

Oregon MLAC Testimony

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Greetings, Committee Members:

My name is Dan Whu, testifying in support of expanding presumptive cancer coverage for Oregon fire fighters. I currently serve as the Chief Medical Officer for the International Association of Fire Fighters. As such, I'm responsible for the health and medical wellbeing of nearly 370,000 professional firefighters across all of the U.S. and Canada. I am also in my 41st year as an emergency first responder with a distinguished 30-year career as a professional fire fighter, EMS paramedic, and SCUBA Rescue Diver. In the fire service, I worked for the sixth largest fire, rescue and EMS provider in the nation and was the top-ranked candidate in my department's extremely competitive chief fire officer promotional process during my very first eligible year. Subsequently, I was promoted to the rank of Division Chief in charge of Fire, Rescue, and EMS operations for half of the most populated county in Florida. In addition, I am also a 34-year veteran and Founding Member of an elite and one of the most recognized search and rescue teams in the world; FEMA, Urban Search & Rescue, Florida Task Force-1. In that capacity, I am a Senior Disaster Physician and Medical Team Manager and have responded to multiple major disasters in both, the U.S. and abroad. My mission response to the 9/11 World Trade Center attacks, led to the honor of being recognized as one of the founding members of the U.S. Department of Homeland Security.

Moreover, I am a triple board-certified medical doctor and epidemiologist with a master's degree in public health. The most relevant board certification for this setting is in preventive medicine and public health, which trains physicians in population medicine. Epidemiology is the specialty that identifies, hypothesizes, designs, researches, evaluates, interprets and develops recommendations related to the incidence, prevalence and associated trends in morbidity and mortality of diseases and injuries in populations. Naturally, I specialize in the emergency first responder subpopulation.

Professionally, I have served in and held several ranks, titles and positions that are directly and indirectly related to the public health, safety and wellbeing of fire fighters. This includes evaluating their occupational exposures and consequential work-related diseases. Given my experience and expertise, I am confident that my testimony today will be insightful and assist you to more clearly elucidate the correlation between fire fighters' workplace exposures during both, emergency and routine work, to their increased risk in incidence and prevalence for **all** forms of cancers.

As the highest medical executive for the largest fire fighter organization in the world, I appear before you today to bridge the critical gap between clinical oncologic pathology

and your State's current presumptive legislative state. My duties include investigating negative health outcomes afflicting fire fighters and to base my professional medical opinions on the "reasonable degree of medical certainty" standard. To that end, it is my professional medical opinion, within said reasonable degree of medical certainty, that given the available evidence, the State of Oregon is currently experiencing a wide gap between the occupationally related malignancies that arise among fire fighters and the presumptive coverage it recognizes for them. In my medical expert opinion, Oregon's current presumptive legislation should be amended to recognize **all** cancers arising out of and in the course of employment as a fire fighter, as a rebuttable presumption. Doing so would place Oregon in-line with other jurisdictions as a leader in the nation with respect to ensuring that its fire fighters attain just benefits and entitlements for work-related malignancies already proven by science to arise from exposures related to their occupation.

Currently, the adjudicative process in Oregon fails to reflect the principles of general carcinogenesis among fire fighters, many of which are known to originate from genetic and epigenetic alterations occurring from toxic fireground exposures. This shortcoming has led to many Oregon fire fighters currently being trapped in protracted disputes regarding the specific organ or anatomy of cancer origin, as well as to the specific wording the types and subtypes of their cancers were given during diagnosis. It is time for Oregon to shift the burden of proof where it belongs, on the employer, and away from sick and dying fire fighters. Said system will acknowledge what science has evidenced to be clear and convincing evidence, that is, the occupation of firefighting is inextricably linked to carcinogenesis.

The model which exists in Oregon, and in other states where cancers are periodically added to the relevant presumptive statutes for fire fighters, is reactive, and thus, disadvantageous, as it limits the period for expansion of these presumptive laws to only when the legislative sessions are occurring. This leads to long, drawn-out bureaucratic adjudicative processes for fire fighter cancer claims in the interim, often leading to a resolution only after the fire fighter has experienced medical bankruptcy or has succumbed to the illness.

The pattern for fire fighters' working exposures that result in cancers is consistent and irrefutable when the corrected biostatistical metrics are implemented. Unfortunately, most of these cancers occur and are studied too infrequently to be significant in epidemiological conclusions. It is only when individual studies are eventually combined during meta-analytic processes, that they provide rationale for broader general causation determinations. One of the best examples on this point comes from Grace LeMasters, et al.,¹ who in 2006, published a meta-analysis of 32 lower-powered studies which, individually, carried limited biostatistical weight, but collectively, once meta-analyzed, had much higher biostatistical power and yielded important information about the increased risks in incidence and prevalence of several cancers in fire fighters.

Notwithstanding, performing meta-analyses can be tediously slow and may be unnecessary in light of the recently discovered mechanistic carcinogenic evidence from

the World Health Organization's International Agency for Research on Cancer (IARC) that supports that fire fighters who are diagnosed with **any** form of cancer are more likely than not to have sustained these cancers from their workplace exposures.

Since Oregon's Legislature enacted its list of fire fighter presumptive cancers, IARC reclassified in 2022 the occupation of firefighting as a Group 1, Known Human Carcinogen. This signifies that "Firefighter" is no longer merely a job title, but a source of "known human carcinogenesis." This reclassification was rooted in 5 mechanistic characteristics of general carcinogenesis by which firefighting compromises the human immunologic system. These are:

1. **Genotoxicity:** Direct damage to genetic information.
2. **Epigenetic Alterations:** Changes in gene expression that do not involve alterations to the underlying DNA sequence.
3. **Oxidative Stress:** An imbalance leading to profound cellular and molecular damage.
4. **Chronic Inflammation:** Persistent immune responses that trigger tumor growth.
5. **Modulated Receptor-Mediated Effects:** Interference with cellular communication and growth.

It is important to note that IARC only required 1 of the 10 existing mechanistic processes to be present to corroborate this positivity and in the case of firefighting, not 1, but 5 of these mechanistic characteristics were positively identified.

Because these mechanisms are systemic, and our bodies are not compartmentalized anatomical regions, a toxin does not selectively "choose" a specific organ. Rather, it circulates throughout the entire body, poisoning it entirely. And even though some carcinogens may have been attributed to have an affinity for certain organs, the reality is that these studies were limited by their research aims or funding and as such, are not definitive. This effectively makes site-specific cancer lists medically obsolete when faced with systemic chemical exposures that circulate throughout the entire bodies of fire fighters. For example, a landmark 2025 study by Furlong, et al,² identified genetic instability and autoimmune dysfunction among fire fighters caused by PFAS and other toxic exposures. This research links firefighting to **14** specific cancers, many of which are currently **not covered** under Oregon's existing presumptive law. These are:

- Lung, Breast, Liver, and Kidney
- Bone, Spine, and Chordoma
- Endometrium and Bladder
- Biliary tract, Pancreas, and Gallbladder
- Lymphomas (beyond NHL)

It is also well understood by researchers that fire fighters, because of the emergency nature of their work, are a very difficult subpopulation to study accurately. As such, the true risk for cancer among fire fighters is often underestimated. Oftentimes, legislators are mostly presented with epidemiological data from these suboptimal studies that

suggest a “low power” of association for certain fire fighter cancers. However, as an epidemiologist and medical doctor, I, as do many of my colleagues, recognize the existence of statistical noise that may mask the true causal risk factors within data sets. Current studies are often biased toward the null (meaning the studied outcome is unproven or may be due to chance) because of the Healthy Worker Effect and also because most mortality studies rely on each individual State’s death certificates and register-based data that may be lacking important information. Fire fighter studies are also plagued with significant Ascertainment and Survival biases, which together compound the problem of losing fire fighter-specific evidence to, as well as assigning fire fighter-specific risk increases to the general population.

As for death certificates, their completion emphasizes timeliness, often within 24 hours. And while on the one hand, this is much helpful to assist grieving families, on the other, it leads to information imprecision and inaccuracies that frequently lead to misclassification and non-specific ICD diagnostic codes. Dr. Siemiatycki, a preeminent expert in occupational carcinogens, notes that previous research relied on crude exposure assessment schemes that are hard-pressed to detect the actual risks. That is why a dynamic approach to causation is now contemporarily used, because it incorporates theories of causation that can account for the limitations of some research.

One such tool is the **Rothman’s “Causal Pie” model**, where a disease is the result of various component slices. When evaluating fire fighters, we find they typically have lower rates of tobacco use and higher fitness levels than the general population. When these personal lifestyle “slices” are removed, the remaining occupational and other relevant exposures, naturally expand to fill the voids of the causative pie.

This is supported by the 2025 Descatha et al. study entitled, ***Work Exposome and Related Disorders of Firefighters***, which concludes that occupational exposures are the greatest contributors to cancer in fire fighters compared to personal risk factors.

Furthermore, the **Russo-Williamson Thesis (RWT)** provides a framework for “evidence pluralism,” allowing us to combine statistical correlations with the qualitative mechanistic evidence identified by IARC.

Together, these models allow for the “more likely than not” threshold to be met, regarding employment as a fire fighter being causative of **all** cancers.

Expanding presumptive coverage is a matter of equitability and modernization. By moving to an **“all-cancer”** model, Oregon would join a growing international consensus of jurisdictions that prioritize firefighter health over bureaucratic convenience, including Louisiana, Ohio, California, New Jersey, Rhode Island, Oklahoma, as well as the Canadian Provinces of British Columbia, Manitoba, and the Northwest Territories, all of which have completed or are in the process of reviewing the transition to an **all-cancer** model.

Of the currently existing legislative languages, I support the proposal for Oregon to adopt language that reflects that of Louisiana's. It reads:

Because of exposure to heat, smoke, and fumes or carcinogenic, poisonous, toxic, or chemical substances, when a firefighter... has developed cancer, the cancer shall be classified as an occupational disease or infirmity connected with the duties of a firefighter. The disease or infirmity shall be presumed to have been caused by or to have resulted from the work performed.

The evidence is clear:

1. **Systemic carcinogenic mechanistic evidence** has been proven, and through these pathophysiological processes, toxins attack the entire body, making site-specific lists of cancer inaccurate and imprecise, altogether impractical.
2. **The 'Work' Exposome** is the primary driver of these illnesses, as firefighters lack many of traditional lifestyle risk factors affecting the general population.
3. **Equitability** demands that we stop picking winners and losers among those exposed to the same carcinogens. An example of this point will follow.

As to costs, when one considers the cost benefit from reduced appeals hearings associated with fire fighter cancer claims' appeals, the resultant increase in costs would be marginal and it would allow for just and equitable entitlements for fire fighters suffering from occupationally acquired cancers.

And this is of the utmost importance, as many fire fighters pass away before their claim approvals are decided. They die without the recognition that their illness was a result of their sworn duties and the fulfillment of their oath as a fire fighter, not knowing if their families will have the support necessary to retain their home, and make ends meet after they are gone. I have personally seen fire fighter families become destitute after the passing of their fire fighter provider, only for this to be rectified on appeal, oftentimes after years or decades of those families enduring the economic devastation that an erroneous administrative ruling gave them.

This underscores another point, far too often the evidentiary onus, when placed on fire fighters, is far too high to allow for the fair and equitable adjudication of their claims. This is because they can only rely on the medical opinions of their treating practitioners, who oftentimes neither have the time nor are experts on fire fighter occupational medicine, fire service epidemiology, or the standards of causation used in workers' compensation schemes in their States of practice to provide a fully informed opinion. This is because fire fighters are unlikely to have no access to medical experts, and when they do, most

lack the financial means to retain them. A current internet search yielded a market rate for these medical experts to range from \$500 to \$2,500 per hour.

In Summary:

- Listing presumptive firefighting cancers individually is reactive. This is inappropriate and impractical from a legislative standpoint, because fire fighters have to wait until your legislation is in session before any corrective action can be pursued.
- Current research describes the mechanistic pro-oncogenic alterations that occur from firefighting exposures for **all** cancers.
- Genetic and epigenetic alterations cause many forms of rare cancers, which are difficult to recreate through high-power epidemiological studies due to the small sample size fire fighters represent. In this setting, traditional dose-response endpoint studies become ill-suited as the metric to establish presumptive causation. A common epidemiological expression applies here: Because rare diseases occur rarely, they are rarely funded, so they're rarely studied. Notice the operative word here is 'funding.'
- To contest the denials of their cancer claims, firefighters require well nuanced medical experts which carry honoraria that is out of reach to most fire fighters, Conversely, well-funded insurances not only have these resources readily available but oftentimes have these medical experts on retainer. Clearly, this creates an unfair advantage for the latter.
- Once the specific causation has been established at appeal, jurisdictions, including Oregon, consistently rule in favor of fire fighters. This specific causation must now be applied broadly to support coverage for **all** cancers in fire fighters.
- Many other jurisdictions do, or are proposing coverage for **“all cancers”, “any type of cancer”, or “any cancer”** acquired by those who have served as a fire fighter.
- If the same occupational exposure can lead to a multitude of different cancers, the equitable approach is to allow coverage for **all** such cancers.

I close with a salient example of this problem. Your current Oregon Statute contains a significant medical blind spot regarding hematopoietic (blood-based) cancers. Your law lists only 3 forms of blood cancers, Multiple Myeloma, Leukemia and Non-Hodgkin's Lymphoma. These 3 type-specific blood cancers are woefully inaccurate with respect to the pathological reality of how blood cancers and their pre-disease states (many of which are considered cancers in their own right) manifest.

All hematopoietic malignancies originate in the stem cells of the bone marrow. Research has shown that occupational toxic exposures cause clonal expansion of genes most associated with blood-based tumors (specifically the JAK2 mutation). This mutation is directly linked to benzene and volatile organic compounds (VOCs), both known carcinogens heavily encountered on the fireground.

Consider the case of **Eugene, OR, Fire Chief Michael Caven**, who is currently battling **Essential Thrombocythemia**. He worked in the Training Division along with 2 other colleagues, one who has been diagnosed with **Polycythemia Vera** and the other with **Acute Myeloblastic Leukemia**. Under your current law, Chief Caven and his colleague with Polycythemia Vera are being denied benefits, while the one with Acute Myeloblastic Leukemia is being covered, because **Leukemia** is noted in your legislation. This one example underscores how your current system creates winners and losers based solely on what specific cancers were included in your legislative language, even for cancers with pathological relatedness and origination from the same stem cell mutation process. Moreover, for each of these 3 cancers, benzene, an IARC Group 1, Known Human Carcinogen, is a demonstrated ubiquitous exposure in the fire service.

Thank you for the opportunity to speak before you today.

¹ LeMasters GK, Genaidy AM, Succop P, Deddens J, Sobeih T, Barriera-Viruet H, Dunning K, Lockey J. Cancer risk among firefighters: a review and meta-analysis of 32 studies. *J Occup Environ Med*. 2006 Nov;48(11):1189-202. doi: 10.1097/01.jom.0000246229.68697.90. PMID: 17099456.

² Furlong, Melissa A., et al. "Per-and polyfluoroalkyl Substances (PFAS) and microRNA: an epigenome-wide association study in firefighters." *Environmental research* (2025): 121766.