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Cancers of the Lip and Oropharynx in Different Social and Occupational Groups in Finland

Eero Pukkala, Anna-Liisa Söderholm and Christian Lindqvist

Social status and occupation-specific risks of cancers of the lip, tongue, mouth and pharynx were studied in a nationwide series of 2369 men and 809 women diagnosed in Finland in 1971–1985 and recorded in the files of the Finnish Cancer Registry. Codes for social status (four classes) and occupation (336 categories) were drawn from the files of the 1970 Population Census. The standardised incidence rates (SIR) were defined as the ratios of observed and expected numbers of cases, the expected ones being based on the sex, age, site and calendar period-specific incidence rates in the Finnish population. The SIR of lip cancer in the lowest social class was five times that of the highest one, thus indicating the effects of social class differences in smoking habits. The effect of outdoor work on the development of lip cancer was also strongly supported by this study. The social class-adjusted SIR for fishermen was 2.7 (95% C.I. 1.3–5.0), for forestry managers 2.2 (1.2–3.6), for timber workers 1.9 (1.2–2.9) and for farmers 1.8 (1.2–2.6). For cancers of the oral cavity and pharynx there was no clear correlation with social class. However, the SIR for these cancers among farmers was significantly reduced. The occupation-specific SIRs pointed more to alcohol than smoking aetiology. In the case of cancer of the tongue, no aetiological clues whatsoever could be found. The role of direct occupational factors in the aetiology of any of these cancers seemed to be minimal.

Keywords: oropharyngeal cancer, occupational exposure, social status, lip cancer, cancer of the tongue, oral cancer, pharyngeal cancer, risk factors, standardised incidence ratio, incidence.

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INTRODUCTION

SEVENTY-FIVE years ago Russel [1] stated that persons working in the liquor trade, where alcohol was relatively freely available, were particularly prone to develop oropharyngeal cancer. This observation has since been confirmed by several other authors [2, 3]. The elevated risk for lip cancer among rural males observed in several countries has been linked to outdoor work and smoking [4–8]. Single studies have reported elevated incidence rates of oral cancer among asbestos, steel, metal and textile mill workers [9, 10], but no consistent evidence for occupational risk factors for oropharyngeal cancer has been found [11].

The present study was carried out to establish whether any occupational risks of cancers of the lip and oropharynx exist in Finland. To distinguish the roles of general life-style factors from specific occupational ones, social status-specific risk ratios were also defined and risk ratios by occupation were adjusted for by social status.

Correspondence to E. Pukkala.
E. Pukkala is at the Finnish Cancer Registry, Liisankatu 21B, 00170 Helsinki; and A.-L. Söderholm and C. Lindqvist are at the Department of Oral and Maxillofacial Surgery, Helsinki University Central Hospital, Kasarmikatu 11, 00130 Helsinki, Finland.
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MATERIALS AND METHODS

Our study series consisted of all cancers of the lip (ICD-9 code 140), tongue (141), oral cavity (143–144) and pharynx (145–148) diagnosed in Finland in 1971–1985 and recorded in the files of the Finnish Cancer Registry. The Finnish Cancer Registry has been recording cancer patients on a nationwide basis since 1953 and its coverage and accuracy—especially in the case of solid tumours—are virtually complete [12]. A recent comparison of the cancer register and a nationwide register including all hospital discharges during 1985–1988 revealed that 98.8% of cancers of the lip and 99.6% of cancers of the oral cavity and pharynx in the Hospital Discharge Register had also been reported to the Cancer Registry.

Data on the occupation and social class of the patients were drawn from the files of the 1970 Finnish Population Census in a computerised record linkage based on the unique personal identification number given to all persons residing in Finland. The coverage of the census was 98%, and the accuracy of the occupational data satisfactory [13]. Occupations were coded at

Table 1. *Numbers of cases of cancer of the lip, tongue, oral cavity and pharynx diagnosed in Finland during* 1971–1985 *in persons born during* 1906–1945 *included in the study, and proportions of those excluded from the study because of missing census data*

Site (ICD-9)	Included			Excluded	
	Men	Women	Total	*n*	%
Lip (140)	1405	145	1550	24	1.5
Tongue (141)	246	197	443	6	1.4
Oral cavity (143–144)	235	197	432	7	1.6
Pharynx (145–148)	483	270	753	20	3.3
Total	2369	809	3178	57	1.8

Statistics Finland using a modified Nordic Classification of Occupations [14]. The total number of occupational categories was 336. In addition, upper levels of the occupational codes (here the highest levels are called occupational branches) were used.

Social status was classified into four classes as follows:

I. Managers and other higher administrative or clerical employees, farmers owning more than 50 hectares of land.
II. Lower administrative or clerical employees, small-scale entrepreneurs, farmers owning 15–49.9 hectares of land.
III. Skilled and specialised workers, farmers owning 5–14.9 hectares of land.
IV. Labourers, farm and forestry workers, institutionalised persons, farmers owning less than 5 hectares of land, pensioners whose former occupation is unknown.

Economically active persons were classified by their current or former occupation, and economically dependent persons (e.g. housewives, students) by the occupation of their supporter. The small category of those of unknown social status (1.0%) was combined with class III.

The observed numbers of cases for different social classes and occupations were calculated and compared with the expected numbers based on the sex, age, calandar period, occupation and social class-specific number of person-years produced by the Statistics Finland, and the sex, age, calendar period and site-specific incidence rates for the whole Finnish population produced by the Finnish Cancer Registry. Both crude and social class-adjusted expected numbers of cases were calculated for each occupational category.

The standardised incidence ratios (SIR) were defined as the ratios of the observed and expected numbers of cases, and their 95% confidence intervals (95% C.I.) were estimated on the assumption that the number of observed cases followed a Poisson distribution.

RESULTS

A total of 3235 cases of cancer of the lip, tongue, oral cavity and pharynx were diagnosed in Finland during 1971–1985 among persons born during 1906–1945. After exclusion of the 57 (1.8%) for whom no census data existed, 2369 male and 809 female patients remained in the analysis (Table 1). Half of them (59% of males) had lip cancer.

The risk of lip cancer increased strongly with the decreasing standard of living (Fig. 1). The SIR for men in the lowest social class was 1.34 (95% C.I. 1.19–1.49), five times that in the highest social class (Fig 1). A similar trend was seen for women despite the small number of cases.

In lip cancer among men there was also a 5-fold difference between the branches with the highest and the lowest SIR (1.49 in farming, forestry and fishing, 0.29 in administration and clerical work; Table 2). The SIR was also very low (0.39)

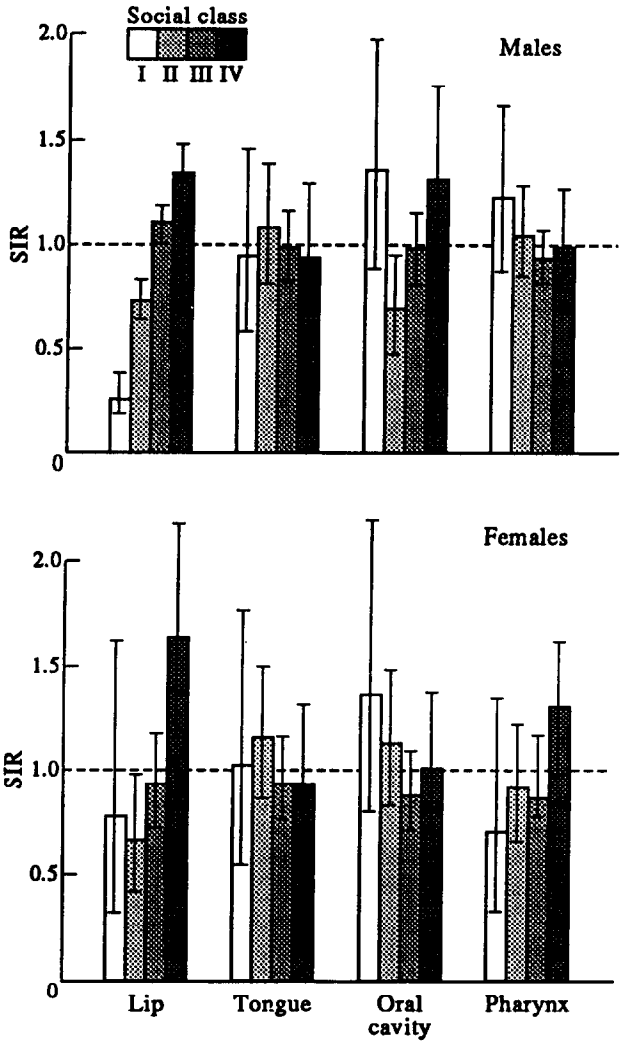

Fig. 1. Standardised incidence ratios (SIR), with their 95% confidence intervals, of cancers of the lip, tongue, oral cavity and pharynx in Finland during 1971–1985 in persons born during 1906–1945, by sex and social class.

Table 2. Observed (Obs.) and expected (Exp.) numbers of lip cancer during 1971–1985, *and standardised incidence ratios (SIR) with* 95% *confidence intervals* (95% *C.I.) among persons born during* 1906–1945, *by sex and occupational branch; with and without adjustment for social class*

Occupational branch	Obs.	Adjusted			Unadjusted		
		Exp.	SIR	95% C.I.	Exp.	SIR	95% C.I.
Males							
Economically active persons	1131	1166	0.97	0.91–1.03	1180	0.96	0.90–1.01
0 Technical, humanistic, etc. work	41	53	0.77	0.55–1.04	106	0.39	0.28–0.53
1 Administrative/clerical work	21	34	0.62	0.38–0.95	71	0.29	0.18–0.45
2 Sales professions	21	45	0.47	0.29–0.72	54	0.39	0.24–0.60
3 Farming, forestry, fishing	540	395	1.37	1.25–1.49	363	1.49	1.36–1.62
4 Mining and quarrying	8	7	1.16	0.50–2.28	6	1.27	0.55–2.50
5 Transport and communications	89	98	0.91	0.73–1.12	104	0.86	0.69–1.05
6/7 Industrial and construction work	375	482	0.78	0.70–0.86	422	0.89	0.80–0.98
8/9 Services	36	53	0.68	0.48–0.94	54	0.66	0.47–0.92
Economically inactive	274	239	1.15	1.02–1.29	225	1.22	1.08–1.37
Whole population	1405	1405	1.00	0.95–1.05	1405	1.00	0.95–1.05
Females							
Economically active persons	71	73	0.98	0.76–1.23	71	1.00	0.78–1.26
0 Technical, humanistic, etc. work	3	6	0.53	0.11–1.55	7	0.40	0.08–1.18
1 Administrative/clerical work	4	5	0.88	0.24–2.26	8	0.53	0.14–1.35
2 Sales professions	5	5	0.93	0.30–2.17	6	0.79	0.25–1.83
3 Farming, forestry, fishing	27	21	1.30	0.86–1.90	19	1.43	0.95–2.09
5 Transport and communications	1	2	0.51	0.01–2.85	2	0.44	0.01–2.43
6/7 Industrial and construction work	12	13	0.96	0.50–1.68	12	0.97	0.50–1.70
8/9 Services	19	22	0.87	0.52–1.35	16	1.20	0.72–1.85
Economically inactive	74	72	1.02	0.80–1.28	74	1.00	0.78–1.25
Whole population	145	145	1.00	0.84–1.17	145	1.00	0.84–1.17

among people doing technical, humanistic, scientific and artistic work, and in sales professions. Adjustment for social class diminished the variation but the highest SIR was still three times as high as the lowest one (Table 2). Among women the SIR pattern was rather similar to that of men.

In specific occupations, statistically significantly elevated crude SIRs above 2 for lip cancer were found among male fishermen (3.02), agricultural workers (2.23) and timber workers (2.09) (Table 3). Even the social class-adjusted SIR for fishermen was as high as 2.70; for forestry managers it was 2.18. Very low SIRs were recorded in a number of professions in manufacturing but also in business and management. Adjustment for social class had a striking effect especially on the SIRs of occupational categories with the great proportion of persons from the highest social class. For example, the significantly low SIR of 0.28 (95% C.I. 0.10–0.60) among male teachers rose to 0.87 (95% C.I. 0.30–1.81) when adjusted for social class. Among women, farmers topped the list, but the variation between occupations was smaller than among men (Table 3).

The risk of pharyngeal cancer among women seemed to decrease with increasing social status (Fig 1). There were no clear-cut trends by social status for pharyngeal cancer among men or for cancers of the tongue or oral cavity in either sex. Hence, for these sites the crude SIRs for occupational categories are close to those adjusted for social class, and thus only adjusted rates are used in the following.

In cancer of the tongue, none of the occupational branches differed significantly from the national average (Table 4). The highest SIR in both sexes was obtained among administrative workers. In men this excess was attributable to the elevated SIRs of clerical workers and corporate administrators (Table 5). The statistically significant SIR for male journalists (6.84, 3 cases observed; Table 5) was supported by the parallel observation in women (1 case observed, 0.2 expected).

The risk of cancers of the oral cavity and pharynx was significantly reduced among men in farming, forestry and fishing (Table 4); the same was seen at the level of specific occupational categories (Tables 6 and 7). The risk of oral cancer in both sexes was highest among persons in service professions. Within the service branch, civilian guards and waitresses had significantly elevated risks of oral cancer (Table 6). Of the occupations with elevated risks observed in earlier studies, textile workers showed some increase (5 cases observed, SIR 1.92, 95% C.I. 0.62–4.49) in our study, whereas the SIRs for steel and metal workers were below 1.0.

Male electrical workers had a significant excess (SIR 2.29) of oral cancer (Table 6). They also had a slight excess of pharyngeal cancer, primarily among electronics workers (Table 7). The risk of pharyngeal cancer was significantly elevated among managers and men in artistic and literary work and among female shoemakers and—in contrast to men—farmers (Table 7).

An increased SIR among economically inactive men was found for all sites studied (Tables 2 and 4). This excess was highest for cancers of the pharynx (social class adjusted SIR 1.71) and oral cavity (SIR 1.61). These SIRs are higher than for any of the occupational branches among economically active men. Among women there was no difference between economically active and inactive persons (Tables 2 and 4).

Table 3. Observed (Obs.) and expected (Exp.) numbers of lip cancer during 1971–1985, *and standardised incidence ratios (SIR) with* 95% *confidence intervals (*95% *C.I.) among persons born in* 1906–1945 *for selected occupations*, by sex; with and without adjustment for social class*

Occupation	Obs.	Adjusted			Unadjusted		
		Exp.	SIR	95% C.I.	Exp.	SIR	95% C.I.
Males							
330 Fishermen	10	3.7	2.70	1.29–4.96	3.3	3.02	1.45–5.55
302 Forestry managers	15	6.9	2.18	1.22–3.60	15.7	1.57	0.88–2.59
671 Timber workers	23	12.0	1.92	1.22–2.89	11.0	2.09	1.33–3.14
310 Agricultural workers	30	16.4	1.83	1.24–2.61	13.4	2.23	1.51–3.19
300 Farmers, silviculturists	423	306.8	1.38	1.25–1.51	290.2	1.46	1.32–1.60
697 Building hands	25	38.2	0.65	0.42–0.97	27.7	0.90	0.58–1.33
66 Electrical workers	12	26.4	0.45	0.23–0.79	23.8	0.50	0.26–0.88
68 Painters, lacquerers	7	17.4	0.40	0.16–0.83	16.4	0.43	0.17–0.88
13 Mechanical technicians	2	7.3	0.27	0.03–0.99	9.9	0.20	0.02–0.73
22 Sales representatives	2	7.9	0.25	0.03–0.91	10.9	0.18	0.02–0.66
58 Postal services/couriers	2	7.9	0.25	0.03–0.91	7.1	0.28	0.03–1.01
650 Tuners, machinists	4	20.0	0.20	0.05–0.51	18.1	0.22	0.06–0.57
64 Precision mechanical workers	—	4.2	—	0.00–0.87	4.4	—	0.00–0.84
775 Machine setters, riggers	—	4.6	—	0.00–0.80	4.1	—	0.00–0.90
70 Printers	—	6.4	—	0.00–0.58	5.7	—	0.00–0.65
Females							
30 Farmers	10	7.0	1.43	0.69–2.64	6.0	1.67	0.80–3.07
31 Farm workers	17	13.6	1.25	0.73–1.99	12.8	1.33	0.77–2.13
831 Cleaners	8	11.3	0.71	0.31–1.39	6.8	1.18	0.51–2.32

*Social class adjusted SIR $\leqslant 0.75$ or SIR $\geqslant 1.25$; for females Exp $\geqslant 5$, for males $P < 0.05$.

DISCUSSION

The risk of lip cancer decreases with increasing prosperity whereas for the other sites studied there were no consistent trends by social class. This is in accordance with the results of earlier studies, showing that lip and intraoral cancers differ from each other aetiologically [1, 5, 15–18].

The fact that we found the high SIRs for lip cancer in fishermen and farmers—sometimes called "classic associations" [19]—and that even the levels of SIRs were very similar to those obtained in other studies implies that our study design is able to reveal differences in cancer risk between occupations. The known limitations of this type of study (misclassification of occupations, lack of occupational history, lacking data on confounding factors, etc.) tend to dilute the real differences but, in practical terms, this dilution seems to be relatively small.

The prevalence of smoking among Finnish men varied in 1968 from 37% among academic workers to 62% among industrial workers [20]. The unadjusted SIR for lip cancer in men correlates with this prevalence, but adjustment for social class makes the correlation disappear. Similarly, the adjustment for social class is likely to substantially diminish the effect of other factors associated with general life style. Still, some residual confounding certainly exists.

Exposure to sunlight or other factors causing dryness of the lips have been held as significant risk factors for lip cancer [1, 4, 5, 17, 21, 22]. The hypothesis has been presented that smokers experiencing recurrent herpes simplex virus 1 (HSV-1) infections are more liable to tumour initiation [23]. A case–control questionnaire survey showed that only when outdoor working and smoking are combined did they pose a markedly increased risk [6]. In our study, typical indoor workers, e.g. mechanical technicians, machinists and printers, who presumably do not smoke less than farmers, showed low SIRs. This finding supports the hypothesis that smoking is an important risk factor of lip cancer only when combined with an outdoor occupation. The joint influence of outdoor work and smoking to the risk of lip cancer seems to be so strong that other possible risk factors may not be detected.

For cancer of the tongue there was practically no variation between the occupation-specific risks. The only significant observation was the increased SIR for journalists, which may well be a chance finding typical of studies with numerous tests. Our study did not shed any light on the obscure aetiology of cancer of the tongue but the risk factors certainly differ from those of cancers of the oral cavity and pharynx.

Alcohol and tobacco—especially when used together—are known to increase the risk of cancer of the mouth and pharynx [24–28]. In our study, significantly high SIRs for these cancers were obtained among economically inactive men more prone to tobacco and alcohol abuse than the general population [29–31]. Although smoking is strongly related to social status, adjustment for social status did not change the SIRs for oral and pharyngeal cancer. Thus, smoking as such does not seem to be a strong risk factor for these cancers in Finland. It is more likely that much of the difference in the risk of oral and pharyngeal cancers is attributable to differences in drinking. Not only high risks among economically inactive men but also many of the elevated occupation-specific risks (among artists, managers, civilian guards, dock and warehouse workers, waitresses) can be associated with increased alcohol consumption.

The low risk of oral and pharyngeal cancers among farmers and forestry workers is difficult to explain. Smoking or alcohol

Table 4. Observed numbers (Obs.) of cancer of the tongue, oral cavity and pharynx; social class adjusted expected numbers of cases (Exp.) and standardised incidence ratios (SIR) with 95% confidence intervals (95% C.I.) during 1971–1985 among persons born during 1906–1945, by sex and occupational branch

Occupational branch	Tongue				Oral cavity				Pharynx			
	Obs.	Exp.	SIR	95% C.I.	Obs.	Exp.	SIR	95% C.I.	Obs.	Exp.	SIR	95% C.I.
Males												
Economically active persons	198	210	0.94	0.82–1.08	181	199	0.91	0.78–1.04	299	339	0.88	0.78–0.98
0 Technical, humanistic, etc. work	18	21	0.84	0.50–1.33	23	20	1.16	0.73–1.74	43	35	1.22	0.88–1.64
1 Administrative/ clerical work	19	13	1.48	0.89–2.31	11	13	0.82	0.41–1.47	17	24	0.72	0.42–1.15
2 Sales professions	12	11	1.11	0.57–1.93	8	8	1.00	0.43–1.97	25	17	1.51	0.98–2.24
3 Farming, forestry, fishing	48	60	0.81	0.60–1.08	31	57	0.55	0.37–0.78	63	99	0.64	0.49–0.82
4 Mining and quarrying	—	1	—	0.00–3.23	3	1	2.74	0.56–8.00	3	2	1.73	0.36–5.07
5 Transport and communications	23	20	1.17	0.74–1.76	20	17	1.17	0.71–1.81	30	31	0.97	0.66–1.39
6/7 Industrial and construction work	65	75	0.87	0.67–1.11	69	75	0.92	0.72–1.17	107	17	0.92	0.75–1.10
8/9 Services	13	10	1.29	0.69–2.20	16	9	1.82	1.04–2.96	11	16	0.71	0.35–1.26
Economically inactive	43	31	1.37	0.99–1.85	48	30	1.62	1.20–2.15	97	57	1.71	1.39–2.08
Whole population	241	241	1.00	0.88–1.13	229	229	1.00	0.87–1.13	396	396	1.00	0.90–1.10
Females												
Economically active persons	99	101	0.98	0.79–1.19	99	100	0.99	0.80–1.20	96	103	0.93	0.75–1.14
0 Technical, humanistic, etc. work	13	13	1.00	0.53–1.71	13	15	0.90	0.48–1.54	5	10	0.52	0.17–1.22
1 Administrative/ clerical work	17	14	1.22	0.71–1.95	12	13	0.91	0.47–1.58	9	11	0.85	0.39–1.61
2 Sales professions	6	10	0.62	0.23–1.34	9	10	0.93	0.43–1.77	6	9	0.70	0.26–1.52
3 Farming, forestry, fishing	24	24	1.02	0.65–1.51	19	23	0.83	0.50–1.29	27	27	1.01	0.66–1.47
5 Transport and communications	3	4	0.86	0.18–2.50	3	3	0.89	0.18–2.61	2	3	0.62	0.08–2.24
6/7 Industrial and construction work	14	17	0.84	0.46–1.41	14	16	0.86	0.47–1.45	16	17	0.92	0.53–1.49
8/9 Services	22	21	1.05	0.66–1.59	29	20	1.42	0.95–2.04	31	27	1.14	0.78–1.62
Economically inactive	91	89	1.03	0.83–1.26	91	90	1.02	0.82–1.25	102	94	1.08	0.88–1.30
Whole population	190	190	1.00	0.86–1.15	190	190	1.00	0.86–1.15	198	198	1.00	0.87–1.14

Table 5. Observed (Obs.) and expected (Exp.) numbers of cases of cancer of the tongue during 1971–1985, and standardised incidence ratios (SIR) with 95% confidence intervals (95% C.I.) among persons born during 1906–1945 for selected occupations (males only; in females no observations to report); adjusted for social status*

Occupation	Obs.	Exp.	SIR	95% C.I.
Males				
84 Journalists	3	0.4	6.84	1.41–20.0
14 Clerical workers	9	5.3	1.69	0.77–3.21
540 Motor-vehicle and tram drivers	19	12.2	1.56	0.94–2.44
11 Corporate administrators	8	5.7	1.40	0.61–2.76
65 Machine shop/steelworkers	11	15.1	0.73	0.36–1.30
673 Construction carpenters	5	9.2	0.54	0.18–1.26

*Social class adjusted SIR ≤ 0.75 or SIR ≥ 1.25; Exp ≥ 5 or $P < 0.05$.

Table 6. Observed (Obs.) and expected (Exp.) numbers of cases of cancer of the oral cavity during 1971–1985, and standardised incidence ratios (SIR) with 95% confidence intervals (95% C.I.) among persons born during 1906–1945 for selected occupations, by sex; adjusted for social status*

Occupation	Obs.	Exp.	SIR	95% C.I.
Males				
804 Civilian guards	5	1.2	4.13	1.34–9.63
66 Electrical workers	10	4.4	2.29	1.10–4.21
78 Dock and warehouse workers	7	5.2	1.36	0.55–2.80
11 Corporate administrators	5	7.9	0.64	0.21–1.48
77 Machinists	3	5.6	0.53	0.11–1.56
30 Farmers	22	44.2	0.50	0.31–0.75
673 Construction carpenters	3	8.6	0.35	0.07–1.02
697 Building hands	1	5.8	0.17	0.00–0.96
Females				
562 Railway traffic supervisors	2	0.1	13.64	1.65–49.3
54 Vocational teachers	3	0.4	8.28	1.71–24.2
82 Waitresses	6	2.0	3.01	1.11–6.56
81 Housekeeping/domestic workers	10	7.0	1.44	0.69–2.64
144 Office clerks	7	5.5	1.27	0.51–2.63
30 Farmers	5	6.8	0.73	0.24–1.71

*Social class adjusted SIR $\leqslant 0.75$ or SIR $\geqslant 1.25$; Exp $\geqslant 5$ or $P < 0.05$.

Table 7. Observed (Obs.) and expected (Exp.) numbers of cases of cancer of the pharynx during 1971–1985, and standardised incidence ratios (SIR) with 95% confidence intervals (95% C.I.) among persons born during 1906–1945 for selected occupations, by sex; adjusted for social status*

Occupation	Obs.	Exp.	SIR	95% C.I.
Males				
663 Electronics and telefitters	3	0.4	7.81	1.61–22.8
113 Administrative managers	3	0.6	5.18	1.07–15.1
8 Artistic/literary workers	8	2.5	3.20	1.38–6.31
23 Sales workers	10	6.8	1.48	0.71–2.72
83 Caretakers and cleaners	4	5.4	0.74	0.20–1.90
14 Clerical workers	6	8.4	0.72	0.26–1.56
34 Forestry workers	7	11.2	0.62	0.25–1.29
30 Farmers	50	81.4	0.61	0.46–0.81
67 Woodworkers	14	23.2	0.60	0.33–1.01
80 Watchmen, security guards	3	6.0	0.50	0.10–1.45
110 Corporate managers	2	5.6	0.36	0.04–1.29
652 Machine and motor repairers	0	5.3	0.00	0.00–0.69
Females				
620 Shoemakers and cobblers	2	0.0	1.02	12.36–369
61 Cutting/sewing workers	8	3.4	2.34	1.01–4.61
30 Farmers	15	8.3	1.80	1.01–2.98
31 Farm workers	12	18.4	0.65	0.34–1.14
231 Shop personnel	4	6.5	0.62	0.17–1.58

*Social class adjusted SIR $\leqslant 0.75$ or SIR $\geqslant 1.25$; Exp $\geqslant 5$ or $P < 0.05$.

use are no less frequent among people in these occupations than in the general population [20, 32]. In Finland, health care is about equally available for everybody almost free of charge irrespective of social status or place of residence. Differences in diagnostic practice are thus not likely to explain the differences. The role of diet-related protective factors in rural areas is a subject that should be further studied.

The variation by occupation is less pronounced in women than in men. One reason why statistically significant SIRs are more rare among women than among men is that there are fewer cases of oropharyngeal cancer among women. Until the 1970s, women in Finland smoked conspicuously less than men [20]. This certainly explains part of the lower incidence among women. Also, women tend to drink less than men.

The incidence of all cancers analysed in our study among economically inactive women was close to the national average. This was as expected because the majority of these women were housewives or farmers' wives.

The role of direct occupational risk factors—besides the previously mentioned outdoor work and indirectly occupation-related use of alcohol—seems to be small. Our study did not show the excess risk of oral cancer among asbestos, steel or metal workers suggested by some earlier studies [10]. The nonsignificantly increased SIR of oral cancer among textile workers (1.9) is consistent with some earlier observations, and the significant risk of pharyngeal cancer among cutting, sewing and upholstering workers (SIR 2.3) could be of a similar origin. Almost the only potential candidate for a new occupational association to be tested in future studies seems to be the excess risk of oral and pharyngeal cancer among electrical workers exposed to e.g. soldering fumes.

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