

## **Addendum: Recommended Minimum Employment Durations**

The preceding report considered the occupational risk to firefighters of developing certain cancers. This addendum recommends minimum employment durations necessary before a claim made by a firefighter for lung or colon cancer could fall under a presumption of occupational disease. The durations given below take into account both exposure and latency issues.

The epidemiological literature uses employment duration as a proxy for exposure to carcinogenic or other substances. Latency is different from exposure. Latency is the elapsed time between first exposure to a carcinogen and the clinical manifestation of the disease.

We have been asked to comment on the latency period (the period of time between first exposure and the clinical manifestation of the disease) necessary before a claim made by a firefighter could fall under a presumption of occupational disease. It is my considered opinion that the length of time since first exposure that would qualify a firefighter for a presumption of occupational disease would be:

1. for lung cancer, 15 years
2. for colon cancer, 15 years

The basis for this conclusion is an abundant epidemiological literature that supports a peak latency period for both cancers specifically, and for solid tumours in general, on the order of two decades. However, occasional cancers occur relatively early and could be expected before 20 years have elapsed, but not as early as 10 years after first exposure (first hire).

It is more difficult to comment on the duration of exposure required by a firefighter to qualify for a presumption of occupational disease because in most of the available data, including our own, duration of exposure is essentially equal to latency for career firefighters. I would suggest:

1. for lung cancer, 15 years

2. for colon cancer, 15 years

The justification for the latter recommendations is inferential. It is, in other words, weaker than the latency criterion.

The limited evidence for length of exposure for lung cancer, most of which comes from our own study, suggests that some firefighters who do not complete probation or who drop out of the occupation in early years have a higher risk of lung cancer than those who stay longer, probably because of lifestyle differences, and that this effect then disappears as the duration of exposure to hazards in firefighting increases and becomes much more important after 40 years. If this interpretation is correct, and it is arguable, it would mean that the effect of firefighting as an occupation would first be visible around or somewhat after 15 years of service. A simpler rationale is that an effect may be present in our data at "<20 years" but because of latency issues (most of the firefighters in our study worked straight through, and so their exposure duration is the same as their latency) would not be credible at 10 years. Therefore, 15 is a reasonable estimate, giving the benefit of the doubt to the worker.

The evidence for colon cancer is the simpler rationale because we do not have the confusing early effect that we see in lung cancer. An effect may be present in our data at "<20 years" but because of latency issues (most of the firefighters in our study worked straight through, and so their exposure duration is the same as their latency) would not be credible at 10 years. Therefore, 15 is a reasonable estimate, giving the benefit of the doubt to the worker. It is entirely possible that the "hazard" associated with colon cancer has nothing to do with combustion products from the fire.