O1E.5 SHORT-TERM DISABILITY LEAVE AND EMPLOYMENT TERMINATION: USING MARGINAL STRUCTURAL MODELS TO ESTIMATE COUNTERFACTUAL RISKS

[1]Sally Picciotto*, [1]Andreas Neophytou, [2]Mark Cullen, [1]Ellen Eisen. [1]*UC Berkeley, Berkeley, USA*; [2]*Stanford University, Palo Alto, USA*

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Introduction Short-term disability leave can be considered as a measure of not being well enough to work. The American Manufacturing Cohort, followed 1996–2013, consists of employees of a light-metal company that provided short-term disability insurance to all employees: coverage to replace wages for up to 6 months of work absence due to medical issues. We hypothesized that since brief short-term disability leave allows workers time to recover from illness or injury without losing their jobs, it should be protective against employment termination.

Methods We analyzed 18 386 (83% male, 80% white) hourly employees. We censored workers once their accumulated disability leave exceeded 6 weeks because longer time spent on short-term disability leave suggests more serious illness or injury that may prevent return to work. To analyze the effect of short-term disability leave on employment termination, we applied a marginal structural pooled logistic model that allowed for a time-varying hazard function. We adjusted for time-varying confounding by occupational exposures and health-related variables using inverse probability weighting. Using the estimated coefficients, we compared the predicted probabilities (by person-month) of terminating employment with the corresponding counterfactual probabilities if the worker had never taken disability leave. These probabilities yielded estimated survival curves under the two scenarios.

Results The average worker was followed for 5.5 years. Approximately 42% of the workers took at least one day of disability leave, and 48% terminated employment during follow-up. We estimated that 1058 (29%) more workers would have terminated employment within 5 years from cohort entry if the company had had no disability leave benefit than were predicted under the natural course.

Conclusion Short-term disability leave is a potentially relevant health variable for occupational epidemiologists. This analysis suggests that short-term disability leave can help employees retain their jobs when a temporary health issue prevents them from working.

Work Organisation

O1E.6 THE IMPACT OF A PROGRAM OF MANDATORY AWARENESS TRAINING ON WORKER AWARENESS AND EMPOWERMENT TO PARTICIPATE IN INJURY PREVENTION

Peter Smith*. *Institute for Work and Health, Toronto, Canada*

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On July 1 st 2014, the province of Ontario introduced a program of mandatory occupational health and safety (OHS) awareness training. The objective of this study was to evaluate the impact of this program on worker level self-reported OHS awareness and empowerment to participate in injury prevention activities in Ontario, compared to the province of British Columbia (BC) where no similar program was introduced.

We collected information on OHS awareness and empowerment, as well as participation in OHS training from samples of workers in Ontario and BC on four occasions. The first survey was conducted between May and June 2014 (prior to the introduction of mandatory training); then additional surveys were completed in February/March 2015, September/October 2015, and November/December 2017. For each cross-sectional sample we recruited over 1800 respondents, with a total sample of over 7500 respondents (63% from Ontario) across all time points. Logistic regression models were used to examine a time by province interaction in each outcome, after adjusting for a variety of workplace and worker characteristics.

After the introduction of mandatory awareness training respondents in Ontario were almost twice as likely to participate in training compared to respondents in BC. However, we observed no difference in trends over time (pre-post introduction of mandatory training) in levels of adequate awareness or empowerment between Ontario and BC. Respondents in Ontario had higher levels of adequate OHS awareness than respondents in BC at all time points (both before and after the introduction of mandatory awareness training). No differences were present between Ontario and BC in relation to empowerment.

Taken together, these results suggest that the introduction of mandatory awareness training in Ontario was associated with greater training participation. However, no differences in levels of adequate awareness or empowerment were observed between Ontario respondents compared to BC respondents.

Pesticide Health Effects

O2A.1 PESTICIDES AND WORK-RELATED ASTHMA: HOW THIS RELATES TO SELF-REPORTED EXPOSURES

[1]David Fishwick*, [1]Anne-Helen Harding, [1]David Fox, [1]Yiqun Chen, [2]Neil Pearce, [1]Gillian Frost. [1]*HSE GB and NHS, Sheffield, UK*; [2]*London School of Hygiene and Tropical Medicine, London, UK*

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Pesticide exposure has been linked to a number of potentially adverse health outcomes, including asthma. We were interested to explore the relationship between asthma and pesticide use, particularly from the perspective of self-reported work-related asthma.

Using the existing UK PIPAH (Prospective Investigation of Pesticide Applicators' Health) study population, we administered a respiratory questionnaire to 4814 current and past pesticide users. Participants were asked about doctor-diagnosed and self-reported asthma symptoms, and, if present, their views about the cause of work-related asthma (asthma reported to be worse at work).

Of the 2562 respondents (53% response) with a median age of 60.2 years, 97.4% were male and 34.1% ever smoked. The prevalence of ever being doctor diagnosed asthma was 11.4% (n=292), and 123 of these (42.1% of those with

asthma) reported that their asthma was caused, or made worse, by their work. 17.8% reported wheeze in the last 12 months.

Grouping relevant exposures, 117 of the 123 participants reported in decreasing order of proportion, the following agents as being responsible for worsening of their asthma; organic dusts (n=73, 59%), unspecified dust (n=12, 10%), mixed exposures (n=12, 10%), any mention of chemical (n=9, 7%), physical work environment, e.g. temperature, exercise (n=7, 6%), other, e.g. irritant, fumes (n=4, 3%).

This large study of pesticide applicators has confirmed a prevalence of 11.4% for doctor-diagnosed asthma. Self-reported exposures thought by workers to aggravate their asthma were predominantly organic in nature, although a smaller proportion identified chemicals as aggravants. Workplace based preventative strategies in this sector should address all potential inhaled hazards and their associated risks to respiratory health.

O2A.2 PESTICIDES AND RESPIRATORY HEALTH; THE GB BASED PIPAH STUDY

[1]David Fishwick*, [1]Anne-Helen Harding, [1]David Fox, [1]Chen Yiqun, [2]Neil Pearce, [1]Gillian Frost. [1]*HSE GB and NHS, Sheffield, UK*; [2]*London School of Hygiene and Tropical Medicine, London, UK*

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We administered a cross sectional respiratory questionnaire in January to 4814 PIPAH (Prospective Investigation of Pesticide Applicators' Health) participants. Of the 2562 respondents (53% response) with a median age of 60.2 years, 97.4% were male and 34.1% ever smoked.

The prevalence of ever doctor diagnosed conditions was 11.4% for asthma, 1.29% for COPD, 0.9% for chronic bronchitis and 0.4% for farmer's lung.

Self-reported symptoms, however, were more prevalent. Nasal allergies were reported by 21.4%, coughing in winter (possibly signifying chronic bronchitis) by 13.7%, chest tightness or difficulty in breathing by 12.9% and trouble in breathing by 9%. The majority (n=1806, 86%) had mixed, loaded handled or applied pesticides in the last 12 months, in a range of work areas.

For those respondents actively using pesticides, the association between respiratory health and pesticide use was investigated using logistic regression. Doctor diagnosed; none of the doctor diagnosed conditions were statistically associated with (binary) pesticide use in the last 12 months. Doctor diagnosed asthma was only associated with age (OR 0.987, p=0.024) and ever smoking (OR 1.47, p=0.004).

Self-reported; self-reported nasal allergies (OR=1.81), chest tightness (OR=2.18) and trouble breathing (OR=2.68) were associated with 'golf courses, bowling greens, sports grounds' work, cough (OR=1.91) with forestry and cough (OR=1.4) and wheeze (OR=1.31) with grain store work. After adjustment for age, self-reported nasal allergy was significantly inversely associated with pesticide use (OR 0.72, p=0.03), although no significant associations with pesticide use were identified for other self-reported symptoms.

This study has identified low levels of doctor diagnosed ill health in this group, in contrast to more prevalent self-reported symptoms; suggesting the possibility of under-diagnosis of respiratory ill health. Forestry and grass-exposed areas were associated with nasal allergies and cough. Pesticide use specifically was only associated with nasal allergies.

O2A.3 INCREASED RISK OF CENTRAL NERVOUS SYSTEM TUMORS WITH CARBAMATE INSECTICIDE USE IN THE PROSPECTIVE COHORT AGRICAN

[1]Clément Piel*, [1,2]Camille Pouchieu, [1]Lucile Migault, [1]Beatrix Béziat, [3,4,5]Mathilde Boulanger, [1]Mathilde Bureau, [1,6]Camille Carles, [1,2]Anne Grüber, [3,4,5]Yannick Lecluse, [1]Virginie Rondeau, [1]Xavier Schwall, [3,4,5]Séverine Tual, [7]the AGRICAN group, [3,4,5]Pierre Lebailly, [1,2,6]Isabelle Baldi. [1]*Epicene Team, Isped, U1219 Inserm, Bordeaux Population Health Research Center, University of Bordeaux, Bordeaux, France*; [2]*Registre des tumeurs primitives du système nerveux central de la Gironde, ISPED, Centre INSERM U1219, Bordeaux Population Health Research Center, University of Bordeaux, Bordeaux, France*; [3]*INSERM, U1086 Anticipe Axe Cancers et Préventions, Caen, France*; [4]*Université de Caen Normandie, Caen, France*; [5]*Centre de Lutte Contre le Cancer François Baclesse, Caen, France*; [6]*CHU de Bordeaux, Service de Médecine du Travail et Pathologies Professionnelles, Bordeaux, France*; [7]*Arveux P (Registre des Cancers du Sein et Cancers Gynécologiques de Côte d'Or), Bara S (Registre Général des Cancers de la Manche), Bouvier AM (Registre Bourguignon des cancers Digestifs), Busquet T (MSA Gironde), Colonna M (Registre Général des Cancers de l'Isère), Coureau G (Registre Général des Cancers de la Gironde), Delanoé M (MSA Midi Pyrénées Nord), Grosclaude P (Registre Général des Cancers du Tarn), Guizard AV (Registre Général des Tumeurs du Calvados), Herbrecht P (MSA Alsace), Laplante JJ (MSA Franche Comté), Lapotre-Ledoux B (Registre Général des Cancers de la Somme), Launoy G (Registre des tumeurs digestives du Calvados), Lenoir D (MSA Bourgogne), Marrer E (Registre Général des cancers du Haut-Rhin), Marcotullio E (Caisse Centrale de la MSA), Maynadié M (Registre des Hémopathies Malignes Côte d'Or), Molinié F (Registre Général de la Loire-Atlantique et Vendée), Monnereau A (Registre des Hémopathies Malignes de la Gironde), Paumier A (MSA Picardie), Pouzet P (MSA Côtes Normandes), Thibaudier JM (MSA Alpes du Nord), Troussard X (Registre Régional des Hémopathies Malignes de Basse Normandie), Velten M (Registre Général des Cancers du Bas-Rhin), Wavelet E (MSA Loire Atlantique-Vendée), Woronoff AS (Registre général des tumeurs du Doubs)*

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Background Pesticide exposures are suspected to be implicated in the excess of Central Nervous System (CNS) tumors observed in farmers, but evidence concerning individual pesticides remains limited. Carbamate insecticides, used on a wide range of crops, have shown evidence of carcinogenicity in some experimental studies. In the cohort AGRICAN (AGRIculture and CANcer), we assessed the associations between potential exposures to carbamate insecticides and the incidence of CNS tumors, overall and by histological subtype.

Methods AGRICAN enrolled 181 842 participants involved in agriculture. Incident CNS tumors were identified by linkage with cancer registries from enrolment (2005–2007) until 2013. Carbamate exposure was assessed by combining information on lifetime periods of pesticide use on crop or livestock and the French crop-exposure matrix PESTIMAT, individually for each of the 19 carbamate insecticides registered in France since 1950. Associations were estimated using proportional hazards models with age as the underlying timescale, adjusting for gender, educational level and smoking.

Results During a 6.9 year average follow-up, 381 incident cases of CNS tumors occurred, including 164 gliomas and 134 meningiomas. Analyses showed increased risks of CNS tumors with overall exposure to carbamate insecticides and linear trends with duration of use of each carbamate. Considering tumor subtypes, hazard ratios for gliomas ranged from 1.18 for thiofanox to 4.60 for