



June 14-16, 2022

LUNG CANCER SURVIVAL AMONG MALE FLORIDA CAREER AND VOLUNTEER FIREFIGHTERS

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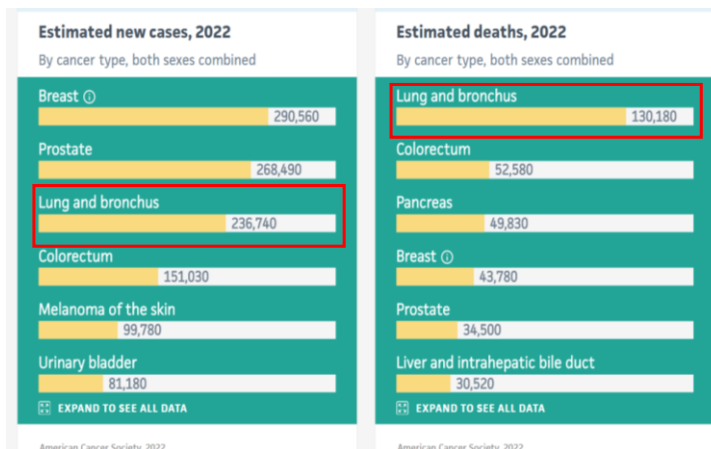


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Lung Cancer: USA

- Leading cause of cancer incidence and death in the US.



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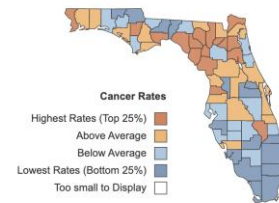
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Lung Cancer: Florida

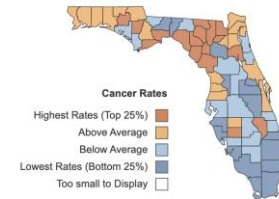
- Florida ranks as 22nd in the nation for lung cancer incidence.
- Florida's survival rate is 25.3%, currently above the national average of 24% .

*2021 American Lung Association

New Cancers (LC) 2015-2019



Cancer Deaths (LC) 2015-2019



*Florida Cancer Data Registry Dashboard



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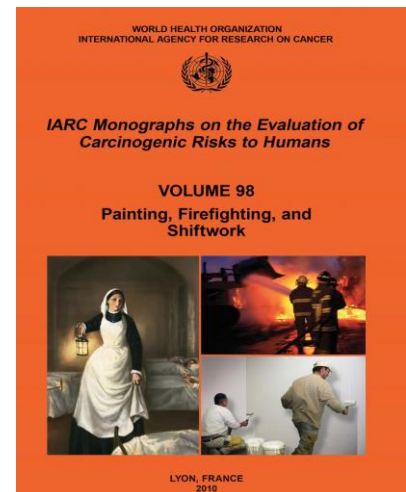
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Occupational exposure as a firefighter is “possibly carcinogenic to humans”

- Firefighters are exposed to various toxic substances by the inhalation of particulate matter and gases as well as dermal exposure routes.
- Epidemiologic investigations on lung cancer survivorship for both career- and volunteer-firefighters are lacking.



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Methods

- Lung cancer specific survival was defined as the time from diagnosis to lung cancer death or last follow-up. Event-free patients were censored at the date of last follow-up or the patients who died from other causes
- Primary prognostic variables- occupation
 - Career Firefighters vs Volunteer Firefighters vs non-Firefighters
- Other covariables include sociodemographics, clinical characteristics, treatment-specific variables.
- Lung cancer specific survival was estimated by Kaplan-Meier method and associations with prognostic factors assessed by log-rank test. Univariate and multivariable Cox proportional-hazard regression models were fit.
- Statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC).



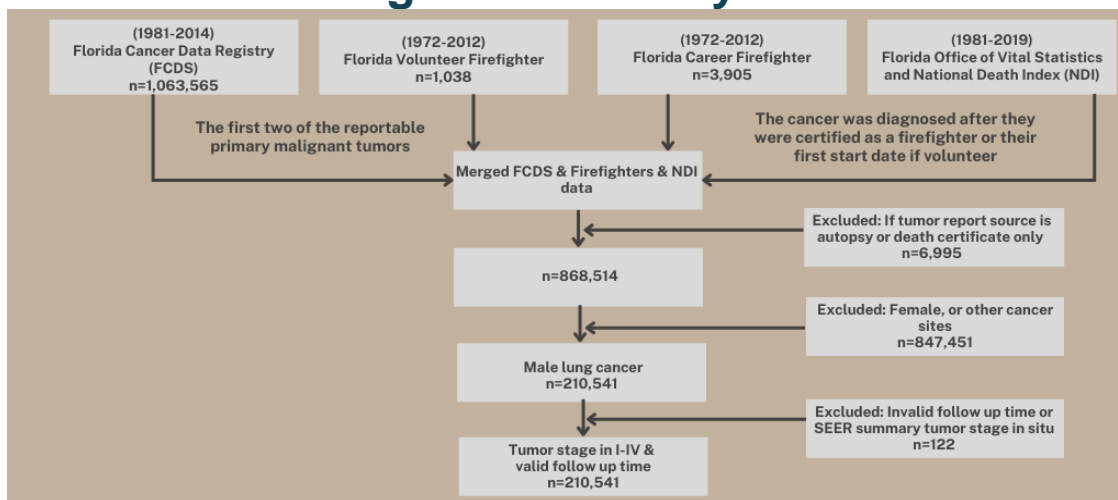
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Firefighter Cancer Initiative Linkage Lung Cancer Study Data



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Demographic Characteristics

	All Patients		Non-Firefighters		Firefighters			
					Volunteer		Career	
	n	col%	n	col%	n	col%	n	col%
All Patients	210,541	100.0	209,935	99.7	157	0.07	449	0.21
Year of Cancer Diagnosis								
1981-1991	61,773	29.3	61,692	29.4	11	7.0	70	15.6
1992-2002	71,318	33.9	71,121	33.9	53	33.8	144	32.1
2003-2014	77,450	36.8	77,122	36.7	93	59.2	235	52.3
Age at Diagnosis								
18-44	4,340	2.1	4,306	2.1	*	5.7	25	5.6
45-54	19,575	9.3	19,478	9.3	25	15.9	72	16.0
55-64	50,111	23.8	49,913	23.8	42	26.8	156	34.7
65-74	76,965	36.6	76,761	36.6	61	38.9	143	31.8
75+	59,550	28.3	59,477	28.3	20	12.7	53	11.8
Insurance								
Uninsured	5,868	2.8	5,858	2.8	*	2.5	*	1.3
Insured	118,533	56.3	118,071	56.2	129	82.2	333	74.2
Unknown	86,140	40.9	86,006	41.0	24	15.3	110	24.5
Neighborhood SES								
20% - 100% poverty	20,772	9.9	20,694	9.9	29	18.5	49	10.9
10% - <20% poverty	43,189	20.5	42,993	20.5	58	36.9	138	30.7
5% - <10% poverty	37,743	17.9	37,597	17.9	36	22.9	110	24.5
0% - <5% poverty	15,621	7.4	15,571	7.4	*	5.7	41	9.1
Unknown	93,216	44.3	93,080	44.3	25	15.9	111	24.7
Cigarette use								
Never	14,934	7.1	14,895	7.1	*	4.5	32	7.1
History	76,586	36.4	76,335	36.4	65	41.4	186	41.4
Current	79,104	37.6	78,888	37.6	56	35.7	160	35.6
Unknown	39,917	19.0	39,817	19.0	29	18.5	71	15.8



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Clinical Characteristics

	All Patients		Non-Firefighters		Firefighters			
					Volunteer		Career	
	n	col%	n	col%	n	col%	n	col%
All Patients	210,541	100.0	209,935	99.7	157	0.07	449	0.21
SEER Summary Tumor Stage								
Localized	34,078	16.2	33,985	16.2	20	12.7	73	16.3
Regional	49,236	23.4	49,063	23.4	43	27.4	130	29.0
Distant	98,403	46.7	98,110	46.7	84	53.5	209	46.5
Unknown	28,824	13.7	28,777	13.7	10	6.4	37	8.2
Treatment Received								
Surgery	45,996	21.8	45,838	21.8	32	20.4	126	28.1
Radiation	80,206	38.1	79,941	38.1	68	43.3	197	43.9
Chemotherapy	70,387	33.4	70,124	33.4	73	46.5	190	42.3
Histology								
Non-Small Cell Lung Cancer	148,986	70.8	148,542	70.8	118	75.2	326	72.6
Small Cell Lung Cancer	29,621	14.1	29,524	14.1	25	15.9	72	16.0
Unspecified/Unknown	31,934	15.2	31,869	15.2	14	8.9	51	11.4
Vital Status								
Alive/Dead - other cause	42,209	20.0	42,052	20.0	39	24.8	118	26.3
Dead - primary diagnosis	168,332	80.0	167,883	80.0	118	75.2	331	73.7



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Survival Rates by Patient Groups

Group	n	Survival rate (%) with 95% Confidence Interval			
		1 year	3 years	5 years	10 years
All patients	210,541	44.6 (44.4 - 44.8)	27.4 (27.3 - 27.6)	23.8 (23.6 - 24.0)	20.9 (20.7 - 21.0)
Non-Firefighters	209,935	44.6 (44.4 - 44.8)	27.4 (27.2 - 27.6)	23.8 (23.6 - 24.0)	20.9 (20.7 - 21.0)
Career-Firefighters	449	53.7 (48.9 - 58.2)	35.0 (30.6 - 39.4)	30.2 (26.0 - 34.5)	26.6 (22.5 - 30.8)
Volunteer-Firefighters	157	52.9 (44.8 - 60.3)	31.2 (24.1 - 38.5)	27.4 (20.7 - 34.5)	26.6 (20.0 - 33.7)



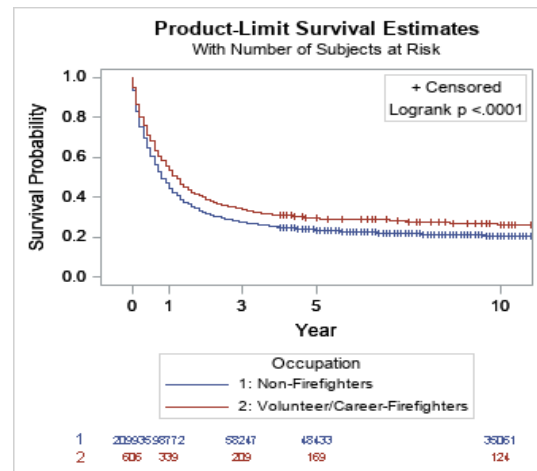
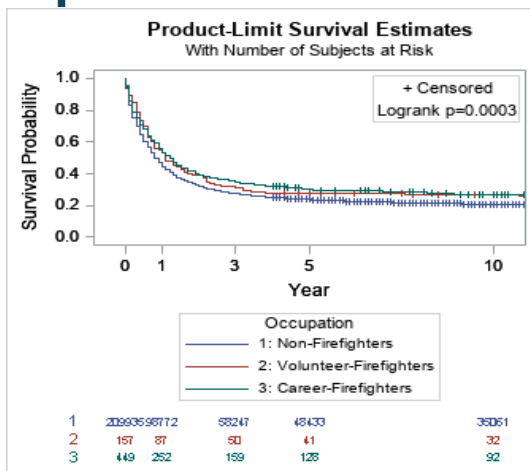
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Kaplan Meier Survival Curves



The Kaplan-Meier plots used all years of incidence cases (1981-2014) followed up until 2019.
The plots were created for the first 10-years to clearly show survival curves.



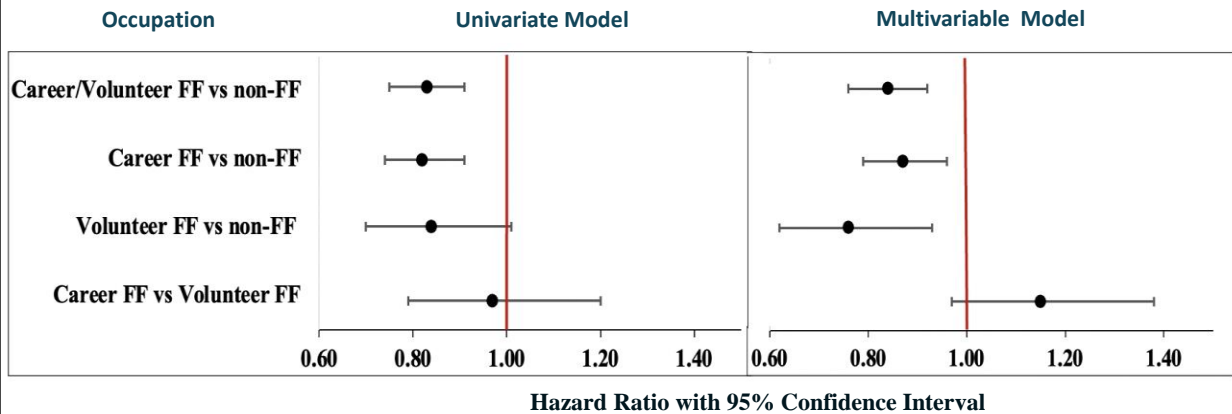
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Cox Proportional-Hazard Regression Models



Multivariable Cox regression models included sociodemographics, clinical, treatment specific variables where occupation as the main effect.



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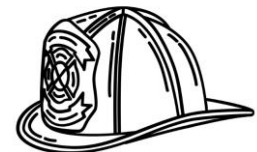
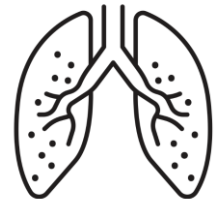
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Conclusion

- ❑ Lung cancer survivorship is significantly better among firefighters compared to non-firefighters.
- ❑ These findings could be driven, in part, by a healthy worker effect.
- ❑ Career, and possibly volunteer firefighters, may have lower barriers to cancer care via more consistent access to health insurance coverage during their working lives.
- ❑ Many career and some volunteer firefighters have advanced medical training (e.g., EMT, paramedic), which could also lead to greater involvement in, and compliance with cancer treatments.



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Thank you!

Please visit us at:
www.sylvester.org/firefighters

Research reported in this presentation was supported in part by a grant award from the State of Florida appropriation #2382A to the University of Miami (UM) Sylvester Comprehensive Cancer Center and by the National Cancer Institute of the National Institutes of Health under Award Number P30CA240139. The content is solely the responsibility of the authors and does not necessarily represent the official views of the State of Florida nor the National Institutes of Health.



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