



2023 LEGISLATIVE REPORT TO THE
HOUSE COMMITTEE ON APPROPRIATIONS
HOUSE COMMITTEE ON COMMERCE AND ECONOMIC DEVELOPMENT
HOUSE COMMITTEE ON GOVERNMENT OPERATIONS AND MILITARY AFFAIRS
SENATE COMMITTEE ON APPROPRIATIONS
SENATE COMMITTEE ON ECONOMIC DEVELOPMENT
SENATE COMMITTEE ON HOUSING AND GENERAL AFFAIRS
SENATE COMMITTEE ON GOVERNMENT OPERATIONS

**Report on Screening, Detection, and Prevention
of Cancer in Firefighters
Pursuant to Act 26 (S.73) of the 2023 Session**

Submitted by:

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Division of Fire Safety

January 2024

Pursuant to Act 26 of the 2023 Vermont legislative session, this report on screening, prevention, and detection of cancer in Vermont’s firefighters is hereby presented for review and consideration by the respective committees.

The Director of the Division of Fire Safety assembled a working group of Vermont fire service representatives to comprehensively research and investigate the topics and information contained within this report. Where necessary, the working group sought the input of additional subject matter experts for guidance and data to support the conclusions contained herein.

ACT 26 FIREFIGHTER CANCER WORKING GROUP MEMBERS

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The Centers for Disease Control and Prevention have concluded that cancer is a leading cause of death among firefighters, and firefighters are at a higher risk for certain types of cancer when compared to the general population.¹ The Vermont Fire Service appreciates the Legislature’s attention to this important topic in the 2023-2024 session. A significant amount of work lies ahead to ensure that Vermont’s firefighters are better protected and provided for as they face this inherent risk.

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1/11/2024
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¹ Centers for Disease Control and Prevention. (2021, January 8). Firefighter Cancer Awareness. Centers for Disease Control and Prevention. <https://www.cdc.gov/niosh/newsroom/feature/firefighter-cancer-awareness.html>

EXECUTIVE SUMMARY

Cancer is a leading cause of death among firefighters, and they have a 9% greater cancer risk and a 15% higher mortality rate from cancer than the general population. The firefighter cancer presumption serves to expedite the adjudication of workers' compensation claims made by firefighters with service-related cancer. Work needs to be done to improve the prevention, detection, and screening of firefighter cancer as well as educating firefighters on the benefits available to firefighters suffering from work-related cancer.

To adequately answer the questions posed by Act 26 and to generate this report, a stakeholder working group was assembled to research and collect information. Additionally, the Vermont Fire Service was surveyed to gather pertinent information. This group worked diligently to assemble the following findings and recommendations over a period spanning several months.

Work related firefighter cancer appears to be under-reported. The number of workers' compensation claims filed are far fewer than the number of cases that the fire service reported in the survey. This suggests that education should be provided to Vermont's firefighters to inform them of the coverage that is available in the case of a work-related cancer. It further suggests that firefighters may not be correlating their cancer with the exposures of firefighting.

Since the risk of cancer is so much higher for firefighters than the general population, a more intense screening should be provided. Appropriate firefighter cancer screening is identified in NFPA 1582, the Standard on Comprehensive Occupational Medical Program for Fire Departments. The estimated cost to provide all of Vermont's firefighters with this screening is approximately \$4.5 million annually.

The same cancer screenings can be provided to all Vermont Fire Academy Firefighter I program enrollees at a cost of approximately \$145,000 annually. This would provide a baseline screening to most of Vermont's firefighters as they enter the fire service.

One of the best ways to protect firefighters from exposure to carcinogens is to ensure that they are equipped with compliant firefighting personal protective equipment (PPE). This equipment has a 10-year service life unless it sustains unserviceable damage prior to its expiration. The cost of providing one firefighter with compliant PPE is approximately \$4,520.00. This creates difficulties for many of our local fire departments who do not have the budget to support such an expense for each member, every 10 years. A program to provide every Vermont firefighter with compliant PPE every 10 years on a rolling basis is estimated to cost \$2,034,000 in the first year and increase each year thereafter due to inflation. Since we know anecdotally that there is a large amount of non-compliant PPE in use currently, it is recommended that such a program be bolstered in the first few years to expedite the replacement of the oldest, expired PPE still in use early in the program.

The State does have opportunities to reduce the cost to fire departments for the replacement of PPE through the administration of State contracts. Entering into State contracts with vendors for firefighter PPE and allowing municipal and private fire departments to utilize those contracts could bring realistic savings to local fire departments. Such contracts could create a more

competitive landscape and create volume-based incentives to leverage better pricing from contracted vendors.

Additionally, the establishment of a State-funded grant program to fully-fund or subsidize PPE purchases by local fire departments would be beneficial. Providing financial support to local fire departments for PPE purchases would bring us closer to our goal of providing compliant PPE to every firefighter in Vermont. This report provides details on a similar model program currently offered by the State of Massachusetts.

Finally, the working group took the opportunity to make the following recommendations within this report:

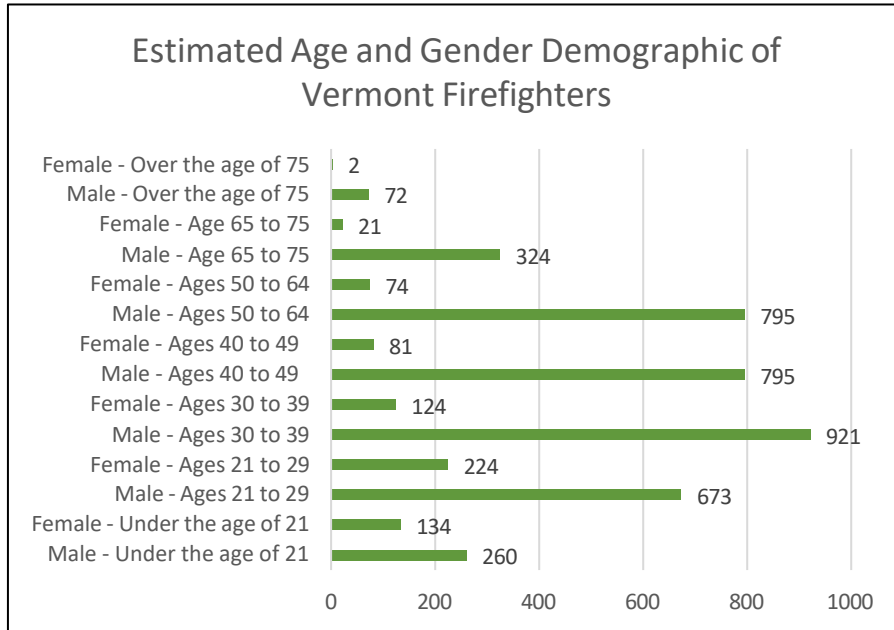
- Support increased firefighter education on the topics of cancer risks, prevention, detection, reporting, and the benefits available through workers' compensation coverage for cases of work-related firefighter cancer.
- Education efforts should be directed at healthcare providers to inform them on the recommended cancer screening needed for firefighters. This will strengthen our detection effort through primary care and offer an opportunity for reduced health care costs via improved early detection.
- Take steps to close gaps in firefighter demographics and cancer data collection. The working group struggled to identify the number of firefighters in Vermont and their age and gender demographic. Additionally, we found that our vital record and cancer registry systems lack a means to identify a cancer case as being that of a firefighter.
- Take steps to encourage the replacement of current firefighter gear with PFAS-free gear once it is available on the market as a product that provides adequate protection to firefighters in a fire environment. There are currently gaps in scientific evidence pointing to the correlation between firefighter cancer risks and PFAS materials in firefighting gear and the technology surrounding replacement materials are still in development.

DATA COLLECTION METHODS

In the process of developing this report, the working group experienced difficulties in determining the demographic make-up of Vermont's fire service. Since there is no requirement for fire departments to report their membership make-up or numbers, it was difficult to ascertain an accurate count of firefighters in Vermont or determine their age and gender. The working group performed a survey of the Vermont Fire Service to account for fire service personnel, identify the percentage of firefighters within each age group as listed in the American Cancer Society screening recommendations, and to count the known number of fire service cancer cases in Vermont. The survey resulted in a 35% response rate and that data was used to estimate the total number of firefighters and their demographic make-up specific to Vermont.

VERMONT'S FIREFIGHTER DEMOGRAPHICS

Since cancer screening recommendations vary with age and gender, it was necessary to determine how many firefighters are currently serving Vermont and identify their age and gender demographics. The conclusions and recommendations within this report are based on the estimation that there are 4,500 firefighters in Vermont that fall into the following age and gender demographics.



FIREFIGHTER CANCER AND REPORTING IN VERMONT

Testimony provided to the House Committee on Commerce and Economic Development indicated that the Vermont League of Cities and Towns Property and Casualty Intermunicipal Fund has received only 9 firefighter cancer presumption claims since 2008.² While they are not the sole provider of workers' compensation coverage to Vermont Fire Departments, they are assumed to be the largest. The working group survey of the Vermont fire service asked respondents to quantify the number of known cancer cases among members of their fire department that occurred while the member was an active firefighter or within 10 years of being an active firefighter. The survey received a 35% response rate and identified 73 cancer cases known to respondents, 21 of which occurred after the firefighter was active but within 10 years of the last firefighting activity.

The working group concluded that Vermont firefighter cancer cases are under-reported to the employer's workers' compensation insurance and are instead most often being covered by an individual's health insurance. This leaves no means of compensating the firefighter for lost

² Testimony of Joe Damiata, Director of Risk Management, Vermont League of Cities and Towns, Vermont House Committee on Commerce and Economic Development, April 12, 2023.

wages due to the illness. Education should be provided to Vermont's firefighters to inform them of the coverage available in the event of a work-related cancer to reduce their personal loss.

PROJECTED COSTS FOR THE STATE TO FUND ANNUAL OR BIENNIAL CANCER SCREENING FOR ALL FIREFIGHTERS IN VERMONT

For a firefighter cancer case to be presumed to have been a result of exposure to conditions in the line of duty, the firefighter must have completed cancer screening evaluations as recommended by the American Cancer Society and the result of that evaluation must have indicated no evidence of cancer prior to a cancer diagnosis. These screenings are a part of a routine wellness examination performed by primary care providers and the cost of such screening is covered by most health insurance plans, resulting in low cost or co-payment by the patient, and no additional cost to the fire department that they serve.

We must acknowledge that the American Cancer Society screening recommendations are directed at the general population, but firefighters have a 9% greater risk of cancer and a mortality rate that is 14% higher than the general population due to occupational exposure to carcinogens. This increased risk calls for a more thorough screening evaluation in this high-risk population.

NFPA 1582 is the Standard on Comprehensive Occupational Medical Program for Fire Departments, and this standard outlines an occupational medicine program that will reduce risks and provide for the health, safety, and effectiveness of firefighters. NFPA 1582 compliant physicals are comprehensive and structured to establish a health profile and baseline as well as achieve early detection of pre-cancerous and cancerous diseases in firefighters. They may be structured and relevant to the age, gender, medical history, and job duties of the individual firefighter. In addition to a physical exam and history collecting, they include respiratory testing (spirometry), blood tests, and urinalysis. The cancer screening should include a method of early cancer detection utilizing a method such as multi-cancer blood tests, ultrasound examination or other imaging, or a combination of these as deemed appropriate by the qualified healthcare provider.

The components of the examination vary from year to year based on age, gender, risk factors, medical history, and exposure. The required components of an exam for an individual are typically determined by the qualified healthcare provider and may be based on the results of previous exams. When calculating an estimated cost, these variations were accounted for with the understanding that not every exam would carry the same cost each year.

To establish the estimated costs of providing cancer screening to Vermont's firefighters, the working group solicited estimates from established providers who specialize in NFPA 1582 compliant examinations. These estimates were then evaluated for compliance and comparability and averaged to form the basis of the cost estimates. Comparisons were also conducted between these estimates and actual costs incurred by a small sample of Vermont fire departments who have been conducting these examinations in-state.

The average cost for a single NFPA 1582 compliant physical exam is \$1,000 per firefighter. The cost to provide this exam to Vermont's estimated 4,500 firefighters annually would be \$4,500,000.

It is important to note that this cost estimate does not include the routine screening tests that are applied to the general population including colonoscopy, mammography, and cervical cancer screening with cytology (i.e. pap smear). The working group feels that those tests occur independently of a firefighter cancer screening as arranged by a primary care provider and are generally covered by the individual's health insurance.

PROJECTED COST FOR THE STATE TO FUND CANCER SCREENINGS FOR ALL ENROLLEES IN THE VERMONT FIRE ACADEMY FIREFIGHTER I PROGRAM PRIOR TO THE COMMENCEMENT OF TRAINING.

The NFPA 1582 compliant physical is recommended for all fire service candidates prior to employment as a volunteer or career firefighter which includes age-appropriate cancer screening. The components of this exam were described in the previous section of this report. The Vermont Fire Academy's Firefighter I program provides most of Vermont's newest firefighters with their entry-level training. Over the past 4 years, the Vermont Fire Academy enrollment in Firefighter I programs has averaged 145 students per year.

Cost estimates were obtained as described previously. The average cost per physical exam is \$1,000 for a total of \$145,000. It should be noted that this estimate is based on average student enrollment, which is variable from year to year.

OPPORTUNITIES FOR THE STATE TO REDUCE THE COST FOR FIRE DEPARTMENTS TO PROVIDE ANNUAL CANCER SCREENINGS FOR THEIR FIREFIGHTERS.

There are opportunities for the State to reduce the cost for fire departments to provide annual cancer screenings for their firefighters. The most effective way to reduce costs would be to administer a State contract for the screening services and allow municipal and private fire departments to utilize the contract. Contracting these services could create a more competitive market and result in lower costs from providers due to the increased volume of services provided.

The Department of Buildings and General Services has verified to the working group that they routinely work on behalf of municipalities by extending pricing to political subdivisions, which allows municipalities to take advantage of the State's contract pricing. It is unclear whether private or incorporated non-municipal fire departments would be able to take advantage of State contracts because political subdivisions of the State are defined as "including, but not limited to, cities, towns, and school districts".

Research performed by the working group found that volume pricing can be achieved by combining department participation for a minimum of 24 to 70 people screened. Similar volume discounts apply to some of the multi-cancer blood tests on the market today (such as One Test for Cancer). Utilization of a State contract would provide a mechanism to leverage those savings, and it would allow local fire departments to work directly with the contractor.

The contractor must be a Vermont licensed provider offering a proven business record of providing annual firefighter exams that meet or exceed the NFPA 1582 standard. The business platform selected must offer medical testing and monitoring that includes physician review, patient consultation, and referral to an individual's personal provider for any abnormal findings.

PROJECTED COST FOR THE STATE TO FUND THE REPLACEMENT OF PERSONAL PROTECTIVE EQUIPMENT ON A ROLLING BASIS WITHIN 10 YEARS OF BEING ACQUIRED.

NFPA 1851 is the Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural and Proximity Fire Fighting. This standard requires firefighter personal protective equipment (PPE) to be retired within 10 years of the date of manufacture. Most Vermont fire departments experience a call volume that allows for their PPE to remain in use for its full 10-year service life. The cost of outfitting firefighters with compliant PPE is certainly one of the greatest financial challenges faced by our fire departments. Many fire departments are unable to comply with the requirement of retiring PPE within 10 years due to the financial burden.

There are many variations and options to choose from when purchasing firefighter protective equipment. To calculate the financial impact of purchasing or replacing turnout gear, it was noted that there are several specifications and features unique to each fire department which make it complicated to develop a standard specification. Taking all of this into consideration, the working group concluded the best option was to choose a specification that was mid-range that included standard options as identified by each manufacturer as most commonly used by fire departments. A total of five major PPE manufacturers, whose products are sold by vendors in Vermont, were chosen to provide a quote for this study.

It is recommended that each firefighter have two sets of PPEs to allow for the firefighter to remain in service while the primary set of PPE is undergoing decontamination. The working group felt that the intent of this report was to identify the cost of providing each firefighter with one compliant set of PPE every 10 years.

For the purposes of this report, a set of PPE includes a structural firefighter coat, pants, helmet, particulate hood, gloves, and boots. The unit cost of each of these items is detailed in Table 1 and the total cost of each complete set is estimated at \$4,520.00.

Item	Cost Per Unit
Structural Firefighter Coat	\$2,000.00
Structural Firefighter Pant	\$1500.00
Helmet	\$400.00
Particulate Hood	\$120.00
Firefighting Gloves	\$100.00
Firefighting Boots	\$400.00
TOTAL	\$4,520.00

Table 1: Unit cost of firefighter PPE.

To replace 4,500 sets of firefighter PPE on a 10-year rolling basis, you would have to replace 450 sets per year at a cost of \$2,034,000 in the first year.

Each sales representative who was contacted indicated that the prices were for the current year and would not reflect any price increases in 2024 and beyond. We are experiencing significant price increases in PPE products occurring multiple times per year and this estimate could become inaccurate quickly. Estimates from sales representatives indicate that price increases are expected to occur at 10% per year for the next 5 years and then 3% thereafter. Table 2 outlines the estimated cost per year, calculating for the anticipated cost increases.

2024	2025	2026	2027	2028
\$2,034,000	\$2,237,400	\$2,461,140	\$2,707,254	\$2,977,979
2029	2030	2031	2032	2033
\$3,275,777	\$3,374,051	\$3,475,272	\$3,579,530	\$3,686,916

Table 2: 10-year projected costs of PPE replacement.

As fire departments have struggled with the ever-increasing cost of PPE, local inventories are of varying condition and age. If a funding mechanism is developed for firefighter PPE replacement, the working group suggests that the program starts with a goal of replacing more than 10% per year annually to expedite the replacement of the oldest and most non-compliant PPE sooner, which would require more funding initially than is indicated in Table 4.

OPPORTUNITIES FOR THE STATE TO REDUCE THE COST TO FIRE DEPARTMENTS FOR THE REPLACEMENT OF PERSONAL PROTECTIVE EQUIPMENT.

There are opportunities for the State to reduce the cost to fire departments for the replacement of PPE. The administration of State contracts for the purchasing of PPE that allows municipal and private fire departments to purchase from could create a more competitive market. Lower costs from vendors could be realized due to the increased volume of sales being directed to contracted vendors.

As stated previously, there are many options and variations in PPE specifications and fire departments customize their PPE to suit the needs of their jurisdiction. Negotiating contracts that provided a discount below the manufacturer's suggested retail price would allow for the continuation of each fire department customizing their PPE. Another approach could be to identify mid-range base specifications within the contract and negotiate a base cost-plus options price schedule.

Opportunities also exist to reduce the cost of PPE replacement to fire departments by developing a state-funded grant program. Such a program could be customized to equitably distribute funding based on demonstrated need and a priority system. The State of Massachusetts has a model grant program that distributes \$5 million annually to local fire departments on a sliding

scale of award maximums based on population. The program uses clear criteria that can be adjusted by the program administrator to meet the current need.

The only grant opportunity like this that is available to Vermont fire departments is the FEMA Assistance to Firefighters Grant program. Unfortunately, this is a very competitive grant program where only 2,000 awards are made nationwide each year. In 2023, approximately 8,000 grant applications were received by the program and only 9 Vermont fire departments received awards. Developing a state grant program would greatly benefit the Vermont fire service by protecting our firefighters through compliant PPE acquisition.

WORKING GROUP RECOMMENDATIONS

Education

The working group concluded that the Vermont fire service is not well-informed on the topic of firefighter cancer. We recommend supporting increased education on the topics of cancer risks, prevention, detection, and the importance of registering with the National Firefighter Registry for Cancer. This education should also include information on the benefits that a firefighter has available to them in the event of an occupational related cancer diagnosis.

The working group also feels that general healthcare providers are often not well-informed on the added cancer screening recommendations for firefighters. Educational efforts should be directed at healthcare providers to improve cancer screenings being performed on firefighters. The creation of an educational program for fire service members and Vermont medical practitioners to encourage dialogue, awareness, and improved understanding of the risk factors, causes, and prevention measures for firefighter cancer will improve outcomes.

Data

The working group found that there are gaps in data pertaining to firefighter cancer. It does not appear that there is a means to identify firefighter cancer deaths in the current Vermont Department of Health Vital Records Reporting System. This is especially difficult in the case of volunteer firefighters because their "occupation" listed on a death certificate will most likely be their full-time occupation. A means should be developed within this reporting system to identify a decedent as a firefighter.

The Centers for Disease Control have introduced the National Firefighter Registry for Cancer, which serves as a data collection tool for firefighter cancer. Firefighters are encouraged to register so that there can be a better understanding of the relationship between firefighting and cancer. The Vermont Department of Health Cancer Registry Manager is aware of the national registry and believes that Vermont's data will be shared with the registry through normal linkage processes. Steps should be taken to ensure that Vermont's data is linked to the national registry as soon as possible to aid in better understanding the firefighter cancer issues in Vermont.

Elimination of Per- and Polyfluoroalkyl Substances (PFAS) in Firefighter PPE

PFAS have been widely used in various industrial and consumer products since the 1940s due to their unique properties, such as resistance to heat, water, and oil. In fact, consumers contact PFAS regularly due to their widespread use in common consumer products. Most firefighter PPE contains PFAS, however there is a lack of conclusive evidence that it is contributing to an increased incidence of firefighter cancer. Of course, its presence in firefighter PPE is a concern that should be closely scrutinized.

Efforts to reduce or eliminate PFAS from firefighting gear are concentrated on finding alternative materials that maintain or enhance the necessary protective properties while minimizing environmental and health concerns associated with PFAS. In recent testing, non-PFAS outer shell fabrics were found not to be diesel/oil-repellent, posing a potential flammability hazard if exposed to diesel and subsequent flame on an emergency response.³ Further studies currently underway are suggesting that PFAS-free textiles offer a greatly reduced thermal protection to firefighters, which may pose a greater risk. PFAS-free textiles need more research and development before a conclusion can be made on this issue.

Currently, there is no structural firefighting gear available on the market that is PFAS-free. Once developed, PFAS-free firefighting gear will undoubtedly come at an increased cost, further complicating the issue of affordability for Vermont's fire departments. Without unequivocal scientific evidence of PFAS-laden firefighting gear poses an increased cancer risk, and the existence of a safe alternative that provides adequate protection to firefighters, it seems premature to mandate the elimination of PFAS from firefighter gear through legislation. It is reasonable to work toward replacement of current gear with PFAS-free gear that provides adequate protection from hazards when it is available.

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