

## Online Supplementary Material

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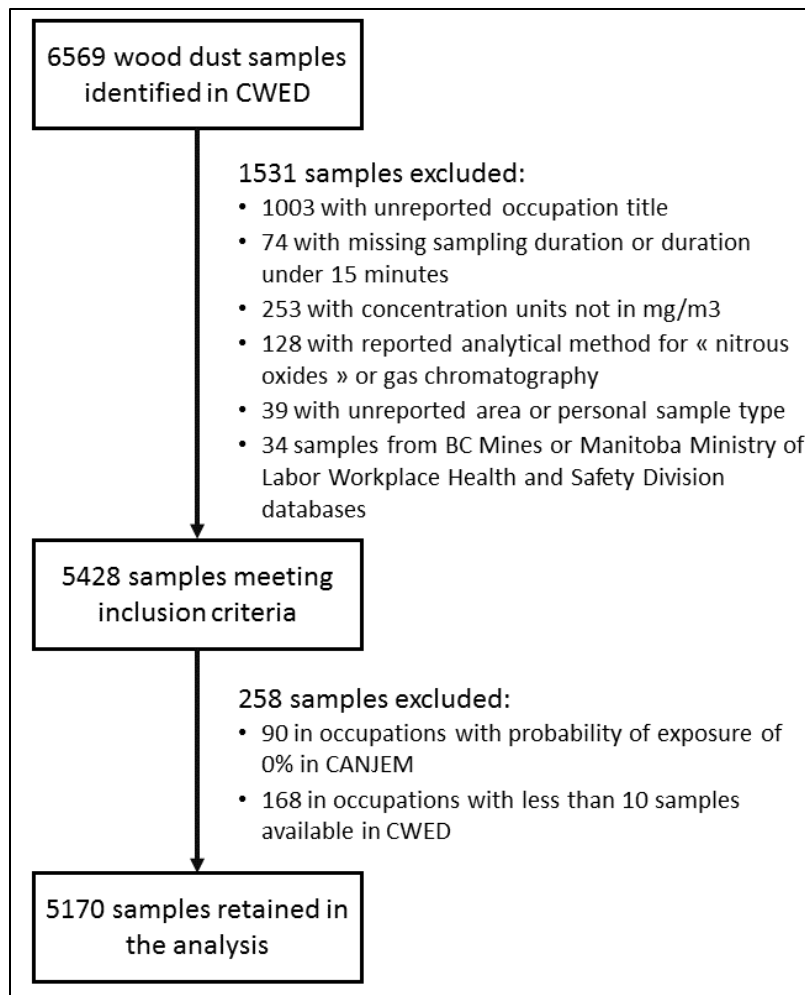
### Development of quantitative estimates of wood dust exposure in a Canadian general population job-exposure matrix based on past expert assessments

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**Figure S1. Selection of samples from CWED and reasons from exclusion from the analyses**



**Table S1. Number of samples and geometric mean and geometric standard deviation of wood dust exposure levels by occupation (n=31), and the corresponding probability and intensity of exposure in CANJEM cells for period 1930-2005**

NOC 2011 occupation code and title	Wood dust measurement data				CANJEM cell estimates, period 1930-2005					
	N <sup>a</sup>	ND <sup>b</sup> (n)	GM <sup>c</sup> (mg/m <sup>3</sup> )	GSD <sup>d</sup>	N <sup>e</sup>	N <sub>exp</sub> <sup>f</sup>	P <sup>g</sup> (%)	Relative percentage of exposed jobs by rating		
								Low (%)	Med (%)	High (%)
1241: Administrative assistants	13	0	3.53	6.9	663	2	0.3	100.0	0.0	0.0
2252: Industrial designers	23	3	0.75	3.0	21	4	19.0	75.0	25.0	0.0
4021: College and other vocational instructors	88	5	1.30	3.7	142	9	6.3	11.1	66.7	22.2
4031: Secondary school teachers	163	4	2.18	3.4	257	6	2.3	83.3	16.7	0.0
6733: Janitors, caretakers and building superintendents	115	5	1.67	4.3	347	55	15.9	34.5	58.2	7.3
7231: Machinists and machining and tooling inspectors	17	0	0.66	5.2	195	2	1.0	0.0	100.0	0.0
7232: Tool and die makers	13	0	2.46	3.5	64	5	7.8	40.0	20.0	40.0
7242: Industrial electricians	11	0	0.42	2.9	76	8	10.5	62.5	37.5	0.0
7271: Carpenters	100	2	2.60	3.4	343	320	93.3	15.0	78.8	6.3
7272: Cabinetmakers	279	3	2.91	3.9	105	102	97.1	3.9	36.3	59.8
7311: Construction millwrights and industrial mechanics	36	1	0.55	2.5	169	10	5.9	40.0	60.0	0.0
7321: Automotive service technicians, truck and bus mechanics and mechanical repairers	14	1	4.62	3.9	295	2	0.7	100.0	0.0	0.0
7384: Other trades and related occupations, n.e.c.	10	1	0.53	2.7	13	4	30.8	50.0	50.0	0.0
7452: Material handlers	92	3	0.95	3.4	743	56	7.5	66.1	28.6	5.4
7521: Heavy equipment operators (except crane)	18	0	0.33	3.5	119	3	2.5	33.3	66.7	0.0
7611: Construction trades helpers and labourers	63	1	1.00	3.6	488	288	59.0	50.0	48.6	1.4
7612: Other trades helpers and labourers	10	0	2.54	1.4	31	2	6.5	0.0	100.0	0.0
8421: Chain saw and skidder operators	14	0	4.59	4.4	272	259	95.2	52.1	46.7	1.2
9224: Supervisors, furniture and fixtures manufacturing	14	0	3.11	2.8	24	21	87.5	23.8	38.1	38.1

NOC 2011 occupation code and title	Wood dust measurement data				CANJEM cell estimates, period 1930-2005					
	N <sup>a</sup>	ND <sup>b</sup> (n)	GM <sup>c</sup> (mg/m <sup>3</sup> )	GSD <sup>d</sup>	N <sup>e</sup>	N <sub>exp</sub> <sup>f</sup>	P <sup>g</sup> (%)	Relative percentage of exposed jobs by rating		
								Low (%)	Med (%)	High (%)
9227: Supervisors, other products manufacturing and assembly	10	0	2.27	3.6	16	1	6.3	0.0	0.0	100.0
9431: Sawmill machine operators	1127	40	0.93	4.0	10	10	100.0	10.0	10.0	80.0
9434: Other wood processing machine operators	441	9	1.07	3.5	13	8	61.5	37.5	50.0	12.5
9436: Lumber graders and other wood processing inspectors and graders	93	5	0.60	2.5	11	10	90.9	60.0	20.0	20.0
9437: Woodworking machine operators	1616	23	2.67	4.0	57	54	94.7	5.6	24.1	70.4
9532: Furniture and fixture assemblers and inspectors	143	0	3.08	4.0	45	34	75.6	32.4	32.4	35.3
9533: Other wood products assemblers and inspectors	135	6	2.06	5.2	19	19	100.0	5.3	42.1	52.6
9534: Furniture finishers and refinishers	41	1	3.48	3.1	9	7	77.8	14.3	57.1	28.6
9536: Industrial painters, coaters and metal finishing process operators	18	1	2.27	2.5	107	8	7.5	25.0	75.0	0.0
9612: Labourers in metal fabrication	20	0	2.45	3.8	162	6	3.7	66.7	16.7	16.7
9614: Labourers in wood, pulp and paper processing	336	13	0.99	4.8	63	54	85.7	22.2	50.0	27.8
9619: Other labourers in processing, manufacturing and utilities	97	0	2.82	3.6	425	26	6.1	38.5	26.9	34.6

<sup>a</sup>Number of samples

<sup>b</sup>Number of non-detected samples

<sup>c</sup>Geometric mean, computed with the robust Regression on order statistics (ROS) method for non-detects (Helsel, 2012)

<sup>d</sup>Geometric standard deviation, computed with the robust ROS method

<sup>e</sup>Total number of jobs evaluated

<sup>f</sup>Number of jobs exposed to wood dust

<sup>g</sup>Probability of exposure to wood dust

**Table S2. Fixed and random-effects model parameters and variance components**

<b>Model parameters</b>	<b>Estimate<sup>a</sup></b>	<b>SD<sup>b</sup></b>
<b>Fixed-effects terms</b>		
Intercept	3.029	0.227
Sample year (reference = 1978)	-0.034	0.004
Sample duration (ln[minutes])	-0.618	0.026
Sample type (reference=area)		
Personal	0.542	0.039
Province (reference = British Columbia)		
Ontario	0.517	0.047
Proportion of jobs in cell, medium intensity	0.223	0.215
Proportion of jobs in cell, high intensity	0.858	0.313
<b>Variance components</b>		
Within occupation	1.221	0.012
Between occupation	0.435	0.081
<b>Random-effects (NOC code and title)</b>		
1241: Administrative assistants	0.387	0.294
2252: Industrial designers	-0.521	0.254
4021: College and other vocational instructors	-0.319	0.161
4031: Secondary school teachers	0.131	0.163
6733: Janitors, caretakers and building superintendents	0.294	0.148
7231: Machinists and machining and tooling inspectors	-0.454	0.272
7232: Tool and die makers	0.455	0.283
7237: Welders and related machine operators	-0.273	0.292
7242: Industrial electricians	0.269	0.162
7271: Carpenters	0.209	0.156
7272: Cabinetmakers	-0.095	0.211
7311: Construction millwrights and industrial mechanics	0.571	0.301
7321: Automotive service technicians, truck and bus mechanics and mechanical repairers	-0.138	0.306
7384: Other trades and related occupations, n.e.c. <sup>c</sup>	-0.217	0.163
7452: Material handlers	-0.501	0.260
7521: Heavy equipment operators (except crane)	-0.295	0.178
7611: Construction trades helpers and labourers	0.222	0.304
7612: Other trades helpers and labourers	0.827	0.291
8421: Chain saw and skidder operators	0.244	0.270
9224: Supervisors, furniture and fixtures manufacturing	-0.121	0.322
9227: Supervisors, other products manufacturing and assembly	-0.524	0.193
9431: Sawmill machine operators	-0.263	0.110
9434: Other wood processing machine operators	-0.565	0.158
9436: Lumber graders and other wood processing inspectors and graders	0.074	0.167

<b>Model parameters</b>	<b>Estimate<sup>a</sup></b>	<b>SD<sup>b</sup></b>
9437: Woodworking machine operators	0.281	0.135
9532: Furniture and fixture assemblers and inspectors	-0.065	0.161
9533: Other wood products assemblers and inspectors	0.457	0.196
9534: Furniture finishers and refinishers	-0.083	0.259
9536: Industrial painters, coaters and metal finishing process operators	0.115	0.245
9612: Labourers in metal fabrication	-0.380	0.113
9614: Labourers in wood, pulp and paper processing	0.390	0.151

<sup>a</sup>Median of the posterior distribution taken as the point estimate

<sup>b</sup>Standard deviation of the posterior distribution of the model parameter

<sup>c</sup>n.e.c.: Not elsewhere classified

**Table S3. Predicted geometric mean wood dust concentrations for 1989 for all occupations with at least one exposed job in CANJEM for period 1930-2005 (n=198)**

NOC 2011 occupation code and title	CANJEM cell estimates, period 1930-2005						Predicted wood dust GM (90%CI) for year 1989 (mg/m <sup>3</sup> ) <sup>d</sup>	
	N <sup>a</sup>	N <sub>exp</sub> <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
0015: Senior managers - trade, broadcasting and other services, n.e.c.	5	1	20.0	0.0	100.0	0.0	0.97 (0.77-1.27)	
0114: Other administrative services managers	347	4	1.2	75.0	25.0	0.0	0.80 (0.64-0.99)	
0601: Corporate sales managers	66	1	1.5	0.0	100.0	0.0	0.97 (0.77-1.27)	
0621: Retail and wholesale trade managers	629	15	2.4	80.0	20.0	0.0	0.79 (0.63-0.98)	
0631: Restaurant and food service managers	157	1	0.6	100.0	0.0	0.0	0.76 (0.56-0.95)	
0632: Accommodation service managers	39	1	2.6	0.0	100.0	0.0	0.97 (0.77-1.27)	
0651: Managers in customer and personal services, n.e.c.	17	1	5.9	0.0	100.0	0.0	0.97 (0.77-1.27)	
0711: Construction managers	89	37	41.6	81.1	18.9	0.0	0.79 (0.62-0.98)	
0731: Managers in transportation	18	1	5.6	0.0	100.0	0.0	0.97 (0.77-1.27)	
0821: Managers in agriculture	110	23	20.9	34.8	65.2	0.0	0.89 (0.73-1.08)	
0911: Manufacturing managers	145	5	3.4	40.0	40.0	20.0	0.99 (0.85-1.16)	
0912: Utilities managers	1	1	100.0	100.0	0.0	0.0	0.76 (0.56-0.95)	
1121: Human resources professionals	25	1	4.0	100.0	0.0	0.0	0.76 (0.56-0.95)	
1122: Professional occupations in business management consulting	52	1	1.9	100.0	0.0	0.0	0.76 (0.56-0.95)	
1211: Supervisors, general office and administrative support workers	55	2	3.6	100.0	0.0	0.0	0.76 (0.56-0.95)	
1215: Supervisors, supply chain, tracking and scheduling coordination occupations	97	8	8.2	75.0	25.0	0.0	0.80 (0.64-0.99)	
1224: Property administrators	42	6	14.3	33.3	66.7	0.0	0.90 (0.73-1.09)	
1225: Purchasing agents and officers	31	1	3.2	100.0	0.0	0.0	0.76 (0.56-0.95)	
1241: Administrative assistants	663	2	0.3	100.0	0.0	0.0	0.76 (0.56-0.95)	1.11 (0.70-1.77)

NOC 2011 occupation code and title	CANJEM cell estimates, period 1930-2005						Predicted wood dust GM (90%CI) for year 1989 (mg/m <sup>3</sup> ) <sup>d</sup>	
	N <sup>a</sup>	Nexp <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
1411: General office support workers	790	4	0.5	100.0	0.0	0.0	0.76 (0.56-0.95)	
1414: Receptionists	316	1	0.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
1423: Desktop publishing operators and related occupations	21	1	4.8	0.0	100.0	0.0	0.97 (0.77-1.27)	
1431: Accounting and related clerks	551	6	1.1	100.0	0.0	0.0	0.76 (0.56-0.95)	
1432: Payroll clerks	48	1	2.1	100.0	0.0	0.0	0.76 (0.56-0.95)	
1512: Letter carriers	60	1	1.7	100.0	0.0	0.0	0.76 (0.56-0.95)	
1513: Couriers, messengers and door-to-door distributors	185	4	2.2	100.0	0.0	0.0	0.76 (0.56-0.95)	
1521: Shippers and receivers	304	11	3.6	81.8	9.1	9.1	0.84 (0.66-1.02)	
1522: Storekeepers and partspersons	188	7	3.7	57.1	28.6	14.3	0.92 (0.77-1.08)	
1523: Production logistics co-ordinators	70	2	2.9	50.0	50.0	0.0	0.86 (0.71-1.03)	
2122: Forestry professionals	3	1	33.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
2123: Agricultural representatives, consultants and specialists	6	1	16.7	0.0	100.0	0.0	0.97 (0.77-1.27)	
2131: Civil engineers	74	3	4.1	100.0	0.0	0.0	0.76 (0.56-0.95)	
2141: Industrial and manufacturing engineers	43	1	2.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
2151: Architects	25	1	4.0	100.0	0.0	0.0	0.76 (0.56-0.95)	
2154: Land surveyors	40	2	5.0	50.0	50.0	0.0	0.86 (0.71-1.03)	
2211: Chemical technologists and technicians	43	1	2.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
2223: Forestry technologists and technicians	11	5	45.5	80.0	20.0	0.0	0.79 (0.63-0.98)	
2231: Civil engineering technologists and technicians	10	2	20.0	50.0	50.0	0.0	0.86 (0.71-1.03)	
2232: Mechanical engineering technologists and technicians	28	2	7.1	0.0	100.0	0.0	0.97 (0.77-1.27)	
2233: Industrial engineering and manufacturing technologists and technicians	39	1	2.6	100.0	0.0	0.0	0.76 (0.56-0.95)	
2241: Electrical and electronics engineering technologists and technicians	58	3	5.2	100.0	0.0	0.0	0.76 (0.56-0.95)	
2242: Electronic service technicians (household and business equipment)	59	4	6.8	75.0	25.0	0.0	0.80 (0.64-0.99)	



NOC 2011 occupation code and title	CANJEM cell estimates, period 1930-2005						Predicted wood dust GM (90%CI) for year 1989 (mg/m <sup>3</sup> ) <sup>d</sup>	
	N <sup>a</sup>	Nexp <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
2252: Industrial designers	21	4	19.0	75.0	25.0	0.0	0.80 (0.64-0.99)	0.48 (0.32-0.70)
2262: Engineering inspectors and regulatory officers	15	2	13.3	50.0	50.0	0.0	0.86 (0.71-1.03)	
2263: Inspectors in public and environmental health and occupational health and safety	21	1	4.8	0.0	100.0	0.0	0.97 (0.77-1.27)	
2264: Construction inspectors	19	1	5.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
4021: College and other vocational instructors	142	9	6.3	11.1	66.7	22.2	1.08 (0.92-1.31)	0.79 (0.63-0.98)
4031: Secondary school teachers	257	6	2.3	83.3	16.7	0.0	0.79 (0.62-0.97)	0.90 (0.75-1.07)
4032: Elementary school and kindergarten teachers	276	1	0.4	100.0	0.0	0.0	0.76 (0.56-0.95)	
4154: Professional occupations in religion	47	1	2.1	0.0	100.0	0.0	0.97 (0.77-1.27)	
4163: Business development officers and marketing researchers and consultants	24	1	4.2	100.0	0.0	0.0	0.76 (0.56-0.95)	
4311: Police officers (except commissioned)	112	1	0.9	0.0	100.0	0.0	0.97 (0.77-1.27)	
4313: Non-commissioned ranks of the Canadian Forces	712	1	0.1	100.0	0.0	0.0	0.76 (0.56-0.95)	
4422: Correctional service officers	21	1	4.8	0.0	100.0	0.0	0.97 (0.77-1.27)	
4423: By-law enforcement and other regulatory officers, n.e.c.	14	1	7.1	0.0	100.0	0.0	0.97 (0.77-1.27)	
5136: Painters, sculptors and other visual artists	17	3	17.6	33.3	66.7	0.0	0.90 (0.73-1.09)	
5212: Technical occupations related to museums and art galleries	2	1	50.0	0.0	100.0	0.0	0.97 (0.77-1.27)	
5223: Graphic arts technicians	6	2	33.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
5227: Support occupations in motion pictures, broadcasting, photography and the performing arts	9	1	11.1	0.0	100.0	0.0	0.97 (0.77-1.27)	
5242: Interior designers and interior decorators	9	3	33.3	33.3	33.3	33.3	1.09 (0.93-1.29)	
5243: Theatre, fashion, exhibit and other creative designers	29	5	17.2	20.0	80.0	0.0	0.93 (0.75-1.15)	
5244: Artisans and craftspersons	32	4	12.5	25.0	75.0	0.0	0.92 (0.74-1.12)	
6221: Technical sales specialists - wholesale trade	254	4	1.6	75.0	25.0	0.0	0.80 (0.64-0.99)	

NOC 2011 occupation code and title	CANJEM cell estimates, period 1930-2005						Predicted wood dust GM (90%CI) for year 1989 (mg/m <sup>3</sup> ) <sup>d</sup>	
	N <sup>a</sup>	Nexp <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
6322: Cooks	306	3	1.0	66.7	33.3	0.0	0.82 (0.66-1.00)	
6331: Butchers, meat cutters and fishmongers - retail and wholesale	102	38	37.3	86.8	13.2	0.0	0.78 (0.60-0.97)	
6342: Tailors, dressmakers, furriers and milliners	204	6	2.9	50.0	50.0	0.0	0.86 (0.71-1.03)	
6343: Shoe repairers and shoemakers	147	14	9.5	50.0	42.9	7.1	0.90 (0.75-1.06)	
6344: Jewellers, jewellery and watch repairers and related occupations	66	1	1.5	100.0	0.0	0.0	0.76 (0.56-0.95)	
6345: Upholsterers	37	18	48.6	50.0	50.0	0.0	0.86 (0.71-1.03)	
6346: Funeral directors and embalmers	3	1	33.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
6411: Sales and account representatives - wholesale trade (non-technical)	408	3	0.7	33.3	66.7	0.0	0.90 (0.73-1.09)	
6421: Retail salespersons	876	15	1.7	66.7	33.3	0.0	0.82 (0.66-1.00)	
6541: Security guards and related security service occupations	383	1	0.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
6552: Other customer and information services representatives	60	2	3.3	50.0	50.0	0.0	0.86 (0.71-1.03)	
6611: Cashiers	161	1	0.6	100.0	0.0	0.0	0.76 (0.56-0.95)	
6622: Store shelf stockers, clerks and order fillers	66	6	9.1	100.0	0.0	0.0	0.76 (0.56-0.95)	
6623: Other sales related occupations	127	2	1.6	50.0	50.0	0.0	0.86 (0.71-1.03)	
6711: Food counter attendants, kitchen helpers and related support occupations	346	4	1.2	100.0	0.0	0.0	0.76 (0.56-0.95)	
6722: Operators and attendants in amusement, recreation and sport	26	1	3.8	0.0	100.0	0.0	0.97 (0.77-1.27)	
6731: Light duty cleaners	532	9	1.7	22.2	66.7	11.1	0.99 (0.83-1.18)	
6732: Specialized cleaners	89	3	3.4	100.0	0.0	0.0	0.76 (0.56-0.95)	
6733: Janitors, caretakers and building superintendents	347	55	15.9	34.5	58.2	7.3	0.93 (0.78-1.11)	1.25 (1.03-1.52)

NOC 2011 occupation code and title	CANJEM cell estimates, period 1930-2005						Predicted wood dust GM (90%CI) for year 1989 (mg/m <sup>3</sup> ) <sup>d</sup>	
	N <sup>a</sup>	Nexp <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
7201: Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	56	3	5.4	66.7	33.3	0.0	0.82 (0.66-1.00)	
7202: Contractors and supervisors, electrical trades and telecommunications occupations	41	8	19.5	75.0	25.0	0.0	0.80 (0.64-0.99)	
7203: Contractors and supervisors, pipefitting trades	16	1	6.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
7204: Contractors and supervisors, carpentry trades	21	17	81.0	35.3	58.8	5.9	0.92 (0.77-1.10)	
7205: Contractors and supervisors, other construction trades, installers, repairers and servicers	51	19	37.3	57.9	42.1	0.0	0.84 (0.69-1.02)	
7231: Machinists and machining and tooling inspectors	195	2	1.0	0.0	100.0	0.0	0.97 (0.77-1.27)	0.62 (0.41-0.94)
7232: Tool and die makers	64	5	7.8	40.0	20.0	40.0	1.12 (0.94-1.34)	1.77 (1.13-2.81)
7233: Sheet metal workers	112	12	10.7	41.7	58.3	0.0	0.88 (0.72-1.06)	
7235: Structural metal and platework fabricators and fitters	32	4	12.5	25.0	75.0	0.0	0.92 (0.74-1.12)	
7236: Ironworkers	46	6	13.0	66.7	33.3	0.0	0.82 (0.66-1.00)	
7237: Welders and related machine operators	260	3	1.2	100.0	0.0	0.0	0.76 (0.56-0.95)	
7241: Electricians (except industrial and power system)	124	71	57.3	66.2	33.8	0.0	0.82 (0.67-1.00)	
7242: Industrial electricians	76	8	10.5	62.5	37.5	0.0	0.83 (0.68-1.01)	0.63 (0.39-1.01)
7244: Electrical power line and cable workers	40	1	2.5	100.0	0.0	0.0	0.76 (0.56-0.95)	
7245: Telecommunications line and cable workers	12	2	16.7	100.0	0.0	0.0	0.76 (0.56-0.95)	
7246: Telecommunications installation and repair workers	38	4	10.5	100.0	0.0	0.0	0.76 (0.56-0.95)	
7247: Cable television service and maintenance technicians	1	1	100.0	100.0	0.0	0.0	0.76 (0.56-0.95)	
7251: Plumbers	101	26	25.7	88.5	11.5	0.0	0.78 (0.60-0.97)	
7252: Steamfitters, pipefitters and sprinkler system installers	97	10	10.3	70.0	30.0	0.0	0.81 (0.66-0.99)	
7271: Carpenters	343	320	93.3	15.0	78.8	6.3	0.98 (0.80-1.20)	1.28 (1.04-1.57)
7272: Cabinetmakers	105	102	97.1	3.9	36.3	59.8	1.38 (1.11-1.78)	1.71 (1.50-1.95)
7281: Bricklayers	105	11	10.5	81.8	18.2	0.0	0.79 (0.62-0.98)	
7282: Concrete finishers	39	8	20.5	62.5	37.5	0.0	0.83 (0.68-1.01)	

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	N <sup>a</sup>	N <sub>exp</sub> <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
7283: Tilesetters	16	5	31.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
7284: Plasterers, drywall installers and finishers and lathers	47	12	25.5	58.3	41.7	0.0	0.84 (0.69-1.02)	
7291: Roofers and shinglers	38	11	28.9	81.8	18.2	0.0	0.79 (0.62-0.98)	
7292: Glaziers	11	6	54.5	50.0	50.0	0.0	0.86 (0.71-1.03)	
7293: Insulators	23	6	26.1	83.3	16.7	0.0	0.79 (0.62-0.97)	
7294: Painters and decorators (except interior decorators)	193	63	32.6	20.6	77.8	1.6	0.94 (0.76-1.15)	
7295: Floor covering installers	25	5	20.0	20.0	0.0	80.0	1.49 (1.11-2.10)	
7301: Contractors and supervisors, mechanic trades	84	2	2.4	50.0	50.0	0.0	0.86 (0.71-1.03)	
7305: Supervisors, motor transport and other ground transit operators	25	1	4.0	0.0	100.0	0.0	0.97 (0.77-1.27)	
7311: Construction millwrights and industrial mechanics	169	10	5.9	40.0	60.0	0.0	0.88 (0.72-1.06)	0.80 (0.58-1.09)
7312: Heavy-duty equipment mechanics	61	4	6.6	25.0	50.0	25.0	1.06 (0.91-1.25)	
7313: Refrigeration and air conditioning mechanics	19	2	10.5	50.0	50.0	0.0	0.86 (0.71-1.03)	
7314: Railway carmen/women	66	22	33.3	22.7	54.5	22.7	1.06 (0.90-1.25)	
7315: Aircraft mechanics and aircraft inspectors	115	2	1.7	50.0	50.0	0.0	0.86 (0.71-1.03)	
7316: Machine fitters	30	2	6.7	50.0	50.0	0.0	0.86 (0.71-1.03)	
7321: Automotive service technicians, truck and bus mechanics and mechanical repairers	295	2	0.7	100.0	0.0	0.0	0.76 (0.56-0.95)	1.33 (0.84-2.16)
7322: Motor vehicle body repairers	97	3	3.1	66.7	33.3	0.0	0.82 (0.66-1.00)	
7331: Oil and solid fuel heating mechanics	11	3	27.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
7332: Appliance servicers and repairers	19	1	5.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
7333: Electrical mechanics	19	1	5.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
7371: Crane operators	77	3	3.9	100.0	0.0	0.0	0.76 (0.56-0.95)	
7372: Drillers and blasters - surface mining, quarrying and construction	45	1	2.2	100.0	0.0	0.0	0.76 (0.56-0.95)	
7381: Printing press operators	106	2	1.9	0.0	50.0	50.0	1.32 (1.08-1.65)	

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	N <sup>a</sup>	Nexp <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
7384: Other trades and related occupations, n.e.c.	13	4	30.8	50.0	50.0	0.0	0.86 (0.71-1.03)	0.74 (0.45-1.22)
7441: Residential and commercial installers and servicers	51	29	56.9	24.1	27.6	48.3	1.23 (1.02-1.50)	
7445: Other repairers and servicers	25	1	4.0	0.0	100.0	0.0	0.97 (0.77-1.27)	
7451: Longshore workers	87	14	16.1	21.4	71.4	7.1	0.97 (0.80-1.17)	
7452: Material handlers	743	56	7.5	66.1	28.6	5.4	0.85 (0.69-1.02)	0.68 (0.55-0.84)
7511: Transport truck drivers	784	54	6.9	63.0	31.5	5.6	0.86 (0.71-1.03)	
7514: Delivery and courier service drivers	499	12	2.4	66.7	33.3	0.0	0.82 (0.66-1.00)	
7521: Heavy equipment operators (except crane)	119	3	2.5	33.3	66.7	0.0	0.90 (0.73-1.09)	0.54 (0.36-0.81)
7522: Public works maintenance equipment operators and related workers	36	1	2.8	100.0	0.0	0.0	0.76 (0.56-0.95)	
7531: Railway yard and track maintenance workers	60	4	6.7	100.0	0.0	0.0	0.76 (0.56-0.95)	
7532: Water transport deck and engine room crew	114	3	2.6	33.3	66.7	0.0	0.90 (0.73-1.09)	
7611: Construction trades helpers and labourers	488	288	59.0	50.0	48.6	1.4	0.87 (0.71-1.04)	0.64 (0.50-0.83)
7612: Other trades helpers and labourers	31	2	6.5	0.0	100.0	0.0	0.97 (0.77-1.27)	1.22 (0.75-2.03)
7621: Public works and maintenance labourers	53	7	13.2	28.6	71.4	0.0	0.91 (0.74-1.11)	
7622: Railway and motor transport labourers	17	1	5.9	100.0	0.0	0.0	0.76 (0.56-0.95)	
8211: Supervisors, logging and forestry	5	3	60.0	66.7	33.3	0.0	0.82 (0.66-1.00)	
8255: Contractors and supervisors, landscaping, grounds maintenance and horticulture services	15	1	6.7	0.0	100.0	0.0	0.97 (0.77-1.27)	
8421: Chain saw and skidder operators	272	259	95.2	52.1	46.7	1.2	0.86 (0.71-1.03)	1.96 (1.24-3.17)
8422: Silviculture and forestry workers	9	4	44.4	75.0	25.0	0.0	0.80 (0.64-0.99)	
8431: General farm workers	596	77	12.9	53.2	42.9	3.9	0.87 (0.72-1.04)	
8432: Nursery and greenhouse workers	13	1	7.7	0.0	100.0	0.0	0.97 (0.77-1.27)	
8612: Landscaping and grounds maintenance labourers	87	7	8.0	14.3	85.7	0.0	0.94 (0.76-1.18)	
8614: Mine labourers	65	4	6.2	25.0	75.0	0.0	0.92 (0.74-1.12)	

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	N <sup>a</sup>	Nexp <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
8616: Logging and forestry labourers	25	13	52.0	84.6	15.4	0.0	0.78 (0.61-0.97)	
9212: Supervisors, petroleum, gas and chemical processing and utilities	28	3	10.7	100.0	0.0	0.0	0.76 (0.56-0.95)	
9214: Supervisors, plastic and rubber products manufacturing	15	2	13.3	50.0	50.0	0.0	0.86 (0.71-1.03)	
9215: Supervisors, forest products processing	9	5	55.6	80.0	0.0	20.0	0.90 (0.71-1.09)	
9217: Supervisors, textile, fabric, fur and leather products processing and manufacturing	111	7	6.3	28.6	57.1	14.3	0.99 (0.84-1.17)	
9222: Supervisors, electronics manufacturing	12	1	8.3	100.0	0.0	0.0	0.76 (0.56-0.95)	
9224: Supervisors, furniture and fixtures manufacturing	24	21	87.5	23.8	38.1	38.1	1.15 (0.98-1.38)	1.48 (0.96-2.30)
9227: Supervisors, other products manufacturing and assembly	16	1	6.3	0.0	0.0	100.0	1.77 (1.23-2.73)	1.58 (0.95-2.62)
9241: Power engineers and power systems operators	107	5	4.7	40.0	40.0	20.0	0.99 (0.85-1.16)	
9411: Machine operators, mineral and metal processing	37	1	2.7	0.0	100.0	0.0	0.97 (0.77-1.27)	
9412: Foundry workers	79	2	2.5	100.0	0.0	0.0	0.76 (0.56-0.95)	
9414: Concrete, clay and stone forming operators	50	1	2.0	0.0	100.0	0.0	0.97 (0.77-1.27)	
9416: Metalworking and forging machine operators	149	2	1.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
9417: Machining tool operators	175	2	1.1	50.0	50.0	0.0	0.86 (0.71-1.03)	
9421: Chemical plant machine operators	98	5	5.1	0.0	100.0	0.0	0.97 (0.77-1.27)	
9422: Plastics processing machine operators	26	2	7.7	0.0	50.0	50.0	1.32 (1.08-1.65)	
9431: Sawmill machine operators	10	10	100.0	10.0	10.0	80.0	1.53 (1.15-2.15)	0.91 (0.83-0.99)
9432: Pulp mill machine operators	5	2	40.0	100.0	0.0	0.0	0.76 (0.56-0.95)	
9433: Papermaking and finishing machine operators	12	2	16.7	50.0	50.0	0.0	0.86 (0.71-1.03)	
9434: Other wood processing machine operators	13	8	61.5	37.5	50.0	12.5	0.96 (0.81-1.13)	0.73 (0.66-0.82)
9435: Paper converting machine operators	68	3	4.4	100.0	0.0	0.0	0.76 (0.56-0.95)	
9436: Lumber graders and other wood processing inspectors and graders	11	10	90.9	60.0	20.0	20.0	0.94 (0.79-1.12)	0.54 (0.43-0.66)

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	N <sup>a</sup>	N <sub>exp</sub> <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
9437: Woodworking machine operators	57	54	94.7	5.6	24.1	70.4	1.47 (1.14-1.97)	1.58 (1.47-1.70)
9441: Textile fibre and yarn, hide and pelt processing machine operators and workers	143	12	8.4	41.7	50.0	8.3	0.92 (0.78-1.09)	
9445: Fabric, fur and leather cutters	117	3	2.6	66.7	33.3	0.0	0.82 (0.66-1.00)	
9446: Industrial sewing machine operators	680	1	0.1	100.0	0.0	0.0	0.76 (0.56-0.95)	
9447: Inspectors and graders, textile, fabric, fur and leather products manufacturing	41	1	2.4	100.0	0.0	0.0	0.76 (0.56-0.95)	
9461: Process control and machine operators, food, beverage and associated products processing	173	4	2.3	25.0	50.0	25.0	1.06 (0.91-1.25)	
9462: Industrial butchers and meat cutters, poultry preparers and related workers	100	21	21.0	95.2	4.8	0.0	0.77 (0.58-0.96)	
9471: Plateless printing equipment operators	20	1	5.0	100.0	0.0	0.0	0.76 (0.56-0.95)	
9472: Camera, platemaking and other prepress occupations	26	1	3.8	100.0	0.0	0.0	0.76 (0.56-0.95)	
9474: Photographic and film processors	23	1	4.3	0.0	0.0	100.0	1.77 (1.23-2.73)	
9523: Electronics assemblers, fabricators, inspectors and testers	62	2	3.2	50.0	50.0	0.0	0.86 (0.71-1.03)	
9524: Assemblers and inspectors, electrical appliance, apparatus and equipment manufacturing	60	2	3.3	50.0	50.0	0.0	0.86 (0.71-1.03)	
9526: Mechanical assemblers and inspectors	22	5	22.7	40.0	60.0	0.0	0.88 (0.72-1.06)	
9532: Furniture and fixture assemblers and inspectors	45	34	75.6	32.4	32.4	35.3	1.11 (0.94-1.31)	1.47 (1.24-1.75)
9533: Other wood products assemblers and inspectors	19	19	100.0	5.3	42.1	52.6	1.32 (1.08-1.65)	1.24 (1.04-1.48)
9534: Furniture finishers and refinishers	9	7	77.8	14.3	57.1	28.6	1.12 (0.95-1.33)	1.77 (1.31-2.40)
9535: Plastic products assemblers, finishers and inspectors	16	1	6.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
9536: Industrial painters, coaters and metal finishing process operators	107	8	7.5	25.0	75.0	0.0	0.92 (0.74-1.12)	0.84 (0.56-1.27)
9537: Other products assemblers, finishers and inspectors	158	13	8.2	53.8	30.8	15.4	0.93 (0.79-1.10)	

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	N <sup>a</sup>	N <sub>exp</sub> <sup>b</sup>	P <sup>c</sup> (%)	Relative percentage of exposed jobs by rating			Ratings only	Combined ratings and random effect
				Low (%)	Med (%)	High (%)		
9611: Labourers in mineral and metal processing	93	6	6.5	50.0	50.0	0.0	0.86 (0.71-1.03)	
9612: Labourers in metal fabrication	162	6	3.7	66.7	16.7	16.7	0.91 (0.75-1.08)	1.02 (0.69-1.50)
9614: Labourers in wood, pulp and paper processing	63	54	85.7	22.2	50.0	27.8	1.09 (0.93-1.29)	0.75 (0.66-0.84)
9615: Labourers in rubber and plastic products manufacturing	12	1	8.3	0.0	100.0	0.0	0.97 (0.77-1.27)	
9617: Labourers in food, beverage and associated products processing	122	2	1.6	100.0	0.0	0.0	0.76 (0.56-0.95)	
9619: Other labourers in processing, manufacturing and utilities	425	26	6.1	38.5	26.9	34.6	1.09 (0.92-1.29)	1.61 (1.31-1.97)

<sup>a</sup>Total number of jobs evaluated

<sup>b</sup>Number of jobs exposed to wood dust

<sup>c</sup>Probability of exposure to wood dust

<sup>d</sup>Predicted GM and 90% interval for the year 1989, a sampling duration of 480 minutes, personal sample type, relative proportion of measurements in each province, and the relative proportion of exposed jobs by intensity rating in the cell



## Supplementary File S1. JAGS program used to fit the main model

```
# JAGS program used for the main analysis
# Model defined by
# - Occupations (4-digit NOC codes) as random effects (n=31)
# - CANJEM rating as proportion of jobs
#   at medium and proportion of jobs at high
#   with constraint on low/medium/high
# - Other predictors:
#   1) sample year, 2) sample duration,
#   3) personal sample type, 4) Province = Ontario

model{

# A) Priors

# 1) Intercept
alpha ~ dnorm(0, 0.0001)
# 2) Coefficients for fixed effects except intensity (nbeta=5)
for(i in 1:nbeta) {beta[i] ~ dnorm(0, 0.1756)}

# 3) Coefficients for intensity levels with constraint
# Folded normal distributions
for(i in 1:2){beta.C0[i] ~ dnorm(0, 0.02145)T(0,)}
# Sort to put constraint low < medium < high
beta.C[1:2] <- sort(beta.C0)

# 4) Occupation means
for(i in 1:n.noc){
mu.noc[i] ~ dnorm(0, tau.noc)
}

# 5) Residual SD
tau <- pow(sigma, -2)
sigma ~ dunif(0, 10)

# 6) Between-occupation SD
sigma.noc ~ dunif(0, 10)
tau.noc <- pow(sigma.noc, -2)

# B) Likelihood
for(i in 1:n){
# For measurements under LOD
isAboveLOD[i] ~ dinterval(logconc[i], loglod[i])
}
```

```

    # Likelihood
    logconc[i] ~ dnorm(mu[i], tau)
    mu[i] <- alpha + mu.noc[vec.noc[i]] + inprod(beta, modmat[i,]) +
inprod(beta.C, modmat.C[i,])
  }
# Where
# modmat = design matrix for predictors except occupation and CANJEM rating
# modmat.C = design matrix for CANJEM ratings
# (proportion of jobs at medium and proportion at high)
# vec.noc = index of occupations

# C) Predictions
# 1) For 100% of jobs by intensity rating, duration of 480 minutes
for(i in 1:3){
  pred.C480[i] <- exp(alpha + inprod(beta, Cpredmat480[i,]) + inprod(beta.C,
Cpredmat.C[i,]))
}
# Where Cpredmat = prediction matrix (except occupation and CANJEM rating)
# Cpredmat.C = prediction matrix for CANJEM rating

# 2) For occupations, duration of 480 minutes
for(i in 1:n.noc){
  pred.noc480[i] <- exp(alpha + mu.noc[predmat.noc[i]] + inprod(beta,
predmat480[i,]) + inprod(beta.C, predmat.C[i,]))
}
# Where
# n.noc = 31 occupations
# predmat = prediction matrix (except occupation and CANJEM rating)
# predmat.C = prediction matrix for CANJEM rating
# (proportion of jobs at medium and high levels in cell)
# predmat.noc = index of occupation code

# 3) For all cells with P>0% in CANJEM, based on
# proportions of jobs at low, medium and high
# n.nocAll = 198 occupations
# predmatAll480 = prediction matrix (excluding CANJEM ratings)
# predmatAll.C = prediction matrix for CANJEM rating of occupations
for(i in 1:n.nocAll){
  pred.nocAll480[i] <- exp(alpha + inprod(beta, predmatAll480[i,]) +
inprod(beta.C, predmatAll.C[i,]))
}
}

```