

# Cancer Prevention in the Danish Fire Service

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## BACKGROUND

Studies show an elevated risk for certain cancers in firefighters due to absorption through the breathing and digestive systems as well as dermal uptake.

Firefighters are exposed to toxic substances when fighting fires such as Polycyclic Aromatic Hydrocarbons PAHs and Volatile Organic Compounds VOCs. Many of them grouped by IARC as known cancer causing for humans Group A.

## STUDY OBJECTIVES

Reduce firefighters exposure to toxic chemicals and exposure time through implementation of new prevention efforts in fire services throughout Europe.

## METHODS

In Europe we have developed best practices from the moment the firefighter goes on duty until they goes off duty after a shift. We also cooperate closely with manufactures of PPE and decontamination systems in order to push for even better protection.

## CONCLUSIONS

Future studies need to address other issues under suspicion of creating health problems such as interrupted sleep and psychological impacts. Areas where preventive measures should be prioritized even more.

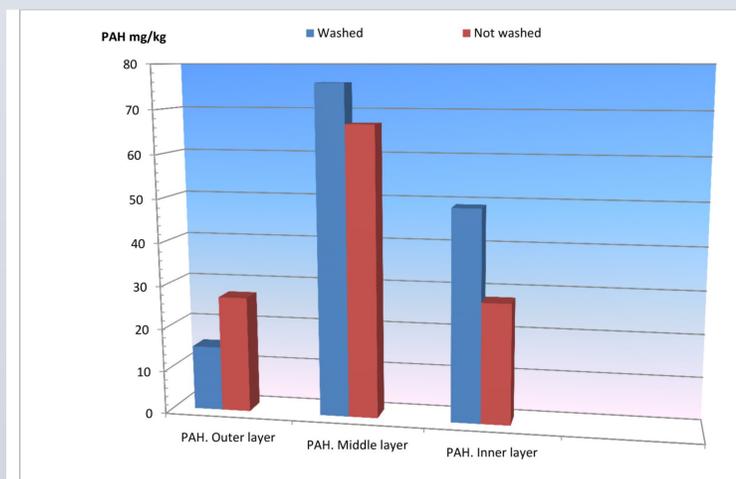
Reaching the goal of producing less cancer sick firefighters it's important for scientists, politicians and firefighters to work together

## RESULTS

BFC has develop practices based on a combination of science, what is practical possible and what is the best known technology in order to bring down cancers in firefighting.

This includes:

- Always avoid cross contamination.
- Building of clean firehouses.
- Good behavior on the fire scene using breathing apparatus and definition of "safe zone".
- Handle contaminated equipment separately from clean not used equipment with special trucks made for this purpose.
- Proper cleaning and decontamination after every fire using LCO2 and Ozone.
- Proper personal washing hygiene after every fire intervention.
- Healthy living and work out.
- Develop education programs for fire academies. And training programs for "old" firefighters.



The measured PAHs were identified with GC-MS (gas chromatography-mass spectrometry) and quantification was based on added deuterated (deuterium labelled) standards.

The extraction was done with a mixture of acetone and hexane (1:1) and the samples (ca. 0,5 g fabric) were sonicated for 1 hour and shaken overnight.

Two firefighter suit jackets were tested for potentially harmful components. Both jacket samples showed the presence of PAHs and all layers of the tested jackets parts were contaminated. The washing procedure seemed to transfer the PAHs to the inner parts of the jacket. However we need to do more repetitions and more tests to be able to validate the findings.



Truck drives to all fire scenes where the firefighters contaminated gear are bagged, sealed and handled. The firefighters are able to shower and change into clean dry clothes.



Clean fire station divided into clean/not clean areas to avoid cross contamination from contaminated equipment into living quarters. This station is build in Hollola, Finland.



Contaminated suits need decontamination. LCO2 is a solution.