

Supplementary (online only) data for:

Exposure-response relationships for select cancer and non-cancer health outcomes in a cohort of U.S. firefighters from San Francisco, Chicago and Philadelphia (1950-2009)

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Table S1. Outcomes of interest

Underlying cause or cancer diagnosis	ICD-10 codes	Cases (<i>n</i>)	
		mortality	incidence
All cancers	C00-C97 D09.0*	1333	2609
MN colorectal	C18-C20	144	289
MN esophagus	C15	61	54
MN lung	C33-C34	429	382
MN prostate	C61	85	832
MN bladder	C67, C68, D09.0*	NA	174
NHL	C82-C85, C88.0, C88.3, C91.4, C96	53	92
Leukemia and aleukemia	C91.0-C91.3, C91.5-C91.9, C92-C95	52	58
IHD	I20-I22, I24-I25, I51.3, I51.6	914	NA
CeVD	G45.0-G45.2, G45.4-G45.9, I60-I69	124	NA
COPD	J40-J44	130	NA
Cirrhosis (alcohol related)	K70, K74-K76, (excl. K75.4, K76.0)	99	NA

* includes *in situ* bladder tumors, D09.0, in incidence analysis only.

CeVD, cerebrovascular disease; COPD, chronic obstructive pulmonary disease; International Classification of Diseases, ICD; IHD, ischemic heart disease; MN, malignancy; NHL, non-Hodgkin lymphoma.

Table S2. Hazard ratios (HRs) at time since exposure (TSE)*

Underlying cause of death	Base model HR @ 4600 runs	Exposure windows for TSE (HR @ 4600 fire-runs)			LRT p-value [†]
		lag to lag+10 years	lag+10 to lag+20 years	>lag+20 years	
All cancers	0.95 (0.89 to 1.01)	0.93 (0.78 to 1.09)	1.00 (0.87 to 1.15)	0.90 (0.79 to 1.02)	0.622
MN colorectal	0.69 (0.55 to 0.86)	0.68 (0.38 to 1.18)	0.85 (0.53 to 1.34)	0.53 (0.32 to 0.83)	0.408
MN esophagus	0.99 (0.73 to 1.32)	0.88 (0.38 to 1.88)	1.25 (0.65 to 2.24)	0.80 (0.40 to 1.44)	0.675
MN lung	1.07 (0.97 to 1.19)	1.06 (0.80 to 1.37)	1.08 (0.86 to 1.34)	1.08 (0.88 to 1.32)	0.987
MN prostate	0.73 (0.55 to 0.94)	0.60 (0.21 to 1.53)	0.68 (0.35 to 1.23)	0.80 (0.52 to 1.18)	0.807
NHL	0.78 (0.55 to 1.07)	0.92 (0.29 to 2.50)	0.77 (0.30 to 1.75)	0.75 (0.43 to 1.20)	0.935
Leukemia	1.08 (0.78 to 1.44)	1.51 (0.65 to 3.21)	1.52 (0.71 to 2.93)	0.70 (0.38 to 1.19)	0.123
IHD	0.92 (0.85 to 1.00)	0.83 (0.68 to 1.01)	0.88 (0.73 to 1.06)	1.05 (0.90 to 1.22)	0.12
CeVD	0.87 (0.69 to 1.08)	1.10 (0.63 to 1.84)	0.89 (0.53 to 1.43)	0.71 (0.45 to 1.07)	0.394
Cirrhosis	0.80 (0.60 to 1.04)	0.92 (0.53 to 1.53)	0.71 (0.39 to 1.23)	0.77 (0.38 to 1.41)	0.834
COPD	0.95 (0.78 to 1.15)	0.62 (0.29 to 1.26)	1.21 (0.76 to 1.87)	0.91 (0.64 to 1.24)	0.426

* All temporal models are piecewise loglinear adjusted for race, fire department, and birth cohort. The exposure lag used for NHL and leukemia was 5 years; all others lagged 10 years.

[†]p- value of likelihood ratio test comparing the base model to the model with two or more exposure windows.

CeVD, cerebrovascular disease; COPD, chronic obstructive pulmonary disease; HR, hazard ratio; IHD, ischemic heart disease; LRT, likelihood ratio test; MN, malignant neoplasm; NHL, non-Hodgkin lymphoma

Table S3. Hazard ratios (HRs) for temporal factors age at exposure (AE) and exposure period (EP)*

Underlying cause of death	Base model HR @ 4600 runs	Exposure windows for AE (HR @ fire-4600 runs)			Exposure windows for EP (HR @ 4600 runs)		
		<40 years	40+ years	LRT p-value	<1970	1970+	LRT p-value [†]
All cancers	0.95 (0.89 to 1.01)	0.96 (0.86 to 1.07)	0.94 (0.84 to 1.04)	0.797	0.94 (0.83 to 1.06)	0.95 (0.87 to 1.03)	0.915
MN colorectal	0.69 (0.55 to 0.86)	0.67 (0.45 to 0.99)	0.70 (0.49 to 0.98)	0.885	0.70 (0.45 to 1.05)	0.69 (0.50 to 0.92)	0.94
MN esophagus	0.99 (0.73 to 1.32)	1.23 (0.76 to 1.90)	0.77 (0.44 to 1.29)	0.253	1.51 (0.86 to 2.47)	0.79 (0.52 to 1.17)	0.083
MN lung	1.07 (0.97 to 1.19)	0.97 (0.81 to 1.16)	1.17 (0.99 to 1.37)	0.194	1.06 (0.87 to 1.29)	1.08 (0.94 to 1.24)	0.922
MN prostate	0.73 (0.55 to 0.94)	0.72 (0.42 to 1.16)	0.73 (0.50 to 1.04)	0.953	0.91 (0.55 to 1.44)	0.63 (0.43 to 0.91)	0.299
NHL	0.78 (0.55 to 1.07)	0.88 (0.49 to 1.47)	0.70 (0.40 to 1.16)	0.601	0.49 (0.21 to 1.00)	0.92 (0.61 to 1.35)	0.157
Leukemia	1.08 (0.78 to 1.44)	0.95 (0.52 to 1.62)	1.19 (0.73 to 1.85)	0.598	0.95 (0.48 to 1.72)	1.14 (0.76 to 1.66)	0.652
IHD	0.92 (0.85 to 1.00)	0.93 (0.81 to 1.07)	0.92 (0.80 to 1.04)	0.886	1.01 (0.87 to 1.17)	0.87 (0.78 to 0.98)	0.15
Stroke	0.87 (0.69 to 1.08)	0.79 (0.52 to 1.17)	0.93 (0.66 to 1.27)	0.592	1.07 (0.71 to 1.54)	0.76 (0.55 to 1.03)	0.222
Cirrhosis	0.80 (0.60 to 1.04)	0.65 (0.42 to 0.97)	1.07 (0.64 to 1.70)	0.174	0.85 (0.49 to 1.38)	0.78 (0.55 to 1.07)	0.798
COPD	0.95 (0.78 to 1.15)	0.84 (0.57 to 1.22)	1.03 (0.77 to 1.35)	0.459	1.06 (0.72 to 1.53)	0.89 (0.67 to 1.17)	0.513

* All temporal models are piecewise loglinear adjusted for race, fire department, and birth cohort. The exposure lag used for NHL and leukemia was 5 years; all others lagged 10 years

[†]p- value of likelihood ratio test comparing the base model to the model with two or more exposure windows..

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