

This section discusses the main results by occupational group and should be considered as preliminary work for future studies on occupational cancer risks in Switzerland.

Main expected associations

In order to avoid overinterpretations of the multitude of results, the discussion mainly focuses on salient results derived primarily from a priori hypotheses (table 5) (See the section Limitations and Interpretation beginning on page 13). These "hypotheses" included well-known cancer risks of well-known occupational exposures, such as mesothelioma among workers exposed to asbestos, or well-documented associations between one type of cancer and one occupational group, such as sinonasal cancer among leather workers, for which no comprehensive knowledge exists on the etiologic agent involved. Other known associations (such as lip cancer among agricultural workers) for which occupation could be a nonspecific marker of a suspected exposure have also been examined. We also investigated whether the results could provide additional information on some controversial associations, like the excess of leukemia in relation to low benzene exposure.

As discussed earlier in this document (section Limitations and Interpretation beginning on page 13), occupational patterns for rare cancers are prone to misinterpretation. Therefore, with a few exceptions, an apparent occupational risk is discussed only when the excess risk involves five or more observed cases. Table 9 (beginning on page 72 at the end of this section) summarizes accordingly the significantly increased risks by occupation. For clusters based on fewer cases, only the histological description of the tumors is given. For further results, the reader should refer to table 8, which systematically presents all the cancer risks by site and occupation.

Coefficient of reliability

The discussion also provides concise information on the coding reliability for each occupation. The comments refer to the sole available data on this topic in Switzerland, based on mortality data. Through individual linkage of a random sample of 3058 records of deceased men, Minder & Beer-Porizek (2) established a concordance value (C, given as the percentage) for every occupational group; this value quantifies the agreement as

to occupation between the death certificate and census data. When C is high (> 75%), the occupation is known to be of good reliability in mortality statistics. When C is low (< 50%), the occupation is known to be unreliably coded on death certificates. Even if this reliability indicator is far from ideal for incidence-based occupational records (as both sources of information and coding differ from death and incidence records), it can be useful for the reader. Results related to occupational groups already known to be of low reliability in mortality statistics should be interpreted with caution.

Farmers and animal producers

The coding for farmers and animal producers (ASCR code 011, N=1393 in this study) was found to be reliable (C 80%) (2). However, this ASCR group is heterogeneous, as it includes agricultural laborers, as well as farmers and farm managers.

In agreement with the a priori hypotheses, this occupational group had higher risks of lip (OR 2.2) and thyroid (OR 2.7) cancers, and the results therefore confirmed those previously documented in numerous other studies (37, 40, 47, 151, 152). These patterns are probably related to sun exposure and to the iodine deficiency formerly common in rural areas of the Swiss mountains (135). Sun exposure could also explain the increased risk of squamous skin carcinoma (OR 1.6), particularly the excess of melanoma arising on the head and neck (OR 2.0) (151).

The slight excess of leukemia (OR 1.3) also fit the a priori hypotheses and could be related to exposure to pesticides, artificial fertilizers, or contact with farm animals (47). However, this excess was observed only among viniculturists (ASCR code 012, N=58 in this study) (OR 3.5), a result based on four cases only.

We also evaluated a potential excess of soft-tissue sarcoma in relation to chlorophenoxy herbicide use and observed a cluster of four bone cancers (all sarcomas) among horticulturists and related occupations (ASCR code 013, N=725 in this study), conferring a 4.0-fold increased risk (95% CI 1.4–11.0).

Butchers and related occupations

The reliability of the occupational coding of butchers and related occupations (ASCR code 023, N=499) was found to be moderate (C 54%) (2).

According to the a priori hypotheses, mainly based on the results of a cohort study carried out among butchers in Geneva (139), we found a 2.0-fold increased risk of chronic lymphatic leukemia. However, the excess of leukemia cases in the Gubéran et al study (139) concerned leukemia as a whole, rather than only chronic lymphatic leukemia. These results agree with those of previous studies (137, 143). However, a causal association between contact with raw meat and lymphohematopoietic malignancies is far from established.

Occupations in the pelt, leather and fur industries

The occupational group of leather-related workers (ASCR code 033, N=301 in this study) was found to be reliably coded (C=67%) (2).

As previously documented for leather workers or shoemakers (47, 48, 53), an almost eightfold increased risk of sinonasal cancer was observed. This result was based on five cases (three cases of the nasal cavity and two sinus tumors) of various histologies (two adenocarcinoma-, one signet-ring-cell carcinoma, one squamous-cell carcinoma, and one transitional-cell carcinoma). All the cases occurred among leather-related workers. According to recent analyses of mortality data (GS), three deaths from sinonasal cancer were observed among these workers between 1979 and 1986, but the excess risk was not significant.

The analytical strategy also focused on evaluating a potential excess of leukemia in relation to benzene exposure. A cluster of chronic leukemia (OR 2.5, 95% CI 1.4–4.4) was observed. With the exception of one furrier, all the cases were leather workers (mainly saddlers). However, because no excess of acute myeloid leukemia was found, benzene is unlikely to be a cause of this cluster (143, 153).

Bricklayers, stonemasons, tilers and related occupations

With respect to occupations listed under “bricklayers, stonemasons, tilers and related occupations” (ASCR code 041, N=1474 in this study), previous validity analyses of death certificates showed that the coding for masons and roofers was relatively reliable (C 59% and 76%, respectively), and was poor for construction laborers and other building trades (C 37%) (2).

An increased risk of neoplasms in relation to alcohol and tobacco consumption was noted, a finding also consistently reported among building and construction workers in European countries (37, 45) and in Swiss mortality data (2).

Plasterers and painters

Under “plasterers and painters” (ASCR code 043, N=1279 in this study), the coding was found reliable for painters (C 82%) and moderately reliable for plasterers (C 47%) (2).

The observed excess of liver cancer (OR 1.4) supports the a priori hypotheses (47, 154). However, the association between this occupational group and liver cancer remains somewhat controversial because no specific agents have been identified. The role of alcohol consumption could not be ruled out. The well-documented excess risk of leukemia in relation to benzene exposure (47) was not found in this study.

Stone and earth trades workers

The coding for stone and earth trade workers (ASCR code 051, N=183 in this study), particularly that for work related to stone and earth processing, was not found to be reliable (C 22%) (2).

The expected excess risk of pleural mesothelioma and lung cancer resulting from exposure to asbestos (and for lung cancer, also to silica dust) was also evident in our study. The 12-fold elevated risk of mesothelioma was probably underestimated, as this study did not include the recent incident data from the canton of Glarus, where an Eternit factory is located and where the Swiss mortality rates from mesothelioma are the highest (46). All 13 observed pleural cancer patients were residents of the canton of Zurich, where most of the other asbestos-derived industries are located. All, with one exception, were brick and cement manufacturers.

Foundry workers

Previous investigations on the quality of occupational coding showed that the group “foundry workers” (ASCR code 061, N=375 in this study) was mentioned too frequently on death certificates (C 35%) (2).

It is well known that lung cancer remains a major neoplastic problem among workers in the metallurgy and mechanical industries (47, 80, 90), probably because of exposure to welding fumes, cutting oil mists, fumes from metal treatment and coating, and exhaust from diesel and gasoline engines.

These workers also showed an approximate three-fold excess of pleural mesothelioma.

Mechanics

The coding was moderately reliable (C 54%) for mechanics (ASCR code 063, N=2203 in this study) and other metal workers (C 60%) (2).

As for foundry workers, we expected to observe an increased risk of lung cancer (47). However, as documented in recent mortality analyses (GS), the lung cancer risk was close to 1. The higher risk of skin, scrotal, and esophageal cancers previously reported for workers exposed to mineral oils was not observed (47, 155). With regard to the controversial association between leukemia and low-level benzene exposure (47), no increase in leukemia risk was found for mechanics.

Turners and related occupations

For metal turners (ASCR code 062, N=806 in this study) the coding reliability has been earlier described as low (C 39%).

The slight excess of lung cancer disappeared after adjustment for socioeconomic status, and no significant increased risks of esophageal or skin cancers were observed. Incidentally observed was an unexplained 2.5-fold increased risk (95% CI 1.0–6.2) for sinonasal cancers, which surprisingly were epidermal cell tumors (three melanomas and two squamous-cell carcinomas). This observation deserves further investigation.

Electricians

For electricians (ASCR code 064, N=1107 in this study), the coding was found to be of moderate reliability (C 52%) (2).

The 2.5-fold increased risk of pleural mesothelioma and the 1.2-fold increased risk of lung cancer (95% CI 1.1–1.4), patterns also observed in the mortality data, confirmed formerly reported asbestos exposure among electricians (37, 72).

In accordance with the a priori hypotheses, a controversial association between leukemia and exposure to electromagnetic fields (132, 143, 144, 145) was observed with an approximate twofold increased risk for acute leukemia (OR 1.9). We also observed an approximate twofold increased risk of biliary tract cancer (OR 1.9). Unexpectedly, among the 13 cases recorded for this site, 10 were localized outside the gallbladder, in the biliary tract. An increased risk of biliary tract cancer was confirmed in a recent analyses of mortality data (proportional mortality ratio 1.9, $P < 0.01$) (GS).

Watchmakers and jewelers

Occupational coding was previously described as not reliable for watchmakers (ASCR code 065, N=221 in this study) (C 28%) but moderately reliable for jewelers (ASCR code 151, N=134 in this study) (C 47%).

Already in 1929, Martland & Humphries (99, 100) described a relation between radium and mesothorium

ingestion and osteosarcoma resulting from watch fluorescent painting. In Switzerland also, several cases occurred among female radium dial painters in the watch industry (unpublished data). Contrary to the a priori hypotheses, such patterns were not found. This study is, however, inconclusive considering its low power and the noninclusion of women, frequently employed in the watch industry. The almost 2.6-fold excess risk of melanoma of the trunk among watchmakers was not an a priori hypothesis, and it remains unexplained.

Joiners, cabinetmakers and related workers

Within the occupations of joiners, cabinetmakers and related workers (ASCR code 072, N=1099 in this study), wood and cork processing were registered as moderately reliable (C 59%) and furnituremaking as reliable (C 81%) (2).

Sinonasal cancer, although rare, has been consistently found to occur with increased frequency among furniture workers (48). According to the a priori hypotheses, a 6.9-fold increase in sinonasal cancer was observed, and this finding confirms the strong excess risk previously reported in Swiss mortality statistics (156). Among the 14 cases recorded for joiners, cabinetmakers and related workers, 12 were adenocarcinomas. In Switzerland, sinonasal cancer in wood-related occupations is a definitely established occupational cancer and should, without further investigation, be considered as such by physicians and the National Accident Insurance Fund.

As found in mortality data (2), these workers also had an approximately fivefold increased risk of pleural mesothelioma (OR 4.7), and this finding confirms asbestos contact at the workplace or during nonoccupational activities (157).

Graphic arts occupations

Of the occupations in the graphic arts (ASCR code 08, N=794 in this study), the occupational coding for printing-related occupations was assessed as unreliable, whereas it was reliable for typesetters (C 68%) and moderately reliable for other occupations (C 48%) (2).

Occupational exposures in the graphic arts are rather heterogeneous and have considerably changed with technical progress (158). According to the a priori hypotheses, a slight excess of leukemia (OR 1.5, 95% CI 1.0–2.2) was observed in the whole group of graphic arts workers. This finding may be due to previous exposure to benzene (159).

For typographers (ASCR code 081, N=212 in this study), the excess risk was not based on a priori hypotheses, and it included fewer than five cases. The

fourfold increased risk for genital cancer was due to three cases of epidermoid cancer located on the penis. Although intriguing, this finding was considered to be spurious. The same observation could be made for sinonasal cancers, which showed no common histological features (one melanoma, one lymphoma, and one inverted papilloma).

Chemical workers

The occupational coding for chemical workers (ASCR code 091, N=463 in this study) was thought to be moderately reliable (C 55%) (2).

Most of the cancer cases occurring among these workers were registered in the canton of Basel, where the Swiss pharmaceutical industries are concentrated. Contrary to the a priori hypotheses, no elevated risks of lymphatic or hemopoietic cancers were observed. This finding confirms previous negative reports in Switzerland (2, 57).

The 1.8-fold increased risk of stomach cancer persisted after adjustment for socioeconomic status. A similar pattern has also been observed in Swiss mortality data (2), as well as in data of other countries (39, 45).

Architects, chemical engineers and other engineers

Coding for both architects (ASCR code 101, N=470 in this study) and engineers [chemical engineers (ASCR code 102, N=149 in this study) and other engineers (ASCR code 103, N=1799 in this study)] on death certificates was considered satisfactory (C 86% and 88%, respectively) (2). However, the engineers' occupational group is heterogeneous, as it includes engineers of different branches.

Patterns for cancer risks in these professions typically reflect high socioeconomic status. In particular, the two- to threefold excess of ocular cancer was due to ocular melanoma (ie, seven of the eight tumors of the eye recorded among engineers and two of the three cases recorded among architects). Similar observations applied to chemical engineers (ASCR code 102, N=149 in this study) and agronomists (ASCR code 103.1, N=59 in this study).

Laboratory assistants

The occupation "laboratory assistants" (ASCR code 106, N=320 in this study) was found to be unreliably coded (C 24%). Therefore, no conclusions could be drawn on the lack of lymphatic and hematopoietic cancer frequently reported elsewhere (39, 45).

Entrepreneurs and managers

The coding for entrepreneurs and managers (ASCR code 111, N=4119 in this study) was considered to be moderately reliable in Swiss death certificate data (C 46%) (2).

The excess of cancer risk observed (ie, colon, prostate and skin cancers, melanoma, NHL, and Kaposi's sarcoma) probably reflects socioeconomic life-style (ie, diet, sedentary work, sun exposure, and sexual habits).

Clerks

This occupational group of "clerks" (ASCR code 112, N=6482 in this study) was the largest in the study. Data from Swiss death certificates showed only moderate to low reliability for commercial and administrative employees (C 46%) (2).

The risks found for this group appeared to reflect the cancer patterns of the middle-upper socioeconomic groups. As for entrepreneurs and managers, slightly elevated risks of skin cancer (OR 1.1) and Kaposi's sarcoma (OR 1.4) were observed.

Salespersons and representatives

The reliability coefficient in the heterogeneous category of salespersons and representatives (ASCR code 115, N=2586 in this study) was found to be, at best, 46% (2). The excesses of risk observed are difficult to interpret. Additional analyses of mortality data (GS) revealed an approximately twofold increased risk of death from cirrhosis, and they confirmed the observed liver cancer excess (OR 1.4).

Drivers, machinists and related workers

The occupational coding of the large group of professional drivers (ASCR code 123, N=1796 in this study) on Swiss death certificates was evaluated as being of low reliability (C 40%) (2). No specific data on coding reliability was available for machinists and related workers (ASCR code 107, N=469 in this study). In the current case series, this last group mainly included crane operators and other related mobile-plant operators.

The most striking finding was the almost 1.5-fold increased risk of lung cancer among both machinists and professional drivers. These patterns, in line with the a priori hypotheses, probably relate to exposure to polycyclic aromatic hydrocarbons (47, 160, 161, 162), and they confirm previous results from mortality studies of Swiss drivers (2, 79, 84) and from a cohort study of Geneva drivers (59).

According to the working hypothesis for machinists, a 1.8-fold increased risk of esophageal cancer was also observed. This finding has already been documented for workers exposed to combustion products, particularly diesel exhaust (2, 50), and for machinists, particularly greasers (38).

A search for an excess of leukemia cases in relation to low-level benzene exposure among machinists, drivers, or pump attendants (ASCR code 067, N=45 in this study) was made but not found.

Railway workers

In the occupational group of railway workers (ASCR code 121, N=1260 in this study), contrary to other railroad occupations (C 50%), the coding was considered reliable for locomotive engineers (C 84%) (2).

According to the a priori hypothesis, locomotive engineers (ASCR code 121.1, N=180) showed an excess of leukemia (OR 2.1). An association between leukemia and railway occupations has been suspected, in particular for locomotive engineers (143, 149, 150), although no causal relation between low benzene or high magnetic field exposures and leukemia has been established for this group of workers.

Possible occupational exposure to asbestos explains the doubled risk of pleural mesothelioma among other railway workers (ASCR code 121.2, N=1080 in this study). Similar findings were observed in recent analyses of Swiss mortality data (GS), as well as in some other statistics on railway workers (45). Among the nine cases of pleural mesothelioma observed in this study, seven occurred in residents of the canton of Zurich, where a factory of train coaches, formerly using asbestos insulation, is located (163).

The railway workers also showed a 2.9-fold increased risk of bone and joint cancers. Even if this result does not fit any a priori hypothesis, it deserves further investigation. An excess of soft-tissue sarcoma has been documented for Swedish railway workers, and the researchers suggested a causal association with exposure to both amitrole and phenoxy acid preparations (103). The Swiss Federal Railway Company used chlorophenoxy acids and aminotriazol as herbicides until 1958 and 1971, respectively. In the current study, an excess of sarcoma was observed in the bone and cartilage on the basis of five cases (three chondrosarcomas, one chordoma, and one Ewing's sarcoma).

Post and telecommunications occupations

Occupations in communications (ASCR code 126, N=737 in this study) were found to be rather reliably coded (C 72%) (2).

The number of cancer cases arising from this group of occupations was too low to allow separate analyses for telephone workers. An excess risk of brain or lymphohematopoietic tumors suspected to occur in relation to exposure to high-frequency electromagnetic fields was not observed.

Law and security occupations

The professional category of law and security (ASCR code 13, N=1206 in this study) was assessed as moderately reliable (C between 54% and 59%) (2).

The increased risk of skin cancers, especially melanoma (OR 2.0), was also observed in the recent analyses of mortality data (GS) and is probably the result of both leisure-time exposure to sunlight and a better surveillance of this group of professionals.

Media and related occupations

Occupations in the media and related fields (ASCR code 14, N=365 in this study), although heterogeneous, were considered to be reliably recorded (C 72%) (2).

These professionals had an increased risk of cancers partly linked to their upper socioeconomic status, such as small-intestinal (OR 4.2) and testicular cancers (OR 2.1) and multiple myeloma (OR 2.8).

Artists and related occupations

The occupational coding was described as moderately reliable for artists and related occupations (ASCR code 152, N=783 in this study) (C between 43% and 61%) (2).

The current pattern of excess cancer observed among artistic occupations appeared to be mainly correlated with life-style factors. In particular, the elevated risks of related cancers observed in analyses with adjustment for socioeconomic status probably reflect a high level of tobacco and alcohol consumption (figure 1). Sexual habits could explain the 5.6-fold increased risk of Kaposi's sarcoma and the 3.2-fold increased risk of other genital-tract cancers in the analysis with adjustment for socioeconomic status (all six cases recorded were penile cancers). Except for lung and laryngeal cancers, these excess risks were not observed in mortality analyses (2).

Hotel and catering occupations

The occupational coding was previously described as rather reliable only for innkeepers and hotel managers (C 73%) and cooks (C 64%) among the occupations in

the "hotel and catering" classification (ASCR code 16, N=1398 in this study) (2).

Socioeconomic factors are probably responsible for the increased frequency of alcohol-related cancers among hotel and restaurant managers (ASCR code 161, N=612 in this study) and cooks (ASCR code 162, N=299 in this study). In Swiss mortality data, very similar patterns were observed for both innkeepers and hotel managers and cooks (164). These findings demonstrate once more that alcohol consumption should be considered a public health problem for these occupations.

Chimney sweeps

The occupational coding was described as reliable for chimney sweeps (ASCR code 171, N=47 in this study) (C 100%) (2).

Chimney sweeps are exposed to soot and dust, and the observed 2.4-fold increased risk of squamous-cell lung carcinoma fit the a priori hypothesis (37, 47). All the observed excesses of other cancer types were based on fewer than five cases. In particular, the case of penile cancer occurring in a young chimney sweep has already been described (165) and was related to a nonsignificant fivefold increased risk of "other genital cancer" in this occupational group.

Other occupations related to cleaning

The occupational coding was described as poorly to moderately reliable for cleaning-related occupations (ASCR code 173, N=815 in this study) (2).

It is difficult to appraise the impact of specific exposures in this sector, given its heterogeneity. In general, the frequency of nearly all tobacco-related cancers was increased. These excesses are probably due to socioeconomic factors, since they all disappeared after adjustment for socioeconomic status, except for urinary bladder cancer, for which a specific exposure could not be ruled out. However, mortality in relation to urinary bladder cancer was generally lower among workers in cleaning services (2).

Hairdressers

The occupational coding has been previously described as reliable for hairdressers (ASCR code 175, N=304 in this study) (C 84%) (2).

Hairdressers experienced a 1.5-fold increased risk of bladder cancer of borderline significance (95% CI 1.0–2.2). This pattern confirms the results previously observed in a cohort study on hairdressers in Geneva (127). Some hair dyes and coloring agents have been strongly suspected to be carcinogenic for the urinary tract (128, 129). However, the excess of bladder cancer observed

in this study was not predicted by the a priori hypotheses and was not confirmed by mortality data (2).

Physicians

The physician group (ASCR code 181, N=483 in this study) was assessed as reliably coded in the mortality data (C 100%) (2).

Physicians are considered to be the professionals having the greatest interest in their own health. The low risk of lung cancer is a likely consequence of early accessibility to information regarding health determinant hazards. The cancer profile of physicians could also reflect differences in diagnostic ascertainment. The excess of cases of basal-cell carcinoma (OR 1.7) and the low risk of cancer at ill-defined sites (OR 0.4) are in line with this argument. Other increased risks, such as skin and ocular melanoma, likely reflect the high socioeconomic level of these professionals.

These professionals also showed a higher risk for well-known radiation-related cancers, such as thyroid cancer (OR 2.6) and leukemia (OR 1.6). The involved thyroid cancers were mainly papillary or papillary-mixed types. Cases of leukemia comprised various histologies (among the 18 cases registered, 8 were chronic lymphatic, 1 was acute lymphatic, 4 were acute myeloid, 1 was acute monocytic and 1 was hairy-cell leukemia). The increased risk of gallbladder and biliary tract cancer (OR 3.4) was based on nine cases. There is limited evidence that ionizing radiation may cause biliary tract tumors, except for the reported risks of intra- and extrahepatic bile duct cancers reported for patients injected with thorotrast, an X-ray diagnostic contrast medium (70). Further inquiries, especially on X-ray exposures, are warranted to clarify these clusters better.

Dentists, veterinarians and pharmacists

The coding for dentists, veterinarians and pharmacists (ASCR code 182, N=249 in this study) (C 92%) was considered reliable (2).

The cancer profiles of these professionals probably reflect their medical knowledge and easy access to health care. Worth noticing is the increased risk of liver cancer (OR_{SES adjusted} 2.8) based on eight cases, all of which occurred among dentists, professionals probably exposed to viral hepatic infections.

Nurses

The coding for nurses (ASCR code 183, N=249 in this study) and hospital orderlies (C 100%) was assessed as very reliable (2).

With regard to male nurses, the 3.0-fold increased risk of Kaposi's sarcoma, as well as the 3.1-fold increased risk of soft-tissue cancer (based on two sarcomas and two malignant histiocytomas), is probably linked to nonoccupational HIV contamination, as no case of occupational blood contamination has been reported for Swiss nurses.

Professors and teachers

The occupational category of professors and teachers (ASCR code 191, N=939 in this study) was found to be, in general, reliably coded (C between 60% to 89%) on Swiss death certificates (2).

The a priori hypothesis was for an increase in multiple myelomas in relation to frequent infectious diseases among schoolteachers, who represented the most frequent occupation in this group. The current results provided additional evidence pointing to this association (OR 1.8). A similar pattern was observed in recent analyses of mortality data (proportional mortality ratio 2.1, $P < 0.001$) (GS). The approximately 1.5-fold increased risk observed for some other cancer sites (ie, colon,

pancreas, prostate, and skin cancers) is probably related to the group's upper socioeconomic status. A higher risk for colon cancer and a lower risk for lung cancer were also observed in the mortality data (2).

Chemists

Despite the fact that chemists (ASCR code 201, N=243 in this study) need postgraduate studies, this category was assessed as not reliably coded (C 41%) (2).

The chemical exposures of these professionals depend on their sector of activity, which could be very different. In line with the a priori hypotheses, an increased frequency of both NHL and leukemias was observed among these scientists (OR 2.7 and 2.0, respectively). Among the 11 leukemias recorded for chemists, 6 were myeloid leukemias. Further inquiries into case-specific exposures are warranted.

Finally, as for chemical workers, we observed an excess of uncommon cancers such as bone and peritoneal cancers, patterns not listed among a priori hypotheses and based on only a few cases of heterogeneous histology.

Table 9. Summary of the results by occupation, only significantly increased risks based on five cases or more are presented. (ASCR = The Association of Swiss Cancer Registries, ICD-O = International Classification of Diseases for Oncology, OR = odds ratio, 95% CI = 95% confidence interval)

ASCR code	Occupation ^a and cancer sites ^{b, c}	N	OR ^d	95% CI
01	AGRICULTURE & ANIMAL PRODUCERS			
	Lip; ICD-O 140 (N=199)	20	2.7	1.6–4.5 ^e
	Melanoma, skin of head & neck (N=252)	23	2.2	1.4–3.4 ^f
	Squamous cell carcinoma of the skin ^g ; ICD-O M 8070–4 (N=2471)	140	1.5	1.1–1.9 ^f
	Thyroid gland; ICD-O 193 (N=320)	20	1.6	1.0–2.6 ^h
011	Farmers & animal producers			
	Lip; ICD-O 140 (N=199)	11	2.2	1.1–4.3 ^h
	Stomach; ICD-O 151 (N=2400)	75	1.3	1.0–1.7 ^h
	Extrahepatic bile duct; ICD-O 156.1–9 (N=237)	12	1.9	1.0–3.5 ^h
	Melanoma, skin of head & neck (N=252)	13	2.0	1.1–3.7 ^h
	Squamous cell carcinoma of the skin ^g ; ICD-O M 8070–4 (N=2471)	88	1.6	1.1–2.2 ^h
	Thyroid gland; ICD-O 193 (N=320)	17	2.7	1.6–4.6 ^e
013	Horticulturists & related occupations			
	Lung; ICD-O 162 (N=9106)	138	1.3	1.1–1.5 ^h
	Lung, epidermoid ^b (N=3974)	70	1.4	1.1–1.8 ^f
02	FOOD, BEVERAGE & TOBACCO INDUSTRIES			
	Prostate; ICD-O 185 (N=9126)	267	1.2	1.0–1.4 ^h
021	Bakers & related occupations			
	Cardia; ICD-O 151.0 (N=616)	11	1.9	1.0–3.4 ^h
022	Cheesemakers & related occupations			
	Non-Hodgkin's lymphoma ⁱ ; ICD-O M 959–64.9 (N=1125)	5	2.5	1.0–6.1 ^h
023	Butchers & related occupations			
	Chronic lymphatic leukemia ^b (N=514)	9	2.0	1.0–3.9 ^h

(continued)

Table 9. Continued.

ASCR code	Occupation ^a and cancer sites ^{b, c}	N	OR ^d	95% CI
03	TEXTILE, LEATHER & FUR INDUSTRIES			
	Nose, sinuses, etc; ICD-O 160 (N=125)	5	3.3	1.3–8.2 ^f
	Nonacute leukemia ^b (N=918)	20	1.6	1.0–2.5 ^h
032	Tailors & related occupations			
	Brain & nervous system; ICD-O 191-2 (N=879)	9	2.5	1.2–4.8 ^f
033	Occupations in the pelt, leather or fur industries			
	Stomach; ICD-O 151 (N=2400)	21	1.6	1.0–2.5 ^h
	Nose, sinuses, etc; ICD-O 160 (N=125)	5	8.7	3.5–21.7 ^e
	Lymphoid leukemia ^b (N=568)	7	2.3	1.1–4.9 ^h
	Chronic lymphatic leukemia ^b (N=514)	7	2.5	1.2–5.3 ^h
	Nonacute leukemia ^b (N=918)	12	2.5	1.4–4.4 ^f
04	CONSTRUCTION & RELATED OCCUPATIONS			
	Oral cavity, oropharynx; ICD-O 141, 143-5, (N=1500)	121	1.3	1.1–1.6 ^f
	Other pharynx; ICD-O 148-9 (N=484)	50	1.9	1.4–2.6 ^e
	Esophagus; ICD-O 150 (N=817)	74	1.5	1.1–1.9 ^f
	Stomach; ICD-O 151 (N=2400)	201	1.2	1.1–1.4 ^f
	Larynx; ICD-O 161 (N=842)	76	1.4	1.1–1.9 ^f
	Lung; ICD-O 162 (N=9106)	877	1.6	1.5–1.8 ^e
	Lung, epidermoid ^b (N=3974)	425	1.8	1.6–2.0 ^e
	Lung, giant cell ^b (N=986)	89	1.4	1.1–1.8 ^f
	Lung, small cell ^b (N=1694)	168	1.6	1.4–1.9 ^e
041	Bricklayers, stonemasons, tilers & related occupations			
	Salivary gland; ICD-O 142 (N=96)	6	2.5	1.1–5.8 ^h
	Other pharynx; ICD-O 148-9 (N=484)	23	2.1	1.4–3.3 ^e
	Esophagus; ICD-O 150 (N=817)	36	1.7	1.2–2.4 ^f
	Stomach; ICD-O 151 (N=2400)	94	1.4	1.1–1.7 ^f
	Larynx; ICD-O 161 (N=842)	36	1.6	1.1–2.3 ^f
	Lung; ICD-O 162 (N=9106)	379	1.8	1.6–2.0 ^e
	Lung, epidermoid ^b (N=3974)	190	2.0	1.7–2.3 ^e
	Lung, small cell ^b (N=1694)	66	1.5	1.2–2.0 ^e
	Lung, giant cell ^b (N=986)	43	1.7	1.2–2.4 ^e
043	Plasterers & painters			
	Liver; ICD-O 155 (N=1172)	39	1.4	1.0–2.0 ^h
	Lung; ICD-O 162 (N=9106)	273	1.4	1.2–1.6 ^e
	Lung, epidermoid ^b (N=3974)	120	1.4	1.1–1.7 ^f
	Lung, small cell ^b (N=1694)	56	1.5	1.1–2.0 ^f
	Renal pelvis; ICD-O 189.1 (N=220)	14	2.2	1.2–4.1 ^h
05	STONE, EARTH & GLASS INDUSTRIES			
	Lung; ICD-O 162 (N=9106)	107	2.1	1.7–2.7 ^e
	Lung, epidermoid ^b (N=3974)	52	2.1	1.5–2.8 ^e
	Lung, small cell ^b (N=1694)	25	2.4	1.6–3.6 ^e
	Lung, giant cell ^b (N=986)	13	2.1	1.2–3.6 ^h
	Pleura; ICD-O 163 (N=310)	14	6.8	3.9–11.9 ^e
	Pleural mesothelioma; ICD-O M 905 (N=215)	11	8.6	4.6–16 ^e
	Kidney, urinary tract; ICD-O 189 (N=1682)	17	1.7	1.1–2.8 ^h
	Kidney; ICD-O 189.0 (N=1356)	15	1.9	1.1–3.2 ^h
051	Stone & earth trades workers			
	Lung; ICD-O 162 (N=9106)	61	2.2	1.6–3.1 ^e
	Lung, epidermoid ^b (N=3974)	31	2.2	1.5–3.3 ^e
	Lung, small cell ^b (N=1694)	13	2.2	1.2–3.9 ^f
	Lung, giant cell ^b (N=986)	8	2.3	1.1–4.8 ^h
	Pleura; ICD-O 163 (N=310)	13	11.9	6.6–21.3 ^e
	Pleural mesothelioma; ICD-O M 905 (N=215)	10	13.8	7.1–26.8 ^e
052	Glassmakers & related trades workers			
	Lung; ICD-O 162 (N=9106)	15	1.8	1.0–3.4 ^h
	Lung, small cell ^b (N=1694)	5	3.1	1.2–7.9 ^h
059	Miners, quarryers & related occupations			
	Lung; ICD-O 162 (N=9106)	31	2.1	1.3–3.2 ^e
	Lung, small cell ^b (N=1694)	7	2.3	1.1–5.0 ^h
	Lung, giant cell ^b (N=986)	5	2.7	1.1–6.8 ^h
	Kidney, urinary tract; ICD-O 189 (N=1682)	9	3.2	1.6–6.5 ^e
	Kidney; ICD-O 189.0 (N=1356)	8	3.5	1.7–7.4 ^e

(continued)

Table 9. Continued.

ASCR code	Occupation ^a and cancer sites ^{b, c}	N	OR ^d	95% CI
06	METALLURGY & ELECTROTECHNOLOGY			
	Other pharynx; ICD-O 148-9 (N=484)	76	1.5	1.1–1.9 ^f
	Esophagus; ICD-O 150 (N=817)	120	1.3	1.0–1.5 ^h
	Larynx; ICD-O 161 (N=842)	132	1.3	1.1–1.6 ^f
	Lung; ICD-O 162 (N=9106)	1450	1.4	1.3–1.5 ^e
	Lung, epidermoid ^b (N=3974)	638	1.3	1.2–1.5 ^e
	Lung, adenocarcinoma ^b (N=2120)	365	1.4	1.3–1.6 ^e
	Lung, small cell ^b (N=1694)	254	1.2	1.1–1.4 ^f
	Pleura; ICD-O 163 (N=310)	72	1.8	1.3–2.3 ^e
	Pleural mesothelioma; ICD-O M 905 (N=215)	60	2.6	1.9–3.5 ^e
	Urinary bladder; ICD-O 188 (N=3014)	437	1.1	1.0–1.3 ^h
	Hodgkin's disease [‡] ; ICD-O M 965–6 (N=345)	61	1.4	1.0–1.8 ^h
	Nonacute leukemia ^b (N=918)	98	0.8	0.6–1.0 ^h
061	Foundry workers			
	Lung; ICD-O 162 (N=9106)	111	2.0	1.6–2.5 ^e
	Lung, epidermoid ^b (N=3974)	57	2.1	1.6–2.8 ^e
	Lung, adenocarcinoma ^b (N=2120)	23	1.7	1.1–2.6 ^h
	Pleural mesothelioma; ICD-O M 905 (N=215)	5	2.9	1.2–7.3 ^h
	Myeloid leukemia ^b (N=543)	8	2.3	1.1–4.7 ^h
062	Turners & related occupations			
	Lung; ICD-O 162 (N=9106)	168	1.2	1.0–1.5 ^h
	Lung, epidermoid ^b (N=3974)	81	1.3	1.0–1.7 ^h
063	Mechanics			
	Lung, adenocarcinoma ^b (N=2120)	100	1.2	1.0–1.5 ^h
	Urinary bladder; ICD-O 188 (N=3014)	145	1.3	1.1–1.5 ^f
	Hodgkin's disease [‡] ; ICD-O M 965–6 (N=345)	25	1.8	1.2–2.8 ^f
064	Electricians			
	Other pharynx; ICD-O 148–9 (N=484)	16	1.9	1.1–3.1 ^h
	Gallbladder, biliary tract; ICD-O 156 (N=369)	13	1.9	1.1–3.3 ^h
	Extrahepatic bile duct; ICD-O 156.1–.9 (N=237)	10	2.2	1.2–4.3 ^h
	Lung; ICD-O 162 (N=9106)	210	1.2	1.1–1.4 ^f
	Pleura; ICD-O 163 (N=310)	14	2.0	1.2–3.4 ^h
	Pleural mesothelioma; ICD-O M 905 (N=215)	11	2.5	1.3–4.6 ^f
065	Watchmakers			
	Melanoma, skin of trunk (N=695)	5	2.6	1.1–6.5 ^h
	Prostate; ICD-O 185 (N=9126)	56	1.7	1.3–2.4 ^e
07	WOOD, CORK & PAPER INDUSTRIES			
	Esophagus; ICD-O 150 (N=817)	31	1.6	1.1–2.4 ^f
	Nose, sinuses, etc; ICD-O 160 (N=125)	16	5.8	3.4–9.9 ^e
	Pleura; ICD-O 163 (N=310)	26	3.0	2.0–4.6 ^e
	Pleural mesothelioma; ICD-O M 905 (N=215)	21	3.8	2.4–5.9 ^e
071	Carpenters			
	Oral cavity, oropharynx; ICD-O 141, 143–5, (N=1500)	10	2.1	1.1–4.1 ^h
	Multiple myeloma; ICD-O M 9730-1 (N=535)	6	2.8	1.2–6.4 ^h
072	Joiners, cabinetmakers & related occupations			
	Esophagus; ICD-O 150 (N=817)	23	1.7	1.1–2.5 ^h
	Nose, sinuses, etc; ICD-O 160 (N=125)	14	6.9	3.9–12.2 ^e
	Pleura; ICD-O 163 (N=310)	22	3.6	2.3–5.6 ^e
	Pleural mesothelioma; ICD-O M 905 (N=215)	19	4.7	2.9–7.6 ^e
08	GRAPHIC ARTS			
	Small intestine; ICD-O 152 (N=276)	8	2.3	1.1–4.6 ^h
	Gallbladder; ICD-O 156.0 (N=132)	5	3.1	1.2–7.5 ^h
	Nose, sinuses, etc; ICD-O 160 (N=125)	5	3.0	1.2–7.3 ^h
	Leukemia; ICD-O M 980-94 (N=1322)	27	1.5	1.0–2.2 ^h
089	Other occupations related to printing & graphic arts			
	Small intestine; ICD-O 152 (N=276)	6	2.3	1.0–5.2 ^h
09	CHEMICAL & PLASTICS INDUSTRIES			
	Stomach; ICD-O 151 (N=2400)	34	1.7	1.2–2.4 ^f
	Lung; ICD-O 162 (N=9106)	114	1.5	1.2–1.9 ^e
	Lung, epidermoid ^b (N=3974)	46	1.4	1.0–1.9 ^h
	Lung, small cell ^b (N=1694)	28	1.8	1.2–2.7 ^f
	Lung, giant cell ^b (N=986)	14	1.7	1.0–3.0 ^h

(continued)

Table 9. Continued.

ASCR code	Occupation ^a and cancer sites ^{b, c}	N	OR ^d	95% CI
091	Chemical workers			
	Stomach; ICD-O 151 (N=2400)	32	1.8	1.3–2.7 ^f
	Lung; ICD-O 162 (N=9106)	95	1.5	1.2–1.8 ^f
	Lung, epidermoid ^b (N=3974)	40	1.4	1.0–2.0 ^h
	Lung, small cell ^b (N=1694)	26	1.9	1.3–2.9 ^f
10	TECHNICAL PROFESSIONS & TRADES			
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	234	1.5	1.3–1.7 ^e
	Melanoma, skin of head & neck (N=252)	45	2.2	1.6–3.1 ^e
	Melanoma, skin of trunk (N=695)	100	1.4	1.1–1.7 ^f
	Melanoma, skin of arm (N=338)	53	1.5	1.1–2.0 ^h
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	714	1.4	1.2–1.5 ^e
	Eye, lacrimal gland; ICD-O 190 (N=109)	19	2.3	1.4–3.8 ^f
	Testis; ICD-O 186 (N=1112)	169	1.5	1.2–1.8 ^e
	Kidney; ICD-O 189.0 (N=1356)	147	1.2	1.0–1.4 ^h
101	Architects			
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	28	1.9	1.3–2.8 ^f
	Melanoma, skin of trunk (N=695)	15	2.2	1.3–3.7 ^f
	Testis; ICD-O 186 (N=1112)	18	1.8	1.0–3.1 ^h
102	Chemical engineers			
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	9	2.1	1.1–4.2 ^h
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	57	2.4	1.7–3.3 ^e
	Testis; ICD-O 186 (N=1112)	6	3.5	1.3–9.1 ^h
103.9	Other engineers			
	Colon; ICD-O 153 (N=3766)	135	1.2	1.0–1.5 ^h
	Pleura; ICD-O 163 (N=310)	18	1.8	1.1–2.9 ^h
	Pleural mesothelioma; ICD-O M 905 (N=215)	12	1.9	1.0–3.4 ^h
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	91	1.7	1.4–2.1 ^e
	Melanoma, skin of head & neck (N=252)	16	2.2	1.3–3.7 ^f
	Melanoma, skin of trunk (N=695)	39	1.5	1.1–2.1 ^h
	Melanoma, skin of arm (N=338)	21	1.7	1.1–2.7 ^h
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	229	1.6	1.3–1.8 ^e
	Testis; ICD-O 186 (N=1112)	71	1.4	1.1–1.9 ^h
	Eye, lacrimal gland; ICD-O 190 (N=109)	7	2.3	1.0–5.0 ^h
104	Technicians & foremen			
	Melanoma, skin of head & neck (N=252)	10	2.2	1.2–4.2 ^h
	Testis; ICD-O 186 (N=1112)	26	1.7	1.1–2.7 ^h
106	Laboratory assistants			
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	82	1.6	1.2–2.1 ^e
	Kidney, urinary tract; ICD-O 189 (N=1682)	16	1.7	1.0–2.9 ^h
107	Machinists & related occupations			
	Esophagus; ICD-O 150 (N=817)	12	1.8	1.0–3.3 ^h
	Lung; ICD-O 162 (N=9106)	111	1.6	1.3–2.0 ^e
	Lung, epidermoid ^b (N=3974)	54	1.8	1.4–2.5 ^e
	Squamous cell carcinoma of the skin ^g ; ICD-O M 8070–4 (N=2471)	22	1.7	1.1–2.7 ^h
	Renal pelvis; ICD-O 189.1 (N=220)	5	3.2	1.3–7.9 ^h
11	TRADE, ADMINISTRATION & COMPUTERS			
	Small intestine; ICD-O 152 (N=276)	78	1.4	1.1–1.9 ^h
	Colon; ICD-O 153 (N=3766)	1018	1.2	1.1–1.3 ^e
	Gallbladder, biliary tract; ICD-O 156 (N=369)	106	1.3	1.0–1.7 ^h
	Gallbladder; ICD-O 156.0 (N=132)	39	1.5	1.0–2.2 ^h
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	95	1.7	1.3–2.2 ^e
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	428	1.2	1.1–1.4 ^e
	Melanoma, skin of trunk (N=695)	209	1.3	1.1–1.6 ^e
	Melanoma, skin of leg (N=246)	73	1.3	1.0–1.8 ^h
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	1964	1.3	1.2–1.4 ^e
	Prostate; ICD-O 185 (N=9126)	2185	1.1	1.0–1.1 ^h
	Kidney, urinary tract; ICD-O 189 (N=1682)	437	1.2	1.0–1.3 ^f
	Kidney; ICD-O 189.0 (N=1356)	348	1.2	1.0–1.3 ^h
111	Entrepreneurs & managers			
	Colon; ICD-O 153 (N=3766)	349	1.3	1.2–1.5 ^e
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	22	2.1	1.3–3.4 ^f
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	134	1.3	1.1–1.5 ^f
	Melanoma, skin of trunk (N=695)	71	1.5	1.2–2.0 ^f
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	569	1.4	1.3–1.6 ^e
	Prostate; ICD-O 185 (N=9126)	740	1.1	1.0–1.2 ^f
	Non-Hodgkin's lymphoma ^h ; ICD-O M 959–64.9 (N=1125)	98	1.3	1.1–1.6 ^h
	Hodgkin's disease ^h ; ICD-O M 965–6 (N=345)	28	1.5	1.0–2.3 ^h

(continued)

Table 9. Continued.

ASCR code	Occupation ^a and cancer sites ^{b, c}	N	OR ^d	95% CI
112	Clerks			
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	52	1.4	1.0–2.0 ^h
	Basal cell carcinoma of the skin ^e ; ICD-O M 8090–4 (N=6516)	936	1.1	1.0–1.2 ^f
115	Salespersons & representatives			
	Small intestine; ICD-O 152 (N=276)	19	1.7	1.0–2.7 ^h
	Colon; ICD-O 153 (N=3766)	191	1.2	1.0–1.4 ^h
	Liver; ICD-O 155 (N=1172)	71	1.4	1.1–1.7 ^h
	Kidney, urinary tract; ICD-O 189 (N=1682)	99	1.4	1.1–1.7 ^f
	Kidney; ICD-O 189.0 (N=1356)	80	1.4	1.1–1.8 ^f
12	TRANSPORT & TELECOMMUNICATIONS			
	Stomach; ICD-O 151 (N=2400)	241	1.3	1.2–1.5 ^e
	Cardia; ICD-O 151.0 (N=616)	76	1.6	1.2–2.0 ^e
	Lung; ICD-O 162 (N=9106)	879	1.2	1.1–1.3 ^e
	Lung, epidermoid ^b (N=3974)	404	1.3	1.2–1.4 ^e
	Lung, small cell ^b (N=1694)	179	1.3	1.1–1.5 ^f
121.1	Locomotive engineers			
	Squamous cell carcinoma of the skin ^e ; ICD-O M 8070–4 (N=2471)	13	2.3	1.3–4.2 ^f
	Leukemia; ICD-O M 980–94 (N=1322)	8	2.1	1.0–4.2 ^h
	Myeloid leukemia ^b (N=543)	5	3.3	1.3–8.0 ^f
121.2	Other occupations related to railways			
	Stomach; ICD-O 151 (N=2400)	68	1.5	1.2–1.9 ^f
	Pleural mesothelioma; ICD-O M 905 (N=215)	9	2.0	1.0–3.9 ^h
	Bone & cartilage; ICD-O 170 (N=104)	5	2.9	1.2–7.3 ^h
123	Drivers			
	Oral cavity, oropharynx; ICD-O 141, 143–5, (N=1500)	78	1.6	1.2–2.0 ^e
	Stomach; ICD-O 151 (N=2400)	95	1.3	1.1–1.7 ^f
	Cardia; ICD-O 151.0 (N=616)	33	1.7	1.2–2.5 ^f
	Larynx; ICD-O 161 (N=842)	39	1.4	1.0–1.9 ^h
	Lung; ICD-O 162 (N=9106)	400	1.5	1.3–1.7 ^e
	Lung, epidermoid ^b (N=3974)	193	1.6	1.4–1.9 ^e
	Lung, small cell ^b (N=1694R)	83	1.6	1.3–2.0 ^e
125	Occupations related to transport			
	Renal pelvis; ICD-O 189.1 (N=220)	6	2.1	1.1–3.9 ^h
126	Post & telecommunications			
	Multiple myeloma; ICD-O M 9730–1 (N=535)	13	1.9	1.1–3.3 ^h
13	LAW & SECURITY OCCUPATIONS			
	Peritoneum; ICD-O 158 (N=100)	5	2.5	1.0–6.3 ^h
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	48	1.4	1.0–1.9 ^h
	Prostate; ICD-O 185 (N=9126)	213	1.2	1.0–1.4 ^h
131	Legal experts & related occupations			
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	29	2.0	1.4–3.0 ^e
	Melanoma, skin of trunk (N=695)	14	2.1	1.2–3.6 ^f
132	Police officers & related occupations			
	Prostate; ICD-O 185 (N=9126)	129	1.3	1.0–1.5 ^h
	Urinary bladder; ICD-O 188 (N=3014)	50	1.4	1.0–1.9 ^h
14	MEDIA & RELATED OCCUPATIONS			
	Small intestine; ICD-O 152 (N=276)	6	4.2	1.8–9.6 ^e
	Testis; ICD-O 186 (N=1112)	18	2.1	1.1–3.7 ^h
	Multiple myeloma; ICD-O M 9730–1 (N=535)	9	2.8	1.4–5.5 ^f
	Myeloid leukemia ^b (N=543)	8	2.1	1.0–4.2 ^h
15	ARTISTIC OCCUPATIONS			
	Salivary gland; ICD-O 142 (N=96)	5	3.5	1.4–8.7 ^f
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	23	5.5	3.3–9.2 ^e
	Other male genital; ICD-O 187 (N=200)	7	2.2	1.0–4.7 ^h
	Nonacute leukemia ^b (N=918)	7	0.5	0.2–1.0 ^h
	Primary site uncertain; ICD-O 199 (N=1262)	33	1.5	1.1–2.1 ^h
152	Artists & related occupations			
	Soft tissue; ICD-O 171 (N=354)	10	2.0	1.1–3.8 ^h
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	20	5.6	3.2–9.5 ^e
	Primary site uncertain; ICD-O 199 (N=1262)	29	1.5	1.0–2.2 ^h

(continued)

Table 9. Continued.

ASCR code	Occupation ^a and cancer sites ^{b, c}	N	OR ^d	95% CI
16	HOTEL & CATERING OCCUPATIONS			
	Oral cavity, oropharynx; ICD-O 141, 143–5, (N=1500)	73	1.7	1.3–2.2 ^e
	Other pharynx; ICD-O 148–9 (N=484)	21	1.6	1.0–2.5 ^h
	Esophagus; ICD-O 150 (N=817)	32	1.5	1.0–2.1 ^h
	Stomach; ICD-O 151 (N=2400)	73	1.3	1.0–1.7 ^h
	Liver; ICD-O 155 (N=1172)	55	2.0	1.5–2.6 ^e
	Pancreas; ICD-O 157 (N=1347)	47	1.5	1.1–2.0 ^f
	Larynx; ICD-O 161 (N=842)	35	1.6	1.1–2.2 ^f
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	37	2.7	1.8–4.1 ^e
161	Hotel & restaurant managers			
	Liver; ICD-O 155 (N=1172)	25	2.0	1.3–3.0 ^e
	Pancreas; ICD-O 157 (N=1347)	28	1.9	1.3–2.8 ^f
	Larynx; ICD-O 161 (N=842)	16	1.8	1.1–2.9 ^h
162	Cooks			
	Oral cavity, oropharynx; ICD-O 141, 143–5, (N=1500)	21	2.3	1.5–3.7 ^e
	Esophagus; ICD-O 150 (N=817)	11	2.5	1.4–4.7 ^f
	Liver; ICD-O 155 (N=1172)	15	2.6	1.5–4.4 ^e
17	CLEANING & PERSONAL SERVICES			
	Lip; ICD-O 140 (N=199)	9	2.6	1.3–5.1 ^f
	Lung; ICD-O 162 (N=9106)	252	1.3	1.1–1.5 ^f
	Lung, epidermoid ^b (N=3974)	121	1.4	1.1–1.6 ^f
	Lung, small cell ^b (N=1694)	50	1.3	1.0–1.8 ^h
	Urinary bladder; ICD-O 188 (N=3014)	87	1.3	1.1–1.7 ^h
171	Chimney sweeps			
	Lung, epidermoid ^b (N=3974)	7	2.4	1.1–5.5 ^h
173	Other occupations related to cleaning			
	Lip; ICD-O 140 (N=199)	7	3.2	1.5–7.0 ^f
	Gallbladder; ICD-O 156.0 (N=132)	5	3.1	1.2–7.6 ^h
	Lung; ICD-O 162 (N=9106)	171	1.3	1.1–1.6 ^f
	Lung, epidermoid ^b (N=3974)	80	1.4	1.1–1.8 ^f
	Lung, small cell ^b (N=1694)	36	1.5	1.1–2.1 ^h
	Urinary bladder; ICD-O 188 (N=3014)	56	1.3	1.0–1.8 ^h
175	Hairdressers			
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	5	5.4	1.7–17.2 ^f
18	HEALTH CARE OCCUPATIONS			
	Gallbladder, biliary tract; ICD-O 156 (N=369)	16	2.3	1.4–3.8 ^f
	Extrahepatic bile duct; ICD-O 156.1–.9 (N=237)	11	2.4	1.3–4.4 ^f
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	52	1.5	1.1–2.0 ^h
	Melanoma, skin of arm (N=338)	16	2.1	1.3–3.5 ^f
	Melanoma, skin of leg (N=246)	13	2.1	1.2–3.8 ^f
	Squamous cell carcinoma of the skin ^g ; ICD-O M 8070–4 (N=2471)	81	1.4	1.1–1.9 ^h
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	205	1.5	1.3–1.8 ^e
	Non-Hodgkin's lymphoma ^g ; ICD-O M 959–64.9 (N=1125)	35	1.5	1.0–2.1 ^h
181	Physicians			
	Gallbladder, biliary tract; ICD-O 156 (N=369)	9	3.4	1.7–6.6 ^e
	Extrahepatic bile duct; ICD-O 156.1–.9 (N=237)	6	3.4	1.5–7.7 ^f
	Melanoma of the skin; ICD-O M 872–9 (N=1541)	25	1.7	1.1–2.5 ^h
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	101	1.7	1.3–2.1 ^e
	Testis; ICD-O 186 (N=1112)	27	2.2	1.4–3.6 ^f
	Thyroid gland; ICD-O 193 (N=320)	7	2.6	1.2–5.6 ^h
	Leukemia; ICD-O M 980–94 (N=1322)	18	1.6	1.0–2.6 ^h
182	Dentists, veterinarians & pharmacists			
	Squamous cell carcinoma of the skin ^g ; ICD-O M 8070–4 (N=2471)	23	2.1	1.3–3.3 ^f
	Non-Hodgkin's lymphoma ^g ; ICD-O M 959–64.9 (N=1125)	11	2.2	1.2–4.1 ^f
183	Nurses & related occupations			
	Kaposi's sarcoma; ICD-O M 9140 (N=288)	8	3.0	1.2–7.8 ^h
19	SOCIAL WORK & TEACHING PROFESSIONS			
	Colon; ICD-O 153 (N=3766)	98	1.4	1.2–1.8 ^e
	Pancreas; ICD-O 157 (N=1347)	35	1.4	1.0–2.0 ^h
	Melanoma, skin of arm (N=338)	14	1.8	1.1–3.2 ^h
	Squamous cell carcinoma of the skin ^g ; ICD-O M 8070–4 (N=2471)	78	1.7	1.3–2.3 ^e
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	188	1.5	1.2–1.7 ^e
	Prostate; ICD-O 185 (N=9126)	190	1.3	1.1–1.5 ^f
	Non-Hodgkin's lymphoma ^g ; ICD-O M 959–64.9 (N=1125)	34	1.5	1.0–2.1 ^h
	Multiple myeloma; ICD-O M 9730–1 (N=535)	18	1.7	1.1–2.8 ^h

(continued)

Table 9. Continued.

ASCR code	Occupation ^a and cancer sites ^{b, c}	N	OR ^d	95% CI
191	Professors & teachers			
	Colon; ICD-O 153 (N=3766)	76	1.4	1.1–1.7 ^h
	Pancreas; ICD-O 157 (N=1347)	32	1.6	1.1–2.3 ^f
	Squamous cell carcinoma of the skin ^g ; ICD-O M 8070–4 (N=2471)	67	1.8	1.3–2.4 ^e
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	161	1.5	1.2–1.8 ^e
	Prostate; ICD-O 185 (N=9126)	149	1.2	1.0–1.5 ^h
	Multiple myeloma; ICD-O M 9730–1 (N=535)	15	1.8	1.1–3.0 ^h
20	SCIENCE PROFESSIONS			
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	160	1.6	1.3–1.9 ^e
	Myeloid leukemia ^b (N=543)	15	1.9	1.1–3.3 ^h
201	Chemists			
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	51	1.5	1.1–2.1 ^h
	Non-Hodgkin's lymphoma ⁱ ; ICD-O M 959–64.9 (N=1125)	12	2.7	1.5–4.9 ^e
	Leukemia; ICD-O M 980–94 (N=1322)	11	2.0	1.1–3.7 ^h
	Myeloid leukemia ^b (N=543)	6	2.7	1.2–6.1 ^h
202	Physicists, biologists & related occupations			
	Basal cell carcinoma of the skin ^g ; ICD-O M 8090–4 (N=6516)	25	1.8	1.1–3.0 ^h

^a See appendix 1.^b See the Materials and Methods section for the ICD-O codes.^c Total number in parentheses.^d The OR values have been adjusted for registry, age, civil status, period of diagnosis, nationality, type of habitat, and, when pertinent, for histological confirmation of tumor, death certificate only cases.^e P<0.001.^f P<0.01.^g The registry of Zurich does not systematically register squamous and basal-cell carcinomas of the skin.^h P<0.05.ⁱ Lymph nodes only.

Concluding remarks

This study presents the results of the first systematic analysis of incidence data on socioeconomic and occupational variations of cancer risks in Swiss cancer registries.

This monograph emphasizes the important social inequalities in cancer occurrence and the preventability potential. The impact of socioeconomic status is particularly high for alcohol-, tobacco- and poor-nutrition-related cancers, such as lung, upper aerodigestive, esophagus, and stomach cancers, which occur in excess among less favored groups. An inverse gradient was observed for cancer related to sun exposure, being predominant in upper socioeconomic groups.

The impact of occupation-related social factors seems to be more important than specific occupational exposures. However, occupation per se remains an

important risk factor for some cancers, for example, those of the lung, pleura, nose and sinuses.

In general, the occupational patterns observed help increase the understanding of cancer etiology, particularly for cancer with poorly known risk factors such as lymphohematopoietic malignancies and biliary tract, bone, and ocular cancers. Our study provides additional evidence that risk factors differ between cardia and stomach cancer, and between types of lung, renal or thyroid cancers.

Despite important limitations linked to occupational definitions, a lack of national coverage, and the statistical approach, this study provides interpretable results for additional research, public health actions, and the epidemiologic surveillance of health inequalities and occupational-related risks.

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