

outwork

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Claim suppression study in B.C. finds under-claiming of work injury to be common

Joint study by Institute for Work & Health and Prism Economics and Analysis also finds employer pressure, inducement not to claim in four to 13 per cent of work injuries

About half of British Columbia workers who have a work injury or illness that results in time away from work do not report the injury or illness to WorkSafeBC. The two most common reasons workers give are not knowing they are entitled to compensation or how to apply, and not thinking it's worth their time to make a claim.

This is according to a recent study on claim suppression commissioned by WorkSafeBC and conducted by the Institute for Work & Health (IWH) and Prism Economics and Analysis. The study found an estimated four to 13 per cent of people with work-related injuries in B.C. experience claim suppression—i.e. pressure or inducement from an employer not to make a claim.

The study was conducted using four data sources. They included:
1) a survey conducted in 2019-2020 of 699 B.C. workers who had experienced a self-reported, work-related injury or illness within three years before the survey;

- 2) a survey of 150 employers across the province, with those in the construction and transportation/warehousing sectors disproportionately over-represented;
- 3) a document review of 1,043 randomly selected no-lost-time claims filed between 2016 and 2019, conducted by WorkSafeBC staff who provided anonymized results to the research team for analysis; and
- 4) a document review of 601 claims that were rejected, suspended or abandoned, again done by WorkSafeBC and analyzed by the research team using anonymized results.

Findings from the study are now available in a policy briefing (see www.iwh.on.ca/summaries/issue-briefing/claim-suppression-in-bc-workers-compensation-system) and a report (see www.iwh.on.ca/scientific-reports/estimates-of-nature-and-extent-of-claim-suppression-in-british-columbias-workers-compensation-system).

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IWH welcomes new post-doc researcher

The Institute for Work & Health (IWH) welcomes **Dr. Robyn O'Loughlin**, who has been named the Mitacs Elevate post-doctoral fellow at the Institute. O'Loughlin recently earned her PhD in legal studies at Carleton University. Working with IWH Scientific Co-Director **Dr. Monique Gignac** and under the supervision of IWH Adjunct Scientist **Dr. Vicky Kristman** at Laurentian University, O'Loughlin will study workplace bullying behaviours experienced by Indigenous people in Canada and the legislative and legal responses to them. She will use qualitative and quantitative methods to explore the experiences of federal workers around bullying and harassment, the way negative behaviour is labelled in the workplace, and the circumstances under which an investigation occurs under the new *Canada Labour Code* amendments that came into force in January 2021. To see O'Loughlin's bio, go to: www.iwh.on.ca/people/robyn-oloughlin

IWH announces Mustard post-doctoral fellowship recipient

The Institute has awarded the 2021 Mustard Fellowship in Work and Health to **Reena Shadaan**, who finishes up her PhD in the Faculty of Environmental and Urban Change at York University this spring. Shadaan's doctoral dissertation concerns nail technicians' occupational health, including their exposure-related hazards, musculoskeletal concerns and stress-induced health outcomes. Her research, conducted in partnership with Toronto's Nail Technicians' Network and Healthy Nail Salon Network, uses an innovative technique called occupational health mapping—a worker-led methodological tool that identifies hazards, their resulting health harms, their implications beyond the worksite and worker-defined solutions. For information about the Institute's fellowship programs, go to: www.iwh.on.ca/opportunities

Announcing four recipients of the 2021 S. Leonard Syme Fellowships

Since 2002, the Institute's S. Leonard Syme Fellowships have supported early-career researchers at the master's or doctoral level who intend to study work and health. This year's recipients are: **Kathleen Dobson**, PhD candidate at the University of Toronto's Dalla Lana School of Public Health (U of T's DLSPH); **Siobhan Saravanamuttu**, PhD candidate at York University's Department of Politics, Faculty of Liberal Arts and Professional Studies; **David Kinitz**, PhD candidate at U of T's DLSPH; and **Jennifer Ritonja**, PhD candidate at Queen's University's Department of Public Health Sciences. To find out about upcoming fellowship opportunities, sign up for updates at: www.iwh.on.ca/subscribe

What Research Can Do

COVID-related research from IWH: findings to watch for

A year ago, we published the 100th issue of *At Work*. It was also the first issue we published during a pandemic. Although many of us remain in lockdown, as we were a year ago, things feel different this spring. There's a real sense we are climbing out and emerging into a new normal—especially as vaccination rates pick up steam across the country.

It's with this sense of hope that we look back at our research strategy during the pandemic and consider what it will look like going forward.

Our pandemic-related research took one of two routes over the past year. We conducted new research, often in collaboration with other organizations, about the impact of COVID-19 on work and health. We also modified some of our studies already in the field to capture new information about the effects of the pandemic.

In terms of new research, our collaboration with the Occupational Health Clinics for Ontario Workers (OHCOW) highlighted the importance of COVID-19 protections on the mental health of workers. Findings related to health-care workers and workers outside the health-care sector have already been shared (see *At Work*, Fall 2020). Findings specific to the education sector are coming soon.

So, too, are findings from a study conducted with researchers from Public Health Ontario (PHO) on the prevalence of COVID-19 infection control practices in Canadian workplaces and another on the rates of workplace outbreaks across industries in Ontario. Both of these studies grew out of IWH's involvement with PHO in the development of the Occupational Exposure to COVID-19 Risk Tool.

Early this fall, at the XXII World Congress on Safety and Health at Work, you'll be hearing about IWH research (conducted with partners in the United States and Europe) comparing the responses of occupational health and safety (OHS) inspectorates in various jurisdictions around the world to COVID-19 in the workplace. You'll also hear about the challenges of tracking the incidence of COVID-19 due to workplace exposures and what information we should be

prepared to collect in the event of a future pandemic if we want to truly understand the role of workplaces in infectious disease transmission.

With respect to incorporating COVID-related questions into ongoing research, you'll find an example in this issue. A study looking at the transition to work of young adults with rheumatic illness resurveyed participants after March 2020 to learn about the effect of the pandemic on their employment (see sidebar on page 5).

Findings from other studies that adapted to the pandemic reality are also coming shortly. In our next issue, you'll read what we learned from an IWH study that incorporated new questions about COVID-related health, financial and organizational-support concerns among workers with and without disabilities. Later this summer, you'll get our findings on the influence of COVID-19 on workers' use of cannabis and alcohol, including use at work.

During the pandemic, we didn't lose sight of the many health, safety and disability issues that were important before COVID, which we managed to continue studying throughout the past year. Going forward, we will continue to seek funding to research a wide range of issues. Depending on the funding envelope, some will have a COVID focus; many others will not. Even if not, we will heed the recent advice of our Scientific Advisory Committee: to consider or examine the impacts of the pandemic as a modifier when studying labour force trends, work precarity, the changing nature of work, and worker mental and physical health.

COVID-19 is an important event within the context of other trajectories that were already affecting the interface between work and health. Our role over the next five years, using sound research methods and the peer-review process, will be to understand the extent and nature of that impact, and to communicate the implications—from remedying the work-related inequities that COVID-19 laid bare to enhancing work and workplaces to ensure worker safety and well-being now and in the future.

Weaker OHS procedures, policies explain small employers' higher injury risks: study

No difference in injury risks between large, small firms once OHS policies, procedures accounted for

It has been well-documented that small employers face unique challenges when it comes to occupational health and safety (OHS). In a recent study by the Institute for Work & Health (IWH) on the effect of Ontario's working-at-heights regulations on construction sector injury rates, the 2017 traumatic injury lost-time claim rate at the smallest firms was more than twice as high as at larger firms—10.3 per 1,000 full-time employees at firms with fewer than five workers, versus 4.1 at firms with 50-plus workers (see www.iwh.on.ca/scientific-reports/evaluation-of-implementation-and-effectiveness-of-ontario-working-at-heights-training-standard-final-report). A similar pattern was found in an IWH study comparing injury frequency among unionized and non-unionized contractors in Ontario's construction sector (see www.iwh.on.ca/scientific-reports/updated-study-on-union-effect-on-safety-in-ici-construction-sector).

However, another study at IWH suggests that a lack of adequate protection may explain the higher work injury risks at small workplaces. This study, shared at the 2017 meeting of the international Understanding Small Enterprises conference, draws on the concept of OHS vulnerability developed by IWH Senior Scientist Dr. Peter Smith. It defines OHS vulnerability as exposure to hazards while lacking protection due to inadequate workplace policies and practices, low OHS awareness or low OHS empowerment. In a previous study, Smith has found that workers reporting OHS vulnerability are more likely to report experiencing a work-related injury in the previous 12 months.

In the study shared at the USE conference, the research team found workers at small firms said they were exposed to hazards more frequently than workers at large firms—57 per cent versus 41 per cent. (The study defined small firms as those with five

to 19 workers and large firms as those with more than 500 employees.)

Among the three different types of OHS vulnerability (exposure to hazard plus one form of inadequate protection), small firm workers reported higher vulnerability due to inadequate policies and procedures than those at larger firms (34 per cent versus 18 per cent). Slimmer differences were found between small and large workplaces in the percentage of workers who reported the other two types of vulnerability.

Looking at the workers who said they experienced a work-related physical injury in the previous 12 months, the team also found a higher incidence of injury among workers at small organizations than at larger organizations (18 per cent versus 13 per cent). In both groups of workers, the team found similar patterns in the association between work injury and hazard exposure and protective measures. For example, among workers who had no hazard exposure and who reported adequate OHS policies and procedures, the incidence of injury was 5.4 per cent in small organizations and 5.3 per cent in large firms. Among workers who said they *were* exposed to hazards and had inadequate OHS policies and procedures, in both small and large organizations, the incidence of self-reported injury was 31 per cent.

When all factors were taken into account, however, workers at small organizations in this study were 44 per cent more likely than workers at large organizations to experience a work-related injury in the previous 12 months. Notably, much of this greater risk was due to weaker OHS policies and procedures at smaller firms. In statistical analyses, the greater risk of injury in small firms was fully accounted for by differences in OHS policies and procedures. Once these were controlled for, no differences in injury risk remained between small and large firms.

“This study is encouraging in suggesting

that injury risks are not intrinsically higher at small firms,” says Dr. Cameron Mustard, senior scientist and president of the Institute, and author of the study.

“Yes, the findings are consistent with previous literature in showing higher hazard exposure and weaker workplace OHS policies and procedures at small firms,” he adds. “However, the study suggests the greater injury risk may be eliminated by focusing on ensuring that protective measures—especially workplace OHS policies and procedures—are adequate.”

How the study was done

The study was based on surveys completed in 2015 by about 1,800 workers in Ontario and British Columbia. The participants, who worked at least 15 hours a week, were asked whether they had experienced a physical injury or illness in the previous 12 months. As part of the 27-item OHS Vulnerability Measure, developed by the Institute, workers were asked whether their jobs exposed them to common hazards. These included lifting or carrying 20 kilograms at least 10 times a day; working at heights greater than two metres; working with hazardous substances; being bullied or harassed at work; doing repetitive movements with their hands or wrists; working in a bent, twisted or awkward work posture; working in excessive noise levels or standing for more than two hours at a time.

Workers in the study were also asked about their awareness of workplace rights and responsibilities, their sense of empowerment to protect themselves, and the existence of OHS policies and procedures at their workplace. Examples of the latter included an active and effective joint health and safety committee, regular communication about safety, and prompt investigation of incidents.

The study is published in the conference proceedings, available at www.iwh.on.ca/publications/understanding-small-enterprises-proceedings-from-2017-conference. ■

Nine trends that will likely shape future of work for groups of vulnerable workers

IWH research team conducts ‘horizon scan’ to identify major changes to come, and what they may mean for people currently facing labour market barriers

Along with other industrialized countries, Canada has entered what some labour market experts call “the fourth industrial revolution.” It’s an era characterized by large-scale and rapid digitization and automation, with potential ripple effects across social, political and economic domains. At the same time, the country is also undergoing a demographic shift, ecological change at an ever-increasing pace, and further disruption brought on by globalization. Heading into the next five to 15 years, some forecasters anticipate a confluence of system-wide pressures, with far-reaching consequences for a generation of workers to come.

A body of research has been growing to explore the implications of these changes on workers and workplaces. Less studied, however, are their effects on vulnerable workers. A project team at the Institute for Work & Health (IWH), led by IWH Scientist Dr. Arif Jetha, has set out to do just that. The team has conducted a comprehensive horizon scan to identify the trends that may be in store—and what they may mean for vulnerable workers.

“While we don’t want to use a broad brush, population-level data suggests that certain labour market subgroups are more likely to experience vulnerability when compared to others. These are the workers who may also be most at risk or most likely to experience challenges in the future of work,” Jetha said at a February 2021 IWH Speaker Series webinar presentation (see www.iwh.on.ca/events/speaker-series/2021-feb-23). In the talk, he outlined the following nine trends that will influence the future of work. A full report about findings from the horizon scan is also available at www.iwh.on.ca/scientific-reports/fragmentation-in-future-of-work.

1. Digital transformation of the economy: The future of work will be shaped by the wide and rapid adoption of novel

digital technologies, including 5G, the Internet of things (IoT), smart sensors, cloud computing, virtual and augmented reality, 3D printing, robotics and blockchain technology. Some of these technologies will result in hyperconnectivity among people, businesses, machines/devices and data. Workers will increasingly perform job tasks in close integration with machines. Certain technologies can also lead to advanced telepresence, in which workers can perform job tasks from anywhere in the world, whether to operate machinery or take part in virtual brainstorming sessions. Other advances in digital technologies can also accelerate the growth of gig work and microwork.

2. Automation enabled by artificial intelligence (AI) and machine learning: Early studies on automation tended to agree that repetitive and low-skilled jobs are among the most likely to be automated. However, with advances in machine learning, neural networks and deep learning, job tasks once considered “high skilled”—e.g. data analysis, communication, prediction and problem-solving—are increasingly performed by machines. The automation of such job tasks can reduce the availability of work opportunities, but it can also drive innovation and create new jobs.

3. AI-enabled human resource management systems: The application of AI in some business functions can have implications on people’s access to the labour market. An example is the use of automation and AI in human resource (HR) management processes—e.g. job applicant tracking, job matching and selection, and performance management. AI algorithms may soon be used to evaluate job candidates’ suitability based on analysis of facial expressions and vocal inflections, compared against benchmarks. Supporters of these automated processes see them as improvements toward fairness and objectivity.

However, AI-enabled HR management systems can lead to greater exclusion of individuals who do not fit the mold or perpetuate biases built into the development and testing of algorithms. They also run the risk of collecting personal information without explicit consent from workers or job applicants, including information about disability status, lifestyle and age.

5. Skill requirements for the future of work: As part of the digital transformation of the economy, the future of work will see new jobs requiring new and specialized skills. Workers across all industries will need advanced technical competencies and digital literacy; they will also need soft skills that are harder to automate, such as creativity, critical thinking, collaboration and empathy. According to some projections, Canada is expected to experience a labour shortage of about two million workers by 2031, with the greatest skills gaps expected in the science, technology, engineering and/or mathematics (STEM) professions.

5. Globalization 4.0: The effects of globalization on the Canadian economy continue to change shape, with “Globalization 4.0” further accelerating a global exchange of ideas, services and goods in both physical and virtual spaces. One of the labour-market features of this stage of globalization is telemigration, in which white-collar jobs are done remotely by workers who are geographically distant—and often working for lower wages. Advancements in digital technologies mean the growth of online marketplaces where freelancers anywhere can bid for work—or microwork—in any country.

6. Climate change and the green economy: The effects of climate change, and the associated interventions to mitigate it, will necessitate adaptations to work conditions and affect the availability of work in certain sectors. Extreme weather events (e.g. wildfires and droughts) can destroy

communities and damage infrastructure and physical workplace facilities; they can also lead to health hazards such as infectious disease, air pollution, heat-related illnesses and other environmental hazards. People who work outdoors, such as those in industrial services, agriculture, and travel and tourism, may be particularly susceptible. However, business and policy responses to curb climate change can result in new work opportunities in industries such as renewable energy, bioengineering and biodesign.

7. Gen Z workers and the work environment: Currently, over a third of the labour market is composed of Gen Z workers (those born 1995-2005). As their numbers grow, some analysts expect that they will bring greater diversity to workplaces and usher in more inclusive and supportive employer attitudes and behaviours. This is expected to be the case for a number of reasons. People of this generation have higher education on average than those of previous generations; they have grown up with daily exposure to advanced digital technologies; they're also more racially diverse than previous generations. Studies suggest that, while Gen Zs are more likely to report valuing employment that provides a higher salary, greater job stability and access to health benefits compared to previous generations, they also prioritize workplaces that value inclusiveness, diversity, social responsibility and accessibility for vulnerable groups.

8. Populism: Technological changes and globalization may give rise to populism—i.e. sociopolitical movements characterized by an anti-establishment orientation, broad anti-elite policies, and opposition to liberal economics and globalization. Although globalization has brought many economic and social benefits, it has also led to more jobs being outsourced, offshored or filled by telemigrants. The resulting rise in income inequality and decline in job opportunities have spurred a growing sense of unfairness, anxiety and frustration among a large proportion of the population.

PANDEMIC'S IMPACT ON YOUNG ADULTS WITH RHEUMATIC DISEASES

About one in 1,000 young adults live with rheumatic diseases and they generally face greater challenges in the job market than their healthy peers. At the Institute for Work & Health (IWH), a research team led by Scientist Dr. Arif Jetha was already conducting a series of surveys about the entry of these young adults into the labour force. When the pandemic arrived in Canada, the team decided to look at the effects of COVID-19 on the employment of this group to see whether they were harder hit.

The two surveys were conducted in the months before March 2020, when emergency measures were introduced across Canada, and nine months later. Over that period, Jetha's team found the share of study participants who were

working fell from 86 per cent to 71 per cent. That drop in employment appears to mirror the work experiences of other young adults in Canada during the pandemic. However, when the research team controlled for factors such as education, physical or mental work demands, and health factors such as depression, pain levels, frequency of disease flares, the picture was worse. The likelihood of employment following the pandemic was reduced by 72 per cent when compared to the period prior to the pandemic.

More detailed findings from this study are available in the online issue of *At Work*, at www.iwh.on.ca/newsletters/at-work/104/education-type-of-work-lesser-pandemic-job-loss-in-youths-with-rheumatic-diseases.

9. External shocks that accelerate the changing nature of work: External shocks (such as economic recessions or depressions, natural disasters and, yes, pandemics) have the potential to accelerate the pace of change to the nature of work. The impact of the COVID-19 pandemic on the availability of jobs and working conditions is a prime example. In its first six months, the COVID-19 pandemic had already fast-tracked many of the work-related trends highlighted above, especially for workers who are already vulnerable (see sidebar above).

The implications for vulnerable workers

The coming changes hold opportunities, but they can also adversely affect work outcomes for many people, Jetha noted. Workers in low-skilled and repetitive jobs may be most at risk of job loss and reduced earnings as a result of automation and many of the other trends. Vulnerable groups may face greater barriers to upskilling and reskilling opportunities. Moreover, these groups are not only more likely to work in jobs that are more susceptible to climate-related displacement; they are also less likely to have access to social protections that support work interruptions due to extreme weather events.

“The important thing to note is the future of work is anticipated to be fragmented and, as a result, has the potential to contribute to health and social inequities,” Jetha added. Although the future of work brings many opportunities, not least being the growth of new industries and the creation of new jobs, “it’s unclear to what extent emerging opportunities will be available to different groups of workers who have traditionally been disadvantaged within the labour market. Anticipating changes to the working world can inform policies and program development to protect at-risk groups of workers.”

About the study

To identify the trends above, the research team used a new method called “horizon scanning.” It’s an inclusive, systematic process of synthesizing information from diverse sources of evidence—i.e. academic research, grey literature and social media. This method is commonly used in the field of strategic foresight. This horizon scan was conducted between December 2019 and January 2020. An update was carried out in August 2020 to capture the changes resulting from the COVID-19 pandemic. ■

Study finds claim suppression more prevalent in workplaces that have injury-free incentive schemes

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In their report, the research team noted important differences between under-claiming, misrepresented claims and claim suppression. Under-claiming occurs when workers who appear to be entitled to workers' compensation benefits choose not to submit or proceed with a claim. Misrepresented claims are claims that are submitted and classified as no-lost-time claims even though the injuries or diseases do involve lost working time. Claim suppression refers to any overt or subtle act by an employer to discourage a worker from reporting an injury or disease or from making a claim.

Workers' reasons for not reporting

Among the 699 workers surveyed, almost six in 10 (58 per cent) had lost two or more days of working time due to a work-related injury. Among these, just over half (54 per cent) did not submit a claim to WorkSafeBC. Findings showed that under-claiming was more common among workers who were immigrants, had lower educational attainment, were not union members, were employed by small employers and worked on a temporary basis (directly or through temp agencies).

The main reasons study participants gave for not claiming were unrelated to claim suppression. The most common reasons included workers not knowing they were entitled to compensation or how to apply for WorkSafeBC wage loss benefits (40 per cent), and thinking it wasn't worth the time to make a claim (36 per cent).

A detailed breakdown of the reasons cited can be found online, at www.iwh.on.ca/newsletters/at-work/104/claim-suppression-study-in-bc-finds-under-claiming-of-work-injury-to-be-common.

As for reasons indicative of claims suppression among those who were off work for two or more days *but did not submit a claim*, the top two were believing they would get into trouble (7.8 per cent) and their employer pressuring them not to apply for WorkSafeBC benefits (4.1 per cent). The survey also found 13 per cent of those off

work for two or more days, *whether they filed a claim or not*, said their employer asked them not to report time loss and/or threatened them with repercussions if they did so.

"In some cases, the claim suppression behaviour may have involved front-line supervisors who were acting contrary to the employer's policy," says Dr. Ron Saunders, an IWH adjunct scientist and principal investigator of the study. "About a third of the respondents who reported claim suppression behaviour also said that their employer assisted them in filing the report to WorkSafeBC."

Claim suppression appears to be higher in workplaces that offer rewards to employees if the workplace is injury-free, the survey results suggest. Among workers who indicated their employer engaged in claim suppression behaviour, about 41 per cent reported their employer operated an incentive scheme. In comparison, among survey respondents who did not indicate their employer engaged in claim suppression, 6.4 per cent said their employer operated an incentive scheme.

Employer perceptions

In the survey of 150 employers, the team found 6.0 per cent said they believed that, in their industry, lost-time injuries were "rarely or never" reported to WorkSafeBC. However, about 27 per cent of employers reported their belief that, in their industry, lost-time injuries were reported to WorkSafeBC as no-lost-time injuries "all the time or almost all the time," and 25 per cent expressed their belief that no-lost-time injuries were "rarely or never" reported to WorkSafeBC.

The employer survey also showed that 72 per cent of employers provided a sick leave/disability plan, medical benefits plan or both. Roughly a fifth of these employers (21 per cent, representing 15 per cent of the total sample) allowed their employees to access benefits through one of these plans instead of claiming WorkSafeBC benefits. As

well, 11 per cent reported that they provided a bonus or incentive to their employees to maintain an injury-free workplace.

From the analysis of no-lost-time claims, the team estimated between 4.1 and 12 per cent of these types of claims were misclassified—i.e. they may have indeed resulted in more than two days off work. From the analysis of claims that were rejected, withdrawn or abandoned, the team estimated between 12 and 19 per cent were "problematic" because documentary evidence in the claim file suggested a compensable, work-related injury or disease.

"The fact that a file was problematic does not necessarily imply that the worker's decision not to proceed with the claim was the result of undue pressure from the employer," says Saunders. However, some of the claim files did suggest the potential for employer pressure. For example, in 8.3 per cent of the files, the worker form (Form 6) indicated that the worker missed more than one day of work and sought medical attention, but no employer form was filed for the incident.

"The findings of this study are in line with those of others looking at claim suppression or under-claiming in Canadian jurisdictions," says Saunders. "Its findings were similar with respect to the approximate magnitude of under-claiming, of lost working-time incidents being misrepresented as involving no lost working time, and of claim suppression on the part of employers." ■

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Having depression leads to lower earnings over 10 years, study finds

Study by IWH researcher finds 10-year earning loss amounts to \$115,000 for men and \$71,000 for women

Working-age Canadians who live through a major depressive episode go on to experience a loss in earnings that persists for at least a decade, a study conducted by an Institute for Work & Health (IWH) researcher has found.

Drawing on tax files and a series of nationally representative health surveys conducted by Statistics Canada, the study found Canadian men who experienced a depressive episode in a given year earned \$115,000 less, on average, over the next 10 years than men who had not experienced depression in the same year. Women who experienced a depressive episode earned \$71,000 less, on average, than those who had not over the same time period.

The study, published in April 2021 in the *Journal of Affective Disorders* (doi:10.1016/j.jad.2021.02.019), found that the earnings drop took place immediately during the year that the depressive episode occurred. The result was a loss of about \$5,000 for men and \$4,500 for women in the first year. These workers did not see their earnings recover during the study's 10-year follow-up. Instead, the earnings of the men fell behind by another \$730 the year after depression was reported, growing to a further \$1,800 behind each year by the end of the decade. The earnings of the women fell behind by another \$360 a year with each passing year over the next decade.

"This drop in earnings in the first year surrounding depression may be due to people being less productive at work, taking time off work for a disability leave, or leaving a job altogether," says IWH Research Associate Kathleen Dobson, who led this study as part of her doctoral thesis at the University of Toronto's Dalla Lana School of Public Health.

The lower earnings over the long term are harder to explain. "It may be that employers are more reluctant to promote or offer

pay increases to people they see as less productive," says Dobson. "It may be that people with depression stay in lower paying jobs, potentially to keep their health benefits, or don't switch to higher paying jobs for fear of the work stress they may entail. Or perhaps people don't have stable employment over the decade following a depressive episode," she says. "These are avenues that we definitely need to explore in future research."

10-year follow-up

The study drew on nearly 800,000 records of people who took part in Statistics Canada's Canadian Community Health Survey (CCHS) during the period 2003 to 2014. The CCHS, which went out every two years until 2007 and then annually until 2014 to a nationally representative sample of Canadians, covered in detail topics related to health, public health, lifestyle and health behaviours.

The study zeroed in on survey participants who were 18 to 54 years old when they took part in the survey and who had answered questions about depressive symptoms. Using only the survey data of people who agreed to have their tax filings linked to the CCHS responses, and who had earned at least \$5,000 the year before the episode of depression, the study ended up with a sample of 85,000.

Previous studies on the impact of depression on people's earnings have been inconsistent in their results. Some found no negative effect on earnings, while others found a link between depression and lower earnings in the range of \$2,000 to \$5,000.

The differing methods used in previous studies may account for the varied findings. The studies that found no impact on income tended to use shorter time frames or to focus on younger adults—that is, on "people who may not have spent enough time in the workforce for a difference in earnings to be visible," says Dobson.

As well, most previous studies failed to account for the many factors that result in systematic differences between people with and without depression. "We know from other studies that people with depression are more likely to have certain characteristics. They're more likely to be women, to not be married, to have a chronic condition, and so on. These systematic differences make it difficult to ensure that, when we see an effect on earnings, we're seeing the effect of depression and nothing else," says Dobson.

Dobson's study addressed these challenges by following workers from a wide age range (18 to 54) and over a long period of time (10 years). She also used a complex study design called "propensity score matching" to ensure she was seeing the effect of depression on earnings. This method involved pairing each individual survey respondent who had depression with another survey respondent who was like them in almost every way except for the depression.

The pairs were matched on gender, year they took part in the health survey, province, age, pregnancy status, and a range of sociodemographic and health factors. Notably, they were also matched on earnings two years before the depressive episodes.

"Essentially, we created pairs that were as similar to each other as possible," says Dobson. "As a result of that work, when we saw the differences in earnings after one of the pair had a depressive episode, we were confident it was due to the depressive episode."

This study is the second of three studies that make up Dobson's thesis. In the first study, published by Statistics Canada in Health Reports, she estimated the prevalence of depression among working-age Canadians between 2000 and 2016—5.4 per cent among workers, 11.7 per cent among unemployed Canadians, and 9.8 per cent among those not in the labour force. An upcoming study will build on this study about earnings loss to examine the economic impact when individuals experience more than one episode of depression. ■

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Benefits outweigh costs when protecting construction workers from UV rays: study

Ultraviolet radiation due to sun exposure is one of the most common causes of work-related cancer in Ontario. About 1,400 cases of work-related non-melanoma skin cancers are diagnosed a year in the province. The most at-risk groups of workers are those working in construction, farming and transportation.

Without additional protective measures, cases among construction workers in Ontario are on track to double by 2060. But according to a new cost-benefit analysis led by Dr. Amir Mofidi, a post-doctoral fellow at the Institute for Work & Health (IWH), 6,034 cases of non-melanoma skin cancers could be averted over 30 years if all Ontario construction workers wore protective clothing such as long sleeves, pants and neck coverings. The averted costs of wearing protective clothing would be \$38.0 million (in 2017 Canadian dollars) over 30 years—a saving of \$0.49 for every dollar spent over that time period.

The research team also found benefits for another type of preventive measure: the use of shade structures. These structures include portable canopies or pop-up tents that are set up near jobsites for workers to use whenever they need during a work shift. With the use of shade structures, 2,945 cases in Ontario could be averted over 30 years, resulting in averted costs of \$20.5 million. For every dollar spent providing workers protective shade structures, a saving of \$0.35 would be realized.

The study, published online in May 2021 in the *Journal of Occupational and Environmental Hygiene* (doi:10.1080/15459624.2021.1910278), drew on an innovative method that was used in past studies of the societal and economic burden of occupational cancer.

For estimates of solar UV radiation exposure in Ontario's construction sector, the team relied on work by the Occupational Cancer Research Centre and CAREX Canada. For the cost-benefit analysis, the team

used a method developed by IWH Senior Scientist and study lead Dr. Emile Tompa. In recent years, Tompa and Mofidi have applied this method to estimate the costs and benefits of silica reduction measures in Ontario's construction sector (doi:10.1186/s12889-020-8307-7) and the societal costs of work injuries and diseases in five European Union countries (doi: 10.1186/s12889-020-10050-7).

The new analysis found that, in a scenario where protective clothing is worn by workers and its use offers 100 per cent protection from 2020 onward, the yearly costs and benefits of this intervention would even out by 2046. A similar scenario for shade structures would see yearly costs and benefits even out by 2041. In models where partial use of, or partial compliance with, these measures results in only 60 per cent protection, the break-even dates would be 2051 for protective clothing and 2044 for shade structures.

"According to the hierarchy of controls, shade structures are preferred over protective clothing. But in the case of construction, workers in some occupations—such as those working at heights—are less likely to be able to use them," says Mofidi.

He notes that, as seen in previous economic analyses of work-related cancer-prevention interventions, the costs and benefits are unevenly distributed. "The costs are borne primarily by employers, while the savings resulting from averted cancer cases are realized by the health-care system, and by workers and their families in the form of averted health treatment costs, caregiving costs, loss of income and loss of health-related quality of life," says Mofidi. "It would be good to have stakeholders negotiate an acceptable distribution of prevention costs, as the total benefits substantially outweigh the total costs." ■