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Original research

Testicular germ cell tumour risk by occupation and industry: a French case–control study – TESTIS

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ABSTRACT

Objective Testicular germ cell tumours (TGCT) are the most common cancer in men of working age and its incidence has increased notably over the past 40 years. Several occupations have been identified as potentially associated with TGCT risk. The aim of this study was to further explore the relationship between occupations, industries and TGCT risk in men aged 18–45 years.

Methods The TESTIS study is a multicenter case–control study conducted between January 2015 and April 2018 in 20 of 23 university hospital centers in metropolitan France. A total of 454 TGCT cases and 670 controls were included. Full job histories were collected. Occupations were coded according to the International Standard Classification of Occupation 1968 version (ISCO-1968) and industry according to the 1999 version of Nomenclature d'Activités Française (NAF-1999). For each job held, ORs and 95% CIs were estimated using conditional logistic regression.

Results A positive association was observed between TGCT and occupation as agricultural, animal husbandry worker (ISCO: 6–2; OR 1.71; 95% CI (1.02 to 2.82)), as well as salesman (ISCO: 4–51; OR 1.84; 95% CI (1.20 to 2.82)). An increased risk was further observed among electrical fitters and related, electrical and electronics workers employed for 2 years or more (ISCO: 8–5; OR_{≥2 years} 1.83; 95% CI (1.01 to 3.32)). Analyses by industry supported these findings.

Conclusions Our findings suggest that agricultural, electrical and electronics workers, and salesman workers experience an increased risk of TGCT. Further research is needed to identify the agents or chemicals in these high-risk occupations which are relevant in the TGCT development.

Trial registration number NCT02109926.

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Current evidence has not allowed to identify consistent occupational risk factors for testicular germ cell tumours (TGCT).
- ⇒ In the past, several occupations and industries have been suggested to increase the risk of TGCT, including agricultural workers, firemen, policemen, military personnel and industrial workers (paper, electric, plastic or metal).
- ⇒ Although TGCT incidence has increased further, only few studies have been published in recent years, while occupational health regulations may have lowered workplace exposures.

WHAT THIS STUDY ADDS

- ⇒ Consistent with previous studies, an increased risk of TGCT among agricultural, electrical and electronics, and salesman workers was observed.
- ⇒ This observation suggests consistent associations over time of occupations with the risk of TGCT.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ The findings of this study offer important insights into the possible role of some high-risk occupations in the development of TGCT, suggesting the need to reinforce work health and safety measures.
- ⇒ Further studies are needed to investigate the agents involved in the high-risk occupations identified in our study and assess their association with the risk of TGCT.

INTRODUCTION

Testicular germ cell tumours (TGCT) are a rare cancer, but the most common cancer affecting men of working age (15–44 years) with an increasing incidence over the past 40 years, particularly among Caucasian populations.^{1,2} TGCT account for approximately 98% of malignant testicular tumours in France and are classified into two main histological subtypes, namely seminoma and non-seminoma.³

Genetic predisposition, personal and family history of TGCT are established as risk factors for TGCT.² Differing incidence rates between population groups and geographical regions,⁴ and evolving incidence in migrant populations⁵ suggest a multifactorial origin, with complex interactions between genetic predisposition and yet unknown environmental factors.³ No specific environmental exposures have yet been identified, but endocrine disrupting chemicals (EDCs) are strongly suspected to play a role in TGCT development, and have been



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associated with increased incidence.^{3 6} Some organochlorines pesticides as well as polychlorinated biphenyls, hexavalent chromium and perfluorooctanoic acid (PFOA) have been associated with TGCT.^{7–11}

Exposure to EDCs or carcinogens can occur in the workplace and the careful study of related occupations could lead to new hypotheses. The literature suggests a higher risk in certain occupations, such as agricultural, metal, electrical, construction, firemen, salesmen and clerical workers.^{2 7 12} However, most studies were published more than 10 years ago.^{7 12} Recently, the International Agency for Research on Cancer classified occupational exposure as a firefighter as ‘carcinogenic to humans’, with ‘limited’ evidence for testicular cancers.¹³ Occupational health regulations and preventive measures over the last decades may have changed some occupational exposures. For example, a decrease in the prevalence of French workers exposed to at least one carcinogenic, mutagenic and reprotoxic agents was observed from 13.7% to 10.6% in 2003–2010, in a context of tightened European regulations.¹⁴ Nevertheless, TGCT in Europe will further increase, particularly in historically low-risk countries.¹⁵ It is thus relevant to obtain current data to examine potential evolutions of occupation-TGCT associations over time to guide future interventions.

Therefore, we report the results of a French nationwide case-control study that investigated whether participants’ occupational history, by occupation and industries, may increase TGCT risk, overall and stratified by histological subtype. This study focuses specifically on TGCT occurring in young men, derived from germ cell neoplasia in situ (GCNIS) according to the 2016 WHO classification.¹⁶ Research hypotheses are distinct from that of non-GCNIS-derived tumours.¹⁶

METHODS

Study design

The TESTIS study is a multicenter case-control study conducted between 2015 and 2018, in 20 out of the 23 university hospital (UH) in metropolitan France.¹⁷ TESTIS included patients (aged 18–45 years) with histologically confirmed TGCT, referred to a Centre d’étude et de conservation d’œufs et de sperme humain (CECOS) for pretreatment sperm cryopreservation. Recruitment with rapid ascertainment of cases through the CECOS was the most promising design resulting from the pilot study, to increase participation rates.¹⁸ Two control groups with no personal history of testicular cancer or cryptorchidism were also recruited: group A—sperm donors and partners of women consulting for fertility disorders, with normal sperm production, in CECOS; group B—partners of women treated for a pathological pregnancy in specialised maternity clinics, adjacent to the CECOS. TGCT cases were individually matched to a control A and a control B on the recruiting UH and year of birth (± 3 years).¹⁷ The target population (ie, young adult men) is particularly associated with low response rates,^{19 20} making it difficult to obtain an unbiased random sample of general population controls.¹⁷ In absence of a perfect control group, we chose two control groups presenting different aspects of the general population, as suggested by Stang *et al.*²¹ Moreover, according to the ‘testicular dysgenesis syndrome’ hypothesis, TGCT, cryptorchidism, hypospadias and some fertility disorders are presumed to originate from common dysfunction in intrauterine genital development.⁴ By selecting controls assumed to be fertile (group B) or with normal sperm count (group A), and without history of cryptorchidism, the risk of recruiting controls with minor forms of this syndrome was reduced. Regional catchment populations

were similar for cases and both control groups.¹⁷ Participants provided written informed consent prior to study entry.

Data collection

Of the 1323 participants included and having agreed to participate, 1124 subjects were interviewed by trained interviewers (IPSOS Company) blinded to the participants’ case-control status. The telephone interview used a structured questionnaire (85% response rate; cases: 87%; group A: 87%; group B controls: 79%). A detailed lifetime work history was recorded of all jobs and internships (>6 months): job title, industry, primary and secondary tasks performed, jobs’ start and end dates, companies’ name, address and activity, number of employees, and percentage of time worked. Participants received a document to prepare information on job history prior to the phone interview.¹⁷

Ascertainment of GCNIS-related TGCT cases

Ascertainment of GCNIS-related TGCT cases has been detailed elsewhere.¹⁷ Briefly, cases were classified into seminoma and non-seminoma by a TGCT expert (HB). Given the low proportion of false-positive TGCT (5.1%), TGCT with missing pathology report (N=43) were included as cases.

Study population

Overall, 1463 eligible subjects were invited to participate in the study, and 1367 (93.4%) agreed to participate. The population structure and reasons for non-participation were detailed previously.¹⁷ Of the 550 recruited cases, 96 were excluded: 21 non-GCNIS TGCT, 4 tumours not confirmed by pathology reports, 4 time from diagnosis to study inclusion >12 months, 1 missing date of diagnosis and 66 incomplete interviews (online supplemental figure S1). Of the controls, 9 not born in ‘metropolitan France’ (ie, excludes French subjects born in the French overseas territories), 5 with personal history of cryptorchidism and 133 with an incomplete interview were excluded. Finally, 1124 participants were included in the analyses.

Coding of job titles

For each job, the occupation was coded according to the International Standard Classification of Occupation 1968 version (ISCO-1968) and industry according to the Nomenclature d’activités française 1999 version (NAF-1999). All coding was based on participants’ job title and task descriptions, blind to their case-control status. Some codes did not have the maximum number of digits (5 for ISCO, 4 for NAF) due to lack of information reported and were considered as aggregate codes. Aggregated codes were used in the code analyses up to their last known digit level and considered as missing for other levels.

Covariates

Based on the literature, covariates established or suspected to be risk factors for TGCT^{22 23} were considered for adjustment (presented in table 1). These included perinatal factors: birth weight, gestational age, birth order, sibship size and born from multiple pregnancy. Further covariates included family history of testicular cancer; family history of cryptorchidism; personal tobacco smoking; cannabis use;²⁴ and personal consumption of alcoholic beverages.²⁵ We considered cannabis use and frequency of use in two periods: adolescence (12–17 years) and young adulthood (18–25 years), puberty being possibly considered as the key point of exposure.²⁴ We used age at voice change as a proxy of timing of pubertal development to consider delayed

Table 1 Characteristics of TGCT cases and controls (group A and group B), TESTIS study, N=1124

Characteristics	TGCT cases (n=454) n (%)	Group A controls (n=384) n (%)	Group B controls (n=286) n (%)	P value cases/all controls*	P value controls A/controls B*
Age at diagnosis (cas)/inclusion (controls) (years)				<0.001	0.69
≤25	64 (14.1)	20 (5.2)	12 (4.2)		
26–30	106 (23.4)	80 (20.8)	64 (22.4)		
31–35	113 (24.9)	131 (34.1)	108 (37.8)		
36–40	85 (18.7)	95 (24.7)	67 (23.4)		
≥41	43 (9.5)	58 (15.1)	35 (12.2)		
Missing	43 (9.5)	0 (0.0)	0 (0.0)		
Year of birth				<0.001	0.15
<1975	37 (8.2)	33 (8.6)	17 (5.9)		
1975–1979	80 (17.6)	82 (21.4)	46 (16.1)		
1980–1984	117 (25.8)	119 (31.0)	99 (34.6)		
1985–1989	130 (28.6)	105 (27.3)	98 (34.3)		
1990–1994	70 (15.4)	40 (10.4)	23 (8.0)		
1995–1999	20 (4.4)	5 (1.3)	3 (1.1)		
Education				0.10	0.002
Secondary	180 (39.7)	137 (35.7)	66 (23.1)		
1–2 years university degree	97 (21.4)	91 (23.7)	57 (19.9)		
> 3 years university degree	128 (28.2)	113 (29.4)	121 (42.3)		
Other	48 (10.6)	43 (11.2)	42 (14.7)		
Missing	1 (0.2)	0 (0.0)	0 (0.0)		
Smoking status				0.12	0.10
Former smoker	102 (22.5)	99 (25.8)	72 (25.2)		
Current smoker	147 (32.4)	116 (30.2)	69 (24.1)		
Never smoker	205 (45.2)	169 (44)	145 (50.7)		
Birth weight (g)				0.49	0.99
<2500	25 (5.5)	20 (5.2)	13 (4.6)		
2500–4000	356 (78.4)	318 (82.8)	243 (85)		
≥4000	46 (10.1)	32 (8.3)	26 (9.1)		
Missing	27 (6.0)	14 (3.7)	4 (1.4)		
Gestational age (weeks)				0.16	0.25
≤36	32 (7.1)	23 (6.0)	11 (3.9)		
>36	415 (91.4)	358 (93.2)	271 (94.8)		
Missing	7 (1.5)	3 (0.8)	4 (1.4)		
Born from multiple pregnancy				0.02	0.59
No	433 (95.4)	375 (97.7)	277 (96.9)		
Yes	21 (4.6)	8 (2.1)	9 (3.2)		
Missing	0 (0.0)	1 (0.3)	0 (0.0)		
Birth order				0.04	0.39
First	213 (46.9)	168 (43.8)	137 (47.9)		
Second	163 (35.9)	135 (35.2)	89 (31.1)		
Third	63 (13.9)	51 (13.3)	42 (14.7)		
Fourth and more	15 (3.3)	30 (7.8)	18 (6.3)		
Sibship size				0.03	0.70
1	25 (5.5)	36 (9.4)	23 (8.0)		
2	192 (42.3)	139 (36.2)	115 (40.2)		
3	153 (33.7)	116 (30.2)	90 (31.5)		
≥4	84 (18.5)	92 (24)	58 (20.3)		
Missing	0 (0.0)	1 (0.3)	0 (0.0)		
Personal history of inguinal hernia				0.01	0.20
No	414 (91.2)	362 (94.3)	275 (96.2)		
Yes	39 (8.6)	22 (5.7)	10 (3.5)		
Missing	1 (0.2)	0 (0.0)	1 (0.4)		
Personal history of testicular trauma				0.004	0.53
No	387 (85.2)	351 (91.4)	260 (90.9)		
Yes	67 (14.8)	33 (8.6)	26 (9.1)		

continued

Table 1 continued

Characteristics	TGCT cases (n=454) n (%)	Group A controls (n=384) n (%)	Group B controls (n=286) n (%)	P value cases/all controls*	P value controls A/controls B*
Family history of TGCT				<0.001	0.33
No	419 (92.3)	375 (97.7)	276 (96.5)		
Yes	33 (7.3)	7 (1.8)	9 (3.2)		
Missing	2 (0.4)	2 (0.5)	1 (0.4)		
Family history of cryptorchidism				0.01	0.76
No	422 (93)	369 (96.1)	276 (96.5)		
Yes	28 (6.2)	10 (2.6)	8 (2.8)		
Missing	4 (0.9)	5 (1.3)	2 (0.7)		
Age at voice change (years)				0.61	0.97
<12	16 (3.5)	17 (4.4)	9 (3.2)		
12–16	375 (82.6)	301 (78.4)	231 (80.8)		
>16	53 (11.7)	56 (14.6)	38 (13.3)		
Missing	10 (2.2)	10 (2.6)	8 (2.8)		
Cannabis use at adolescence (12–17 years)				0.30	0.30
No	312 (68.7)	251 (65.4)	192 (67.1)		
Yes	142 (31.3)	133 (34.6)	94 (32.9)		
Cannabis use (18–25 years)				0.68	0.33
No	262 (57.71)	219 (57.03)	174 (60.84)		
Yes	192 (42.29)	164 (42.71)	112 (39.16)		
Missing	0 (0.0)	1 (0.26)	0 (0.0)		
Alcohol consumption				0.03	0.15
No	17 (1.52)	23 (3.43)	24 (3.58)		
Yes	429 (38.44)	361 (53.88)	262 (39.10)		

Boldface indicates p-value <0.05.

*P values from univariate conditional logistic regression models—except for age at diagnosis/inclusion, age at inclusion and year of birth which were matching factors. TGCT, testicular germ cell tumour.

puberty, a protective factor for TGCT.²⁶ Although biologically questionable, TGCT risk has been reported in several studies to be associated with a personal history of testicular trauma.²³ The selection of covariates followed a two-step process: first, we identified variables associated with TGCT in univariate analyses and selected those with $p < 0.20$. All selected covariates were then included in one single regression model, and a manual backward stepwise selection procedure was performed. The final model included the following variables significantly associated with TGCT ($p < 0.05$): sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT, and family history of cryptorchidism. We used the same adjusted model for all analyses.

Statistical analysis

Descriptive statistics (mean and SD for continuous and frequency and percentage for categorical variables) summarising participants' characteristics were used. In the individual matching, some cases could not be matched to controls and vice versa. Therefore, we performed instead frequency matching on birth year grouped into 5-year categories and region of recruitment. Conditional logistic regression models were used to estimate the OR and 95% CI for ever being employed in a specific occupation/industry compared with not (reference). Each of the jobs reported in the work history was considered. To obtain comparable exposure periods for cases and controls within 5-year age strata, we only considered exposures occurring before the index date (ie, date of TGCT diagnosis for cases, considering; the median age of cases at diagnosis in each stratum for controls).

As the subjects included in the TESTIS study are young, the duration of employment is short. Thus, duration of employment

was assessed as an ordinal variable by using the median as cut point (never (reference), <2 years, ≥ 2 years) for each digit of both codes. Tests for trend were performed by applying the Wald χ^2 test to the duration variable as an ordinal variable.

Given the broad age strata, we further adjusted for age at index date to avoid residual confounding by age (online supplemental table S1). Adjusted analyses were limited to subjects with no missing data for the adjustment variables and complete occupational history (N=12 and 33 exclusions, respectively). Analyses were repeated for TGCT histological subtype. Associations heterogeneity was tested using polytomous logistic regression for matched case-control studies (SAS macro %subtype).²⁷ P values for heterogeneity were derived from the likelihood ratio test.²⁷ We additionally conducted sensitivity analyses: excluding cases with a personal history of cryptorchidism (N=40), and TGCT cases not confirmed by pathology reports (N=43).

Data analysis used SAS statistical software V.9.4 (SAS Institute), p values were two sided and considered statistically significant if lower than 0.05.

RESULTS

Characteristics of the study population

The mean age (\pm SD) of cases and group A and group B controls were 31.1 (± 6.3), 33.3 (± 5.6) and 32.9 (± 5.2) years, respectively (table 1). Cases were younger than controls ($p < 0.001$). No difference between the two control groups was observed, except for education level ($p = 0.002$). Although most participants were first born and single born, cases and controls differed for these characteristics ($p = 0.04$ and 0.02 , respectively), as well as for sibship size ($p = 0.03$). Cases reported greater alcohol

Table 2 ORs and 95% CIs for TGCT associated with occupations, overall and according to histological subtypes, TESTIS study

Occupation description (ISCO-68)*	All TGCT cases		Seminoma†		Non-seminoma‡		P-HET§
	Ca/Co (%ever)	OR (95% CI)¶	Ca/Co (%ever)	OR (95% CI) ¶	Ca/Co (%ever)	OR (95% CI)¶	
Professional, technical and related workers (0/1)	39.5/45.4	0.83 (0.63 to 1.08)	40.7/45.4	0.82 (0.59 to 1.15)	36.4/45.4	0.78 (0.53 to 1.14)	0.82
Architects, engineers and related technicians (0–2/0–3)	12.4/12.8	0.94 (0.63 to 1.40)	13.6/12.8	1.16 (0.72 to 1.89)	9.1/12.8	0.64 (0.34 to 1.21)	0.14
Doctors, dentists, veterinarians and similar workers (0–6/0–7)	4.0/6.9	0.58 (0.32 to 1.05)	3.3/6.9	0.48 (0.21 to 1.12)	6.1/6.9	0.83 (0.39 to 1.76)	0.34
Teachers (1–3)	6.9/8.8	0.83 (0.51 to 1.35)	6.5/8.8	0.65 (0.34 to 1.26)	6.7/8.8	0.89 (0.44 to 1.80)	0.53
Secondary education teachers (1–32)	4.5/4.3	1.09 (0.57 to 2.05)	4.7/4.3	0.89 (0.39 to 2.04)	4.2/4.3	1.29 (0.53 to 3.14)	0.56
Administrative and managerial workers (2)	12.9/16.3	0.86 (0.59 to 1.26)	15.0/16.3	0.97 (0.61 to 1.54)	9.7/16.3	0.75 (0.41 to 1.37)	0.51
Clerical and related workers (3)	20.5/19.5	1.02 (0.74 to 1.40)	21.5/19.5	0.99 (0.66 to 1.48)	18.8/19.5	0.98 (0.62 to 1.57)	0.99
Sales workers (4)	21.0/17.2	1.28 (0.92 to 1.77)	22.0/17.2	1.12 (0.74 to 1.67)	20/17.2	1.39 (0.87 to 2.20)	0.49
Salesmen, shop assistants and related workers (4–5)	13.1/8.2	1.66 (1.09 to 2.52)	12.6/8.2	1.29 (0.77 to 2.15)	12.7/8.2	1.91 (1.07 to 3.42)	0.32
Salesmen, shop assistants and demonstrators (4–51)	13.1/7.2	1.84 (1.20 to 2.82)	12.6/7.2	1.44 (0.86 to 2.43)	12.7/7.2	2.08 (1.16 to 3.75)	0.36
Other salesmen, shop assistants and demonstrators (4–51.90)	7.6/2.9	2.54 (1.38 to 4.65)	6.5/2.9	1.71 (0.82 to 3.57)	9.1/2.9	4.34 (2.00 to 9.42)	0.09
Service workers (5)	24.0/21.5	1.17 (0.86 to 1.58)	22.9/21.5	0.94 (0.64 to 1.39)	27.9/21.5	1.43 (0.94 to 2.16)	0.15
Cooks, waiters, bartenders and related workers (5–3)	10.2/8.9	1.21 (0.78 to 1.86)	9.3/8.9	0.95 (0.54 to 1.67)	13.3/8.9	1.50 (0.86 to 2.63)	0.26
Waiters, bartenders and related workers (5–32)	6.4/4.5	1.65 (0.94 to 2.90)	6.5/4.5	1.37 (0.69 to 2.74)	7.9/4.5	1.72 (0.83 to 3.57)	0.65
Waiter, general (5–32.10)	5.0/2.9	1.93 (0.99 to 3.74)	3.7/2.9	1.20 (0.49 to 2.90)	7.9/2.9	2.80 (1.29 to 6.09)	0.15
Protective service workers (5–8)	8.3/7.4	1.10 (0.69 to 1.77)	8.9/7.4	1.04 (0.58 to 1.87)	7.3/7.4	1.11 (0.55 to 2.24)	0.90
Firefighters (5–81)	3.1/1.7	1.59 (0.69 to 3.69)					
Agricultural, animal husbandry and forestry workers (6)	10.7/6.0	1.71 (1.07 to 2.72)	10.3/6.0	1.51 (0.85 to 2.68)	12.7/6.0	1.94 (1.05 to 3.61)	0.55
Farmers (6–1)	2.4/1.4	1.84 (0.71 to 4.76)					
Agricultural and animal husbandry workers (6–2)	8.6/4.8	1.71 (1.02 to 2.86)	6.5/4.8	1.25 (0.63 to 2.51)	12.1/4.8	2.12 (1.11 to 4.04)	0.27
Production and related workers, transport equipment operators and labourers (7/8/9)	48.6/40.8	1.35 (1.04 to 1.76)	46.3/40.8	1.23 (0.88 to 1.72)	51.5/40.8	1.43 (0.99 to 2.07)	0.56
Production supervisors and general foremen (7–0)	5.0/4.6	1.24 (0.69 to 2.25)	4.7/4.6	1.12 (0.52 to 2.43)	6.1/4.6	1.29 (0.59 to 2.83)	0.81
Machinery fitters, machine assemblers and precision-instrument makers (except electrical) (8–4)	13.8/8.8	1.72 (1.14 to 2.59)	13.6/8.8	1.74 (1.05 to 2.88)	13.3/8.8	1.41 (0.80 to 2.48)	0.59
Machinery fitters and machine assemblers (8–41)	3.6/1.7	2.46 (1.08 to 5.62)	2.3/1.7	1.81 (0.58 to 5.64)	3.0/1.7	1.58 (0.49 to 5.08)	0.87
Refrigeration and air-conditioning plan installer and mechanic (8–41.80)	2.6/1.2	2.43 (0.92 to 6.39)					
Motor-vehicle mechanics (8–43)	3.3/2.9	1.16 (0.56 to 2.39)					
Machinery fitters, machine assemblers and precision-instrument makers (except electrical) N.E.C. (8–49)	7.6/4.9	1.60 (0.94 to 2.73)	7.5/4.9	1.58 (0.82 to 3.06)	8.5/4.9	1.64 (0.80 to 3.37)	0.94
Electrical fitters and related electrical and electronics workers (8–5)	10.0/5.7	1.80 (1.11 to 2.91)	9.3/5.7	1.65 (0.90 to 3.00)	10.3/5.7	1.71 (0.90 to 3.25)	0.94
Plumbers, welders, sheet-metal and structural metal preparers and erectors (8–7)	7.6/4.6	1.67 (0.97 to 2.87)	7.0/4.6	1.29 (0.65 to 2.55)	7.2/4.6	1.82 (0.86 to 3.83)	0.50
Welders and flame-cutters (8–72)	2.9/1.8	1.40 (0.59 to 3.29)	2.8/1.8	1.16 (0.40 to 3.36)	3.0/1.8	2.41 (0.74 to 7.81)	0.37
Sheet-metal workers (8–73)	1.4/1.2	1.31 (0.43 to 4.00)					
Painters (9–3)	1.9/2.2	0.70 (0.28 to 1.74)					
Bricklayers, carpenters and other construction workers (9–5)	9.5/7.5	1.27 (0.80 to 2.01)	8.4/7.5	1.19 (0.65 to 2.17)	10.9/7.5	1.38 (0.74 to 2.59)	0.74
Material handling and related equipment operators, dockers and freight handlers (9–7)	11.0/8.6	1.28 (0.83 to 1.97)	9.3/8.6	1.01 (0.57 to 1.79)	12.1/8.6	1.50 (0.83 to 2.69)	0.35
Transport equipment operators (9–8)	8.1/7.8	1.03 (0.64 to 1.65)	8.9/7.8	0.96 (0.53 to 1.73)	9.1/7.8	1.38 (0.73 to 2.62)	0.42
Labourers N.E.C (9–9)	2.9/2.5	1.07 (0.48 to 2.38)					

Boldface indicates p-value <0.05.

*Total number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

†219 cases of seminoma TGCT were present in the TESTIS study.

‡191 cases of non-seminoma TGCT were present in the TESTIS study.

§P value for heterogeneity derived from the likelihood ratio test, comparing seminoma versus non-seminoma tumours.

¶Estimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls (grey line if less).

Ca/Co (%ever), percentage of cases/controls ever employed; ISCO, International Standard Classification of Occupations; N.E.C., not elsewhere classified; P-HET, P-value for heterogeneity; TGCT, testicular germ cell tumour.

consumption ($p=0.03$) and more testicular trauma ($p=0.004$) than controls. Family history of TGCT and of cryptorchidism were more frequent among cases than controls ($p<0.001$ and 0.01 , respectively). Finally, there was no difference between cases and controls in age at voice change, smoking status, cannabis use, birth weight and gestational age.

TGCT risk by occupation (ISCO68)

There was a positive association between TGCT risk and working as ‘salesmen, shop assistants and demonstrators’ (ISCO: 4–51; OR 1.84; 95% CI (1.20 to 2.82)), particularly for non-seminoma (ISCO: 4–51; OR 2.08; 95% CI (1.16 to 3.75)) (table 2, online

supplemental table S1). The subcategory of ‘other salesmen, shop assistants and demonstrators’ (ISCO: 4–51.90) showed the strongest association, both with TGCT overall (OR 2.54; 95% CI (1.38 to 4.65)) and non-seminoma subtype (OR 4.34; 95% CI (2.00 to 9.42)), although CIs were wide. There was a positive association between TGCT (OR 1.71; 95% CI (1.02 to 2.82)), non-seminoma (OR 2.12; 95% CI (1.11 to 4.04)) and ‘agricultural and animal husbandry workers’ (ISCO: 6–2). A positive association was further observed between TGCT risk and ‘production and related workers, transport equipment operators and labourers’ (ISCO: 7/8/9; OR 1.35; 95% CI (1.04 to 1.76)), whereof ‘machinery fitters, machine assemblers’ and ‘electrical

Table 3 ORs and 95% CIs for TGCT associated with occupations, according to employment duration (<2 vs ≥2 years), TESTIS study

Occupation description (ISCO-68)*	Ca/Co (never)	Ca/Co<2 Years	OR1 (95% CI)†	Ca/Co≥2 Years	OR2 (95% CI)†	P trend
Professional, technical and related workers (0/1)	254/355	27/42	0.81 (0.48 to 1.39)	139/253	0.83 (0.62 to 1.10)	0.38
Architects, engineers and related technicians (0–2/0–3)	368/567	12/22	0.72 (0.33 to 1.50)	40/61	1.03 (0.66 to 1.62)	0.68
Teachers (1–3)	391/593	7/20	0.62 (0.25 to 1.50)	22/37	0.94 (0.53 to 1.68)	0.56
Administrative and managerial workers (2)	366/544	13/26	0.82 (0.41 to 1.68)	41/80	0.88 (0.57 to 1.34)	0.74
Clerical and related workers (3)	334/523	38/42	1.37 (0.85 to 2.22)	48/85	0.84 (0.87 to 1.26)	0.27
Sales workers (4)	332/538	30/37	1.28 (0.76 to 2.15)	58/75	1.28 (0.87 to 1.88)	0.34
Salesmen, shop assistants and related workers (4–5)	365/597	25/22	1.81 (0.98 to 3.33)	30/31	1.54 (0.90 to 2.66)	0.06
Salesmen, shop assistants and demonstrators (4–51)	365/603	25/18	2.12 (1.12 to 4.02)	30/29	1.65 (0.95 to 2.87)	0.02
Retail trade salesman (4–51.30)	391/622	16/13	1.77 (0.82 to 3.81)	13/15	1.33 (0.61 to 2.92)	0.27
Other salesmen, shop assistants and demonstrators (4–51.90)	388/631	22/9	3.58 (1.59 to 8.06)	10/10	1.55 (0.61 to 3.95)	<0.01
Service workers (5)	319/510	32/37	1.31 (0.78 to 2.20)	69/103	1.11 (0.78 to 1.58)	0.53
Cooks, waiters, bartenders and related workers (5–3)	377/592	18/21	1.28 (0.66 to 2.51)	25/37	1.16 (0.67 to 2.00)	0.68
Waiters, bartenders and related workers (5–32)	393/621	13/9	2.58 (1.07 to 6.24)	14/20	1.22 (0.58 to 2.53)	0.10
Waiter, general (5–32.10)	399/631	13/7	3.38 (1.28 to 8.94)	8/12	1.11 (0.43 to 2.86)	0.05
Protective service workers (5–8)	385/602	7/10	1.11 (0.40 to 3.10)	28/38	1.10 (0.65 to 1.87)	0.92
Protective service workers N.E.C (5–89)	396/617	8/10	1.41 (0.52 to 3.79)	16/23	1.04 (0.52 to 2.04)	0.79
Watchman (5–89.40)	409/634	6/6	1.25 (0.37 to 4.22)	5/10	1.00 (0.34 to 2.99)	0.94
Agricultural, animal husbandry and forestry workers (6)	375/611	13/11	1.71 (0.73 to 3.98)	32/28	1.71 (0.99 to 2.95)	0.08
Agricultural and animal husbandry workers (6–2)	384/619	14/11	1.81 (0.78 to 4.19)	22/20	1.65 (0.86 to 3.15)	0.13
Production and related workers, transport equipment operators and labourers (7/8/9)	216/385	43/66	1.06 (0.68 to 1.66)	161/199	1.45 (1.09 to 1.94)	0.03
Production supervisors and general foremen (7–0)	399/620	6/13	0.78 (0.29 to 2.13)	15/17	1.62 (0.78 to 3.36)	0.38
Machinery fitters, machine assemblers and precision-instrument makers (except electrical) (8–4)	362/593	23/14	2.50 (1.24 to 5.06)	35/43	1.43 (0.87 to 2.34)	0.02
Motor-vehicle mechanics (8–43)	406/631	7/9	1.12 (0.39 to 3.17)	7/10	1.19 (0.44 to 3.26)	0.92
Machinery fitters, machine assemblers and precision-instrument makers (except electrical) N.E.C (8–49)	388/618	15/9	2.65 (1.12 to 6.26)	17/23	1.16 (0.59 to 2.30)	0.08
Electrical fitters and related electrical and electronics workers (8–5)	378/613	15/14	1.75 (0.81 to 3.76)	27/23	1.83 (1.01 to 3.32)	0.06
Electrical wiremen (8–55)	394/626	8/8	1.39 (0.50 to 3.88)	18/16	1.77 (0.87 to 3.60)	0.24
Plumbers, welders, sheet-metal and structural metal preparers and erectors (8–7)	388/620	16/10	2.23 (0.96 to 5.20)	16/20	1.36 (0.67 to 2.75)	0.13
Welders and flame-cutters (8–72)	408/638	7/6	1.31 (0.41 to 4.17)	5/6	1.51 (0.44 to 5.21)	0.73
Bricklayers, carpenters and other construction workers (9–5)	380/601	16/16	1.75 (0.84 to 3.67)	24/33	1.05 (0.60 to 1.86)	0.33
Material handling and related equipment operators, dockers and freight handlers (9–7)	374/594	26/31	1.39 (0.79 to 2.45)	20/25	1.15 (0.61 to 2.18)	0.49
Transport equipment operators (9–8)	386/599	16/29	0.81 (0.42 to 1.59)	18/22	1.31 (0.67 to 2.54)	0.60

Boldface indicates a p value <0.05.

*Total number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

†Estimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

Ca/Co (ever)/(never), cases/controls ever/never employed; ISCO, International Standard Classification of Occupations; N.E.C, not elsewhere classified; TGCT, testicular germ cell tumour.

fitters, related electrical, electronic workers' (ISCO: 8–41; OR 2.46; 95% CI (1.08 to 5.62)/ISCO: 8–5; OR 1.80; 95% CI (1.11 to 2.91)). Finally, none of the observed associations showed heterogeneity between histologic subtypes.

Analyses by duration of employment (table 3) showed a positive association between TGCT and subjects who had been employed for ≥2 years as 'production and related workers, transport equipment operators and labourers' (ISCO: 7/8/9; OR_{≥2 years} =1.45; 95% CI (1.09 to 1.94); p for trend=0.03), whereas 'electrical fitters and related electrical and electronics workers', however, with a non-significant duration trend (ISCO: 8–5; OR_{≥2 years} =1.83; 95% CI (1.01 to 3.32); p for trend=0.06). A positive association between TGCT risk and duration of employment of less than 2 years for: 'stock clerks' (ISCO: 3–91; OR_{<2 years} =2.27; 95% CI (1.14 to 4.50); p-for-trend=0.03); 'other salesmen, shop assistants and demonstrators' (ISCO: 4–51.90; OR_{<2 years} =3.58; CI (1.59 to 8.06); p for trend <0.01) and for 'machinery fitters, machine assemblers and precision-instrument makers' (ISCO: 8–4; OR_{<2 years} =2.50; 95% CI (1.24 to 5.06);

p for trend=0.02) was observed. However, the CIs were wide, indicating substantial uncertainty around the risk estimates.

TGCT risk by industries (NAF99)

This analysis suggested an association between TGCT, non-seminoma and 'agriculture, hunting and related service activities' (NAF: 01) (table 4, online supplemental table S2). However, CIs were wide and compatible with inverse associations. Although CIs were also wide, ORs suggested associations between TGCT risk and 'electrical installation work', 'installation of heating and air conditioning equipment' (NAF: 45.3A; OR 1.98; 95% CI (1.12 to 3.50)/NAF: 45.3F; OR 2.95; 95% CI (1.18 to 7.39)). There was a positive association between TGCT and 'trade, repair of motor vehicles and household goods' (NAF: 50–52; OR 1.42; 95% CI (1.06 to 1.90)), 'supermarkets' (NAF: 52.1D; OR 2.28; 95% CI (1.28 to 4.06)), industries and 'technical or professional secondary education' (NAF: 80.2C; OR 1.55; 95% CI (1.03 to 2.34)). The analysis also suggested a positive association with 'food

Table 4 ORs and 95% CIs for TGCT associated with industries, overall and according to histological subtypes, TESTIS study

Industry description (NAF-99 code)*	All TGCT cases		Seminomas‡		Non-seminomas§		P-HET¶
	Ca/Co (%ever)	OR (95% CI)†	Ca/Co (%ever)	OR (95% CI)†	Ca/Co (%ever)	OR (95% CI)†	
Agriculture, hunting and forestry (01, 02)	7.9/5.2	1.43 (0.85 to 2.41)	7.5/5.3	1.32 (0.69 to 2.54)	9.8/5.3	1.64 (0.83 to 3.25)	0.65
Agriculture, hunting and related service activities (01)	7.6/4.8	1.56 (0.91 to 2.67)	7.5/4.8	1.48 (0.76 to 2.88)	9.1/4.8	1.79 (0.88 to 3.64)	0.70
Manufacturing (15–37)	31.3/29.4	1.10 (0.83 to 1.46)	31.3/29.4	1.13 (0.79 to 1.61)	29.3/29.4	1.00 (0.67 to 1.50)	0.66
Publishing, printing and reproduction of recorded media (22)	1.7/1.1	1.67 (0.56 to 4.99)					
Metalworking (28)	3.8/4.6	0.84 (0.44 to 1.61)	3.7/4.7	0.82 (0.35 to 1.89)	4.3/4.7	0.92 (0.37 to 2.34)	0.85
Electricity, gas and water supply (40, 41)	3.6/2.9	1.12 (0.53 to 2.36)	2.3/2.9	0.80 (0.28 to 2.28)	3.7/2.9	0.88 (0.32 to 2.40)	0.90
Electricity, gas, steam and hot water supply (40)	2.9/2.6	0.98 (0.44 to 2.19)	2.3/2.6	0.85 (0.29 to 2.46)	3.0/2.6	0.75 (0.25 to 2.25)	0.88
Construction (45)	20.5/16.6	1.27 (0.91 to 1.77)	16.8/16.4	0.94 (0.61 to 1.47)	22.6/16.4	1.41 (0.89 to 2.22)	0.22
Site preparation (45.1)	1.2/1.2	0.76 (0.23 to 2.50)					
Construction of building and civil engineering works (45.2)	6.2/4.7	1.38 (0.78 to 2.43)	3.3/4.7	0.61 (0.26 to 1.47)	9.1/4.7	1.80 (0.88 to 3.66)	0.06
Installation work (45.3)	11.2/6.4	1.99 (1.25 to 3.15)	9.4/6.4	1.52 (0.84 to 2.75)	9.8/6.4	1.59 (0.83 to 3.03)	0.92
Electrical installation work (45.3A)	6.9/4.04	1.98 (1.12 to 3.50)	6.6/4.1	1.66 (0.82 to 3.38)	6.1/4.1	1.96 (0.89 to 4.34)	0.76
Installation of heating and air conditioning equipment (45.3F)	3.3/1.2	2.95 (1.18 to 7.39)					
Finishing work (45.4)	5.0/5.3	0.87 (0.48 to 1.56)	4.7/5.1	0.82 (0.38 to 1.78)	6.1/5.1	1.15 (0.53 to 2.51)	0.54
Trade, repair of motor vehicles and household goods (50–52)	30.1/23.7	1.42 (1.06 to 1.90)	31.8/23.8	1.34 (0.94 to 1.92)	28.0/23.8	1.41 (0.93 to 2.14)	0.86
Motor trade and repair (50)	5.7/4.2	1.40 (0.78 to 2.52)	7.5/4.2	1.59 (0.81 to 3.12)	4.3/4.2	1.16 (0.47 to 2.86)	0.57
Wholesale trade and commercial intermediaries (51)	10.5/8.2	1.35 (0.87 to 2.10)	10.7/8.2	1.25 (0.73 to 2.16)	11.0/8.2	1.44 (0.79 to 2.65)	0.73
Retail trade and repair of household goods (52)	17.7/13.7	1.38 (0.97 to 1.96)	17.3/13.0	1.18 (0.76 to 1.82)	17.1/13.0	1.46 (0.90 to 2.39)	0.52
Retail sale in non-specialised shops (52.1)	7.4/4.3	1.91 (1.11 to 3.28)	5.6/4.3	1.29 (0.63 to 2.66)	9.8/4.3	3.00 (1.51 to 5.98)	0.10
Supermarkets (52.1D)	7.2/3.5	2.28 (1.28 to 4.06)	5.6/3.6	1.64 (0.78 to 3.46)	9.1/3.6	3.20 (1.55 to 6.60)	0.21
Food retail in specialised shops (52.2)	2.4/1.1	2.89 (1.03 to 8.14)					
Hotels and restaurants (55)	12.2/10.6	1.23 (0.82 to 1.84)	11.2/10.5	1.07 (0.63 to 1.79)	14.0/10.5	1.34 (0.79 to 2.29)	0.56
Transport and communications (60–64)	10.7/14.5	0.74 (0.50 to 1.09)	14.0/14.6	0.94 (0.59 to 1.50)	7.3/14.6	0.49 (0.26 to 0.94)	0.10
Financial activities (65–67)	4.8/5.4	1.05 (0.58 to 1.88)	4.7/5.4	0.95 (0.45 to 2.03)	6.1/5.4	1.72 (0.80 to 3.69)	0.29
Real estate, rental and business services (70–74)	24.1/30.2	0.77 (0.57 to 1.03)	29.0/30.3	0.91 (0.63 to 1.31)	17.1/30.3	0.51 (0.32 to 0.81)	0.05
Other business activities (74)	14.8/16.6	0.91 (0.64 to 1.30)	17.8/16.7	1.06 (0.69 to 1.63)	8.5/16.7	0.50 (0.27 to 0.92)	0.04
Public administration (75)	16.9/16.5	0.98 (0.69 to 1.38)	15.9/16.6	0.83 (0.52 to 1.30)	18.9/16.6	1.15 (0.71 to 1.86)	0.33
Education (80)	22.7/23.9	0.97 (0.72 to 1.31)	21.0/24.0	0.78 (0.52 to 1.15)	23.2/24.0	0.99 (0.65 to 1.51)	0.41
Secondary education (80.2)	15.8/12.3	1.33 (0.92 to 1.92)	15.0/12.4	1.03 (0.64 to 1.66)	15.2/12.4	1.27 (0.76 to 2.13)	0.55
General secondary education (80.2A)	3.1/3.3	0.88 (0.41 to 1.88)	2.8/3.3	0.50 (0.18 to 1.41)	3.0/3.3	1.33 (0.46 to 3.86)	0.20
Technical or professional secondary education (80.2C)	12.9/8.9	1.55 (1.03 to 2.34)	12.1/8.9	1.31 (0.78 to 2.21)	12.8/8.9	1.35 (0.77 to 2.39)	0.94
Health and social work (85)	7.4/12.9	0.57 (0.37 to 0.89)	8.4/13.0	0.64 (0.36 to 1.11)	7.9/13.0	0.61 (0.32 to 1.16)	0.92
Human health activities (85.1)	5.5/9.7	0.56 (0.33 to 0.93)	4.7/9.8	0.45 (0.22 to 0.93)	7.9/9.8	0.79 (0.41 to 1.52)	0.26
Hospital activities (85.1A)	4.5/7.9	0.56 (0.32 to 0.98)	2.8/7.9	0.33 (0.13 to 0.81)	7.9/7.9	1.01 (0.52 to 1.96)	0.04
Other community, social and personal services (90–93)	14.1/10.9	1.48 (1.00 to 2.19)	13.6/11.0	1.23 (0.75 to 2.01)	16.5/11.0	2.26 (1.32 to 3.87)	0.10
Recreational, cultural and sporting activities (92)	10.5/8.6	1.40 (0.91 to 2.17)	9.8/8.7	1.09 (0.62 to 1.90)	12.2/8.7	2.07 (1.14 to 3.76)	0.12

Boldface indicates a p value <0.05.

*Total number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

†Estimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls (grey line if less).

‡219 cases of seminoma TGCT were present in the TESTIS study.

§191 cases of non-seminoma TGCT were present in the TESTIS study.

¶P-value for heterogeneity derived from the Likelihood Ratio Test, comparing seminoma versus non-seminoma tumours.

Ca/Co (%ever), percentage of cases/controls ever employed; ISCO, International Standard Classification of Occupations; NAF-99, Nomenclature d'Activités Française-1999; N.E.C., not elsewhere classified; P-HET, P-value for heterogeneity; TGCT, testicular germ cell tumour.

retailing in specialty stores' (NAF: 52.2; OR 2.89; 95% CI (1.03 to 8.14)) but the CI was wide, reflecting the statistical uncertainty of this risk estimate. The category of 'other community, social and personal services' (NAF: 90–93) was associated with non-seminoma (OR 2.26; 95% CI (1.32 to 3.87)). An inverse association was observed for non-seminoma for 'other business activities' (NAF: 74; OR 0.50; 95% CI (0.27 to 0.92)) with heterogeneity in this association (p for heterogeneity=0.04). 'Hospital activities' (NAF: 85.1A) were also inversely associated with TGCT (OR 0.56; 95% CI (0.32 to 0.98)) and seminoma (OR 0.33; 95% CI (0.13 to 0.81));

the latter was found different from the association with non-seminoma (p for heterogeneity=0.04).

Analyses by duration of employment (online supplemental table S3) showed an association between TGCT risk and subjects who had been employed 2 years or more in 'installation work' sector activities (NAF: 45.3; OR_{≥2 years}=2.01; 95% CI (1.14 to 3.56); p for trend 0.02). Positive association between TGCT and employment less than 2 years was observed for 'supermarket' (NAF: 52.1D; OR_{<2 years}=2.97; 95% CI (1.33 to 6.63); p for trend=0.01). However, the CIs observed were also wide.

Sensitivity analyses

Most of the previously identified occupational groups/sectors were also identified when cases with a personal history of cryptorchidism were excluded (N=40) (online supplemental table S4 and S5), when cases not confirmed by pathology reports were excluded (N=43) (online supplemental table S6 and S7) or when an adjustment for age at index date was made (online supplemental table S8 and S9). However, a numerically positive association with 'production and related workers, transport equipment operators and labourers' (ISCO: 7/8/9) was observed when analyses were restricted to confirmed cases.

DISCUSSION

Men ever employed in agricultural, production, transport and labourer occupations had an elevated TGCT risk compared with those who never worked there, and it appears to increase with duration of employment. An important strength of our study was to use two distinct classifications: one international (ISCO) for occupation and one French national (NAF) for industry that yielded consistent positive associations for several occupations/industries, even if CIs were sometimes wider in one of the two. Thus, men employed in agricultural occupations showed an increased TGCT risk in both classifications, but with wider CI in NAF. Both classifications further found a positive association between electrical workers and TGCT. The positive association observed for salesmen was also supported by the association observed with the 'retail in non-specialty stores' and 'super-market' sectors for TGCT and non-seminoma risk. Finally, both classifications suggested an inverse association in relation to medical/paramedical workers, with wider CI regarding associations found with ISCO.

The observed increased TGCT risk for agricultural workers is consistent with previous studies.^{7 28–31} Conversely, two meta-analyses^{32 33} and a literature review³⁴ of cancers among farmers found no evidence of an increased risk, which does not exclude the possibility that exposure to certain agricultural chemicals may be associated with increased TGCT risk.^{2 7} Several pesticides have been classified as EDCs due to their estrogenic or anti-androgenic effects.³⁵ Exposure to EDCs has been hypothesised to increase TGCT risk by interfering with the regular hormonal balance.³⁵ For instance, a positive association between dichlorodiphenyldichloroethylene, the most persistent metabolite of dichlorodiphenyltrichloroethane (DDT) and TGCT has been observed previously.² Although DDT is now banned effectively in many countries, some older subjects may have been exposed early in their occupational history. While pesticides are the most commonly studied exposure in relation to TGCT among agricultural workers,^{7 12} they may also be exposed to a variety of other potentially carcinogenic substances, including solvents, metals, organic dusts and diesel exhaust fumes.³⁶

An increased TGCT risk in non-agricultural workers such as production and related workers, transportation equipment operators, and labourers has also been observed, especially for those who have held these jobs for 2 years or more. Our results were consistent with previous studies suggesting an increased TGCT risk among workers in the electrical and electronics industry and related sectors,^{28 31} but other did not support this finding.³⁷ Some studies, based on job titles, suggested that exposure to solvents may increase TGCT risk.^{2 12} Moreover, an increase in TGCT risk for subjects employed in the trade, motor vehicle repair and household goods industries were observed in our study, consistent with the common use of certain solvents as degreasers in these industries.³⁸

In contrast to our findings, an association between testicular cancer and firefighters has been suggested in several studies,^{39 40} potentially associated with some complex chemical compounds present in fire smoke.³⁹ For example, firefighters may be more exposed to PFOA than the general population. A recent review meta-analysis suggests an average increase in TGCT risk per 10 ng/mL increase in serum PFOA.⁸ Other occupations have been found linked to TGCT risk in our study, although it may be more difficult to relate them to specific occupational exposures. Conversely to a previous study,³¹ our results suggest an inverse association of TGCT with health and social work. Furthermore, the observed excess TGCT risk in white-collar workers (ie, production supervisor and general foreman) is consistent with previous findings.^{7 41} However, this finding is possibly due to socioeconomic status (SES),³¹ yet the association between SES and TGCT risk remains unclear with divergent evidence.⁴²

Finally, the results suggest that despite evolving regulation and increased workplace protection from carcinogen exposure,¹⁴ agricultural workers, production and transport workers such as electrical and electronic are consistently associated with TGCT over time. Nevertheless, humans are exposed to many chemicals, nearly 1500 are suspected EDCs, and this number will continue to grow.⁴³ It is, therefore, necessary to conduct further epidemiological studies, with advanced methods of occupational exposure assessment, on the role of chemicals involved in high-risk occupations and TGCT risk, such as solvents or pesticides.

Strengths and limitations

This study has several strengths. Because of its national coverage (20 recruiting UH) and the participants' detailed occupational history including tasks performed, it offers an opportunity to investigate and characterise occupations and industry sectors associated with testicular cancer in young adults in recent years. Detailed information allowed accounting for suspected or known TGCT risk factors.

This study has some limitations. The main one was the difficulty to obtain an unbiased random sample of general population controls given the low response rate in the target population.^{19 20} Another limitation was our inability to determine the controls' representativeness of the source population from which the cases originated; this limitation has been discussed in detail previously.¹⁷ While it has been suggested that occupational exposure might not be relevant for TGCT because of the young age of patients and the short duration of occupational exposure, the presence of GCNIS early in life and TCGT in young adulthood supports the hypothesis of combined early and later life exposures in the development of TGCT.² Although this limitation is not specific to our study, the method applied identified occupational groups with higher risk due to collective exposure to agents or chemicals, exposure to these also varies within each job or industry, which is not accounted for in this way.¹² Grouping potentially highly exposed subjects with unexposed from the same job could attenuate the strength of the association. Based on a priori hypothesis, we investigated associations between TGCT and occupations/industries. The use of two complementary nomenclatures, based on broad occupation/industry categories and associated subcategories, involved multiple analyses. Yet, as these variables are related, as well as to allow interpretation of results in light of previous literature, correction for multiple testing and the commonly used Bonferroni method were not considered appropriate.⁴⁴ Therefore, positive associations may have occurred by chance and our results should be interpreted with caution. Of note, most of the associations

observed were on jobs for which we had plausible hypotheses, and that have been found in previous studies. There is also a risk of bias due to differential participation in case-control studies. This bias is positively associated with the difference in response rates between groups for the characteristic causing differential participation, and inversely associated with the total response rate in controls in previous studies.⁴⁵ However, status of non-participants (N=96 people who were contacted but did not participate in the study, see online supplemental figure S1) was unfortunately not available to compare response rates between cases and controls. The overall response rate in this study is like that of previous studies.^{46–48} Yet, in the clinical setting, it is likely that additional eligible cases and controls were not interested in participating but not reported by the centres, and our response rate may be overestimated. A previous French hospital-based case-control study on TGCT risk factors, with recruitment of cases in CECOS at time of sperm cryopreservation (between 2002 and 2005), reported a response rate of 81% for cases and of 39% for controls recruited among partners of women in the maternity clinic of the same hospital as the CECOS.⁴⁹ Our occupational data were self-reported and could have been subject to recall bias. However, the use of structured documents to prepare the interview and questionnaires, as well as training of interviewers and telephone interviews blinded to case-control status were intended to minimise recall bias. Thus, it is more likely that recall bias was non-differential with respect to recall of lifetime work history and coding by an industrial hygienist blinded to case-control status, leading instead to null bias.⁵⁰ There is also a difference in the regional distribution of the population, with participating controls more often coming from nearby/urban locations. Some types of jobs may be underrepresented for our control population, such as agricultural jobs, leading to a potential differential job classification error and thus biasing the OR.⁵⁰ Results by duration of employment should also be interpreted with caution. The subjects' young age resulted in a low median duration of employment, which may have reduced the strength of the association in this analysis. The subtypes show different peak incidences by age (ie, the highest incidence rate of non-seminoma is in the 25–29 years age group, while it is in the 35–39 years age group for seminomas²), so the results may be biased by analysing the duration for all TGCT, when we observed a stronger effect in one of the subtypes. We could not verify the influence of histological subtype on risk by duration due to an insufficient number of subjects.

CONCLUSION

In conclusion, the findings suggest a possible role of some occupational exposures in the development of TGCT. Men employed in agricultural, electrical and electronics occupations had an elevated TGCT risk compared with those who never worked there, and it seems to be higher for workers employed for 2 years or more. The consistency of these findings with previous studies suggests opportunities to reinforce work health and safety measures to reduce occupational exposure to carcinogens. Also, further research targeting specific exposures is warranted to determine the role of agents or chemical currently involved in the identified high-risk occupations and investigate associated TGCT risk.

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Contributors AD, OP, HB, LB, JS, BC and BF participated in the conception and design of the study. AD, BDa, OP, HB, JS, LB, CM-G, SG'dE, MT, BDu, CF, BC and BF participated in the acquisition of data. MG, AC, ML, FD, AD, SA, AO, BC and BF participated in the analysis and interpretation of data. MG drafted the manuscript. AC, ML, AD, SA, AO, JS, BC and BF critically revised the manuscript for important intellectual content. All authors read and approved the final manuscript. BF is responsible for the overall content as a guarantor.

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Ethics approval This study involves human participants and the study received ethical approval from the French Ethics Committee (ref. no. A14-94), the French national agency for medicines and health products safety (ref. no. 140184B-12) and the IARC Ethics Committee (ref. no. 14-26) and was declared to the Commission nationale Informatique et Libertés (MR-001, ref. no. 2016-177). Participants gave informed consent to participate in the study before taking part.

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Supplementary material

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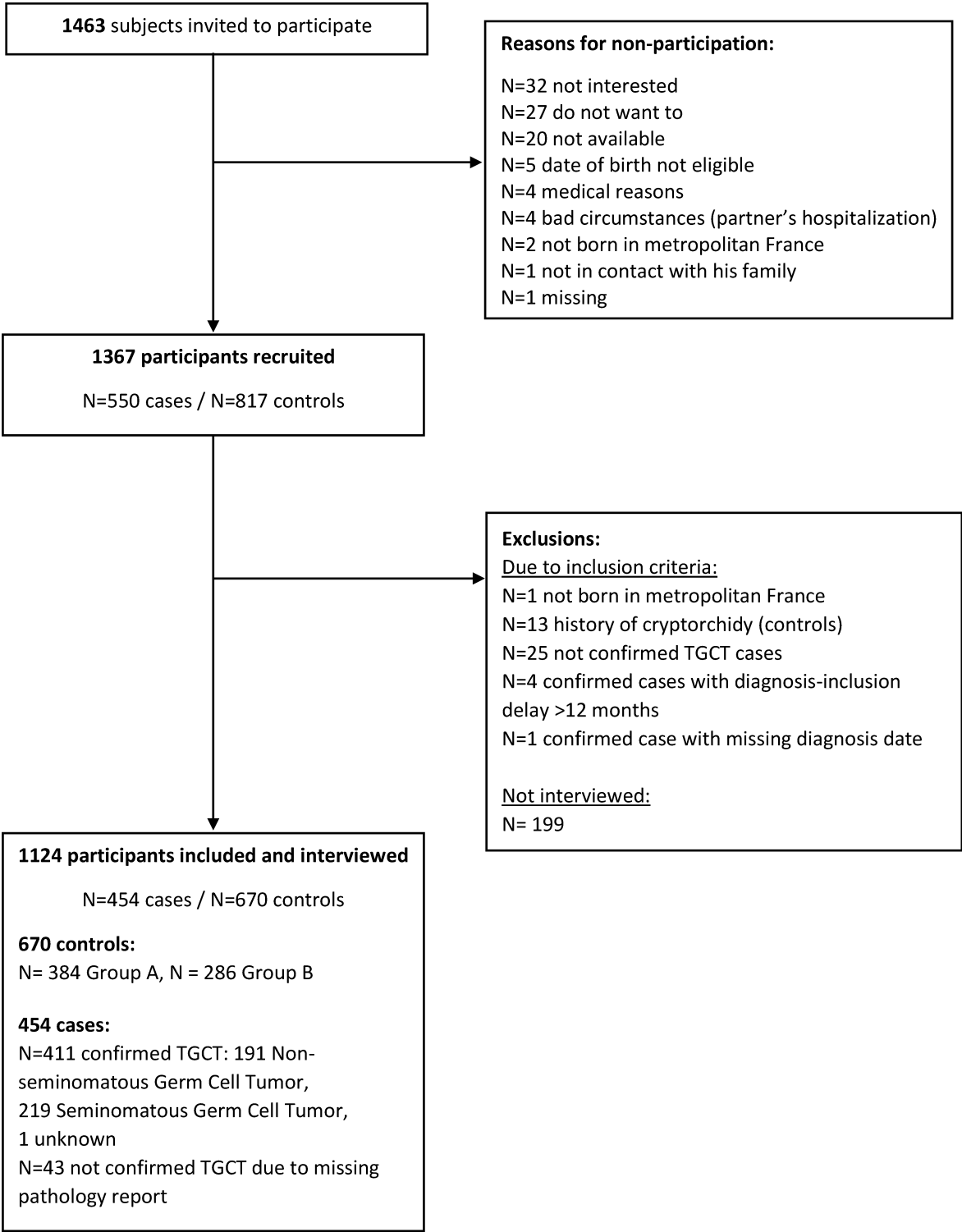


Figure S1. Flow chart of the TESTIS study population

Table S1. Odds ratios and 95% confidence intervals for TGCT associated with occupations, overall and according to histological subtypes, TESTIS study – *full table*.

Occupation description (ISCO-68) ^a	All TGCT cases			Seminomas ^c			Non-seminomas ^d			P-HET ^e
	<i>Ca/Co (never)</i>	<i>Ca/Co (ever)</i>	OR (95% IC) ^b	<i>Ca/Co (never)</i>	<i>Ca/Co (ever)</i>	OR (95% IC) ^b	<i>Ca/Co (never)</i>	<i>Ca/Co (ever)</i>	OR (95% IC) ^b	
Professional, Technical and Related Workers (0/1)	254/355	166/295	0.83 (0.63-1.08)	127/355	87/295	0.82 (0.59-1.15)	105/355	60/295	0.78 (0.53-1.14)	0.82
Architects, engineers and related technicians (0-2/0-3)	368/567	52/83	0.94 (0.63-1.40)	185/567	29/83	1.16 (0.72-1.89)	150/567	15/83	0.64 (0.34-1.21)	0.14
Mechanical engineers (0-24)	412/634	7/16	0.59 (0.22-1.61)							
Draughtsmen (0-32)	408/639	11/11	1.60 (0.65-3.98)	209/639	5/11	1.75 (0.55-5.60)	159/639	5/11	1.97 (0.59-6.59)	0.89
Civil engineering technicians (0-33)	411/637	8/13	0.97 (0.38-2.48)							
Clerk of works (0-33.40)	411/639	8/11	1.05 (0.40-2.76)							
Electrical and electronics engineering technicians (0-34)	413/640	6/10	0.77 (0.26-2.31)							
Engineering technicians N.E.C (0-39)	411/632	8/18	0.73 (0.31-1.74)							
Other engineering technicians (0-39.90)	413/640	6/10	0.92 (0.32-2.65)							
Life scientists and related technicians (0-5)	408/639	12/11	1.40 (0.58-3.41)							
Doctors, dentists, veterinarians and similar workers (0-6/0-7)	403/605	17/45	0.58 (0.32-1.05)	207/605	7/45	0.48 (0.21-1.12)	155/605	10/45	0.83 (0.39-1.76)	0.34
Medical doctors (0-61)	415/634	5/16	0.49 (0.17-1.38)							
Professional nurses (0-71)	414/637	6/13	0.66 (0.24-1.79)							
Professional nurse (general) (0-71.10)	414/639	6/11	0.74 (0.26-2.06)							
Statisticians, mathematicians, systems analysts and related technicians (0-8)	384/597	36/53	1.13 (0.70-1.81)	193/597	21/53	1.40 (0.79-2.49)	152/597	13/53	0.99 (0.50-1.94)	0.43
Systems analysts (0-83)	386/603	34/47	1.23 (0.75-2.01)	194/600	20/47	1.48 (0.82-2.68)	153/600	12/47	1.05 (0.52-2.12)	0.46
Accountants (1-1)	410/640	10/10	1.73 (0.69-4.38)							
Accountants (1-10)	410/640	10/10	1.73 (0.69-4.38)							
Auditor (1-10.20)	410/641	10/9	1.96 (0.76-5.09)							
Teachers (1-3)	391/593	29/57	0.83 (0.51-1.35)	200/593	14/57	0.65 (0.34-1.26)	154/593	11/57	0.89 (0.44-1.80)	0.53
Secondary education teachers (1-32)	401/622	19/28	1.09 (0.57-2.05)	204/622	10/28	0.89 (0.39-2.04)	158/622	7/28	1.29 (0.53-3.14)	0.56

Other secondary education teachers (1-32.90)	408/632	9/15	1.02 (0.42-2.44)								
Administrative and Managerial Workers (2)	366/544	54/106	0.86 (0.59-1.26)	182/544	32/106	0.97 (0.61-1.54)	149/544	16/106	0.75 (0.41-1.37)	0.51	
Managers (2-1)	366/545	54/105	0.87 (0.60-1.27)	182/545	32/105	0.97 (0.61-1.54)	149/545	16/105	0.76 (0.42-1.39)	0.53	
General managers (2-11)	413/622	7/22	0.56 (0.23-1.37)								
Managers N.E.C (2-19)	372/563	48/82	1.03 (0.69-1.55)	187/563	27/82	1.12 (0.68-1.85)	150/563	15/82	0.92 (0.49-1.71)	0.63	
Sales manager (except wholesale and retail trade) (2-19.30)	412/636	8/8	1.58 (0.57-4.43)								
Budgeting and accounting manager (2-19.50)	414/629	6/13	0.89 (0.32-2.44)								
Other managers (2-19.90)	385/581	35/61	0.98 (0.62-1.55)	194/581	20/61	1.06 (0.60-1.88)	153/581	12/61	0.96 (0.48-1.91)	0.82	
Clerical and Related Workers (3)	334/523	86/127	1.02 (0.74-1.40)	168/523	46/127	0.99 (0.66-1.48)	134/523	31/127	0.98 (0.62-1.57)	0.99	
Bookkeepers, cashiers and related workers (3-3)	410/629	10/21	0.61 (0.27-1.35)	209/629	5/21	0.47 (0.17-1.31)	160/629	5/21	1.13 (0.39-3.23)	0.25	
Bookkeepers and cashiers (3-31)	415/642	5/8	0.70 (0.22-2.28)								
Bookkeepers, cashiers and related workers N.E.C (3-39)	414/637	6/13	0.65 (0.24-1.80)								
Computing machine operators (3-4)	408/634	12/16	1.09 (0.49-2.44)	209/634	5/16	0.70 (0.23-2.11)	160/634	5/16	1.25 (0.42-3.73)	0.46	
Clerical and related workers N.E.C (3-9)	355/569	65/81	1.24 (0.86-1.79)	177/569	37/81	1.39 (0.89-2.17)	144/569	21/81	1.00 (0.59-1.72)	0.36	
Stock clerks (3-91)	385/609	35/41	1.24 (0.76-2.02)	195/609	19/41	1.39 (0.76-2.53)	154/609	11/41	0.97 (0.47-2.00)	0.45	
Dispatching and receiving clerk (3-91.20)	404/627	16/23	1.10 (0.57-2.15)								
Storeroom clerk (3-91.40)	403/632	17/18	1.28 (0.63-2.59)	205/632	9/18	1.32 (0.55-3.19)	159/632	6/18	1.18 (0.45-3.13)	0.87	
Correspondence and reporting clerks (3-93)	405/627	15/23	1.08 (0.55-2.13)								
Office clerk (general) (3-93.10)	408/633	12/17	1.12 (0.52-2.42)								
Receptionists and travel agency clerks (3-94)	403/628	17/22	1.14 (0.58-2.24)	205/628	9/22	1.14 (0.49-2.62)	157/628	8/22	1.34 (0.54-3.32)	0.79	
Receptionist (general) (3-94.10)	407/640	13/10	1.88 (0.79-4.49)	207/640	7/10	1.71 (0.61-4.75)	159/640	6/10	2.28 (0.72-7.17)	0.71	
Sales Workers (4)	332/538	88/112	1.28 (0.92-1.77)	167/535	47/112	1.12 (0.74-1.67)	132/535	33/112	1.39 (0.87-2.20)	0.49	
Working proprietors (wholesale and retail trade) (4-1)	413/642	7/8	1.71 (0.58-5.02)								
Technical Salesmen, Commercial Travellers and Manufacturers' Agents (4-3)	388/597	32/53	0.93 (0.58-1.50)	196/597	18/53	0.92 (0.51-1.66)	152/597	13/53	0.95 (0.49-1.86)	0.94	
Technical Salesmen and Service Advisers (4-31)	388/599	32/51	0.97 (0.60-1.56)	196/599	18/51	0.96 (0.53-1.73)	152/599	13/51	0.98 (0.50-1.90)	0.97	
Insurance, Real Estate, Securities and Business Services Salesmen and Auctioneers (4-4)	414/638	6/12	0.80 (0.29-2.22)								

Insurance, Real Estate and Securities Salesmen (4-41)	414/639	6/11	0.86 (0.31-2.42)							
Salesmen, Shop Assistants and Related Workers (4-5)	365/597	55/53	1.66 (1.09-2.52)	187/597	27/53	1.29 (0.77-2.15)	144/597	21/53	1.91 (1.07-3.42)	0.32
Salesmen, Shop Assistants and Demonstrators (4-51)	365/603	55/47	1.84 (1.20-2.82)	187/603	27/47	1.44 (0.86-2.43)	144/603	21/47	2.08 (1.16-3.75)	0.36
Retail trade salesman (4-51.30)	391/622	29/28	1.54 (0.89-2.68)	200/622	14/28	1.32 (0.67-2.61)	156/622	9/28	1.23 (0.55-2.77)	0.90
Other salesmen, shop assistants and demonstrators (4-51.90)	388/631	32/19	2.54 (1.38-4.65)	200/631	14/19	1.71 (0.82-3.57)	150/631	15/19	4.34 (2.00-9.42)	0.09
Service Workers (5)	319/510	101/140	1.17 (0.86-1.58)	165/510	49/140	0.94 (0.64-1.39)	119/510	46/140	1.43 (0.94-2.16)	0.15
Cooks, Waiters, Bartenders and Related Workers (5-3)	377/592	43/58	1.21 (0.78-1.86)	194/592	20/58	0.95 (0.54-1.67)	143/592	22/58	1.50 (0.86-2.63)	0.26
Cooks pressers (5-31)	396/616	24/34	1.09 (0.62-1.91)	205/616	9/34	0.69 (0.31-1.53)	151/616	14/34	1.72 (0.86-3.44)	0.09
Cook, except private service (5-31.30)	406/636	14/14	1.63 (0.74-3.56)	208/636	6/14	0.98 (0.35-2.77)	157/636	8/14	2.53 (0.99-6.48)	0.18
Other cooks (5-31.90)	405/624	15/26	0.84 (0.43-1.66)	209/624	5/26	0.50 (0.18-1.41)	156/624	9/26	1.35 (0.60-3.10)	0.13
Waiters, Bartenders and Related Workers (5-32)	393/621	27/29	1.65 (0.94-2.90)	200/621	14/29	1.37 (0.69-2.74)	152/621	13/29	1.72 (0.83-3.57)	0.65
Waiter, general (5-32.10)	399/631	21/19	1.93 (0.99-3.74)	206/631	8/19	1.20 (0.49-2.90)	152/631	13/19	2.80 (1.29-6.09)	0.15
Bartender (5-32.50)	410/640	10/10	2.01 (0.81-5.02)							
Building Caretakers, Charworkers, Cleaners and Related Workers (5-5)	382/594	38/56	1.08 (0.69-1.69)	197/594	17/56	0.79 (0.44-1.43)	145/594	20/56	1.40 (0.79-2.47)	0.17
Charworkers, Cleaners and Related Workers (5-52)	382/594	38/56	1.08 (0.69-1.69)	197/594	17/56	0.79 (0.44-1.43)	145/594	20/56	1.40 (0.79-2.47)	0.17
Charworker (5-52.20)	386/595	34/55	0.98 (0.62-1.55)	198/595	16/55	0.76 (0.41-1.40)	147/595	18/55	1.25 (0.69-2.27)	0.25
Protective Service Workers (5-8)	385/602	35/48	1.10 (0.69-1.77)	195/602	19/48	1.04 (0.58-1.87)	153/602	12/48	1.11 (0.55-2.24)	0.90
Fire-Fighters (5-81)	407/639	13/11	1.59 (0.69-3.69)							
Fire-fighter (general) (5-81.10)	408/639	12/11	1.42 (0.60-3.34)							
Protective Service Workers N.E.C (5-89)	396/617	24/33	1.14 (0.65-2.01)	198/617	16/33	1.32 (0.69-2.53)	157/617	8/33	1.16 (0.50-2.69)	0.81
Watchman (5-89.40)	409/634	11/16	1.10 (0.49-2.49)							
Other protective service workers (5-89.90)	405/635	15/15	1.53 (0.72-3.27)	205/635	9/15	1.62 (0.66-3.95)	159/635	6/15	1.96 (0.69-5.52)	0.79
Service Workers N.E.C (5-9)	412/628	8/22	0.56 (0.24-1.32)							
Other Service Workers (5-99)	412/631	8/19	0.63 (0.27-1.51)							

Agricultural, Animal Husbandry and Forestry Workers (6)	375/611	45/39	1.71 (1.07-2.72)	192/611	22/39	1.51 (0.85-2.68)	144/611	21/39	1.94 (1.05-3.61)	0.55
Farmers (6-1)	410/641	10/9	1.84 (0.71-4.76)							
Specialised Farmers (6-12)	414/644	6/6	1.68 (0.52-5.48)							
Agricultural and Animal Husbandry Workers (6-2)	384/619	36/31	1.71 (1.02-2.86)	200/619	14/31	1.25 (0.63-2.51)	145/619	20/31	2.12 (1.11-4.04)	0.27
Nursery Workers and Gardeners (6-27)	401/635	19/15	1.74 (0.85-3.54)	204/635	10/15	1.60 (0.67-3.81)	157/635	8/15	1.89 (0.72-4.95)	0.81
Gardener (6-27.40)	402/636	18/14	1.70 (0.81-3.53)	205/636	9/14	1.54 (0.62-3.78)	157/636	8/14	1.89 (0.72-4.95)	0.76
Production and related workers, transport equipment operators and labourers (7/8/9)	216/385	204/265	1.35 (1.04-1.76)	115/385	99/265	1.23 (0.88-1.72)	80/385	85/265	1.43 (0.99-2.07)	0.56
Production Supervisors and General Foremen (7-0)	399/620	21/30	1.24 (0.69-2.25)	204/620	10/30	1.12 (0.52-2.43)	155/620	10/30	1.29 (0.59-2.83)	0.81
Production Supervisors and General Foremen (7-00)	399/620	21/30	1.24 (0.69-2.25)	204/620	10/30	1.13 (0.52-2.43)	155/620	10/30	1.29 (0.59-2.83)	0.81
Production supervisor and general foreman (general) (7-00.10)	406/638	14/12	2.32 (1.05-5.15)	206/638	8/12	2.58 (1.00-6.69)	159/638	6/12	2.06 (0.73-5.80)	0.75
Food and Beverage Processers (7-7)	409/627	11/23	0.76 (0.36-1.64)							
Cabinetmakers and Related Woodworkers (8-1)	415/645	5/5	1.45 (0.39-5.44)							
Blacksmiths, Toolmakers and Machine Tool Operators (8-3)	408/633	12/17	0.84 (0.37-1.91)							
Machinery Fitters, Machine Assemblers and Precision-Instrument Makers (except Electrical) (8-4)	362/593	58/57	1.72 (1.14-2.59)	185/593	29/57	1.74 (1.05-2.88)	143/593	22/57	1.41 (0.80-2.48)	0.59
Machinery Fitters and Machine Assemblers (8-41)	405/639	15/11	2.46 (1.08-5.62)	209/639	5/11	1.81 (0.58-5.64)	160/639	5/11	1.58 (0.49-5.08)	0.87
Refrigeration and air-conditioning plan installer and mechanic (8-41.80)	409/642	11/8	2.43 (0.92-6.39)							
Motor-Vehicle Mechanics (8-43)	406/631	14/19	1.16 (0.56-2.39)							
Automobile mechanic (8-43.20)	413/639	7/11	1.03 (0.39-2.76)							
Motor-truck mechanic (8-43.30)	413/644	7/6	1.68 (0.54-5.24)							
Machinery Fitters, Machine Assemblers and Precision-Instrument Makers (except Electrical) N.E.C. (8-49)	388/618	32/32	1.60 (0.94-2.73)	198/618	16/32	1.58 (0.82-3.06)	151/618	14/32	1.64 (0.80-3.37)	0.94
Agricultural machinery mechanic (8-49.55)	415/645	5/5	1.64 (0.46-5.94)							

Plant maintenance mechanic (8-49.70)	405/633	15/17	1.37 (0.65-2.86)	209/633	5/17	0.90 (0.31-2.60)	157/633	8/17	1.54 (0.60-3.92)	0.46
Electrical Fitters and Related Electrical and Electronics Workers (8-5)	378/613	42/37	1.80 (1.11-2.91)	194/613	20/37	1.65 (0.90-3.00)	148/613	17/37	1.71 (0.90-3.25)	0.94
Electrical Wiremén (8-55)	394/626	26/24	1.64 (0.91-2.97)	199/626	15/24	1.87 (0.93-3.75)	157/626	8/24	1.36 (0.56-3.26)	0.57
Building electrician (8-55.20)	400/629	20/21	1.47 (0.77-2.81)	202/629	12/21	1.71 (0.80-3.66)	160/629	5/21	0.96 (0.34-2.68)	0.37
Plumbers, Welders, Sheet-Metal and Structural Metal Preparers and Erectors (8-7)	388/620	32/30	1.67 (0.97-2.87)	199/620	15/30	1.29 (0.65-2.55)	153/620	12/30	1.82 (0.86-3.83)	0.50
Plumbers and Pipe Fitters (8-71)	406/638	14/12	1.70 (0.75-3.84)	208/638	6/12	1.40 (0.49-4.00)	160/638	5/12	1.28 (0.42-3.92)	0.91
Plumber (general) (8-71.05)	406/641	14/9	2.35 (0.98-5.65)	208/641	6/9	2.13 (0.70-6.43)	160/641	5/9	1.65 (0.51-5.27)	0.75
Welders and Flame-Cutters (8-72)	408/638	12/12	1.40 (0.59-3.29)	208/638	6/12	1.16 (0.40-3.36)	160/638	5/12	2.41 (0.74-7.81)	0.37
Sheet-Metal Workers (8-73)	414/642	6/8	1.31 (0.43-4.00)							
Rubber and Plastics Product Makers (9-0)	414/645	6/5	2.09 (0.62-7.11)							
Painters (9-3)	412/636	8/14	0.70 (0.28-1.74)							
Bricklayers, Carpenters and Other Construction Workers (9-5)	380/601	40/49	1.27 (0.80-2.01)	196/601	18/49	1.19 (0.65-2.17)	147/601	18/49	1.38 (0.74-2.59)	0.74
Bricklayers, Stonemasons and Tile Setters (9-51)	409/635	11/15	1.01 (0.44-2.35)							
Bricklayer (construction) (9-51.20)	413/639	6/5	2.12 (0.62-7.22)							
Reinforced Concreters, Cement Finishers and Terrazzo Workers (9-52)	409/640	11/10	1.49 (0.59-3.73)	209/640	5/10	1.34 (0.43-4.16)	159/640	6/10	1.95 (0.61-6.25)	0.65
Carpenters, Joiners and Parquetry Workers (9-54)	407/637	13/13	1.82 (0.81-4.09)	208/637	6/13	1.62 (0.56-4.64)	159/637	6/13	2.22 (0.79-6.28)	0.68
Construction joiner (9-54.20)	413/640	7/10	1.15 (0.42-3.14)							
Plasterers (9-55)	415/641	5/9	0.84 (0.26-2.67)							
Construction Workers N.E.C. (9-59)	410/637	10/13	1.31 (0.56-3.09)							
Material Handling and Related Equipment Operators, Dockers and Freight Handlers (9-7)	374/594	46/56	1.28 (0.83-1.97)	194/594	20/56	1.01 (0.57-1.79)	145/594	20/56	1.50 (0.83-2.69)	0.35
Dockers and Freight Handlers (9-71)	385/611	35/39	1.30 (0.79-2.15)	201/611	13/39	0.82 (0.41-1.64)	148/611	17/39	1.83 (0.95-3.52)	0.10
Warehouse porter (9-71.45)	400/626	20/24	1.17 (0.62-2.23)	205/626	9/24	0.83 (0.36-1.91)	156/626	9/24	1.77 (0.76-4.12)	0.21
Machine packer (9-71.55)	411/642	9/8	1.35 (0.49-3.67)							
Material Handling Equipment Operators N.E.C (9-79)	410/636	10/14	1.27 (0.54-2.97)							
Lifting-truck operator (9-79.20)	411/636	9/14	1.12 (0.47-2.68)							
Transport Equipment Operators (9-8)	386/599	34/51	1.03 (0.64-1.65)	195/599	19/51	0.96 (0.53-1.73)	150/599	15/51	1.38 (0.73-2.62)	0.42

Motor-vehical drivers (9-85)	388/602	32/48	1.02 (0.62-1.66)	196/602	18/48	0.95 (0.52-1.73)	151/602	14/48	1.37 (0.71-2.63)	0.42
Lorry and van driver (local transport) (9-85.50)	402/625	18/25	1.08 (0.57-2.07)	207/625	7/25	0.65 (0.27-1.59)	154/625	11/25	2.11 (0.96-4.64)	0.05
Other motor-vehicle drivers (9-85.90)	414/642	6/8	1.00 (0.31-3.18)							
Laboureres N.E.C (9-9)	408/634	12/16	1.07 (0.48-2.38)							

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^bEstimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls (grey line if less).

^c 219 cases of seminoma TGCT were present in the TESTIS study.

^d 191 cases of non-seminoma TGCT were present in the TESTIS study.

^e P-value for heterogeneity derived from the Likelihood Ratio Test, comparing seminoma versus non-seminoma tumours.

Table S2. Odds ratios and 95% confidence intervals for TGCT associated with industries, overall and cording to histological subtypes, TESTIS study – *full table*.

Industry description (NAF-99 code) ^a	All TGCT cases			Seminomas ^c			Non-seminomas ^d			P-HET ^e
	<i>Ca/Co (never)</i>	<i>Ca/Co (ever)</i>	OR (95% IC) ^b	<i>Ca/Co (never)</i>	<i>Ca/Co (ever)</i>	OR (95% IC) ^b	<i>Ca/Co (never)</i>	<i>Ca/Co (ever)</i>	OR (95% IC) ^b	
Agriculture, hunting and forestry (01, 02)	386/615	33/34	1.43 (0.85-2.41)	198/612	16/34	1.32 (0.69-2.54)	148/612	16/34	1.64 (0.83-3.25)	0.65
Agriculture, hunting and related service activities (01)	387/618	32/31	1.56 (0.91-2.67)	198/615	16/31	1.48 (0.76-2.88)	149/615	15/31	1.79 (0.88-3.64)	0.70
Culture (01.1)	404/636	15/13	1.82 (0.84-3.97)	206/633	8/13	1.67 (0.66-4.28)	158/633	6/13	2.11 (0.72-6.17)	0.75
Farming of animals (01.2)	408/643	11/6	2.62 (0.92-7.49)							
Farming of cattle, dairy farming (01.2A)	412/643	7/5	2.03 (0.60-6.87)							
Services related to agriculture and landscape management (01.4)	411/639	8/10	0.98 (0.36-2.64)							
Creation and maintenance of ornamental plantations (01.4B)	412/640	7/9	1.06 (0.37-3.01)							
Manufacturing (15 to 37)	288/458	131/191	1.10 (0.83-1.46)	147/456	67/190	1.13 (0.79-1.61)	116/456	48/190	1.00 (0.67-1.50)	0.66
Manufacture of food products and beverages (15)	393/615	26/34	1.24 (0.72-2.16)	203/612	11/34	0.96 (0.46-1.99)	150/612	14/34	1.76 (0.88-3.53)	0.24
Production, processing and preserving of meat and meat products (15.1)	410/643	9/6	2.12 (0.71-6.31)							
Industrial preparation of meat products (15.1E)	413/644	6/5	1.77 (0.52-6.07)							
Manufacture of other food products (15.8)	408/630	11/19	1.00 (0.45-2.22)							
Publishing, printing and reproduction of recorded media (22)	412/642	7/7	1.67 (0.56-4.99)							
Manufacture of chemicals and chemical products (24)	405/632	14/17	1.17 (0.54-2.50)	207/629	7/17	1.08 (0.43-2.75)	159/629	5/17	1.05 (0.35-3.14)	0.96
Manufacture of pharmaceuticals, medicinal chemicals and botanical products (24.4)	410/641	9/8	1.26 (0.45-3.52)							
Manufacture of rubber and plastic products (25)	413/642	6/7	1.26 (0.38-4.19)							
Manufacture of other non-metallic mineral products (26)	408/641	11/8	1.83 (0.71-4.76)							

Manufacture of basic metals (27)	409/640	10/9	2.19 (0.81-5.96)							
Metalworking (28)	403/619	16/30	0.84 (0.44-1.61)	206/617	8/29	0.82 (0.35-1.89)	157/584	7/29	0.92 (0.37-2.34)	0.85
Metal processing, general mechanics (28.5)	413/639	6/10	0.81 (0.27-2.38)							
Manufacture of machinery and equipment (29)	407/617	12/32	0.56 (0.27-1.14)	208/614	6/32	0.60 (0.24-1.52)	158/614	6/32	0.76 (0.29-2.00)	0.74
Manufacture of general-purpose machinery (29.2)	413/633	6/16	0.62 (0.23-1.73)							
Manufacture of machinery and electrical (31)	407/638	12/11	1.59 (0.66-3.81)							
Manufacture of radio, television and communication equipment (32)	414/638	5/11	0.83 (0.27-2.50)							
Manufacture of medical, precision, optical and watchmaking instruments (33)	413/638	6/11	0.84 (0.30-2.38)							
Manufacture of measuring and control instruments (33.2)	413/643	6/6	1.42 (0.44-4.63)							
Manufacture of motor vehicles, trailers and semi-trailers (34)	404/623	15/26	1.00 (0.50-2.01)	205/620	9/26	1.31 (0.58-2.95)	159/620	5/26	0.79 (0.25-2.46)	0.48
Construction of motor vehicles (34.1)	411/635	8/14	1.00 (0.40-2.48)							
Manufacture of other transport equipment (35)	403/630	16/19	1.36 (0.67-2.77)							
Manufacture of aircraft and spacecraft (35.3)	409/633	10/16	0.92 (0.39-2.17)							
Manufacture of furniture; manufacturing n.e.c (36)	412/640	7/9	1.18 (0.42-3.32)							
Manufacture of furniture (36.1)	414/645	5/4	2.24 (0.57-8.80)							
Electricity, gas and water supply (40, 41)	404/630	15/19	1.12 (0.53-2.36)	209/627	5/19	0.80 (0.28-2.28)	158/627	6/19	0.88 (0.32-2.40)	0.90
Electricity, gas, steam and hot water supply (40)	407/632	12/17	0.98 (0.44-2.19)	209/629	5/17	0.85 (0.29-2.46)	159/629	5/17	0.75 (0.25-2.25)	0.88
Production and distribution of electricity (40.1)	410/633	9/16	0.75 (0.31-1.83)							
Electricity generation and distribution (40.12)	410/633	9/16	0.75 (0.31-1.83)							
Construction (45)	333/541	86/108	1.27 (0.91-1.77)	178/540	36/106	0.94 (0.61-1.47)	127/540	37/106	1.41 (0.89-2.22)	0.22
Site preparation (45.1)	413/635	5/8	0.76 (0.23-2.50)							

Construction of building and civil engineering works (45.2)	392/614	26/30	1.38 (0.78-2.43)	206/612	7/30	0.61 (0.26-1.47)	149/612	15/30	1.80 (0.88-3.66)	0.06
General masonry work (45.2V)	406/631	10/8	1.76 (0.66-4.69)							
Installation work (45.3)	371/602	47/41	1.99 (1.25-3.15)	193/600	20/41	1.52 (0.84-2.75)	148/600	16/41	1.59 (0.83-3.03)	0.92
Electrical installation work (45.3A)	389/617	29/26	1.98 (1.12-3.50)	199/615	14/26	1.66 (0.82-3.38)	154/615	10/26	1.96 (0.89-4.34)	0.76
Water and gas installation (45.3E)	411/635	7/8	1.19 (0.41-3.44)							
Installation of heating and air conditioning equipment (45.3F)	404/635	14/8	2.95 (1.18-7.39)							
Finishing work (45.4)	398/609	21/34	0.87 (0.48-1.56)	204/608	10/33	0.82 (0.38-1.78)	154/608	10/33	1.15 (0.53-2.51)	0.54
Wood and plastic joinery (45.4C)	409/632	10/11	1.34 (0.54-3.30)							
Trade, repair of motor vehicles and household goods (50 to 52)	293/495	126/154	1.42 (1.06-1.90)	146/492	68/154	1.34 (0.94-1.92)	118/492	46/154	1.41 (0.93-2.14)	0.86
Motor trade and repair (50)	395/622	24/27	1.40 (0.78-2.52)	198/619	16/27	1.59 (0.81-3.12)	157/619	7/27	1.16 (0.47-2.86)	0.57
Motor vehicle trade (50.1)	413/641	6/8	1.48 (0.50-4.41)							
Motor vehicle trade (50.1Z)	413/641	6/8	1.48 (0.50-4.41)							
Maintenance and repair of motor vehicles (50.2)	406/634	13/15	1.40 (0.65-3.03)							
Wholesale trade and commercial intermediaries (51)	375/596	44/53	1.35 (0.87-2.10)	191/593	23/53	1.25 (0.73-2.16)	146/593	18/53	1.44 (0.79-2.65)	0.73
Wholesale intermediaries (51.1)	414/643	5/6	1.22 (0.34-4.30)							
Wholesale of food products (51.3)	414/641	5/8	0.87 (0.26-2.91)							
Wholesale of non-food consumer goods (51.4)	409/639	10/10	1.75 (0.70-4.36)							
Wholesale of non-agricultural intermediate products (51.5)	413/638	6/11	0.86 (0.30-2.41)							
Wholesale of industrial equipment (51.6)	402/630	17/19	1.59 (0.79-3.19)	205/627	9/19	1.66 (0.72-3.80)	156/627	8/19	1.96 (0.80-4.85)	0.79
Retail trade and repair of household goods (52)	345/560	74/89	1.38 (0.97-1.96)	177/557	37/89	1.18 (0.76-1.82)	136/557	28/83	1.46 (0.90-2.39)	0.52
Retail sale in non-specialised shops (52.1)	388/621	31/28	1.91 (1.11-3.28)	202/618	12/28	1.29 (0.63-2.66)	148/618	16/28	3.00 (1.51-5.98)	0.10
Supermarkets (52.1D)	389/626	30/23	2.28 (1.28-4.06)	202/623	12/23	1.64 (0.78-3.46)	149/623	15/23	3.20 (1.55-6.60)	0.21
Food retail in specialized shops (52.2)	409/642	10/7	2.89 (1.03-8.14)							
Other retail sale in specialised shops (52.4)	385/608	34/41	1.12 (0.69-1.84)	195/605	19/41	1.13 (0.63-2.04)	153/605	11/41	1.03 (0.50-2.12)	0.83
Retail sale of sports and recreation	408/642	11/7	1.79 (0.66-4.80)							

equipment (52.4W)											
Retail trade (non-store) (52.6)	414/635	5/14	0.67 (0.23-1.94)								
Hotels and restaurants (55)	368/580	51/69	1.23 (0.82-1.84)	190/578	24/68	1.07 (0.63-1.79)	141/578	23/68	1.34 (0.79-2.29)	0.56	
Hotels (55.1)	406/636	13/13	1.58 (0.70-3.54)								
Tourist hotels with restaurant (55.1A)	407/637	12/11	1.63 (0.69-3.86)								
Restaurants (55.3)	391/604	28/45	1.06 (0.63-1.75)	200/602	14/44	1.05 (0.55-2.01)	151/602	13/44	1.11 (0.56-2.18)	0.91	
Traditional food service (55.3A)	398/624	21/23	1.61 (0.85-3.05)	205/621	9/23	1.25 (0.55-2.85)	152/621	12/23	1.90 (0.89-4.08)	0.46	
Fast food restaurants (55.3B)	408/624	11/23	0.74 (0.34-1.58)								
Coffee shops (55.4)	413/644	6/5	2.36 (0.70-7.92)								
Canteens and caterers (55.5)	412/642	7/7	1.32 (0.43-4.08)								
Transport and communications (60 to 64)	374/555	45/94	0.74 (0.50-1.09)	184/552	30/94	0.94 (0.59-1.50)	152/552	12/94	0.49 (0.26-0.94)	0.10	
Land transport (60)	396/607	23/42	0.88 (0.51-1.51)	200/604	14/42	1.09 (0.56-2.09)	156/604	8/42	0.77 (0.35-1.70)	0.51	
Urban and road transport (60.2)	399/618	19/28	1.04 (0.56-1.93)	203/615	10/28	1.08 (0.49-2.35)	156/615	8/28	1.11 (0.48-2.54)	0.96	
Intercity road freight transport (60.2M)	411/635	7/10	0.93 (0.33-2.58)								
Auxiliary transport services (63)	405/627	14/22	1.03 (0.51-2.10)								
Post and telecommunications (64)	407/618	12/31	0.58 (0.29-1.16)								
Telecommunications (64.2)	411/626	8/23	0.55 (0.24-1.29)								
Other telecommunications activities (64.2B)	411/629	8/20	0.65 (0.28-1.54)								
Financial activities (65 to 67)	399/614	20/35	1.05 (0.58-1.88)	204/611	10/35	0.95 (0.45-2.03)	154/611	10/35	1.72 (0.80-3.69)	0.29	
Financial intermediation (65)	403/621	16/28	0.96 (0.50-1.84)	205/618	9/28	0.97 (0.43-2.17)	157/618	7/28	1.38 (0.57-3.35)	0.57	
Real estate, rental and business services (70 to 74)	318/453	101/196	0.77 (0.57-1.03)	152/450	62/196	0.91 (0.63-1.31)	136/450	28/196	0.51 (0.32-0.81)	0.05	
Real estate (70)	414/639	5/10	0.90 (0.29-2.72)								
Rental without operator (71)	414/643	5/6	1.43 (0.41-4.96)								
Computer and related activities (72)	386/589	33/60	0.88 (0.55-1.40)	195/586	19/60	0.93 (0.52-1.65)	151/586	13/60	0.85 (0.44-1.65)	0.84	
Hardware consultancy (72.1)	389/605	12/17	1.09 (0.50-2.37)	196/602	7/17	1.06 (0.40-2.78)	153/602	5/17	1.22 (0.42-3.55)	0.85	
Software development (72.2)	396/606	5/17	0.51 (0.18-1.42)								
Research and development (73)	406/614	13/35	0.59 (0.30-1.17)	206/611	8/35	0.67 (0.30-1.52)	159/611	5/35	0.64 (0.24-1.72)	0.94	
Research and experimental development on natural sciences and engineering (73.1)	407/616	12/31	0.60 (0.29-1.23)	207/613	7/31	0.64 (0.27-1.54)	159/613	5/31	0.71 (0.26-1.93)	0.89	
Other business activities (74)	357/541	62/108	0.91 (0.64-1.30)	176/538	38/108	1.06 (0.69-1.63)	150/538	14/108	0.50 (0.27-0.92)	0.04	
Legal, accounting and management	400/609	19/40	0.78 (0.44-1.39)	206/606	8/40	0.63 (0.28-1.39)	158/606	6/40	0.65 (0.26-1.62)	0.95	

consultancy activities (74.1)											
Business and management consulting (74.1G)	406/626	13/23	0.92 (0.45-1.88)	208/623	6/23	0.81 (0.31-2.09)	159/623	5/23	0.89 (0.32-2.50)	0.90	
Architectural and engineering activities and related technical consultancy (74.2)	405/625	14/24	0.91 (0.45-1.84)								
Engineering, technical studies (74.2C)	408/628	11/21	0.75 (0.34-1.64)								
Publicity (74.4)	413/639	6/10	1.08 (0.37-3.11)								
Selection and supply of personnel (74.5)	414/640	5/9	0.50 (0.16-1.60)								
Temporary work (74.5B)	414/642	5/7	0.62 (0.18-2.11)								
Investigation and security (74.6)	412/636	7/13	0.91 (0.34-2.40)								
Cleaning activities (74.7)	412/637	7/12	1.00 (0.38-2.64)								
Miscellaneous business activities N.E.C. (74.8)	414/643	5/6	1.51 (0.44-5.22)								
Public administration (75)	348/542	71/107	0.98 (0.69-1.38)	180/539	34/107	0.83 (0.52-1.30)	133/539	31/107	1.15 (0.71-1.86)	0.33	
General, economic and social administration (75.1)	387/612	32/37	1.33 (0.79-2.21)	200/609	14/37	1.07 (0.54-2.09)	147/609	17/37	1.86 (0.97-3.55)	0.24	
General public administration (75.1A)	391/616	28/33	1.37 (0.79-2.36)	202/613	12/33	1.13 (0.55-2.33)	149/613	15/33	1.84 (0.93-3.66)	0.34	
Supervision of economic activities (75.1E)	413/644	6/5	1.26 (0.37-4.30)								
Services of public prerogative (75.2)	379/579	40/70	0.81 (0.53-1.25)	192/576	22/70	0.82 (0.47-1.40)	151/576	13/70	0.66 (0.33-1.30)	0.63	
Defence (75.2C)	393/597	26/52	0.71 (0.42-1.19)	198/594	16/52	0.83 (0.44-1.54)	155/594	9/52	0.60 (0.27-1.35)	0.54	
Civil protection (75.2J)	406/636	13/13	1.28 (0.57-2.90)								
Education (80)	324/494	95/155	0.97 (0.72-1.31)	169/491	45/155	0.78 (0.52-1.15)	126/491	38/155	0.99 (0.65-1.51)	0.41	
Primary education (80.1)	413/639	6/10	0.88 (0.31-2.52)								
Secondary education (80.2)	353/569	66/80	1.33 (0.92-1.92)	182/566	32/80	1.03 (0.64-1.66)	139/566	25/80	1.27 (0.76-2.13)	0.55	
General secondary education (80.2A)	406/624	13/21	0.88 (0.41-1.88)	208/621	6/21	0.50 (0.18-1.41)	159/621	5/21	1.33 (0.46-3.86)	0.20	
Technical or professional secondary education (80.2C)	365/586	54/57	1.55 (1.03-2.34)	188/583	26/57	1.31 (0.78-2.21)	143/583	21/57	1.35 (0.77-2.39)	0.94	
Higher education (80.3)	394/587	25/62	0.71 (0.43-1.17)	202/584	12/62	0.65 (0.34-1.26)	153/584	11/62	0.77 (0.38-1.56)	0.73	
Health and social work (85)	388/565	31/84	0.57 (0.37-0.89)	196/562	18/84	0.64 (0.36-1.11)	151/562	13/84	0.61 (0.32-1.16)	0.92	
Human health activities (85.1)	396/585	23/63	0.56 (0.33-0.93)	204/582	10/63	0.45 (0.22-0.93)	151/582	13/63	0.79 (0.41-1.52)	0.26	
Hospital activities (85.1A)	400/597	19/51	0.56 (0.32-0.98)	208/594	6/51	0.33 (0.13-0.81)	151/594	13/51	1.01 (0.52-1.96)	0.04	
Social action (85.3)	411/624	8/25	0.53 (0.23-1.20)								

Other community, social and personal services (90 to 93)	360/578	59/71	1.48 (1.00-2.19)	185/575	29/71	1.23 (0.75-2.01)	137/575	27/71	2.26 (1.32-3.87)	0.10
Sanitation, roads and waste management (90)	412/641	7/8	1.29 (0.45-3.68)							
Association activities (91)	410/643	9/6	2.61 (0.90-7.62)							
Recreational, cultural and sporting activities (92)	375/593	44/56	1.40 (0.91-2.17)	193/590	21/56	1.09 (0.62-1.90)	144/590	20/56	2.07 (1.14-3.76)	0.12
Film and video activities (92.1)	414/640	5/9	1.11 (0.36-3.40)							
Other service activities (92.3)	402/634	17/15	1.92 (0.91-4.02)	204/631	10/15	1.80 (0.76-4.30)	159/631	5/15	1.67 (0.55-5.06)	0.91
Sporting activities (92.6)	407/629	12/20	0.99 (0.46-2.12)							
Management of sports facilities (92.6A)	414/642	5/7	1.06 (0.31-3.63)							
Other sports activities (92.6C)	411/636	8/13	1.07 (0.43-2.66)							
Other recreational activities (92.7)	413/638	6/11	0.88 (0.32-2.44)							
Other recreational activities N.E.C. (92.7C)	413/639	6/10	0.96 (0.34-2.71)							

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^a Total number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^b Estimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

Table S3. Odds ratios and 95% confidence intervals for TGCT associated with industries, according to employment duration (< 2 vs. ≥ 2 years), TESTIS study.

Industry description (NAF-99 code) ^a	Ca/Co (never)	Ca/Co < 2 YEARS	OR1 (95% IC) ^b	Ca/Co ≥ 2 YEARS	OR2 (95% IC) ^b	P-trend ^c
Agriculture, hunting and forestry (01, 02)	391/617	9/8	1.81 (0.68-4.81)	24/26	1.38 (0.77-2.48)	0.28
Agriculture, hunting and related service activities (01)	388/620	9/7	1.84 (0.65-5.22)	23/24	1.48 (0.80-2.74)	0.25
Manufacturing (15 to 37)	292/460	43/55	1.22 (0.79-1.88)	88/ 136	1.06 (0.77-1.45)	0.66
Metalworking (28)	404/621	10/11	1.48 (0.60-3.65)	6/19	0.47 (0.17-1.26)	0.22
Electricity, gas and water supply (40, 41)	409/632	5/7	0.89 (0.26-2.97)	10/12	1.42 (0.59-3.36)	0.73
Production and distribution of electricity, gas and heat (40)	408/634	5/6	0.94 (0.26-3.35)	7/11	1.00 (0.36-2.80)	0.99
Construction (45)	334/543	28/38	1.27 (0.74-2.16)	58/70	1.27 (0.86-1.88)	0.38
Construction of building and civil engineering works (45.2)	390/612	9/11	1.62 (0.63-4.15)	17/19	1.27 (0.63-2.56)	0.49
Installation work (45.3)	369/600	18/16	1.91 (0.93-3.95)	29/25	2.03 (1.15-3.59)	0.01
Electrical installation work (45.3A)	389/617	9/10	1.69 (0.65-4.39)	20/16	2.11 (1.06-4.19)	0.06
Finishing work (45.4)	396/607	8/13	0.90 (0.35-2.31)	13/21	0.86 (0.41-1.79)	0.90
Trade, auto repair and household goods (50, 51, 52)	293/495	39/50	1.32 (0.83-2.10)	87/ 104	1.45 (1.04-2.02)	0.07
Wholesale trade and commercial intermediaries (51)	376/598	17/17	1.58 (0.76-3.30)	27/36	1.25 (0.73-2.13)	0.36
Retail trade and repair of household goods (52)	346/562	29/40	1.15 (0.69-1.93)	45/49	1.58 (1.02-2.47)	0.59
Retail sale in non-specialised shops (52.1)	386/619	18/13	2.26 (1.07-4.76)	13/15	1.60 (0.73-3.49)	0.03
Supermarkets (52.1D)	412/638	18/10	2.80 (1.25-6.28)	12/13	1.68 (0.74-3.83)	0.02
Hotels and restaurants (55)	369/582	17/26	1.00 (0.52-1.94)	34/43	1.38 (0.85-2.26)	0.43
Transport and communication (60 to 64)	374/555	10/33	0.47 (0.22-0.98)	35/61	0.89 (0.57-1.41)	0.12
Real estate, rental and business services (70 to 74)	318/453	25/53	0.69 (0.41-1.17)	76/ 143	0.81 (0.58-1.13)	0.22
Other business activities (74)	358/543	25/32	1.14 (0.64-2.01)	37/76	0.81 (0.53-1.25)	0.56
Public administration (75)	352/553	20/27	1.14 (0.61-2.12)	48/70	1.01 (0.67-1.53)	0.92
Education (80)	381/579	14/23	1.02 (0.51-2.04)	25/49	0.77 (0.45-1.32)	0.64
Health and social work (85)	389/567	8/23	0.57 (0.25-1.31)	23/61	0.57 (0.34-0.96)	0.05
Hospital activities (85.1A)	423/609	5/9	0.92 (0.30-2.85)	14/42	0.48 (0.25-0.90)	0.08
Other community, social and personal services (90 to 93)	3/578	15/18	1.47 (0.71-3.03)	44/53	1.51 (0.97-2.37)	0.12
Recreational, cultural and sporting activities (92)	376/595	8/11	1.33 (0.51-3.47)	36/45	1.42 (0.88-2.30)	0.31

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^b Estimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

Table S4. Odds ratios and 95% confidence intervals for TGCT associated with occupations, excluding cases with personal history of cryptorchidism, TESTIS study.

Occupation description (ISCO-68) ^a	Ca/Co (never)	Ca/Co (ever)	OR (95% IC) ^{b,c}
Professional, Technical and Related Workers (0/1)	228/355	153/295	0.85 (0.65-1.12)
Architects, engineers and related technicians (0-2/0-3)	334/567	47/83	0.98 (0.65-1.47)
Mechanical Engineers (0-24)	373/634	7/16	0.73 (0.27-1.96)
Draughtsmen (0-32)	369/639	11/11	1.80 (0.73-4.44)
Civil Engineering Technicians (0-33)	373/637	7/13	0.92 (0.35-2.44)
Clerk of works (0-33.40)	373/639	7/11	1.00 (0.32-2.71)
Engineering Technicians N.E.C. (0-39)	373/632	7/18	0.68 (0.27-1.70)
Other engineering technicians (0-39.90)	375/640	5/10	0.79 (0.25-2.47)
Life scientists and related technicians (0-5)	371/639	10/11	1.46 (0.58-3.68)
Doctors, dentists, veterinarians and similar workers (06/07)	367/605	14/45	0.50 (0.26-0.94)
Professional Nurses (0-71)	375/637	6/13	0.71 (0.26-1.93)
Professional nurse (general) (0-71.10)	375/639	6/11	0.81 (0.29-2.25)
Statisticians, mathematicians, systems analysts and related technicians (0-8)	346/597	35/53	1.18 (0.73-1.90)
Systems Analysts (0-83)	348/603	33/47	1.29 (0.78-2.11)
Accountants (1-1)	371/640	10/10	1.78 (0.71-4.50)
Accountants (1-10)	371/640	10/10	1.78 (0.71-4.50)
Auditor (1-10.20)	371/641	10/9	2.02 (0.78-5.23)
Teachers (1-3)	355/593	26/57	0.80 (0.48-1.33)
University and Higher Education Teachers (1-31)	374/628	7/22	0.69 (0.29-1.67)
Secondary Education Teachers (1-32)	364/622	17/28	1.05 (0.54-2.01)
Other secondary education teachers (1-32.90)	370/632	8/15	0.93 (0.37-2.29)
Authors, Journalists and Related Writers (1-5)	376/644	5/6	1.64 (0.49-5.55)
Authors, Journalists and Related Writers N.E.C (1-59)	376/645	5/5	1.89 (0.53-6.73)
Painters, Photographers and Related Creative Artists (1-6)	375/644	6/6	1.86 (0.57-6.07)
Composers and Performing Artists (1-7)	373/643	8/7	2.06 (0.71-5.93)
Athletes, Sportsmen and Related Workers (1-8)	375/633	6/17	0.66 (0.26-1.73)
Athletes, Sportsmen and Related Workers (1-80)	375/633	6/17	0.66 (0.26-1.73)
Sports coach (1-80.30)	375/634	6/16	0.72 (0.28-1.90)
Professional, Technical and Related Workers N.E.C (1-9)	369/619	12/31	0.66 (0.33-1.33)
Social Workers (1-93)	372/626	9/24	0.61 (0.27-1.37)

Culture centre worker (1-93.30)	373/630	7/12	0.88 (0.33-2.37)
Administrative and Managerial Workers (2)	330/544	51/106	0.87 (0.59-1.28)
Managers (2-1)	330/545	51/105	0.88 (0.60-1.29)
General managers (2-11)	375/622	6/22	0.54 (0.21-1.38)
Managers N.E.C (2-19)	335/563	46/82	1.05 (0.69-1.58)
Sales manager (except wholesale and retail trade) (2-19.30)	373/636	8/8	1.68 (0.60-4.69)
Budgeting and accounting manager (2-19.50)	375/629	6/13	0.91 (0.33-2.51)
Other managers (2-19.90)	348/581	33/61	0.96 (0.60-1.54)
Clerical and Related Workers (3)	309/523	72/127	0.94 (0.67-1.31)
Bookkeepers, cashiers and related workers (3-3)	372/629	9/21	0.60 (0.26-1.37)
Bookkeepers and Cashiers (3-31)	376/642	5/8	0.75 (0.23-2.44)
Bookkeepers, Cashiers and Related Workers N.E.C (3-39)	376/637	5/13	0.62 (0.21-1.79)
Computing Machine Operators (3-4)	372/634	9/16	0.95 (0.40-2.24)
Clerical and Related Workers N.E.C (3-9)	327/569	54/81	1.14 (0.78-1.67)
Stock clerks (3-91)	350/609	31/41	1.23 (0.75-2.03)
Dispatching and receiving clerk (3-91.20)	366/627	15/23	1.12 (0.56-2.21)
Storeroom clerk (3-91.40)	366/632	15/18	1.28 (0.62-2.65)
Correspondence and Reporting Clerks (3-93)	369/627	12/23	0.96 (0.47-1.99)
Office clerk (general) (3-93.10)	372/633	9/17	0.94 (0.41-2.18)
Receptionists and Travel Agency Clerks (3-94)	368/628	13/22	0.94 (0.46-1.95)
Receptionist (general) (3-94.10)	372/640	9/10	1.40 (0.55-3.59)
Sales Workers (4)	296/538	85/112	1.38 (0.99-1.93)
Working Proprietors (Wholesale and Retail Trade) (4-1)	374/642	7/8	1.82 (0.62-5.35)
Technical Salesmen, Commercial Travellers and Manufacturers' Agents (4-3)	349/597	32/53	1.02 (0.63-1.63)
Technical Salesmen and Service Advisers (4-31)	349/599	32/51	1.05 (0.65-1.69)
Insurance, Real Estate, Securities and Business Services Salesmen and Auctioneers (4-4)	375/638	6/12	0.88 (0.32-2.45)
Insurance, Real Estate and Securities Salesmen (4-41)	375/639	6/11	0.95 (0.34-2.67)
Salesmen, Shop Assistants and Related Workers (4-5)	329/597	52/53	1.73 (1.13-2.65)
Salesmen, Shop Assistants and Demonstrators (4-51)	329/603	52/47	1.92 (1.24-2.96)
Retail trade salesman (4-51.30)	353/622	28/28	1.67 (0.96-2.92)
Other salesmen, shop assistants and demonstrators (4-51.90)	351/631	30/19	2.64 (1.43-4.86)
Service Workers (5)	293/510	88/140	1.13 (0.83-1.56)

Cooks, Waiters, Bartenders and Related Workers (5-3)	346/592	35/58	1.13 (0.72-1.79)
Cooks pressers (5-31)	363/616	18/34	0.94 (0.52-1.72)
Cook, except private service (5-31.30)	373/636	8/14	1.14 (0.46-2.81)
Other cooks (5-31.90)	369/624	12/26	0.78 (0.38-1.60)
Waiters, Bartenders and Related Workers Workers (5-32)	356/621	25/29	1.74 (0.98-3.10)
Waiter, general (5-32.10)	362/631	19/19	1.99 (1.01-3.94)
Bartender (5-32.50)	371/640	10/10	2.22 (0.89-5.56)
Building Caretakers, Charworkers, Cleaners and Related Workers (5-5)	348/594	33/56	1.04 (0.66-1.67)
Charworkers, Cleaners and Related Workers (5-52)	348/594	33/56	1.04 (0.66-1.67)
Charworker (5-52.20)	351/595	30/55	0.96 (0.60-1.56)
Protective Service Workers (5-8)	347/602	34/48	1.20 (0.74-1.94)
Fire-Fighters (5-81)	369/639	12/11	1.69 (0.72-3.99)
Fire-fighter (general) (5-81.10)	370/639	11/11	1.50 (0.62-3.60)
Protective Service Workers N.E.C (5-89)	357/617	24/33	1.26 (0.72-2.23)
Watchman (5-89.40)	370/634	11/16	1.21 (0.53-2.73)
Other protective service workers (5-89.90)	366/635	15/15	1.70 (0.79-3.66)
Service Workers N.E.C (5-9)	373/628	8/22	0.62 (0.27-1.44)
Other Service Workers (5-99)	373/631	8/19	0.70 (0.30-1.67)
Agricultural, Animal Husbandry and Forestry Workers (6)	342/611	39/39	1.60 (1.03-2.59)
Farmers (6-1)	372/641	9/9	1.91 (0.72-5.05)
Specialised Farmers (6-12)	376/644	5/6	1.63 (0.48-5.61)
Agricultural and Animal Husbandry Workers (6-2)	350/619	31/31	1.56 (0.91-2.67)
Nursery Workers and Gardeners (6-27)	365/635	16/15	1.54 (0.74-3.23)
Gardener (6-27.40)	365/636	16/14	1.62 (0.76-3.43)
Production and related workers, transport equipment operators and labourers (7/8/9)	198/385	183/265	1.33 (1.02-1.75)
Production Supervisors and General Foremen (7-0)	363/620	18/30	1.15 (0.62-2.13)
Production Supervisors and General Foremen (7-00)	363/620	18/30	1.15 (0.62-2.13)
Production supervisor and general foreman (general) (7-00.10)	369/638	12/12	2.14 (0.94-4.89)
Food and Beverage Processers (7-7)	373/627	8/23	0.65 (0.28-1.52)
Blacksmiths, Toolmakers and Machine Tool Operators (8-3)	370/633	11/17	0.78 (0.34-1.80)
Machinery Fitters, Machine Assemblers and Precision- Instrument Makers (except Electrical) (8-4)	329/593	52/57	1.71 (1.12-2.61)

Machinery Fitters and Machine Assemblers (8-41)	367/639	14/11	2.49 (1.07-5.75)
Refrigeration and air-conditioning plan installer and mechanic (8-41.80)	371/642	10/8	2.29 (0.86-6.14)
Motor-Vehicle Mechanics (8-43)	368/631	13/19	1.19 (0.56-2.51)
Automobile mechanic (8-43.20)	375/639	6/11	1.02 (0.36-2.87)
Motor-truck mechanic (8-43.30)	374/644	7/6	1.78 (0.57-5.57)
Machinery Fitters, Machine Assemblers and Precision-Instrument Makers (except Electrical) N.E.C (8-49)	353/618	28/32	1.55 (0.89-2.69)
Agricultural machinery mechanic (8-49.55)	376/645	5/5	1.75 (0.48-6.36)
Plant maintenance mechanic (8-49.70)	367/633	14/17	1.35 (0.64-2.87)
Electrical Fitters and Related Electrical and Electronics Workers (8-5)	339/613	42/37	2.00 (1.24-3.24)
Electrical Wiremén (8-55)	355/626	26/24	1.81 (1.30-3.28)
Building electrician (8-55.20)	361/629	20/21	1.61 (0.84-3.08)
Plumbers, Welders, Sheet-Metal and Structural Metal Preparers and Erectors (8-7)	351/620	30/30	1.69 (0.97-2.93)
Plumbers and Pipe Fitters (8-71)	368/638	13/12	1.69 (0.74-3.87)
Plumber (general) (8-71.05)	368/641	13/9	2.35 (0.96-5.73)
Welders and Flame-Cutters (8-72)	369/638	12/12	1.61 (0.68-3.80)
Sheet-Metal Workers (8-73)	376/642	5/8	1.11 (0.34-3.61)
Rubber and Plastics Product Makers (9-0)	375/645	6/5	2.44 (0.71-8.36)
Painters (9-3)	374/636	7/14	0.62 (0.24-1.61)
Bricklayers, Carpenters and Other Construction Workers (9-5)	348/601	33/49	1.12 (0.69-1.83)
Bricklayers, Stonemasons and Tile Setters (9-51)	371/635	10/15	0.99 (0.41-2.36)
Bricklayer (construction) (9-51.20)	375/639	5/5	1.91 (0.52-7.06)
Reinforced Concreters, Cement Finishers and Terrazzo Workers (9-52)	371/640	10/10	1.41 (0.55-3.62)
Carpenters, Joiners and Parquetry Workers (9-54)	371/637	10/13	1.57 (0.66-3.73)
Construction joiner (9-54.20)	376/640	5/10	0.95 (0.31-2.88)
Plasterers (9-55)	376/641	5/9	0.94 (0.30-2.98)
Construction Workers N.E.C (9-59)	373/637	8/13	1.22 (0.49-3.05)
Material Handling and Related Equipment Operators, Dockers and Freight Handlers (9-7)	341/594	40/56	1.26 (0.81-1.97)
Dockers and Freight Handlers (9-71)	349/611	32/39	1.36 (0.81-2.26)
Warehouse porter (9-71.45)	362/626	19/24	1.28 (0.67-2.45)
Machine packer (9-71.55)	372/642	9/8	1.48 (0.55-4.00)
Material Handling Equipment Operators N.E.C (9-79)	373/636	8/14	1.12 (0.45-2.78)

Lifting-truck operator (9-79.20)	374/636	7/14	0.95 (0.37-2.47)
Transport Equipment Operators (9-8)	350/599	31/51	1.06 (0.65-1.73)
Motor-vehical drivers (9-85)	352/602	29/48	1.04 (0.63-1.72)
Lorry and van driver (local transport) (9-85.50)	365/625	16/25	1.05 (0.54-2.06)
Other motor-vehicle drivers (9-85.90)	376/642	5/8	1.03 (0.31-3.37)
Laboureres N.E.C (9-9)	372/634	9/16	0.84 (0.35-2.02)

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^bEstimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

^c40 cases with personal history of cryptorchidism were excluded from the analyses.

Table S5. Odds ratios and 95% confidence intervals for TGCT associated with industries, excluding cases with personal history of cryptorchidism, TESTIS study.

Industry description (NAF-99 code) ^a	Ca/Co (never)	Ca/Co (ever)	OR (95% IC) ^{b,c}
Agriculture, hunting and forestry (01, 02)	351/615	29/34	1.37 (0.80-2.36)
Agriculture, hunting, related services (01)	352/618	28/31	1.50 (0.86-2.61)
Culture (01.1)	368/636	12/13	1.62 (0.71-3.70)
Livestock (01.2)	370/643	10/6	2.65 (0.91-7.76)
Cattle breeding (01.2A)	374/643	6/5	1.88 (0.53-6.66)
Services related to agriculture and landscape management (01.4)	372/639	8/10	1.06 (0.39-2.88)
Creation and maintenance of ornamental plantations (01.4B)	373/640	7/9	1.17 (0.41-3.32)
Manufacture industry (15 to 37)	261/458	119/191	1.11 (0.83-1.49)
Food industry (15)	358/615	22/34	1.18 (0.66-2.10)
Meat industry (15.1)	374/643	6/6	1.49 (0.45-4.94)
Other food industries (15.8)	370/630	10/19	1.04 (0.46-2.35)
Publishing, printing, reproduction (22)	375/642	5/7	1.27 (0.38-4.22)
Chemical industry (24)	366/632	14/17	1.35 (0.63-2.90)
Pharmaceutical industry (24.4)	371/641	9/8	1.39 (0.50-3.87)
Rubber and plastics industry (25)	375/642	5/7	1.33 (0.39-4.56)
Manufacture of other non-metallic mineral products (26)	370/641	10/8	1.80 (0.67-4.83)
Metallurgy (27)	371/640	9/9	2.21 (0.80-6.12)
Metalworking (28)	367/619	13/30	0.73 (0.36-1.48)
Metal processing, general mechanics (28.5)	375/639	5/10	0.78 (0.25-2.44)
Manufacture of machinery and equipment (29)	368/617	12/32	0.62 (0.30-1.26)
Manufacture of general-purpose machinery (29.2)	374/633	6/16	0.68 (0.25-1.86)
Manufacture of machinery and electrical (31)	368/638	12/11	1.80 (0.75-4.34)
Manufacture of medical, precision, optical and watchmaking instruments (33)	375/638	5/11	0.81 (0.27-2.42)
Manufacture of measuring and control instruments (33.2)	375/643	5/6	1.39 (0.41-4.77)
Automobile industry (34)	366/623	14/26	1.00 (0.49-2.04)
Construction of motor vehicles (34.1)	372/635	8/14	1.08 (0.44-2.69)
Manufacture of other transport equipment (35)	364/630	16/19	1.56 (0.76-3.19)
Aeronautical and space construction (35.3)	370/633	10/16	1.09 (0.46-2.56)

Manufacture of furniture; miscellaneous industries (36)	374/640	6/9	1.00 (0.34-2.94)
Production and distribution of electricity, gas and water (40, 41)	365/630	15/19	1.23 (0.59-2.58)
Production and distribution of electricity, gas and heat (40)	368/632	12/17	1.07 (0.48-2.39)
Electricity generation and distribution (40.1)	371/633	9/16	0.82 (0.34-2.00)
Construction (45)	301/541	79/108	1.27 (0.90-1.78)
Construction of building and civil engineering works (45.2)	356/614	23/30	1.29 (0.72-2.32)
General masonry work (45.2V)	368/631	9/8	1.73 (0.63-4.74)
Installation work (45.3)	334/602	45/41	2.03 (1.28-3.23)
Electrical installation work (45.3A)	350/617	29/26	2.16 (1.22-3.81)
Water and gas installation (45.3E)	372/635	7/8	1.40 (0.48-4.07)
Installation of heating and air conditioning equipment (45.3F)	367/635	12/8	2.48 (0.96-6.38)
Finishing work (45.4)	362/609	18/34	0.81 (0.43-1.49)
Wood and plastic joinery (45.4C)	372/632	8/11	1.18 (0.45-3.08)
Trade, repair of motor vehicles and household goods (50 to 52)	262/495	118/154	1.47 (1.09-1.98)
Motor trade and repair (50)	358/622	22/27	1.37 (0.75-2.49)
Motor vehicle trade (50.1)	374/641	6/8	1.57 (0.52-4.68)
Maintenance and repair of motor vehicles (50.2)	369/634	11/15	1.25 (0.56-2.83)
Wholesale trade and commercial intermediaries (51)	339/596	41/53	1.38 (0.88-2.16)
Wholesale of non-food consumer goods (51.4)	371/639	9/10	1.76 (0.69-4.45)
Wholesale of non-agricultural intermediate products (51.5)	374/638	6/11	0.88 (0.31-2.48)
Wholesale of industrial equipment (51.6)	363/630	17/19	1.70 (0.85-3.41)
Retail trade and repair of household goods (52)	310/560	70/89	1.45 (1.02-2.07)
Retail sale in non-specialised shops (52.1)	351/621	29/28	1.93 (1.11-3.36)
Supermarkets (52.1D)	352/626	28/23	2.32 (1.29-4.17)
Food retail in specialized shops (52.2)	370/642	10/7	3.10 (1.11-8.67)
Other retail sale in specialised shops (52.4)	348/608	32/41	1.17 (0.71-1.93)
Retail sale of sports and recreation equipment (52.4W)	370/642	10/7	1.93 (0.71-5.27)
Retail trade (non-store) (52.6)	379/644	5/14	0.75 (0.26-2.16)
Hotels and restaurants (55)	336/580	44/69	1.22 (0.80-1.85)

Hotels (55.1)	371/636	9/13	1.25 (0.51-3.06)
Tourist hotels with restaurant (55.1A)	372/637	8/11	1.25 (0.48-3.26)
Restaurants (55.3)	354/604	26/46	1.10 (0.65-1.84)
Traditional food service (55.3A)	361/624	19/23	1.63 (0.85-3.13)
Fast food restaurants (55.3B)	369/624	11/23	0.82 (0.39-1.76)
Coffee shops (55.4)	374/644	6/5	2.65 (0.78-8.97)
Canteens and caterers (55.5)	375/642	5/7	1.22 (0.37-4.06)
Transport and communications (60 to 64)	338/555	42/94	0.76 (0.50-1.13)
Land transport (60)	358/607	22/42	0.93 (0.54-1.62)
Urban and road transport (60.2)	361/618	18/28	1.09 (0.58-2.04)
Intercity road freight transport (60.2M)	373/635	6/10	0.90 (0.31-2.63)
Auxiliary transport services (63)	367/627	13/22	1.05 (0.51-2.19)
Post and telecommunications (64)	369/618	11/31	0.56 (0.27-1.16)
Telecommunications (64.2)	373/626	7/23	0.51 (0.21-1.25)
Other telecommunications activities (64.2B)	373/629	7/20	0.61 (0.25-1.51)
Financial activities (65 to 67)	361/614	19/35	1.07 (0.59-1.94)
Financial intermediation (65)	365/621	15/28	0.96 (0.50-1.87)
Real estate, rental and business services (70 to 74)	288/453	92/196	0.79 (0.58-1.06)
Real estate (70)	375/639	5/10	0.98 (0.33-2.97)
IT activities (72)	349/589	31/60	0.90 (0.56-1.44)
IT systems consulting (72.1)	352/605	12/17	1.20 (0.55-2.62)
Software development (72.2)	359/606	5/17	0.55 (0.20-1.53)
Research and development (73)	368/614	12/35	0.63 (0.31-1.28)
Research and development in the physical and natural sciences (73.1)	369/616	11/31	0.65 (0.31-1.35)
Services provided mainly to businesses (74)	323/541	57/108	0.93 (0.65-1.34)
Legal, accounting and management consultancy activities (74.1)	362/609	18/40	0.78 (0.43-1.40)
Business and management consulting (74.1G)	368/626	12/23	0.90 (0.44-1.88)
Activités d'architecture et d'ingénierie (74.2)	366/625	14/24	1.03 (0.51-2.09)
Engineering, technical studies (74.2C)	369/628	11/21	0.85 (0.39-1.87)
Publicity (74.4)	375/6398	5/10	0.97 (0.32-2.98)
Investigation and security (74.6)	373/636	7/13	1.03 (0.39-2.74)

Cleaning activities (74.7)	373/637	7/12	1.14 (0.43-3.04)
Various services provided mainly to businesses (74.8)	375/643	5/6	1.62 (0.47-5.59)
Public administration (75)	315/542	65/107	0.98 (0.69-1.41)
General, economic and social administration (75.1)	351/612	29/37	1.28 (0.76-2.17)
General public administration (75.1A)	355/616	25/33	1.30 (0.74-2.29)
Supervision of economic activities (75.1E)	375/644	5/5	1.14 (0.31-4.13)
Services of public prerogative (75.2)	343/579	37/70	0.84 (0.54-1.31)
Defence (75.2C)	356/597	24/52	0.73 (0.43-1.25)
Civil protection (75.2J)	368/636	12/13	1.35 (0.59-3.11)
Education (80)	298/494	82/155	0.89 (0.65-1.22)
Primary education (80.1)	375/639	5/10	0.77 (0.25-2.37)
Secondary education (80.2)	324/569	56/80	1.21 (0.82-1.77)
General secondary education (80.2A)	368/624	12/21	0.93 (0.43-2.00)
Technical or professional secondary education (80.2C)	335/586	45/57	1.36 (0.89-2.09)
Higher education (80.3)	358/587	22/62	0.67 (0.40-1.14)
Health and social work (85)	354/565	26/84	0.52 (0.32-0.83)
Activities for human health (85.1)	362/585	18/63	0.47 (0.27-0.82)
Hospital activities (85.1A)	364/597	16/51	0.51 (0.29-0.93)
Social action (85.3)	372/624	8/25	0.57 (0.25-1.30)
Other community, social and personal services (90 to 93)	328/578	52/71	1.45 (0.97-2.17)
Sanitation, roads and waste management (90)	374/641	6/8	1.26 (0.42-3.76)
Association activities (91)	372/643	8/6	2.73 (0.91-8.20)
Recreational, cultural and sporting activities (92)	340/593	40/56	1.39 (0.89-2.17)
Other artistic and performing activities (92.3)	364/634	16/15	1.93 (0.91-4.07)
Sports-related activities (92.6)	369/629	11/20	1.03 (0.48-2.23)
Management of sports facilities (92.6A)	375/642	5/7	1.25 (0.37-4.24)
Other sports activities (92.6C)	373/636	7/13	1.06 (0.41-2.70)
Recreational activities (92.7)	374/638	6/11	0.95 (0.34-2.65)
Other recreational activities (92.7C)	374/639	6/10	1.05 (0.37-2.96)

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never):

Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^b Estimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

^c 40 cases with personal history of cryptorchidism were excluded from the analyses.

Table S6. Odds ratios and 95% confidence intervals for TGCT associated with occupations, excluding cases not confirmed by pathology reports, TESTIS study.

Occupation description (ISCO-68) ^a	Ca/Co (never)	Ca/Co (ever)	OR (95% IC) ^{b,c}
Professional, Technical and Related Workers (0/1)	232/355	148/295	0.80 (0.61-1.06)
Architects, engineers and related technicians (0-2/0-3)	336/567	44/83	0.87 (0.57-1.32)
Mechanical Engineers (0-24)	373/634	6/16	0.58 (0.20-1.67)
Draughtsmen (0-32)	369/639	10/11	1.57(0.62-3.99)
Civil Engineering Technicians (0-33)	371/637	8/13	1.02 (0.40-2.62)
Clerk of works (0-33.40)	371/639	8/11	1.12 (0.42-2.93)
Engineering Technicians N.E.C (0-39)	372/632	7/18	0.69 (0.28-1.73)
Other engineering technicians (0-39.90)	374/640	5/10	0.78 (0.25-2.42)
Life scientists and related technicians (0-5)	368/639	12/11	1.54 (0.63-3.75)
Doctors, dentists, veterinarians and similar workers (0-6/0-7)	363/605	17/45	0.64 (0.35-1.16)
Medical Doctors (0-61)	375/634	5/16	0.54 (0.19-1.53)
Professional Nurses (0-71)	374/637	6/13	0.72 (0.27-1.96)
Professional nurse (general) (0-71.10)	374/639	6/11	0.82 (0.29-2.29)
Statisticians, mathematicians, systems analysts and related technicians (0-8)	345/597	35/53	1.26 (0.78-2.04)
Systems Analysts (0-83)	347/603	33/47	1.38 (0.84-2.27)
Accountants (1-1)	373/640	7/10	1.44 (0.53-3.94)
Accountants (1-10)	373/640	7/10	1.44 (0.53-3.94)
Auditor (1-10.20)	373/641	7/9	1.64 (0.58-4.59)
Teachers (1-3)	354/593	26/57	0.81 (0.49-1.35)
University and Higher Education Teachers (1-31)	373/628	7/22	0.70 (0.29-1.68)
Secondary Education Teachers (1-32)	363/622	17/28	1.07 (0.56-2.08)
Other secondary education teachers (1-32.90)	368/632	9/15	1.08 (0.45-2.61)
Painters, Photographers and Related Creative Artists (1-6)	374/644	6/6	1.79 (0.55-5.80)
Composers and Performing Artists (1-7)	374/643	6/7	1.50 (0.48-4.73)
Athletes, Sportsmen and Related Workers (1-8)	374/633	6/17	0.66 (0.25-1.72)
Athletes, Sportsmen and Related Workers (1-80)	374/633	6/17	0.66 (0.25-1.72)
Sports coach (1-80.30)	374/634	6/16	0.73 (0.28-1.91)
Professional, Technical and Related Workers N.E.C (1-9)	369/619	11/31	0.62 (0.30-1.27)
Social Workers (1-93)	372/626	8/24	0.56 (0.24-1.31)
Culture centre worker (1-93.30)	373/630	6/12	0.77 (0.27-2.19)

Administrative and Managerial Workers (2)	332/544	48/106	0.85 (0.58-1.27)
Managers (2-1)	332/545	48/105	0.86 (0.58-1.28)
General managers (2-11)	374/622	6/22	0.51 (0.20-1.32)
Managers N.E.C (2-19)	338/563	42/82	1.01 (0.66-1.55)
Sales manager (except wholesale and retail trade) (2-19.30)	373/636	7/8	1.54 (0.53-4.49)
Budgeting and accounting manager (2-19.50)	375/629	5/13	0.82 (0.28-2.41)
Other managers (2-19.90)	348/581	32/61	1.00 (0.62-1.61)
Clerical and Related Workers (3)	303/523	77/127	0.97 (0.69-1.35)
Bookkeepers, cashiers and related workers (3-3)	370/629	10/21	0.66 (0.30-1.46)
Bookkeepers and Cashiers (3-31)	375/642	5/8	0.77 (0.24-2.51)
Bookkeepers, Cashiers and Related Workers N.E.C (3-39)	374/637	6/13	0.71 (0.26-1.95)
Computing Machine Operators (3-4)	370/634	10/16	1.01 (0.43-2.36)
Clerical and Related Workers N.E.C (3-9)	322/569	58/81	1.18 (0.81-1.72)
Stock clerks (3-91)	350/609	30/41	1.15 (0.69-1.91)
Dispatching and receiving clerk (3-91.20)	366/627	14/23	1.04 (0.52-2.07)
Storeroom clerk (3-91.40)	365/632	15/18	1.24 (0.60-2.57)
Correspondence and Reporting Clerks (3-93)	366/627	14/23	1.07 (0.53-2.15)
Office clerk (general) (3-93.10)	368/633	12/17	1.21 (0.56-2.61)
Receptionists and Travel Agency Clerks (3-94)	363/628	17/22	1.23 (0.62-2.43)
Receptionist (general) (3-94.10)	367/640	13/10	2.03 (0.85-4.85)
Sales Workers (4)	300/538	80/112	1.25 (0.90-1.75)
Working Proprietors (Wholesale and Retail Trade) (4-1)	374/642	6/8	1.55 (0.50-4.81)
Technical Salesmen, Commercial Travellers and Manufacturers' Agents (4-3)	349/597	31/53	0.98 (0.61-1.58)
Technical Salesmen and Service Advisers (4-31)	349/599	31/51	1.01 (0.63-1.64)
Insurance, Real Estate, Securities and Business Services Salesmen and Auctioneers (4-4)	374/638	6/12	0.87 (0.31-2.43)
Insurance, Real Estate and Securities Salesmen (4-41)	374/639	6/11	0.93 (0.33-2.64)
Salesmen, Shop Assistants and Related Workers (4-5)	332/597	48/53	1.55 (1.01-2.39)
Salesmen, Shop Assistants and Demonstrators (4-51)	332/603	48/47	1.72 (1.11-2.68)
Retail trade salesman (4-51.30)	357/622	23/28	1.33 (0.74-2.39)
Other salesmen, shop assistants and demonstrators (4-51.90)	351/631	29/19	2.56 (1.38-4.75)

Service Workers (5)	285/510	95/140	1.21 (0.88-1.64)
Cooks, Waiters, Bartenders and Related Workers (5-3)	338/592	42/58	1.30 (0.84-2.01)
Cooks pressers (5-31)	357/616	23/34	1.15 (0.65-2.04)
Cook, except private service (5-31.30)	366/636	14/14	1.76 (0.80-3.86)
Other cooks (5-31.90)	366/624	14/26	0.87 (0.44-1.75)
Waiters, Bartenders and Related Workers Workers (5-32)	353/621	27/29	1.79 (1.02-3.16)
Waiter, general (5-32.10)	359/631	21/19	2.13 (1.10-4.14)
Bartender (5-32.50)	370/640	10/10	2.13 (0.85-5.32)
Building Caretakers, Charworkers, Cleaners and Related Workers (5-5)	343/594	37/56	1.14 (0.73-1.78)
Charworkers, Cleaners and Related Workers (5-52)	343/594	37/56	1.14 (0.73-1.78)
Charworker (5-52.20)	346/595	34/55	1.06 (0.67-1.69)
Protective Service Workers (5-8)	349/602	31/48	1.10 (0.67-1.80)
Fire-Fighters (5-81)	371/639	9/11	1.22 (0.49-3.07)
Fire-fighter (general) (5-81.10)	372/639	8/11	1.04 (0.40-2.68)
Protective Service Workers N.E.C (5-89)	356/617	24/33	1.28 (0.73-2.26)
Watchman (5-89.40)	369/634	11/16	1.24 (0.55-2.79)
Other protective service workers (5-89.90)	365/635	15/15	1.72 (0.80-3.68)
Service Workers N.E.C (5-9)	372/628	8/22	0.59 (0.25-1.39)
Other Service Workers (5-99)	372/631	8/19	0.66 (0.28-1.58)
Agricultural, Animal Husbandry and Forestry Workers (6)	337/611	43/39	1.76 (1.10-2.81)
Farmers (6-1)	370/641	10/9	1.94 (0.75-5.00)
Specialised Farmers (6-12)	374/644	6/6	1.77 (0.54-5.75)
Agricultural and Animal Husbandry Workers (6-2)	346/619	34/31	1.75 (1.03-2.96)
Nursery Workers and Gardeners (6-27)	362/635	18/15	1.79 (0.87-3.69)
Gardener (6-27.40)	363/636	17/14	1.75 (0.83-3.67)
Production and related workers, transport equipment operators and labourers (7/8/9)	196/385	184/265	1.30 (0.99-1.71)
Production Supervisors and General Foremen (7-0)	360/620	20/30	1.28 (0.70-2.33)
Production Supervisors and General Foremen (7-00)	360/620	20/30	1.28 (0.70-2.33)
Production supervisor and general foreman (general) (7-00.10)	366/638	14/12	2.54 (1.14-5.66)
Food and Beverage Processers (7-7)	369/627	11/23	0.81 (0.38-1.76)
Blacksmiths, Toolmakers and Machine Tool Operators (8-3)	369/633	11/17	0.80 (0.34-1.86)
Machine-Tool Setter-Operators (8-33)	379/648	5/8	0.73 (0.21-2.54)
Machinery Fitters, Machine Assemblers and Precision- Instrument Makers (8-4)	329/593	51/57	1.58 (1.04-2.41)

Machinery Fitters and Machine Assemblers (8-41)	370/639	10/11	1.73 (0.70-4.30)
Refrigeration and air-conditioning plan installer and mechanic (8-41.80)	374/642	6/8	1.38 (0.45-4.21)
Motor-Vehicle Mechanics (8-43)	366/631	14/19	1.21 (0.58-2.52)
Automobile mechanic (8-43.20)	373/639	7/11	1.08 (0.40-2.89)
Motor-truck mechanic (8-43.30)	373/644	7/6	1.77 (0.56-5.61)
Machinery Fitters, Machine Assemblers and Precision-Instrument Makers (except Electrical) N.E.C (8-49)	350/618	30/32	1.62 (0.94-2.79)
Agricultural machinery mechanic (8-49.55)	375/645	5/5	1.74 (0.48-6.36)
Plant maintenance mechanic (8-49.70)	367/633	13/17	1.26 (0.58-2.72)
Electrical Fitters and Related Electrical and Electronics Workers (8-5)	343/613	37/37	1.67 (1.02-2.74)
Electrical Wirem��n (8-55)	357/626	23/24	1.48 (0.80-2.72)
Building electrician (8-55.20)	363/629	17/21	1.25 (0.64-2.47)
Plumbers, Welders, Sheet-Metal and Structural Metal Preparers and Erectors (8-7)	353/620	27/30	1.46 (0.83-2.57)
Plumbers and Pipe Fitters (8-71)	369/638	11/12	1.37 (0.58-3.24)
Plumber (general) (8-71.05)	369/641	11/9	1.89 (0.75-4.74)
Welders and Flame-Cutters (8-72)	369/638	11/12	1.35 (0.56-3.27)
Sheet-Metal Workers (8-73)	375/642	5/8	1.16 (0.36-3.78)
Rubber and Plastics Product Makers (9-0)	375/645	5/5	1.89 (0.53-6.77)
Painters (9-3)	372/636	8/14	0.72 (0.29-1.79)
Painters N.E.C (9-39)	375/642	5/8	0.71 (0.22-2.35)
Bricklayers, Carpenters and Other Construction Workers (9-5)	344/601	36/49	1.27 (0.78-2.05)
Bricklayers, Stonemasons and Tile Setters (9-51)	370/635	10/15	1.00 (0.42-2.39)
Bricklayer (construction) (9-51.20)	373/639	6/5	2.29 (0.67-7.81)
Reinforced Concreters, Cement Finishers and Terrazzo Workers (9-52)	369/640	11/10	1.62 (0.64-4.08)
Carpenters, Joiners and Parquetry Workers (9-54)	368/637	12/13	1.76 (0.77-4.05)
Construction joiner (9-54.20)	373/640	7/10	1.23 (0.45-3.37)
Plasterers (9-55)	375/641	5/9	1.25 (0.38-4.16)
Construction Workers N.E.C (9-59)	371/637	9/13	1.35 (0.55-3.34)
Material Handling and Related Equipment Operators, Dockers and Freight Handlers (9-7)	340/594	40/56	1.21 (0.77-1.90)
Dockers and Freight Handlers (9-71)	350/611	30/39	1.18 (0.70-1.98)
Warehouse porter (9-71.45)	362/626	18/24	1.14 (0.59-2.20)
Machine packer (9-71.55)	372/642	8/8	1.28 (0.46-3.58)

Material Handling Equipment Operators N.E.C (9-79)	371/636	9/14	1.36 (0.56-3.32)
Lifting-truck operator (9-79.20)	372/636	8/14	1.19 (0.47-2.99)
Transport Equipment Operators (9-8)	346/599	34/51	1.15 (0.71-1.85)
Motor-vehical drivers (9-85)	348/602	32/48	1.14 (0.70-1.87)
Lorry and van driver (local transport) (9-85.50)	362/625	18/25	1.15 (0.60-2.21)
Other motor-vehicle drivers (9-85.90)	374/642	6/8	1.10 (0.34-3.51)
Laboureres N.E.C (9-9)	370/634	10/16	0.94 (0.40-2.20)

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^bEstimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

^c43 cases not confirmed by pathology reports, were excluded from the analyses.

Table S7. Odds ratios and 95% confidence intervals for TGCT associated with industries, excluding cases not confirmed by pathology reports, TESTIS study.

Industry description (NAF-99 code) ^a	Ca/Co (never)	Ca/Co (ever)	OR (95% IC) ^{b,c}
Agriculture, hunting and forestry (01, 02)	347/615	32/34	1.49 (0.88-2.51)
Agriculture, hunting, related services (01)	348/618	31/31	1.62 (0.95-2.79)
Culture (01.1)	365/636	14/13	1.82 (0.82-4.02)
Livestock (01.2)	368/643	11/6	2.73 (0.96-7.75)
Cattle breeding (01.2A)	372/643	7/5	2.12 (0.63-7.08)
Services related to agriculture and landscape management (01.4)	371/639	8/10	1.09 (0.40-2.94)
Creation and maintenance of ornamental plantations (01.4B)	372/640	7/9	1.17 (0.41-3.33)
Manufacture industry (15 to 37)	263/458	116/191	1.06 (0.79-1.42)
Food industry (15)	354/615	25/34	1.31 (0.75-2.30)
Meat industry (15.1)	370/643	9/6	2.28 (0.76-6.80)
Industrial preparation of meat products (15.1E)	373/644	6/5	1.90 (0.55-6.53)
Other food industries (15.8)	369/630	10/19	1.03 (0.46-2.33)
Chemical industry (24)	367/632	12/17	1.08 (0.49-2.39)
Pharmaceutical industry (24.4)	371/641	8/8	1.13 (0.39-3.28)
Rubber and plastics industry (25)	374/642	5/7	1.18 (0.33-4.18)
Manufacture of other non-metallic mineral products (26)	369/641	10/8	1.84 (0.70-4.85)
Metallurgy (27)	370/640	9/9	2.16 (0.77-6.03)
Metalworking (28)	364/619	15/30	0.85 (0.43-1.68)
Metal processing, general mechanics (28.5)	373/639	6/10	0.82 (0.28-2.43)
Manufacture of machinery and equipment (29)	367/617	12/32	0.62 (0.30-1.26)
Manufacture of general purpose machinery (29.2)	373/633	6/16	0.71 (0.26-1.96)
Manufacture of machinery and electrical (31)	370/638	9/11	1.34 (0.52-3.43)
Manufacture of medical, precision, optical and watchmaking instruments (33)	374/638	5/11	0.83 (0.28-2.46)
Manufacture of measuring and control instruments (33.2)	374/643	5/6	1.38 (0.40-4.67)
Automobile industry (34)	365/623	14/26	1.03 (0.50-2.11)
Construction of motor vehicles (34.1)	372/635	7/14	0.95 (0.36-2.49)
Manufacture of other transport equipment (35)	366/630	13/19	1.18 (0.55-2.54)
Aeronautical and space construction (35.3)	372/633	7/16	0.68 (0.26-1.80)
Manufacture of furniture; miscellaneous industries (36)	372/640	7/9	1.25 (0.44-3.50)
Production and distribution of electricity, gas and water (40, 41)	368/630	11/19	0.89 (0.39-2.00)
Production and distribution of electricity, gas and heat (40)	369/632	10/17	0.89 (0.38-2.09)

Electricity generation and distribution (40.1)	372/633	7/16	0.62 (0.24-1.64)
Construction (45)	306/541	73/108	1.14 (0.80-1.61)
Site preparation (45.1)	373/635	5/8	0.83 (0.25-2.73)
Construction of building and civil engineering works (45.2)	356/614	22/30	1.22 (0.67-2.21)
General masonry work (45.2V)	366/631	10/8	1.90 (0.71-5.09)
Installation work (45.3)	342/602	36/41	1.54 (0.94-2.52)
Electrical installation work (45.3A)	354/617	24/26	1.68 (0.92-3.07)
Water and gas installation (45.3E)	372/635	6/8	1.18 (0.39-3.59)
Installation of heating and air conditioning equipment (45.3F)	370/635	8/8	1.59 (0.57-4.45)
Finishing work (45.4)	359/609	20/34	0.93 (0.51-1.70)
Wood and plastic joinery (45.4C)	369/632	10/11	1.42 (0.58-3.51)
Trade, repair of motor vehicles and household goods (50 to 52)	265/495	114/154	1.37 (1.02-1.85)
Motor trade and repair (50)	356/622	23/27	1.41 (0.78-2.55)
Motor vehicle trade (50.1)	373/641	6/8	1.61 (0.54-4.83)
Maintenance and repair of motor vehicles (50.2)	367/634	12/15	1.34 (0.60-2.98)
Wholesale trade and commercial intermediaries (51)	338/596	41/53	1.39 (0.88-2.17)
Wholesale intermediaries (51.1)	374/643	5/6	1.30 (0.37-4.57)
Wholesale of non-food consumer goods (51.4)	370/639	9/10	1.76 (0.69-4.49)
Wholesale of non-agricultural intermediate products (51.5)	374/638	5/11	0.79 (0.26-2.36)
Wholesale of industrial equipment (51.6)	362/630	17/19	1.75 (0.87-3.53)
Retail trade and repair of household goods (52)	314/560	65/89	1.31 (0.92-1.89)
Retail sale in non-specialised shops (52.1)	351/621	28/28	1.92 (1.10-3.35)
Supermarkets (52.1D)	352/626	27/23	2.29 (1.27-4.13)
Food retail in specialized shops (52.2)	371/642	8/7	2.55 (0.86-7.53)
Other retail sale in specialised shops (52.4)	349/608	30/41	1.07 (0.64-1.78)
Retail sale of sports and recreation equipment (52.4W)	369/642	10/7	1.78 (0.65-4.85)
Hotels and restaurants (55)	332/580	47/69	1.29 (0.85-1.95)
Hotels (55.1)	366/636	13/13	1.70 (0.75-3.83)
Tourist hotels with restaurant (55.1A)	367/637	12/11	1.71 (0.72-4.07)
Restaurants (55.3)	352/604	27/45	1.19 (0.71-1.99)
Traditional food service (55.3A)	358/624	21/23	1.80 (0.95-3.41)
Fast food restaurants (55.3B)	369/624	10/23	0.83 (0.38-1.83)
Coffee shops (55.4)	373/644	6/5	2.50 (0.74-8.37)

Transport and communications (60 to 64)	337/555	42/94	0.74 (0.49-1.10)
Land transport (60)	357/607	22/42	0.90 (0.52-1.56)
Urban and road transport (60.2)	360/618	18/28	1.05 (0.56-1.97)
Intercity road freight transport (60.2M)	371/635	7/10	0.99 (0.36-2.77)
Auxiliary transport services (63)	366/627	13/22	1.04 (0.50-2.15)
Post and telecommunications (64)	367/618	12/31	0.60 (0.30-1.24)
Telecommunications (64.2)	371/626	8/23	0.60 (0.26-1.41)
Other telecommunications activities (64.2B)	371/629	8/20	0.71 (0.30-1.67)
Financial activities (65 to 67)	359/614	20/35	1.21 (0.67-2.17)
Financial intermediation (65)	363/621	16/28	1.09 (0.57-2.09)
Real estate, rental and business services (70 to 74)	288/453	91/196	0.76 (0.56-1.03)
Real estate (70)	374/639	5/10	0.96 (0.31-2.93)
Rental without operator (71)	374/643	5/6	1.53 (0.44-5.33)
IT activities (72)	346/589	33/60	0.98 (0.62-1.57)
IT systems consulting (72.1)	349/605	12/17	1.20 (0.55-2.62)
Software development (72.2)	356/606	5/17	0.56 (0.20-1.56)
Research and development (73)	366/614	13/35	0.66 (0.33-1.30)
Research and development in the physical and natural sciences (73.1)	367/616	12/31	0.67 (0.33-1.37)
Services provided mainly to businesses (74)	327/541	52/108	0.83 (0.57-1.20)
Legal, accounting and management consultancy activities (74.1)	365/609	14/40	0.63 (0.33-1.19)
Business and management consulting (74.1G)	368/626	11/23	0.86 (0.40-1.83)
Activités d'architecture et d'ingénierie (74.2)	367/625	12/24	0.86 (0.41-1.81)
Engineering, technical studies (74.2C)	369/628	10/21	0.74 (0.33-1.66)
Publicity (74.4)	374/639	5/10	1.03 (0.34-3.17)
Investigation and security (74.6)	372/636	7/13	1.00 (0.38-2.66)
Cleaning activities (74.7)	374/637	5/12	0.71 (0.24-2.09)
Various services provided mainly to businesses (74.8)	374/643	5/6	1.83 (0.52-6.35)
Public administration (75)	314/542	65/107	0.98 (0.68-1.40)
General, economic and social administration (75.1)	348/612	31/37	1.39 (0.83-2.34)
General public administration (75.1A)	352/616	27/33	1.44 (0.83-2.51)
Supervision of economic activities (75.1E)	373/644	6/5	1.30 (0.38-4.46)
Services of public prerogative (75.2)	344/579	35/70	0.78 (0.49-1.22)
Defence (75.2C)	354/597	25/52	0.77 (0.45-1.30)

Civil protection (75.2J)	370/636	9/13	0.96 (0.39-2.35)
Education (80)	295/494	84/155	0.92 (0.67-1.25)
Primary education (80.1)	374/639	5/10	0.74 (0.24-2.28)
Secondary education (80.2)	322/569	57/80	1.21 (0.82-1.77)
General secondary education (80.2A)	368/624	11/21	0.80 (0.36-1.78)
Technical or professional secondary education (80.2C)	332/586	47/57	1.42 (0.93-2.17)
Higher education (80.3)	355/587	24/62	0.76 (0.46-1.26)
Health and social work (85)	348/565	31/84	0.63 (0.40-0.99)
Activities for human health (85.1)	356/585	23/63	0.62 (0.37-1.03)
Hospital activities (85.1A)	360/597	19/51	0.62 (0.36-1.10)
Social action (85.3)	371/624	8/25	0.57 (0.25-1.29)
Other community, social and personal services (90 to 93)	323/578	56/71	1.53 (1.03-2.28)
Sanitation, roads and waste management (90)	372/641	7/8	1.39 (0.49-3.96)
Association activities (91)	370/643	9/6	2.86 (0.98-8.38)
Recreational, cultural and sporting activities (92)	338/593	41/56	1.42 (0.91-2.21)
Film and video activities (92.1)	374/640	5/9	1.20 (0.39-3.71)
Other artistic and performing activities (92.3)	364/634	15/15	1.73 (0.80-3.73)
Sports-related activities (92.6)	367/629	12/20	1.09 (0.51-2.34)
Management of sports facilities (92.6A)	374/642	5/7	1.16 (0.34-3.97)
Other sports activities (92.6C)	371/636	8/13	1.17 (0.47-2.92)

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^bEstimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT and family history of cryptorchidism. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

^c43 cases not confirmed by pathology reports, were excluded from the analyses.

Table S8. Odds ratios and 95% confidence intervals for TGCT associated with occupations, with additional adjustment for age at index date, TESTIS study.

Occupation description (ISCO-68) ^a	Ca/Co (never)	Ca/Co (ever)	OR (95% IC) ^b
Professional, Technical and Related Workers (0/1)	254/355	166/295	0.78 (0.60-1.01)
Architects, engineers and related technicians (0-2/0-3)	368/567	52/83	0.88 (0.60-1.29)
Mechanical Engineers (0-24)	412/634	7/16	0.60 (0.23-1.57)
Draughtsmen (0-32)	408/639	11/11	1.49 (0.62-3.58)
Civil Engineering Technicians (0-33)	411/637	8/13	0.88 (0.36-2.19)
Clerk of works (0-33.40)	411/639	8/11	1.05 (0.41-2.69)
Electrical and Electronics Engineering Technicians (0-34)	413/640	6/10	0.66 (0.23-1.94)
Engineering Technicians N.E.C (0-39)	411/632	8/18	0.67 (0.29-1.57)
Other engineering technicians (0-39.90)	413/640	6/10	0.91 (0.33-2.57)
Life scientists and related technicians (0-5)	408/639	12/11	1.58 (0.66-3.77)
Medical, dental, veterinary and related workers (0-6/0-7)	403/605	17/45	0.58 (0.33-1.04)
Medical Doctors (0-61)	415/634	5/16	0.52 (0.19-1.45)
Professional Nurses (0-71)	414/637	6/13	0.65 (0.24-1.74)
Professional nurse (general) (0-71.10)	414/639	6/11	0.76 (0.27-2.11)
Statisticians, mathematicians, systems analysts and related technicians (0-8)	384/597	36/53	1.09 (0.68-1.72)
Systems Analysts (0-83)	386/603	34/47	1.21 (0.75-1.95)
Accountants (1-1)	410/640	10/10	1.76 (0.71-4.37)
Accountants (1-10)	410/640	10/10	1.76 (0.71-4.37)
Auditor (1-10.20)	410/641	10/9	1.98 (0.78-5.05)
Teachers (1-3)	391/593	29/57	0.77 (0.47-1.24)
University and Higher Education Teachers (1-31)	413/628	7/22	0.53 (0.22-1.27)
Secondary Education Teachers (1-32)	401/622	19/28	1.02 (0.55-1.89)
Other secondary education teachers (1-32.90)	408/632	9/15	0.95 (0.40-2.24)
Authors, Journalists and Related Writers (1-5)	415/644	5/6	1.23 (0.36-4.15)
Authors, Journalists and Related Writers N.E.C (1-59)	415/645	5/5	1.40 (0.39-5.00)
Painters, Photographers and Related Creative Artists (1-6)	414/644	6/6	1.67 (0.53-5.26)
Composers and Performing Artists (1-7)	412/643	8/7	1.86 (0.66-5.25)
Athletes, Sportsmen and Related Workers (1-8)	414/633	6/17	0.57 (0.22-1.46)
Athletes, Sportsmen and Related Workers (1-80)	414/633	6/17	0.57 (0.22-1.46)
Sports coach (1-80.30)	414/634	6/16	0.62 (0.24-1.60)
Professional, Technical and Related Workers N.E.C (1-9)	408/619	12/31	0.65 (0.33-1.30)

Social Workers (1-93)	411/626	9/24	0.63 (0.29-1.39)
Culture centre worker (1-93.30)	412/630	7/12	0.99 (0.38-2.60)
Administrative and Managerial Workers (2)	366/544	54/106	0.85 (0.59-1.23)
Managers (2-1)	366/545	54/105	0.86 (0.59-1.24)
General managers (2-11)	413/622	7/22	0.57 (0.24-1.36)
Managers N.E.C (2-19)	372/563	48/82	1.01 (0.68-1.50)
Sales manager (except wholesale and retail trade) (2-19.30)	412/636	8/8	1.59 (0.58-4.36)
Budgeting and accounting manager (2-19.50)	414/629	6/13	0.84 (0.31-2.26)
Other managers (2-19.90)	385/581	35/61	0.98 (0.62-1.54)
Clerical and Related Workers (3)	334/523	86/127	1.01 (0.77-1.44)
Bookkeepers, cashiers and related workers (3-3)	410/629	10/21	0.71 (0.32-1.55)
Bookkeepers and Cashiers (3-31)	415/642	5/8	0.89 (0.29-2.80)
Bookkeepers, Cashiers and Related Workers N.E.C (3-39)	414/637	6/13	0.71 (0.26-1.95)
Computing Machine Operators (3-4)	408/634	12/16	1.20 (0.55-2.59)
Clerical and Related Workers N.E.C (3-9)	355/569	65/81	1.25 (0.87-1.79)
Stock clerks (3-91)	385/609	35/41	1.25 (0.77-2.02)
Dispatching and receiving clerk (3-91.20)	404/627	16/23	1.11 (0.57-2.14)
Storeroom clerk (3-91.40)	403/632	17/18	1.26 (0.63-2.52)
Correspondence and Reporting Clerks (3-93)	405/627	15/23	1.04 (0.53-2.06)
Office clerk (general) (3-93.10)	408/633	12/17	1.14 (0.53-2.45)
Receptionists and Travel Agency Clerks (3-94)	403/628	17/22	1.25 (0.65-2.41)
Receptionist (general) (3-94.10)	407/640	13/10	2.17 (0.93-5.07)
Sales Workers (4)	332/538	88/112	1.28 (0.93-1.76)
Working Proprietors (Wholesale and Retail Trade) (4-1)	413/642	7/8	2.01 (0.70-5.77)
Technical Salesmen, Commercial Travellers and Manufacturers' Agents (4-3)	388/597	32/53	0.94 (0.59-1.50)
Technical Salesmen and Service Advisers (4-31)	388/599	32/51	0.98 (0.61-1.56)
Insurance, Real Estate, Securities and Business Services Salesmen and Auctioneers (4-4)	414/638	6/12	0.84 (0.31-2.29)
Insurance, Real Estate and Securities Salesmen (4-41)	414/639	6/11	0.91 (0.33-2.51)
Salesmen, Shop Assistants and Related Workers (4-5)	365/597	55/53	1.65 (1.10-2.49)
Salesmen, Shop Assistants and Demonstrators (4-51)	365/603	55/47	1.85 (1.22-2.83)
Retail trade salesman (4-51.30)	391/622	29/28	1.57 (0.90-2.71)
Other salesmen, shop assistants and demonstrators (4-51.90)	388/631	32/19	2.56 (1.41-4.64)
Service Workers (5)	319/510	101/140	1.16 (0.86-1.57)

Cooks, Waiters, Bartenders and Related Workers (5-3)	377/592	43/58	1.19 (0.78-1.82)
Cooks pressers (5-31)	396/616	24/34	1.07 (0.62-1.86)
Cook, except private service (5-31.30)	406/636	14/14	1.50 (0.70-3.24)
Other cooks (5-31.90)	405/624	15/26	0.86 (0.44-1.66)
Waiters, Bartenders and Related Workers Workers (5-32)	393/621	27/29	1.63 (0.94-2.84)
Waiter, general (5-32.10)	399/631	21/19	1.87 (0.98-3.58)
Bartender (5-32.50)	410/640	10/10	1.89 (0.77-4.64)
Building Caretakers, Charworkers, Cleaners and Related Workers (5-5)	382/594	38/56	1.07 (0.69-1.68)
Charworkers, Cleaners and Related Workers (5-52)	382/594	38/56	1.07 (0.69-1.68)
Charworker (5-52.20)	386/595	34/55	0.96 (0.61-1.52)
Protective Service Workers (5-8)	385/602	35/48	1.15 (0.72-1.83)
Fire-Fighters (5-81)	407/639	13/11	1.88 (0.82-4.30)
Fire-fighter (general) (5-81.10)	408/639	12/11	1.69 (0.73-3.92)
Protective Service Workers N.E.C (5-89)	396/617	24/33	1.14 (0.65-1.98)
Watchman (5-89.40)	409/634	11/16	1.05 (0.47-2.34)
Other protective service workers (5-89.90)	405/635	15/15	1.59 (0.75-3.34)
Service Workers N.E.C (5-9)	412/628	8/22	0.53 (0.23-1.22)
Other Service Workers (5-99)	412/631	8/19	0.61 (0.26-1.44)
Agricultural, animal husbandry and forestry workers, fishermen and hunters (6)	375/611	45/39	1.82 (1.15-2.89)
Farmers (6-1)	410/641	10/9	1.79 (0.70-4.58)
Specialised Farmers (6-12)	414/644	6/6	1.61 (0.50-5.24)
Agricultural and Animal Husbandry Workers (6-2)	384/619	36/31	1.77 (1.06-2.94)
Nursery Workers and Gardeners (6-27)	401/635	19/15	1.84 (0.91-3.72)
Gardener (6-27.40)	402/636	18/14	1.85 (0.90-3.81)
Production and Related Workers, Transport Equipment operators and labourers (7/8/9)	216/385	204/265	1.33 (1.03-1.73)
Production Supervisors and General Foremen (7-0)	399/620	21/30	1.18 (0.66-2.12)
Production Supervisors and General Foremen (7-00)	399/620	21/30	1.18 (0.66-2.12)
Production supervisor and general foreman (general) (7-00.10)	406/638	14/12	2.22 (1.00-4.92)
Food and Beverage Processers (7-7)	409/627	11/23	0.78 (0.37-1.65)
Cabinetmakers and Related Woodworkers (8-1)	415/645	5/5	1.38 (0.38-4.98)
Blacksmiths, Toolmakers and Machine Tool Operators (8-3)	408/633	12/17	0.86 (0.38-1.97)
Machinery Fitters, Machine Assemblers and Precision- Instrument Makers (except Electrical) (8-4)	362/593	58/57	1.56 (1.05-2.33)
Machinery Fitters and Machine Assemblers (8-41)	405/639	15/11	2.04 (0.90-4.61)

Refrigeration and air-conditioning plan installer and mechanic (8-41.80)	409/642	11/8	2.02 (0.78-5.22)
Motor-Vehicle Mechanics (8-43)	406/631	14/19	1.08 (0.53-2.23)
Automobile mechanic (8-43.20)	413/639	7/11	0.92 (0.35-2.47)
Motor-truck mechanic (8-43.30)	413/644	7/6	1.73 (0.56-5.31)
Machinery Fitters, Machine Assemblers and Precision-Instrument Makers (except Electrical) N.E.C (8-49)	388/618	32/32	1.54 (0.91-2.60)
Agricultural machinery mechanic (8-49.55)	415/645	5/5	1.45 (0.41-5.15)
Plant maintenance mechanic (8-49.70)	405/633	15/17	1.35 (0.65-2.81)
Electrical Fitters and Related Electrical and Electronics Workers (8-5)	378/613	42/37	1.73 (1.08-2.77)
Electrical Wiremén (8-55)	394/626	26/24	1.60 (0.89-2.86)
Building electrician (8-55.20)	400/629	20/21	1.41 (0.74-2.67)
Plumbers, Welders, Sheet-Metal and Structural Metal Preparers and Erectors (8-7)	388/620	32/30	1.80 (1.06-3.04)
Plumbers and Pipe Fitters (8-71)	406/638	14/12	1.90 (0.85-4.22)
Plumber (general) (8-71.05)	406/641	14/9	2.54 (1.07-6.04)
Welders and Flame-Cutters (8-72)	408/638	12/12	1.61 (0.71-3.66)
Sheet-Metal Workers (8-73)	414/642	6/8	1.27 (0.43-3.81)
Rubber and Plastics Product Makers (9-0)	414/645	6/5	2.04 (0.61-6.77)
Painters (9-3)	412/636	8/14	0.87 (0.35-2.12)
Painters N.E.C (9-39)	415/642	5/8	1.00 (0.32-3.15)
Bricklayers, Carpenters and Other Construction Workers (9-5)	380/601	40/49	1.28 (0.82-2.01)
Bricklayers, Stonemasons and Tile Setters (9-51)	409/635	11/15	1.13 (0.50-2.53)
Bricklayer (construction) (9-51.20)	413/639	6/5	2.12 (0.62-7.24)
Reinforced Concreters, Cement Finishers and Terrazzo Workers (9-52)	409/640	11/10	1.70 (0.70-4.14)
Carpenters, Joiners and Parquetry Workers (9-54)	407/637	13/13	1.58 (0.72-3.46)
Construction joiner (9-54.20)	413/640	7/10	1.06 (0.40-2.86)
Plasterers (9-55)	415/641	5/9	0.85 (0.28-2.63)
Construction Workers N.E.C (9-59)	410/637	10/13	1.18 (0.50-2.78)
Material Handling and Related Equipment Operators, Dockers and Freight Handlers (9-7)	374/594	46/56	1.28 (0.84-1.97)
Dockers and Freight Handlers (9-71)	385/611	35/39	1.35 (0.83-2.21)
Warehouse porter (9-71.45)	400/626	20/24	1.27 (0.68-2.38)
Machine packer (9-71.55)	411/642	9/8	1.51 (0.57-4.04)
Material Handling Equipment Operators N.E.C (9-79)	410/636	10/14	1.18 (0.51-2.72)
Lifting-truck operator (9-79.20)	411/636	9/14	1.06 (0.45-2.50)

Transport Equipment Operators (9-8)	386/599	34/51	1.01 (0.64-1.62)
Motor-vehical drivers (9-85)	388/602	32/48	1.01 (0.62-1.63)
Lorry and van driver (local transport) (9-85.50)	402/625	18/25	1.07 (0.57-2.01)
Other motor-vehicle drivers (9-85.90)	414/642	6/8	1.14 (0.37-3.47)
Laboureres N.E.C (9-9)	408/634	12/16	1.10 (0.54-2.57)

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^bEstimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT, family history of cryptorchidism and age at index date. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five controls.

Table S9. Odds ratios and 95% confidence intervals for TGCT associated with industries, with additional adjustment for age at index date, TESTIS study.

Industry description (NAF-99 code) ^a	Ca/Co (never)	Ca/Co (ever)	OR (95% IC) ^b
Agriculture, hunting and forestry (01, 02)	386/615	33/34	1.46 (0.87-2.43)
Agriculture, hunting, related services (01)	387/618	32/31	1.58 (0.93-2.67)
Culture (01.1)	404/636	15/13	1.81 (0.84-3.93)
Livestock (01.2)	408/643	11/6	2.78 (1.00-7.75)
Cattle breeding (01.2A)	412/643	7/5	2.09 (0.64-6.83)
Services related to agriculture and landscape management (01.4)	411/639	8/10	1.00 (0.38-2.66)
Creation and maintenance of ornamental plantations (01.4B)	412/640	7/9	1.06 (0.38-2.98)
Manufacture industry (15 to 37)	288/458	131/191	1.18 (0.75-1.85)
Food industry (15)	393/615	26/34	1.26 (0.74-2.17)
Meat industry (15.1)	410/643	9/6	2.48 (0.85-7.25)
Industrial preparation of meat products (15.1E)	413/644	6/5	1.88 (0.55-6.46)
Other food industries (15.8)	408/630	11/19	0.95 (0.44-2.04)
Publishing, printing, reproduction (22)	412/642	7/7	1.69 (0.58-4.96)
Chemical industry (24)	405/632	14/17	1.19 (0.56-2.51)
Pharmaceutical industry (24.4)	410/641	9/8	1.45 (0.53-3.95)
Rubber and plastics industry (25)	413/642	6/7	1.26 (0.40-3.94)
Manufacture of other non-metallic mineral products (26)	408/641	11/8	1.93 (0.76-4.91)
Metallurgy (27)	409/640	10/9	2.24 (0.87-5.81)
Metalworking (28)	403/619	16/30	0.84 (0.44-1.59)
Metal processing, general mechanics (28.5)	413/639	6/10	0.83 (0.29-2.37)
Manufacture of machinery and equipment (29)	407/617	12/32	0.55 (0.27-1.11)
Manufacture of general-purpose machinery (29.2)	413/633	6/16	0.60 (0.22-1.61)
Manufacture of machinery and electrical (31)	407/638	12/11	1.39 (0.58-3.30)
Manufacture of radio, television and communication equipment (32)	414/638	5/11	0.72 (0.24-2.12)
Manufacture of medical, precision, optical and watchmaking instruments (33)	413/638	6/11	0.82 (0.29-2.27)
Manufacture of measuring and control instruments (33.2)	413/643	6/6	1.50 (0.47-4.79)
Automobile industry (34)	404/623	15/26	0.97 (0.50-1.90)
Construction of motor vehicles (34.1)	411/635	8/14	0.95 (0.39-2.35)
Manufacture of other transport equipment (35)	403/630	16/19	1.30 (0.65-2.62)
Aeronautical and space construction (35.3)	409/633	10/16	0.89 (0.39-2.04)
Manufacture of furniture; miscellaneous industries (36)	412/640	7/9	1.10 (0.40-3.03)

Electricity,gas and water supply (40, 41)	404/630	15/19	1.10 (0.54-2.24)
Production and distribution of electricity, gas and heat (40)	407/632	12/17	1.00 (0.46-2.17)
Electricity generation and distribution (40.1)	410/633	9/16	0.80 (0.34-1.88)
Construction (45)	333/541	86/108	1.28 (0.92-1.76)
Site preparation (45.1)	413/635	5/8	0.94 (0.30-2.99)
Construction of building and civil engineering works (45.2)	392/614	26/30	1.40 (0.81-2.44)
General masonry work (45.2V)	406/631	10/8	1.99 (0.76-5.19)
Installation work (45.3)	371/602	47/41	1.83 (1.17-2.87)
Electrical installation work (45.3A)	389/617	29/26	1.74 (1.00-3.05)
Water and gas installation (45.3E)	411/635	7/8	1.25 (0.44-3.60)
Installation of heating and air conditioning equipment (45.3F)	404/635	14/8	2.87 (1.17-7.09)
Finishing work (45.4)	398/609	21/34	0.92 (0.52-1.63)
Wood and plastic joinery (45.4C)	409/632	10/11	1.26 (0.52-3.05)
Trade, repair of motor vehicles and household goods (50 to 52)	293/495	126/154	1.39 (1.05-1.85)
Motor trade and repair (50)	395/622	24/27	1.32 (0.74-2.36)
Motor vehicle trade (50.1)	413/641	6/8	1.31 (0.44-3.90)
Maintenance and repair of motor vehicles (50.2)	406/634	13/15	1.29 (0.59-2.78)
Wholesale trade and commercial intermediaries (51)	375/596	44/53	1.32 (0.86-2.04)
Wholesale intermediaries (51.1)	414/643	5/6	1.07 (0.31-3.71)
Wholesale of food products (51.3)	414/641	5/8	0.88 (0.27-2.82)
Wholesale of non-food consumer goods (51.4)	409/639	10/10	1.74 (0.68-4.23)
Wholesale of non-agricultural intermediate products (51.5)	413/638	6/11	0.99 (0.36-2.73)
Wholesale of industrial equipment (51.6)	402/630	17/19	1.47 (0.74-2.92)
Retail trade and repair of household goods (52)	345/560	74/89	1.38 (0.98-1.95)
Retail sale in non-specialised shops (52.1)	388/621	31/28	1.88 (1.10-3.22)
Supermarkets (52.1D)	389/626	30/23	2.20 (1.25-3.89)
Food retail in specialized shops (52.2)	409/642	10/7	2.40 (0.88-6.51)
Other retail sale in specialised shops (52.4)	385/608	34/41	1.20 (0.74-1.96)
Retail sale of sports and recreation equipment (52.4W)	408/642	11/7	2.25 (0.83-6.09)
Non-store retail trade (52.6)	414/635	5/14	0.66 (0.23-1.87)
Hotels and restaurants (55)	368/580	51/69	1.18 (0.80-1.76)
Hotels (55.1)	406/636	13/13	1.59 (0.71-3.56)
Tourist hotels with restaurant (55.1A)	407/637	12/11	1.70 (0.72-4.01)

Restaurants (55.3)	391/604	28/45	0.99 (0.60-1.64)
Traditional food service (55.3A)	398/624	21/23	1.45 (0.78-2.71)
Fast food restaurants (55.3B)	408/624	11/23	0.72 (0.34-1.51)
Coffee shops (55.4)	413/644	6/5	2.27 (0.67-7.66)
Canteens and caterers (55.5)	412/642	7/7	1.29 (0.43-3.84)
Transport,storage and communication (60 to 64)	374/555	45/94	0.72 (0.49-1.07)
Land transport (60)	396/607	23/42	0.87 (0.51-1.50)
Urban and road transport (60.2)	399/618	19/28	1.05 (0.57-1.93)
Intercity road freight transport (60.2M)	411/635	7/10	1.06 (0.39-2.87)
Auxiliary transport services (63)	405/627	14/22	1.01 (0.50-2.05)
Post and telecommunications (64)	407/618	12/31	0.57 (0.28-1.14)
Telecommunications (64.2)	411/626	8/23	0.52 (0.22-1.20)
Other telecommunications activities (64.2B)	411/629	8/20	0.62 (0.26-1.45)
Financial intermediation (65 to 67)	399/614	20/35	0.98 (0.55-1.76)
Financial intermediation (65)	403/621	16/28	0.97 (0.51-1.85)
Real estate,renting and business activities (70 to 74)	318/453	101/196	0.76 (0.57-1.01)
Real estate (70)	414/639	5/10	0.92 (0.31-2.79)
Rental without operator (71)	414/643	5/6	1.34 (0.40-4.53)
IT activities (72)	386/589	33/60	0.85 (0.54-1.33)
IT systems consulting (72.1)	389/605	12/17	1.09 (0.50-2.36)
Software development (72.2)	396/606	5/17	0.49 (0.18-1.34)
Research and development (73)	406/614	13/35	0.57 (0.29-1.11)
Research and development in the physical and natural sciences (73.1)	407/616	12/31	0.58 (0.29-1.16)
Services provided mainly to businesses (74)	357/541	62/108	0.92 (0.65-1.31)
Legal, accounting and management consultancy activities (74.1)	400/609	19/40	0.81 (0.46-1.43)
Business and management consulting (74.1G)	406/626	13/23	0.98 (0.49-1.98)
Activités d'architecture et d'ingénierie (74.2)	405/625	14/24	0.87 (0.44-1.74)
Engineering, technical studies (74.2C)	408/628	11/21	0.74 (0.34-1.60)
Publicity (74.4)	413/639	6/10	0.99 (0.34-2.84)
Selection and supply of personnel (74.5)	414/640	5/9	0.60 (0.19-1.94)
Temporary work (74.5B)	414/642	5/7	0.71 (0.21-2.42)
Investigation and security (74.6)	412/636	7/13	0.88 (0.33-2.30)
Cleaning activities (74.7)	412/637	7/12	0.96 (0.37-2.51)

Various services provided mainly to businesses (74.8)	414/643	5/6	1.50 (0.45-5.02)
Public administration (75)	348/542	71/107	1.05 (0.75-1.48)
General, economic and social administration (75.1)	387/612	32/37	1.33 (0.80-2.22)
General public administration (75.1A)	391/616	28/33	1.45 (0.85-2.47)
Supervision of economic activities (75.1E)	413/644	6/5	1.78 (0.53-6.01)
Services of public prerogative (75.2)	379/579	40/70	0.86 (0.56-1.32)
Defence (75.2C)	393/597	26/52	0.75 (0.45-1.24)
Civil protection (75.2J)	406/636	13/13	1.50 (0.67-3.35)
Education (80)	324/494	95/155	0.93 (0.69-1.26)
Primary education (80.1)	413/639	6/10	0.91 (0.32-2.58)
Secondary education (80.2)	353/569	66/80	1.31 (0.91-1.89)
General secondary education (80.2A)	406/624	13/21	0.85 (0.41-1.77)
Technical or professional secondary education (80.2C)	365/586	54/57	1.54 (1.03-2.32)
Higher education (80.3)	394/587	25/62	0.64 (0.39-1.04)
Health and social work (85)	388/565	31/84	0.57 (0.37-0.89)
Activities for human health (85.1)	396/585	23/63	0.56 (0.34-0.93)
Hospital activities (85.1A)	400/597	19/51	0.55 (0.32-0.96)
Social action (85.3)	411/624	8/25	0.54 (0.24-1.22)
Other community, social and personal services (90 to 93)	360/578	59/71	1.43 (0.98-2.09)
Sanitation, roads and waste management (90)	412/641	7/8	1.33 (0.47-3.76)
Association activities (91)	410/643	9/6	2.59 (0.90-7.49)
Recreational, cultural and sporting activities (92)	375/593	44/56	1.35 (0.88-2.07)
Film and video activities (92.1)	414/640	5/9	0.90 (0.29-2.77)
Other artistic and performing activities (92.3)	402/634	17/15	1.90 (0.93-3.91)
Sports-related activities (92.6)	407/629	12/20	0.94 (0.44-1.98)
Management of sports facilities (92.6A)	414/642	5/7	1.04 (0.31-3.50)
Other sports activities (92.6C)	411/636	8/13	1.01 (0.41-2.49)
Recreational activities (92.7)	413/638	6/11	0.94 (0.34-2.58)
Other recreational activities (92.7C)	413/639	6/10	1.05 (0.37-2.95)

Abbreviations - OR: odds ratio; 95% CI: confidence interval of 95%; ISCO: International Standard Classification of Occupations; Ca/Co (ever)/(never): Cases/controls ever/never employed; N.E.C: Not Elsewhere Classified.

^aTotal number of subjects presented for each code can vary due to the management of codes with missing digits. Subjects with a single job coded as missing data, were excluded from the analyses (N=33).

^b Estimates obtained comparing TGCT cases to group A and group B controls combined and adjusted for sibship size, being born from multiple pregnancy, personal history of testicular trauma, family history of TGCT, family history of cryptorchidism and age at index date. Analysis was restricted to subjects with no missing data for the adjustment variables (N=12). Results presented if a job was held by more than five cases and five control.