



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



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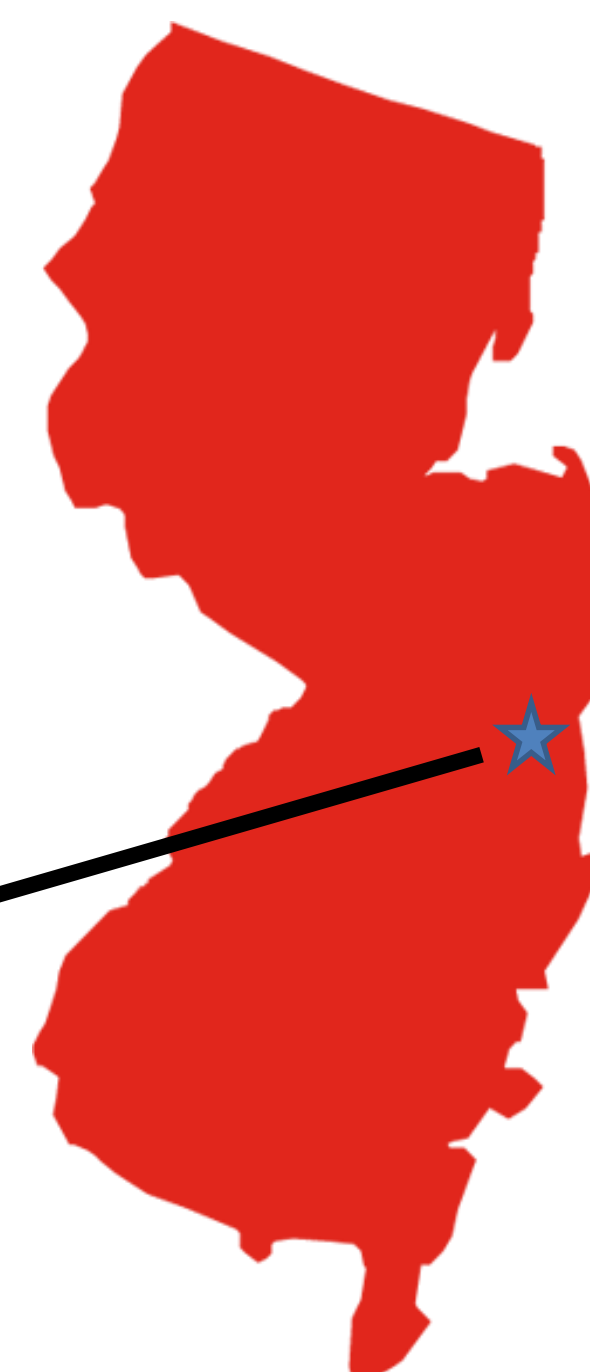
INTRODUCTION

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

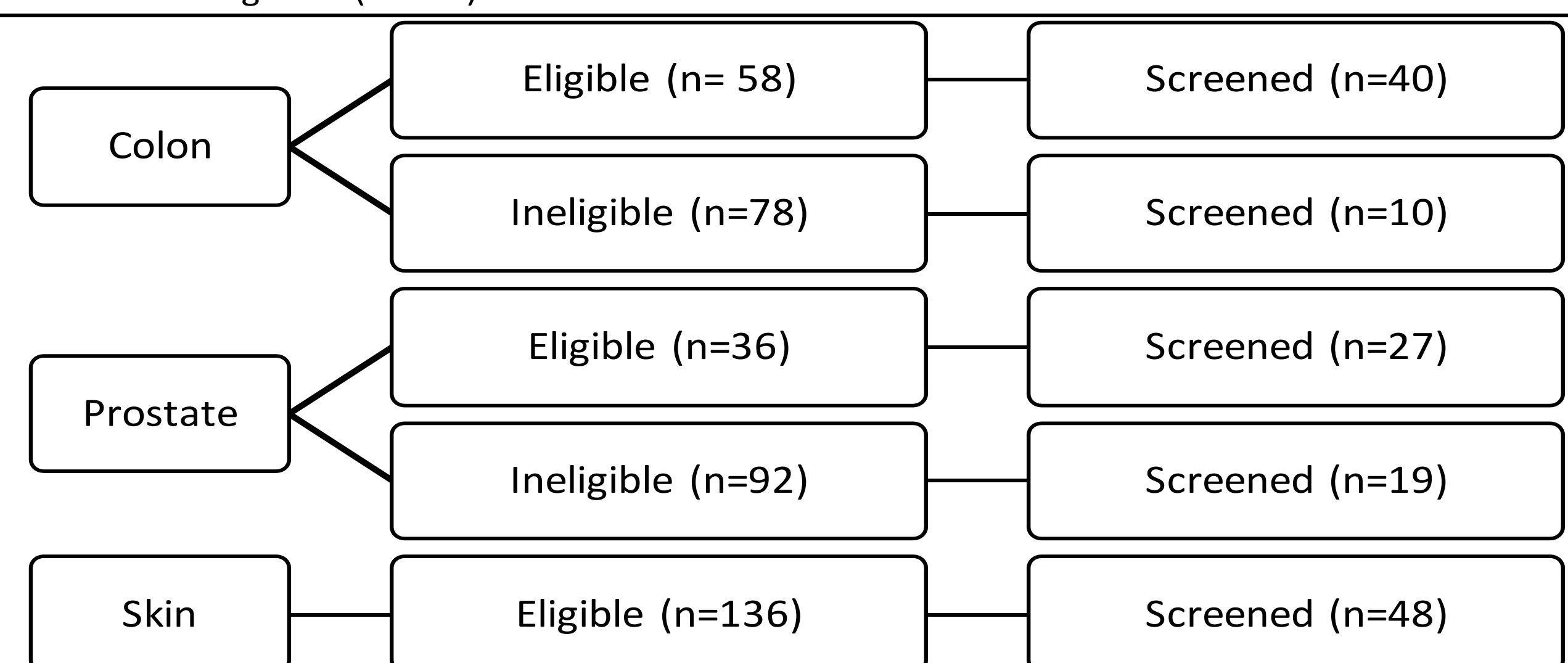
| Cancer type | Eligibility criteria | Screening test and frequency |
|-------------|---|---|
| Colon | Male and female, 50-75 years | Colonoscopy every 10 years, sigmoidoscopy every 5 years, FOBT annually |
| Prostate | Male, 55-69 years | Periodic prostate-specific antigen (PSA) based screening; varies 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 | | 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 ^c | 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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