

# Findings from the Career Firefighter Health Study

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FDNY World Trade Center Health Program (WTCHP)

Albert Einstein College of Medicine

International Association of Fire Fighters (IAFF)

Labor & Management from:

Chicago

FDNY

Philadelphia

San Francisco

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Assembling the Career Firefighter Health Study cohort: A methods overview.  
Am J Ind Med. 2021



# Career Firefighter Health Study

- Original NIOSH cohort of 29,992 professional firefighters employed any time between 1950-2009 from the San Francisco (5,313), Chicago (15,184), and Philadelphia (9,495) fire departments.
  - Originally assembled by NIOSH to study cancer and mortality. (Daniels RD et al., *Occup Environ Med*, 2014)
- Now includes FDNY firefighters
  - 13,833 WTC-exposed
  - Will soon add ~10,000 non-WTC exposed
- Totals over 50,000 firefighters
- Linkages (State tumor registries, National Death Index Registry)
- Web-based survey for health characteristics & self-reported diseases



# Career Firefighter Health Study Cancer Results

- Updates original NIOSH study and adds FDNY WTC firefighters
- Adds a Web-based survey for firefighters to report health characteristics and self-report health conditions
- Focused on cancers diagnosed between 9/11/2001-12/31/2016 in male firefighters who were actively employed on 9/11/2001.
- Received confirmed cancer data from 15 state tumor registries
- Compared cancer rates in WTC-exposed and non-WTC-exposed firefighters with cancer in similar US males
  - Standardized Incidence Ratios (SIRs) presented: Observed number of cancer cases in the firefighter population vs. number of cases *expected* based on the US male cancer rates.

*Cancer Incidence in World Trade Center-Exposed and Non-Exposed Male Firefighters, as Compared with the US Adult Male Population: 2001 – 2016. Occup Environ Med, 2021*



# Career Firefighter Health Study Cancer Results

## Standardized Incidence Ratios (SIRs) of cancers in male WTC-exposed and non-WTC-exposed firefighters vs. US males

Site	WTC-exposed FDNY			Non-WTC-exposed (SFFD + CFD + PFD)		
	Observed case count	SIR	95% CI	Observed case count	SIR	95% CI
All cancer sites <sup>ab</sup>	915	1.15	(1.08-1.23)	1,002	1.05	(0.98-1.12)
Prostate	332	1.70	(1.53-1.88)	358	1.22	(1.11-1.35)
Lung	44	0.53	(0.39-0.72)	83	0.71	(0.57-0.89)
Kidney	39	0.93	(0.67-1.28)	55	1.19	(0.90-1.56)
Non-Hodgkin Lymphoma	55	1.39	(1.06-1.83)	43	1.04	(0.77-1.41)
Melanoma (skin)	96	1.59	(1.30-1.96)	70	1.39	(1.07-1.79)
Thyroid	46	2.37	(1.78-3.17)	15	1.01	(0.61-1.67)

<sup>a</sup>All malignant cancers (multiple primaries), and in situ bladder cancers;

<sup>b</sup>Excludes non-melanoma skin cancers



# Summary - Cancer

- WTC-exposed FDNY firefighters had a higher than expected (15%) number of cancers diagnosed between 9/11/2001-12/31/2016, when compared with similar US males.
  - Site-specific cancers there were statistically elevated include:
    - Thyroid, Prostate, Melanoma, and Non-Hodgkin Lymphoma
    - LOWER rates for lung cancer
- The number of cancers diagnosed in non-WTC exposed firefighters (SFFD, CFD, PFD) when compared with similar US males during this same time period were closer to what would be expected given US male cancer rates.
  - Site-specific cancers there were statistically elevated include:
    - Melanoma and Prostate



# Findings from the Career Firefighter Health Study

## LUNG DISEASES: Web-based survey -

- Self-reported obstructive airway diseases (asthma, COPD=emphysema + chronic bronchitis)
  - All firefighters higher rates than US population (NHIS).
  - WTC-exposed firefighters higher rates than non-exposed firefighters
- Compared with the US population, non-WTC-exposed firefighters were less likely to report asthma, but more likely to report COPD.

	All firefighters vs. NHIS		WTC-exposed <sup>1</sup> vs. NHIS		Non-exposed <sup>2</sup> vs. NHIS	
	OR	95% CI	OR	95% CI	OR	95% CI
All OAD	5.42	5.03, 5.85	7.7	7.12, 8.34	1.71	1.53, 1.91
Asthma	3.1	2.85, 3.38	4.26	3.90, 4.65	0.7	0.60, 0.81
COPD=emphysema/Bronchitis	10.83	9.73, 12.05	15.3	13.70, 17.09	3.48	3.03, 4.00



# Current Findings from the Career Firefighter Health Study Web Based Health Surveys

## MENTAL HEALTH: Web-based survey -

- Proportion of firefighters with PTSD symptoms ranged from 4% to 9% depending on the department.
- Proportion of firefighters with Depression symptoms ranged from 17% to 22%.
- WTC-exposed firefighters had fewer cognitive concerns compared with non-WTC-exposed firefighters.

PTSD symptoms, depressive symptoms, and subjective cognitive concerns in WTC-exposed and non-WTC-exposed firefighters. Am J Ind Med. 2021



# Career Firefighter Health Study

## Mortality

- Both WTC-exposed and non-exposed firefighter had lower than expected all-cause mortality compared with US rates.
- All-cause and cause-specific mortality were lower in WTC-exposed compared with non-WTC-exposed firefighters.

Standardized Mortality Ratios (SMRs) of all-cause and cause-specific mortality in male WTC-exposed FDNY and PFD firefighters vs. US males active on 9/11/2001						
Cause of death (NIOSH major category)	FDNY			3 CITIES		
	N	SMR	95% CI	N	SMR	95% CI
All	261	0.30	0.26-0.34	191	0.64	0.55-0.73
All cancers	86	0.40	0.32-0.49	32	0.45	0.31-0.63
Heart diseases	52	0.27	0.20-0.35	62	0.72	0.55-0.92

Cancer incidence in WTC-exposed and non-exposed male firefighters, compared with the US adult male population: 2001-2016. *Occup Environ Med.* 2021





**All-Cause Mortality Risk Among Cases of Selected Cancers  
FDNY & General Responders compared to NYS population  
Follow-up time starts at diagnosis date**

**WFI EXAM AND THE FIREFIGHTER SUPPORT STRUCTURE HAS VALUE**

All-cause Mortality by cancer site	WTC MMTP vs. NYS non-responders
	HR (95%CI)
Prostate	0.62 (0.44, 0.88)
Lung and bronchus	0.74 (0.56, 0.97)
Esophagus	0.65 (0.36, 1.18)
Colon and rectum	0.48 (0.31, 0.74)
Myeloma	0.49 (0.22, 1.10)
Pancreas	1.66 (1.15, 2.39)
Brain and other nervous system	1.11 (0.70, 1.76)
Liver	0.74 (0.44, 1.22)
Melanoma of the skin	0.54 (0.27, 1.08)
Kidney and renal pelvis	0.36 (0.16, 0.79)

Deaths n (%)	303 (14.9)	224,040 (39.0)
Cancer deaths n (%)	248 (12.2)	158,645 (27.6)
Survival rate n (%)		
1-year survival <sup>a</sup>	1,916 (94.1)	474,895 (82.7)
3-year survival <sup>b</sup>	1,346 (88.3)	326,959 (69.6)
5-year survival <sup>c</sup>	919 (86.1)	228,933 (62.8)

Combining Three Cohorts of WTC Rescue/Recovery Workers for Assessing Cancer Incidence and Mortality. Int. J. Environ. Res. Public Health. 2021  
 Cancer survival among World Trade Center rescue and Recovery Workers: a collaborative cohort study. Am J Ind Med. 2021

