



Cancer Screening Eligibility and Uptake in a New Jersey Volunteer Fire Department



Nimit N. Shah, MPH¹, Taylor M. Black, MPH², Michael B. Steinberg, MD, MPH^{3,4}, Kathleen G. Black, PhD, MPH², Judith M. Graber, PhD, MS^{1,2,4}

INTRODUCTION

Cancer Risk Among US Firefighters

- In 2010, the International Agency for Research on Cancer (IARC) classified firefighting as possibly carcinogenic to humans (Group 2B)
- Little is known about cancer screening behaviors among firefighters, especially among volunteer firefighters
 - Over 67% of the 1.1 million+ members of the US fire service are volunteers
- Information on screening behaviors is needed to inform strategies that reduce cancer mortality among firefighters

Project Aims

- To explore the uptake of colon, prostate, skin and lung cancer screenings among Toms River Fire Department (TRFD) members
- To evaluate adherence to the US Preventative Services Task Force (USPSTF) screening recommendations for these cancers



METHODS

The New Jersey Firefighters Cancer Prevention Study (NJFF CAPS)

- A multidisciplinary research study assessing cancer risk and risk factors in NJ
 - Initiated in response to concerns about excess cancer risk raised by volunteer firefighters of TRFD
 - Collaborates with the national Firefighters Cancer Cohort Study (FFCCS)
- Enrolled current and former TRFD members into CAPS
 - Assessed knowledge and attitudes about occupational and behavioral risk factors, prevention, and screening for cancer by administering FFCCS baseline survey

Figure 1: Current US Preventive Services Task Force (USPSTF) cancer screening guidelines

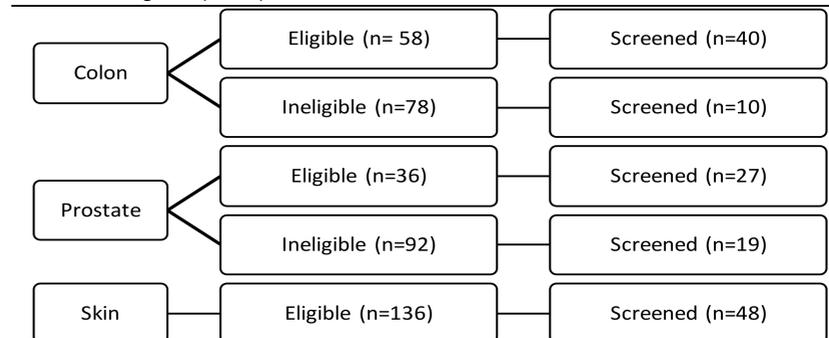
Cancer type	Eligibility criteria	Screening test and frequency
Colon	Male and female, 50-75 years	Colonoscopy every 10 years, sigmoidoscopy every 5 years, FOBT annually
Prostate	Male, 55-69 years	Periodic prostate-specific antigen (PSA) based screening; varies by patient
Skin	Asymptomatic adults	Visual skin examination; no recommendation
Lung	Male and female, 55-80 years, 30 pack-year smoking history and currently smoking (or quit smoking within the past 15 years)	Low-dose computed tomography (LDCT); varies by patient

USPSTF recommendation current as of October 2008 (colon cancer), May 2018 (prostate cancer), July 2016 (skin cancer) and December 2013 (lung cancer).

Data Analysis

- Predictors of each cancer screening assessed using:
 - Bivariate analysis: Chi-square, Fisher's Exact and Wilcoxon Mann Whitney tests
 - Multivariate logistic regression: outcome = skin cancer screening uptake
- TRFD colon cancer screening and healthcare behavior was compared to age-adjusted employed white males assessed by the NJ Behavioral Risk Factor Survey (NJBRFSS), 2012-2017

Figure 2: Colon, Prostate and Skin cancer screening uptake among Toms River Fire Department volunteer firefighters (n=136)



Missing or "Not sure" responses: Colon cancer screening (n=10), Prostate cancer screening (n=6), Skin cancer screening (n=4). None were eligible for lung cancer screening.

RESULTS

Table 1: Characteristics of the study participants (n=136), and Colon, Prostate and Skin cancer screening uptake among those eligible

Characteristic	Study participants (n=136)	Bivariate Analysis						Multivariate Analysis				
		Colon cancer screening			Prostate cancer screening			Skin cancer screening				
		Received (n=40)	Not received (n=12)	p-value ^b	Received (n=27)	Not received (n=7)	p-value ^b	Received (n=48)	Not received (n=84)	p-value ^b	AOR (95%CI)	p-value ^b
Age, mean	46.4	62.6	56.4	<0.01	62.4	58.1	<0.01	57.3	40.8	<0.01	1.05 (1.01, 1.10)	<0.01
Race/Ethnicity, Non-Hispanic white [n (%)]	124 (91.2)	40 (76.9)	12 (23.1)	-	27 (79.4)	6 (17.7)	0.21	48 (36.4)	73 (55.3)	0.007		
Gender, Male [n (%)]	128 (94.1)	38 (73.1)	12 (23.1)	0.99	46 (37.7)	76 (62.3)	-	45 (34.1)	80 (60.6)	0.7		
Education, n (%)				0.37			0.99			0.61		
High school graduate	38 (28.0)	11 (21.1)	4 (7.7)		7 (20.6)	2 (5.9)		11 (8.3)	26 (19.7)			
Some college ^a	63 (46.3)	17 (32.7)	7 (13.5)		16 (47.1)	4 (11.8)		24 (18.2)	38 (28.8)			
College graduate	35 (25.7)	12 (23.1)	1 (1.92)		4 (11.8)	1 (2.9)		13 (9.9)	20 (15.1)			
Employment, n (%)				0.14			0.99			0.04	2.11 (0.59, 7.71)	0.25
Yes	112 (82.4)	26 (50.0)	11 (21.2)		19 (55.9)	5 (14.7)		35 (26.5)	73 (55.3)			
No	24 (17.6)	14 (26.9)	1 (1.9)		8 (23.5)	2 (5.9)		13 (9.9)	11 (8.3)			
Income of \$75,000 or more, n (%)	80 (61.1)	29 (59.2)	9 (18.4)	0.99	21 (65.6)	4 (12.5)	0.16	31 (25.6)	47 (38.8)	0.43		
Marital Status, n (%)				0.66			0.61			0.01		
Married or in an unmarried couple	78 (57.3)	33 (63.5)	11 (21.1)		22 (64.7)	5 (14.7)		35 (26.5)	41 (31.0)			
Other	58 (42.7)	7 (13.5)	1 (1.9)		5 (14.7)	3 (5.9)		13 (9.9)	43 (32.6)			
Health care access												
Have insurance coverage, n (%)	128 (94.1)	40 (76.9)	11 (21.2)	0.23	27 (79.4)	7 (20.6)	-			0.08		
Have a primary physician, n (%)				0.55			0.37			0.03	2.15 (0.52, 8.90)	0.29
Yes	109 (80.2)	38 (73.1)	11 (21.1)		26 (76.5)	6 (17.6)		44 (34.1)	62 (48.1)			
No	24 (17.6)	2 (3.9)	1 (1.9)		1 (2.9)	1 (2.9)		4 (3.1)	19 (14.7)			
Number of doctor visits in a year, mean	4.40	8.20	3.30	0.06	8.70	3.30	0.14	5.90	3.40	<0.01	1.01 (0.95, 1.07)	0.74
Firefighting service												
Lifetime volunteer firefighter calls/year, mean	14.0 (16.0)	25.1	25.7	0.85	30.2	29	0.83	20.4	10.9	0.02	1.01 (0.98, 1.04)	0.43
Active TRFD volunteer firefighter, n (%)	126 (92.7)	36 (69.2)	12 (23.1)	0.56	25 (73.5)	7 (20.6)	0.99	43 (32.6)	79 (59.8)	0.5		
Ever been a career firefighter, n (%)	25 (18.4)	8 (15.4)	3 (5.8)	0.70	5 (14.7)	1 (2.9)	0.99	11 (8.3)	13 (9.9)	0.29		
Other risk factors												
Number of sunburns in the last year, mean	1.5	-	-	-	-	-	-	1.0	1.8	<0.01	0.75 (0.53, 1.06)	0.10
Parental cancer history, n (%)				0.51			0.66			0.01		
Yes	53 (39.0)	25 (48.1)	6 (11.5)		19 (55.9)	4 (11.8)		26 (19.7)	27 (20.4)			
No	83 (61.03)	15 (28.9)	6 (11.5)		8 (23.5)	3 (8.8)		22 (16.7)	57 (43.2)			

Missing values or "Not Sure" responses: income (n=11), smoking status (n=3), insurance coverage (n=2), primary physician (n=3), number of doctor visits last year (n=1), lifetime number of calls as a volunteer firefighter (n=15), heavy alcohol consumption in last 30 days (n=19), engaged in binge drinking in last 30 days (n=34), number of sunburns last year (n=1); a Includes any technical school or Associates Degree; b Performed Fisher's Exact and Chi-Square test for categorical, and Wilcoxon-Mann-Whitney test for continuous variables; AOR: Adjusted Odds Ratio



Table 2: Comparison of health care coverage and colon cancer screening uptake between TRFD firefighters and NJ counterparts (NJBRFSS, 2012-2017)

Characteristic	TRFD (% 95% CI)	NJBRFSS (% 95% CI)
Have any kind of health care coverage	94.1 (90.1, 98.1)	93.9 (93.3, 94.4)
Have a primary physician	80.1 (73.4, 86.9)	84.9 (84.1, 85.7)
Visited physician for routine checkup within the last year	91.9 (87.2, 96.5)	71.7 (70.8, 72.7)
Ever received colon cancer screening	76.9 (65.1, 88.8)	66.2 (64.8, 67.5)

NJBRFSS: New Jersey Behavioral Risk Factor Survey System; TRFD: Toms River Fire Department



Comparing TRFD to NJ counterparts

- TRFD and NJBRFSS participants were similar with respect to prevalence of:
 - Health care coverage
 - Having, and number of visits to a primary physician
 - Colon cancer screening

DISCUSSION & CONCLUSION

- In TRFD, high colon and prostate cancer screening uptake was observed among those eligible (>75% of participants)

Strengths of the project include:

- One of the first studies to evaluate USPSTF guideline screening adherence for colon, prostate, and skin cancer among volunteer firefighters
- Foundational step in developing a cancer screening framework among NJ volunteer firefighters

- Additional analyses is needed to evaluate skin cancer screening uptake among TRFD participants

Potential limitations to this project may include:

- Analyses for colon and prostate cancer screening uptake might be underpowered
- Study population is homogeneous (mostly non-Hispanic white males with high income) and has limited generalizability to other regions

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Author Affiliations:

- Department of Biostatistics & Epidemiology; School of Public Health; Rutgers, The State University of New Jersey; Piscataway, New Jersey, USA
- Environmental and Occupational Health Sciences Institute; Rutgers, The State University of New Jersey; Piscataway, New Jersey, USA;
- Division of General Internal Medicine; Robert Wood Johnson Medical School; Rutgers, The State University of New Jersey; New Brunswick, New Jersey, USA;
- Rutgers, The State University of New Jersey, Cancer Institute of New Jersey, New Brunswick, New Jersey, USA;



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