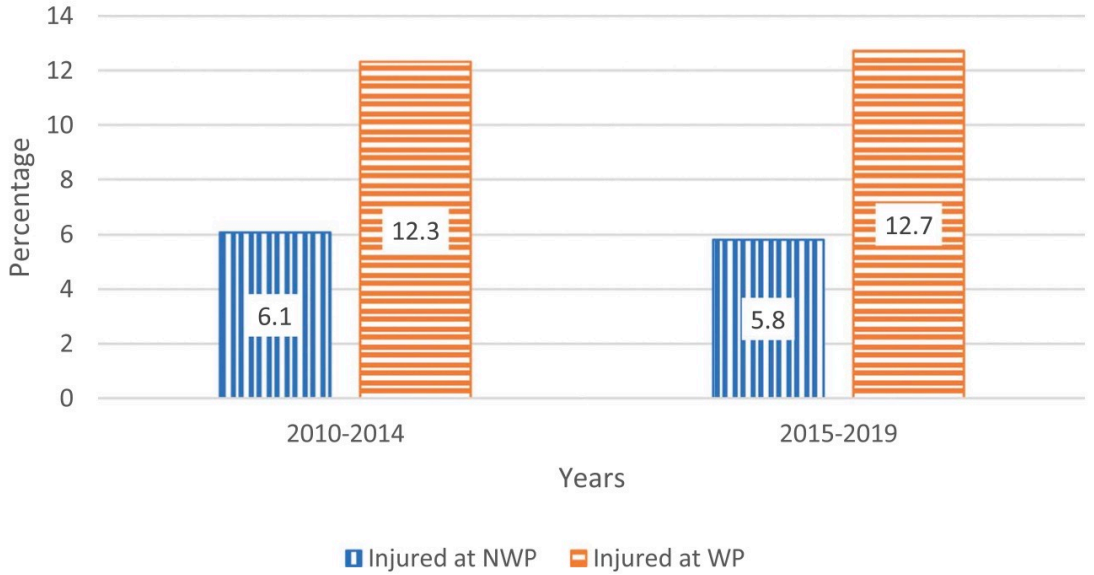

FIGURE 2. Opioid supply days (2010–2014 vs 2015–2019) by reported type of injury.

Source: J Occup Environ Med. 2022 Dec 1;64(12):e823-e832. doi: 10.1097/JOM.0000000000002709.

Is there research linking workplace injuries and opioid-related harms?

Among coroner records of those who have died:

- Some evidence of decedents having a prior work-related injury

Comparison of Opioid-Related Deaths by Work-Related Injury

Melissa Cheng, MD, MHS, MOH,[1]* Brian Sauer, PhD,[2] Erin Johnson, MPH,[3] Christina Porucznik, MPH, PhD,[4] and Kurt Hegmann, MD, MPH[5]†

Objective *To infer whether work-related injuries may impact opioid-related deaths.*
Methods *Descriptive comparisons were done using data from the Utah Department of Health, the Office of Medical Examiners, and the Labor Commission on all Utah residents who died from opioid-related deaths from 2008 to 2009.*
Results *The majority of decedents (145 of 254, 57%) had at least one prior work-related injury. Demographics were similar regardless of work injury status. However, lack of high school diploma (18% vs. 7%, $P < 0.001$), prevalence of mental illness (50% vs. 15%, $P < 0.001$), tobacco (61% vs. 12%, $P < 0.001$), alcohol (87% vs. 28%, $P < 0.001$), and illicit drug (50% vs. 4%, $P < 0.001$) use were all substantially higher than the background population.*
Conclusion *A detailed history and screening for mental illness and substance abuse, including tobacco use, among injured workers may be helpful in avoiding potential opioid-related deaths.* Am. J. Ind. Med. 56:308–316, 2013.

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Source: Am J Ind Med. 2013 Mar;56(3):308-16.

Clinical Characteristics

Table 3: Injuries and pain diagnoses among individuals who died of an opioid toxicity in Ontario, by employment history in the construction industry (2018-2020)

	Worked in construction N=366	No employment history in construction N=4,394	Stat. Sig.
Any pain diagnoses or injury	285 (77.9%)	3,585 (81.6%)	
Major traumatic injury in prior 10 years	20 (5.5%)	156 (3.6%)	
Traumatic brain injury in prior 10 years	36 (9.8%)	363 (8.3%)	
Low back pain in prior 5 years	176 (48.1%)	2,155 (49.0%)	
Fractures, dislocations, strains or sprains in prior 5 years	209 (57.1%)	2,634 (59.9%)	
Arthritis and related conditions† in prior 5 years	147 (40.2%)	1,865 (42.4%)	
Bone and spinal conditions in prior 5 years	112 (30.6%)	1,641 (37.3%)	*
Unspecified musculoskeletal disorders or congenital abnormalities in prior 5 years	147 (40.2%)	2,153 (49.0%)	*
Industrial and construction area as the place of occurrence of the external cause of injury resulting in hospitalization			
5 years prior to death	19 (5.2%)	75 (1.7%)‡	*
10 years prior to death	33 (9.0%)	184 (4.2%)‡	*

Source: Lives lost to opioid toxicity among Ontarians who worked in the construction industry. ODPRN. 2022. https://odprn.ca/research/publications/opioids-in-the-construction-industry/

Is there research linking workplace injuries and opioid-related harms?

Among workers who have been injured at work:

- Prolonged time off work associated with higher risk of death

Increased overall and cause-specific mortality associated with disability among workers' compensation claimants with low back injuries

Christopher J. Martin MD, MSc[1] | ChuanFang Jin MD, MPH[1] | Stephen J. Bertke PhD[2] | James H. Yiin PhD[2] | Lynne E. Pinkerton MD, MPH[2,3]

TABLE 3 Adjusted hazard ratios for selected outcomes according to disability-related factors[a]

	All deaths		All cancers		Heart diseases		Intentional self-harm		Drug overdoses involving opioids	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Lost time	1.44	1.27-1.63	1.41	1.10-1.81	1.42	1.06-1.92	1.85	1.02-3.37	1.89	1.22-2.93
Weeks of lost time (per 100 wk)	1.27	1.14-1.41	1.05	0.84-1.32	1.35	1.06-1.71	1.53	0.94-2.50	1.73	1.23-2.44
Permanent partial disability[b] (vs no disability)	1.25	1.12-1.40	0.98	0.78-1.23	1.25	0.95-1.63	1.28	0.75-2.18	2.31	1.59-3.37
Permanent total disability[c] (vs no disability)	1.11	0.61-2.03	1.37	0.51-3.71	1.38	0.43-4.50	3.36	0.46-24.82	3.16	0.43-23.04
Percent permanent disability (per 10%)	1.10	1.03-1.17	0.97	0.85-1.11	1.13	0.98-1.31	1.27	0.96-1.68	1.40	1.14-1.71
Surgical treatment	0.90	0.55-1.48	0.40	0.10-1.61	0.92	0.29-2.87	1.46	0.20-10.56	0	NC

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Source: Am J Ind Med. 2020 Mar;63(3):209-217.

Is there research linking workplace injuries and opioid-related harms?

Comparing workers who have been injured at work to the general population:

- Elevated risk of opioid-related death

Increased overall and cause-specific mortality associated with disability among workers' compensation claimants with low back injuries

Christopher J. Martin MD, MSc[1] | ChuanFang Jin MD, MPH[1] | Stephen J. Bertke PhD[2] | James H. Yiin PhD[2] | Lynne E. Pinkerton MD, MPH[2,3]

TABLE 2 Mortality among workers with a claim for low back sprain or strain (1998-2015, West Virginia Referent Rates)[a]

	Overall cohort (N = 14 218)			Cohort members with lost work time (N = 8365)			Cohort members with permanent disability[b] (N = 4013)		
	OBS	SMR	95% CI	OBS	SMR	95% CI	OBS	SMR	95% CI
All deaths	1393	0.92	0.87-0.97	958	1.04	0.98-1.11	518	1.07	0.98-1.16
All cancers	353	0.88	0.79-0.98	243	0.99	0.87-1.12	121	0.90	0.75-1.08
Heart diseases	239	0.80	0.70-0.91	168	0.92	0.79-1.07	94	0.95	0.77-1.16
Intentional self-harm	65	1.14	0.88-1.45	48	1.43	1.06-1.90	23	1.41	0.89-2.11
Accidental poisoning	119	1.62	1.34-1.94	85	2.02	1.61-2.50	53	2.78	2.08-3.64

Source: Am J Ind Med. 2020 Mar;63(3):209-217.

Is there research linking workplace injuries and opioid-related harms?

Comparing workers who have been injured at work to non-injured workers:

- Elevated risk of opioid-related death

Impact of workplace injury on opioid dependence, abuse, illicit use and overdose: a 36-month retrospective study of insurance claims

Abay Asfaw [1], Leslie I Boden [2]

Table 2 Hazard of opioid-related morbidity: Cox PH regression results stratified by age groups and region

	Model 1*		Model 2†	
	HR	95% CI	HR	95% CI
Non-injured (ref.)				
Injured	1.79	1.24 to 2.60		
Medical-only injured			1.54	1.02 to 2.32
Lost-time injured			2.91	1.75 to 4.84

Source: *Occup Environ Med. 2020 Sep;77(9):648-653.*

What are other potential reasons behind these patterns?

MALE-DOMINATED OCCUPATIONS

Gender norms of working through pain, showing strength

SUBSTANCE USE WORKPLACE NORMS

Cultural notions of working through pain

WORK ENVIRONMENT FACTORS

E.g., work demands, support, isolated work

DISCLOSURE CONCERNS

Stigma, fear of reprisal or other consequences

A new Ontario study

IWH/OCRC project

Overall project objective:

To establish a surveillance program to monitor opioid-related harms in the Ontario workforce by adapting an existing resource, the Occupational Disease Surveillance System (ODSS)

- Collaboration between IWH and the Occupational Cancer Research Centre at Ontario Health

Financial contribution from

Public Health Agency of Canada | Agence de la santé publique du Canada

The Occupational Disease Surveillance System (ODSS)

- Unique system that can identify and monitor trends in work-related disease in Ontario
- Established by linking existing provincial health databases to job information
  - linkage of WSIB claims records from 1983 to 2019 to hospitalization (DAD) and emergency department data (NACRS) from 2006 to 2020
- Analytical cohort of approximately 1.7 million formerly injured workers

wsib ONTARIO

Ontario
Ministry of Labour, Training and Skills Development

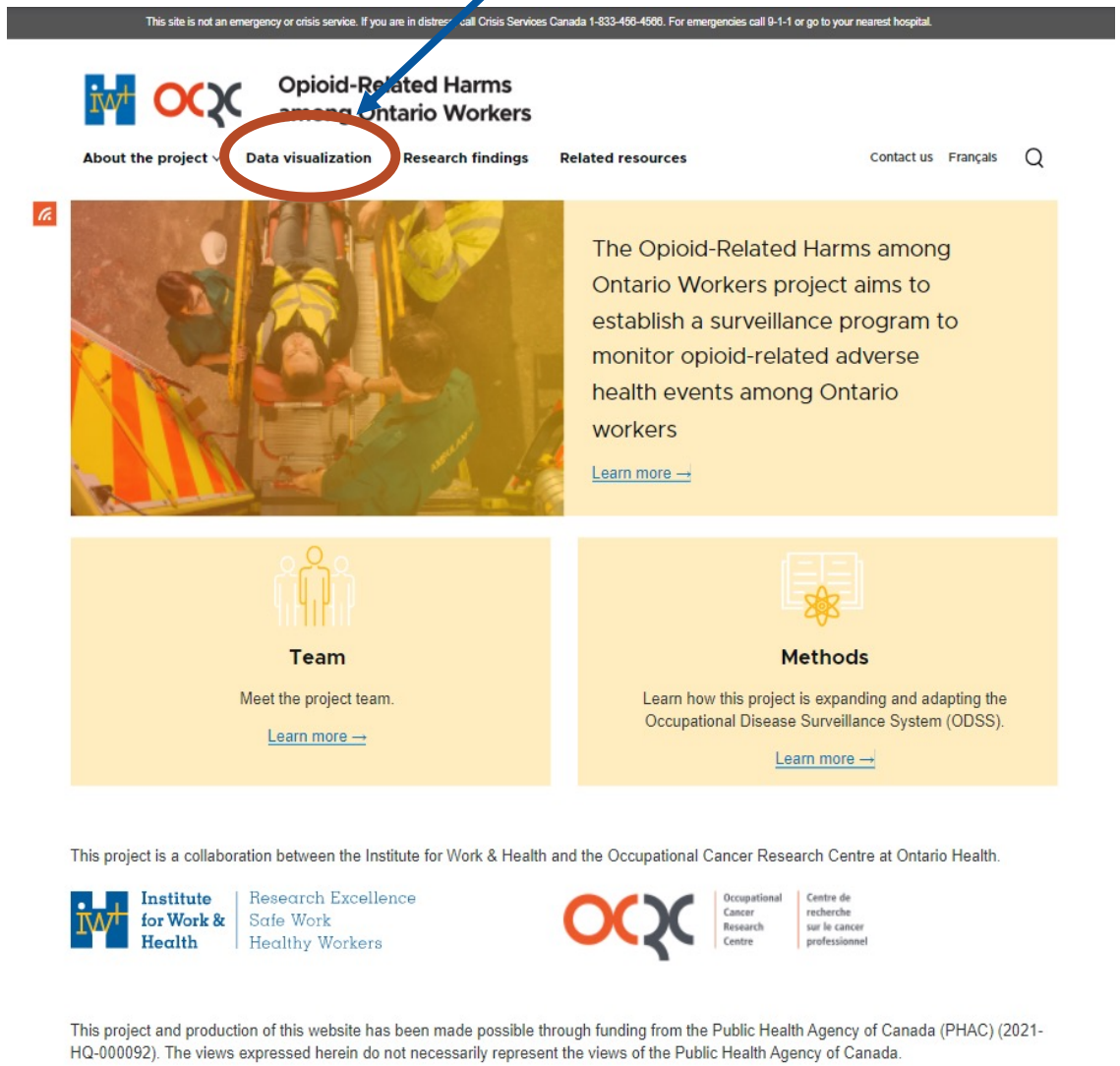
Ontario
Ministry of Health

Do you want to know more?

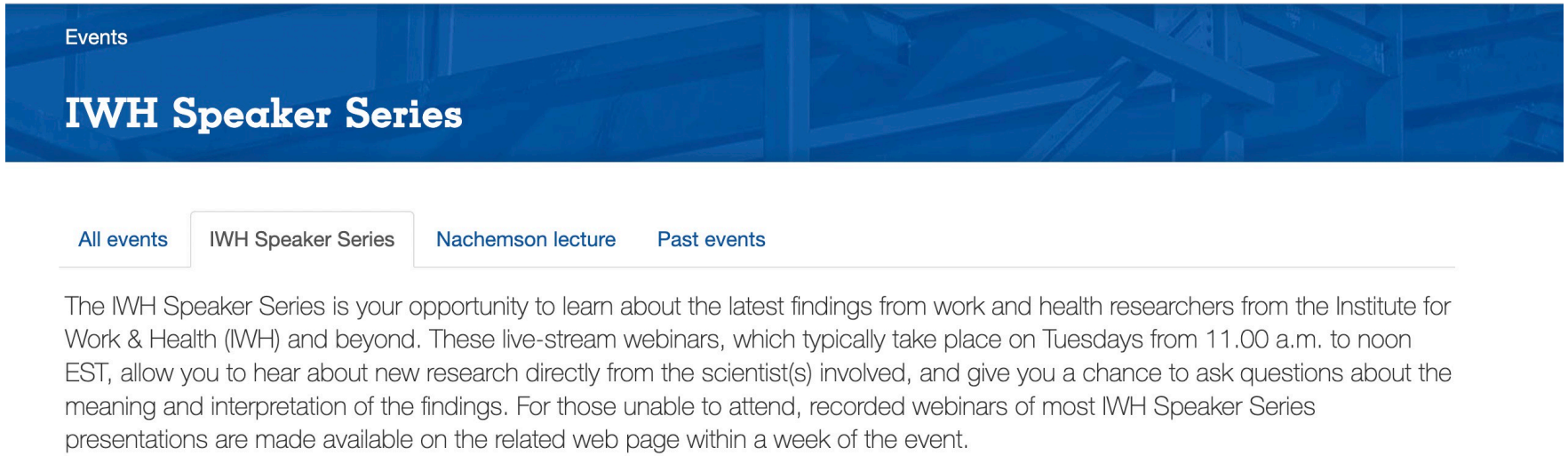
Coming soon!

Project website:

www.opioidsandwork.ca



Upcoming IWH Speaker Series presentation



Date: June 13, 2023
Presenters: Dr. Nancy Carnide and Dr. Paul Demers

Visit www.iwh.on.ca/events/speaker-series to sign up soon!

Thank you

Nancy Carnide

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