

Occupation and Cancer in the Nordic Countries

NOCCA - the Nordic Occupational Cancer Study

Holmfridur K. Gunnarsdottir, Research Center for Occupational Health & Working Life, Iceland; Jan-Ivar Martinsen, Kristina Kjaerheim, and Elisabete Weiderpass, Cancer Registry of Norway; Elsebeth Lynge, University of Copenhagen, Denmark; Pär Sparén, Karolinska Institute, Sweden; Laufey Tryggvadottir, Icelandic Cancer Registry; Eero Pukkala, Finnish Cancer Registry.

Background and Aims

The aim of the study was to assess cancer risk by occupation in the five Nordic countries.

Methods

Individual census information on occupation of 15 million inhabitants of the Nordic countries aged 30 to 65 was collected in 1960, 1970, 1980 and/or 1990. Follow-up was obtained through linkages with national death and cancer registries up to 2005; 2.8 million incident cancer cases were identified. Occupational information was categorized into 53 occupational groups and one group of economically inactive persons. Cancer data were grouped into 48 main cancer sites and 27 histological or anatomical subgroups. The observed number of cancer cases in each occupational group defined by country, gender, age, and period, was compared with the expected number based on the incidence rates of the national populations. Results are presented as standardized incidence ratios (SIRs), defined as the ratio of the observed to the expected number with 95% confidence intervals (95% CI).

Results

Among men, a wide variation in risk was observed, from waiters (SIR 1.48, 95% CI 1.43-1.53) to farmers (SIR 0.83, 95% CI 0.82-0.83). Among women SIRs varied between 1.27 (95% CI 1.19-1.35) among tobacco workers and 0.86 (95% CI 0.85-0.87) among gardeners. Some established occupational risk factors were confirmed and gradients in risk according to socioeconomic status were observed. In general those with low education and in low status jobs had higher risk of smoking- and alcoholrelated cancers than others. Breast cancer among women and prostate cancer among men show an opposite pattern. Farmers, gardeners, and teachers were groups showing low-risk profiles for most cancer sites in both genders.

Discussion and Conclusions

Cancer risk varies with occupation and socioeconomic status in all the Nordic countries, despite of the highly advanced welfare systems in the Nordic countries aiming at equality in health. Life-style factors of the occupational groups, in addition to possible exposures at work, evidently are of importance. Smoking and excessive drinking can be seen as a secondary symptom of deeper underlying features of the social and economic situation of the individuals. The low cancer incidence among farmers and gardeners is worth further exploration.