

GENERAL REMARKS

This ninety-eighth volume of *IARC Monographs* contains evaluations of the carcinogenic hazard to humans of painting, firefighting, and shiftwork. This is the first evaluation of shiftwork and firefighting by IARC. Painting had been evaluated previously in Volume 47, and newer epidemiological and experimental studies are reviewed in this volume. A common feature that led to the assessment of these human activities in one volume is that each is associated with diverse and complex exposures.

Firefighters can work in the profession full time or on a volunteer basis, holding other jobs at the same time. They can battle household fires, chemical fires, oil fires, forest fires, and fires of many other types, resulting in exposures to a vast variety of smoke, dusts, and chemical agents. Exposures are generally intermittent but intense. Many occupational records apply the term “firefighter” rather broadly, including logistics and support personnel as well as the people who enter a fire. The average time spent actually in fires is rather short overall, raising some concern that results for subgroups of highly exposed individuals might be difficult to observe in cohorts that are more broadly defined.

Painters, too, can work in the profession full time, but the term also includes artists and day workers who take different odd jobs on other days. Several studies include job categories such as decorators and wallpaper hangers along with painters, and there are also studies involving residential exposure to freshly painted rooms. Painters can work indoors or outdoors, with varying degrees of ventilation and protective equipment, and some work in construction zones with exposure to various dusts and chemical substances. The paints and coatings themselves have changed in composition over time and can be based on natural oils, synthetic oils, or latex. They include pigments derived from metals and chemical additives for many purposes, including those with pesticidal properties. In addition, painters are exposed to dusts and chlorinated solvents during preparation and cleanup operations.

Shiftwork is perhaps the most wide-ranging classification of all, with various definitions of shiftwork used in the epidemiological studies. As a causal factor, shiftwork is difficult to disentangle from related measures such as circadian disruption, sleep deprivation, and exposure to light at night. Analysis of epidemiological studies is further complicated by the fact that reference populations, too, are invariably exposed to these factors to some degree. The social and physical

environment associated with working at night provides additional factors that complicate the analysis of these studies. The strongest evidence so far is for breast cancer, which is associated with childbearing history, which in turn might affect willingness to take on shiftwork. There are surprisingly few studies of the effects of shiftwork for men working in industrial settings, however.

It is hoped that the critical reviews that appear in this volume will stimulate further research that addresses these aspects and leads to a resolution of the cancer hazards associated with firefighting and shiftwork.

A summary of the findings of this volume appears in *The Lancet Oncology* (Straif et al., 2007).

Reference

Straif K, Baan R, Grosse Y et al. (2007). Carcinogenicity of shift-work, painting, and fire-fighting. *Lancet Oncol*, 8:1065–1066 doi:10.1016/S1470-2045(07)70373-X. PMID:19271347 <http://www.thelancet.com/journals/lanonc/article/PIIS147020450770373X/fulltext>