Cancer incidence in the AGRICAN cohort study (2005-2011)

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Note: CR= Cancer Registry.

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Background: Numerous studies have been conducted among farmers but very few of them were large prospective cohorts and included a significant proportion of women and farmworkers. Our aim was to compare cancer incidence in the cohort (overall, by sex, by work on farm, occupational status and pesticide use) with the general population.

Methods: More than 180,000 participants in the AGRICAN cohort were matched to cancer registries to identify cancer cases diagnosed from enrolment (2005-2007) to 31st December 2011. We calculated standardized incidence ratios (SIRs) and 95% confidence interval (CI).

Results: Over the period, 11,067 incident cancer cases were identified (7,304 men and 3,763 women). Overall cancer incidence in the cohort and the general population was not different. Moreover, SIRs were significantly higher for prostate cancer (SIR= 1.07, 95%CI 1.03-1.11) and non-Hodgkin lymphoma (SIR= 1.09, 95%CI 1.01-1.18) among men, skin melanoma among women (SIR= 1.23, 95%CI 1.05-1.43) and multiple myeloma (men: SIR= 1.38, 95%CI 1.18-1.62; women: SIR= 1.26, 95%CI 1.02-1.54). In contrast SIRs were lower for upper aero-digestive tract and respiratory cancers. Increase in risk was greater in male farmworkers for prostate and lip cancer, in female farmworkers for skin melanoma and in male farmowners for multiple myeloma. Moreover, incidence of multiple myeloma and skin melanoma was higher among male and female pesticide users respectively.

Conclusion: We found a decreased incidence for tobacco-related cancers and an increased incidence of prostate cancers, skin melanoma and multiple myeloma. Specific sub-groups had a higher cancer incidence related to occupational status and pesticide use.

1. Introduction

The relationship between farming and cancer has received considerable attention [1,2] and given rise to general meta-analyses [3,4] and assessment of specific cancers [5-8]. Most studies found a reduced risk in farmers for cancer overall, especially those related to tobacco smoking, and an excess risk for some others (lymphohematopoietic, prostate, brain, lip cancers and skin melanoma), but they were mainly restricted to the male population. Farming entails a large range of occupational hazards such as ultraviolet radiation, diesel exhaust, viruses, dust and pesticide use, the latter being the most widely studied regarding cancer risk in the agricultural context [9,10]. These exposures may differ according to gender, occupational status (farmowner, farmworker), and farm activities, leading potentially to different health effects. In some studies, various associations have been reported according to whether farmowners and farmworkers [11,12] or self-employed, employees and family workers [13] were studied.

Apart from small retrospective studies largely based on mortality data, more recent cohorts have provided results on cancer incidence among farmers, especially from Nordic countries [14], with data on type of farm production from farm registries [15] or from a large prospective cohort study, the Agricultural Health Study (AHS), including pesticide applicators (mainly white male farmowners) and their spouses [16].

In Europe, the AGRIculture and CANcer (AGRICAN) cohort study assess cancer risk in agricultural populations in France with detailed individual information on farming activities and life habits [17]. The analysis of mortality by cancers found overall lower cancer mortality especially for colon and rectal cancers among males, which was more pronounced for farmowners than for farmworkers [17]. Almost half of the AGRICAN subjects were women, so cancer risk could be investigated in this understudied population. Even if pesticide use on crops was infrequent among AGRICAN women, they used pesticides on animals or on

embankments and in farmyards. We assessed cancer risk in relation to various profiles (gender, occupational status, work on farm, pesticide use) in a large cohort of subjects insured by the farmers' health insurance scheme and enrolled in AGRICAN. This analysis is an initial part of the overall project which was and will be completed by further analyses on specific cancer sites, adjusting on potential confounders, with more detailed information on agricultural activities and additional duration of follow-up.

2. Methods

2.1. Population, Data collection and Enrolment

People involved in agriculture in France have a specific health insurance scheme, the *Mutualité Sociale Agricole* (MSA) that includes active and retired people, farmowners and farmworkers involved in agriculture-related jobs. This insurance agency concerns both people working on a farm but also beekeepers, foresters, oyster farmers, people working in agricultural cooperatives, and even tertiary workers serving the agricultural population, defined here as individuals who never worked on a farm. The AGRICAN cohort is described in detail elsewhere [17]. Briefly, 181,842 subjects were enrolled between 2005 and 2007 with the following criteria: living in one of the 11 French geographical areas covered by one of the 16 general or specialised population-based cancer registries at the time of enrolment, being older than 18 years old and having been insured by the MSA for 3 years or more. A self-administered enrolment questionnaire was sent to collect individual data on demographic characteristics, lifestyle habits, health, occupational history and lifetime history (years of beginning and end of activities and tasks including pesticide use in each crop and animal) of 18 agricultural activities (5 types of animals and 13 types of crops). Information was also collected on herbicide use on embankments and/or farmyard.

2.2. Cohort follow-up

Subjects were followed from enrolment (1st November 2005–31st December 2007) to 31st December 2011. Incident and prevalent cancer cases were identified by cross-linkage with population-based cancer registries in the 11 geographical areas and were coded according to the International Classification of Diseases for Oncology, 3rd edition (ICD–O–3). These registries meet high-quality criteria: the completeness and data quality are regularly assessed by the *Comité National des Registres* [French Institute of Health and Medical Research (INSERM), National Cancer Institute (Inca) and the French Institute for Public Health Surveillance (InVS)] and data are regularly published by IARC in Cancer Incidence in Five Continents (CI5). Matching with cancer registries was based on married and maiden names, first names, gender, date and place of birth, place of residence, vital status and date of death (if applicable). Only malignant tumours (exclusion of in-situ) were used in this analysis, except non-melanoma skin cancers due to their non-exhaustive registration. Vital status and place of residence were checked annually using the MSA data, the French National Postal Service (La Poste) and the French National Death Index (*Répertoire National pour l'Identification des Personnes Physiques*). People moving outside the AGRICAN area (0.8%) were no longer followed for cancer diagnosis. Person-years accumulation was calculated from the date of reception of the enrolment questionnaire and ended at cancer diagnosis, date of death (11%), date of loss to follow-up (less than 2% of subjects) or 31st December 2011, whichever occurred first. For a given type of cancer, diagnosis between 1st January 2005 (date of implementation of the most recent registry in the areas concerned) and enrolment were considered as prevalent and excluded from analysis. Earlier information was not considered because of a major heterogeneity between registries (implementation of registries extended over 30 years), in order to avoid selection bias between areas.

2.3. Analysis

Standardized incidence ratios (SIRs) were computed to compare the cancer incidence in people enrolled in the cohort to the total population of the area covered by the study. The expected numbers of cancer cases were calculated by multiplying the number of person-years in each 5-year age group from 20-24 to ≥85 by the corresponding gender-, age- and geographical area-specific cancer incidence for the period of observation (2005-2011).

Ninety-five percent confidence intervals (95% CI) for the SIRs were calculated as recommended by Breslow and Day [18]. Statistical significance was tested by the chi-square test on the assumption that the number of observed cases followed a Poisson distribution. Stratified analyses were also conducted by sex, by farm work (ever/never worked on a farm during lifetime), and among subjects who ever worked on a farm, by occupational status (farmowner / farmworker) and pesticide use during lifetime (three exclusive categories: (1) at least pesticide use on crops, (2) use of insecticides on animals or herbicides on embankments or farmyard but no pesticides on crops and (3) no occupational pesticide use. To assess the robustness of associations, we performed complementary analyses by censoring cancer cases at the first date of diagnosis and i) excluding all prevalent cases between 2005 and enrolment and ii) excluding all prevalent cancers whatever the date of diagnosis. All statistical analyses were performed using SAS version 9.3 (SAS Institute, Inc., Cary, NC).

3. Results

General characteristics of the 181,842 subjects who returned the self-administered questionnaire are presented in Table 1. At enrolment, women (46% of the population) were older than men (mean age 66.2 and 62.0 respectively). Forty-three percent of men and 58% of

169 women had less than middle school education. Men were more often ever-smokers than women
170 (55% *versus* 16%), with a greater intensity of cigarette-smoking, more often daily alcohol
171 consumers (32% *versus* 8%) and more frequently overweight or obese (64% *versus* 48%). The
172 mean duration of affiliation to the health insurance was nearly 24 years. Eighty-seven percent
173 of men and 86% of women reported having ever worked on farm during lifetime (Table 2).
174 About 10% of subjects never worked on a farm and a minority had worked in specific
175 agriculture-related sectors (e.g. agricultural cooperative, fishing, forestry) but not on farm. We
176 excluded the latter group from the stratified analysis owing to its size and heterogeneity. Among
177 people who ever worked on farm, men were more often farmowners than women and less often
178 retired (Supplementary materials 1). Farmworkers were older, more often smokers and had a
179 lower level of education than farmowners (Supplementary materials 2). Men who ever worked
180 on farm were more frequently users of pesticides on crops than women (84% *versus* 34%).
181 More women than men were only involved in pesticide application in the courtyard or in
182 animals (26% *versus* 9%) or used no pesticides (27% *versus* 7%). Men who ever applied
183 pesticides more frequently had attained at least middle school, were less often smokers and
184 were younger than those who never applied pesticides. On the other hand, women applying
185 pesticides on crops were older than those applying pesticides on the courtyard or on animals
186 and non-pesticide users (Supplementary materials 2).
187
188 *3.1. Overall cancer*
189 During the 5.1 years of follow-up (Supplementary materials 3), there were 7,304 incident cancer
190 cases among men and 3,763 among women. No difference was observed for overall cancer
191 incidence for both males (SIR= 0.99, 95%CI 0.97-1.01) and females (SIR= 0.98, 95%CI 0.95-
192 1.02) even if the risk was decreased in farmowners in both genders and was increased in male
193 farmworkers (SIR= 1.07, 95%CI 1.03-1.12) (Table 3). Cancer incidence was lower among male

194 pesticide users on crops (SIR= 0.94, 95%CI 0.91-0.97) and among other pesticide users for both
195 males (SIR= 0.89, 95%CI 0.81-0.99) and females (SIR= 0.88, 95%CI 0.79-0.99)
196
197 *3.2. Upper aero-digestive tract and respiratory cancers*
198 A lower incidence was observed among both men and women for oral cavity and pharynx
199 cancers (SIR= 0.61, 95%CI 0.53-0.70 and SIR= 0.48, 95%CI 0.33-0.69 respectively), for lung
200 cancers (SIR= 0.58, 95%CI 0.54-0.63 and SIR= 0.66, 95%CI 0.56-0.77 respectively), and, for
201 men only, for laryngeal cancers (SIR= 0.56, 95%CI 0.43-0.72) and mesothelioma (SIR= 0.36,
202 95%CI 0.21-0.56). For most of these cancers, the decrease in risk was more pronounced among
203 people who ever worked on farm, especially farmowners. No difference was observed
204 according to pesticide use.
205
206 *3.3. Digestive cancers*
207 There was reduction on oesophageal, colon and pancreatic cancers in males, in rectal and anal
208 cancer in females and in liver cancer in both. Men who ever worked on farm had a lower colon
209 cancer incidence (SIR= 0.82, 95%CI 0.75-0.90) unlike males who did not work on a farm.
210 Among women, pancreatic cancer was decreased among farmowners (SIR= 0.67, 95%CI 0.48-
211 0.92) but was greater than one among farmworkers. No overall difference was observed for
212 stomach cancer even though the risk was decreased in male farmowners (SIR=0.79, 95%CI
213 0.65-0.96) and was increased in female farmworkers and women who never used pesticides.
214
215 *3.4. Reproductive and endocrine system cancers*
216 Men, especially those who ever worked on farm, had a significantly increased incidence of
217 prostate cancer (SIR= 1.07, 95%CI 1.03-1.12), which was more pronounced among
218 farmworkers and in subjects who ever (SIR= 1.09, 95%CI 1.03-1.15) or never used pesticides

(SIR= 1.27, 95%CI 1.06-1.50) (Table 4). The number of male breast cancer cases was higher than expected. Decreased risks were observed for breast and cervix uteri cancers among all women and those who ever worked on farm (SIR= 0.84, 95%CI 0.79-0.91 and SIR= 0.64, 95%CI 0.42-0.95 respectively). Breast cancer risk was lower in women who used pesticides on crops (SIR= 0.70, 95%CI 0.57-0.84). No overall difference was observed for corpus uteri and ovarian cancers, but there were a higher number of ovarian cancers in pesticide users on crops. Thyroid cancer was significantly reduced in men who ever worked on farm (SIR= 0.62, 95%CI 0.40-0.93) especially farmowners. No overall difference was observed in women whereas an increase was observed in female farmowners and those who never used pesticides.

3.5. Lip and cutaneous cancers

Unlike men, women experienced an increased risk of skin melanoma (SIR= 1.23 95%CI 1.05-1.43), mainly those using pesticides on crops (Table 5). An excess of lip cancer was observed in men, almost all cases occurring in men using pesticides on crops (SIR= 2.05, 95%CI 1.27-3.13). These excesses were more pronounced among farmworkers.

3.6. Other solid tumors

Brain cancers, mainly glioblastoma, were increased in men who ever worked on farm and female pesticide users. The incidence of bladder cancer was lower in men, particularly those who ever worked on farm (SIR= 0.65, 95%CI 0.57-0.75) similarly among farmowners and farmworkers. In contrast, the decrease in risk was seen only in female farmworkers (SIR= 0.58, 95%CI 0.35-0.91).

3.7. Haematological malignancies

Men had an increased incidence of non-Hodgkin lymphoma (NHL) (SIR= 1.09, 95%CI 1.01-1.18) (Table 6). Higher risks were observed in men and women for multiple myeloma (SIR= 1.38, 95%CI 1.18-1.62 and SIR= 1.26, 95%CI 1.02-1.54 respectively), more pronounced in male farmowners (SIR=1.59 95%CI 1.29-1.95) and pesticide users on crops (SIR= 1.49, 95%CI 1.19-1.84). The incidence of follicular lymphoma was lower in men (SIR= 0.67, 95%CI 0.45-0.97). In contrast, myelodysplastic syndromes (MDS) were more numerous among women (SIR= 1.34, 95%CI 1.08-1.63), particularly among farmowners (SIR=1.57 95%CI 1.12-2.13).

4. Discussion

This work provides new results on cancer incidence in agricultural population in France. ~~Since~~ AGRICAN is a large prospective cohort study including farmowners and farmworkers and a significant proportion of women. Among the 567,157 subjects who met the inclusion criteria, 181,842 returned the self-administered questionnaire and were included in the cohort. Even if women and younger people participated a little more, geographical distribution was similar between eligible and enrolled people as well as mean duration of affiliation, for both retired and active people (Levêque-Morlais, 2015). This large cohort enables the study of rare cancers or sub-types (for haematological, respiratory or brain cancers) specifically in understudied populations (i.e. women, farmworkers). Cancer diagnoses were collected exhaustively by linkage with population based cancer registries and with less than 2% of study subjects lost to follow-up in the cohort. Individual data on lifetime agricultural exposures were collected before cancer diagnosis, which limits differential information bias. Pesticide use on crops was less frequent in women but they also used pesticides on animals or embankments and in farmyard with a limited number of pesticides (some herbicides and insecticides) and under specific conditions of exposure (mainly manually). It was therefore possible to study cancer risk in a

group of non-pesticide users, thereby highlighting other possible occupational risk factors that seldom received attention.

There was no difference in the incidence of cancer between cohort members and the general population. However, the risk in farmowners was decreased for both genders. These findings are consistent with previous meta-analyses [3,4], a large Nordic cohort study [14] and the AHS study investigating private pesticide applicators (mainly farmowners) [19,20]. In a complementary analysis, after excluding all prevalent cancers and when cancer cases were censored at the first date of diagnosis, a significant lower incidence of overall cancer was observed. Even if the increase in risk did not persist among the understudied population of farmworkers, the lower cancer incidence remained more pronounced among farmowners, a finding that deserves further attention. Significant increased or decreased risks were more pronounced or similar for individual cancers (Supplementary materials 4).

An increased prostate cancer incidence was previously reported in farmers [3,4,7,14] and pesticide applicators [19-22]. The increased risk in pesticide users and in non-users suggests the role of various hazards such as direct or secondary exposure to pesticides applied on crops and animals and the exposure that grain and hay farmers undergo [23].

The decreased female breast cancer incidence we found is consistent with results from most cohort studies [14,24] although no significant difference was observed among private applicators and spouses in the AHS [20]. One explanation could be a difference in reproductive characteristics or hormone use, highly related to breast cancer risk. The elevated number of male breast cancers is in line with elevated mortality we observed previously [17]. This cancer has only rarely been studied in men and its aetiology remains largely unknown but Pukkala et al. observed a lower risk among farmers [14].

To date, thyroid cancer has received little attention among farmers but we observed an increased risk in women and a decreased risk or no difference in men. A suggestion of a higher incidence of thyroid cancer was found in the AHS only in commercial applicators [20]. A slight excess of ovarian cancer in pesticide users was also reported in the AHS in female users but not in spouses [19,20] or in women exposed to triazines in Italy [25].

Differences in incidence in farmers might be impacted by screening practices and farmers' level of participation. In France, a nationwide screening program was adopted for colorectal cancer in 2009 and for breast cancer in 2004, and individual screening exists for prostate, thyroid and cervical cancers. Few data are available and results are not consistent on participation rates of farmers in collective or individual screening although level of participation seems different according to health insurance scheme [26]. Preliminary results from a follow-up questionnaire demonstrated a lower participation rate in prostate cancer screening in AGRICAN than in the general population, invalidating the hypothesis that screening practices play a major role in our results.

For lip cancer, an elevated number of cases among farmers was previously observed in meta-analyses [3,4,27], in Nordic countries [14] and to a lesser extent among farmowners using pesticides in the AHS [19,20]. Solar radiation is the most suggested explanation even if other etiologic factors are related to lip cancer, such as viruses like herpes simplex virus type 1 (HSV-1), reduced immunity and tobacco-smoking [27,28], especially pipes [29].

Skin melanoma was also increased in AGRICAN especially among female farmworkers and pesticide users. Data on skin melanoma in farmers are not consistent. Blair et al. reported a significant excess of skin melanoma [3] as well as the review from Fortes and de Vries who observed an association with skin melanoma in both men and women in 9 of the 10 studies [30], but in contrast with the meta-analysis from Acquavella et al. [4] and the study in Nordic countries [14]. Finally, in the AHS, no difference was observed among applicators but skin

317 melanoma was more frequent in spouses [19,20]. A synergistic effect between occupational
318 exposure to pesticides and sun exposure has been suggested [31] as well as the fact that chronic
319 exposure could be a protective factor for skin melanoma [32].
320 An increase in risk was observed in men for all non-Hodgkin lymphomas. The strongest
321 association with farming was observed for multiple myeloma in both sexes and it was stronger
322 in male farmowners and pesticide applicators on crops. Several meta-analyses and a pooled
323 analysis reported positive associations between multiple myeloma and farming [3,5,33,34] and
324 among pesticide users in the AHS [19,20]. Furthermore, farmowners involved in open field
325 activities [35] and pesticide users in the AHS [36] had a greater prevalence of a multiple
326 myeloma precursor entity, monoclonal gammopathy of undetermined significance (MGUS). In
327 contrast, our results based on around 30 cases of follicular lymphoma suggested an unexpected
328 decreased risk among men while no significant increased risk were observed in InterLymph
329 [37] or either for private applicators nor spouses in the AHS, even if an increased risk was
330 reported in North Carolina for private applicators [20].
331 The lower incidence of respiratory and bladder cancers can be partly explained by the lower
332 prevalence of smoking in the present cohort [17] and in the AHS [19] and by exposure to
333 putative protective factors, as suggested by observations in dairy farming in Italy [38], in
334 poultry and large-scale livestock farming in the AHS study [39], and in AGRICAN especially
335 after exposure during childhood and long-term exposure to cattle and horses [40].
336 While no overall excess of stomach cancer was observed among men in contrast to the findings
337 of meta-analyses [3,4], a low increase was observed among women that was greater for
338 farmworkers and for those who never used pesticides. Likewise, no excess risk was observed
339 among private applicators in the AHS but a non-significant higher incidence was found for
340 spouses in North Carolina [20]. The number of brain cancers was elevated in males, especially

glioblastomas. An excess of brain cancer in farmers was found in a meta-analysis [6] and only in commercial applicators in the AHS [19,20].

This analysis was performed after only 5 years of follow-up but the follow-up will continue to confirm the results especially for less frequent cancers. Our findings highlight the need to consider female and farmworkers specifically and they can be used to generate new hypotheses regarding the role of specific pesticides and other agricultural exposures in cancer aetiology. Finally, given the range of activities in farming in France and the need to take important confounding factors into account (e.g. tobacco smoking, alcohol consumption, reproductive factors), internal analyses on individual cancer sites are underway to identify agricultural activities and tasks related to cancer risk.

CONFLICT OF INTEREST: The authors declare that there are no conflicts of interest.

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474 Table 1: General characteristics of cohort members, AGRICAN, 2005-2007.

		Men (n= 98794)		Women (n= 83048)	
		n	%	n	%
Age at enrolment (in years)					
20-49		23922	24.2	13942	16.8
50-64		25560	25.9	18800	22.6
65-74		23579	23.9	21259	25.6
75-105		25733	26.0	29047	35.0
	Mean (Std)	62.0 (15.8)		66.2 (15.2)	
Highest grade completed					
Less than middle school		40040	43.3	44226	58.1
Middle school or high school		42165	45.6	25578	33.6
More than high school		10220	11.1	6346	8.3
Missing		6369		6898	
Smoking status					
Never		41857	44.9	63130	84.5
Former		38086	40.8	7344	9.8
Current		13288	14.3	4255	5.7
Missing		5563		8319	
Pack-years of cigarette-smoking					
<20		28100	69.8	8228	86.9
20-39		9129	22.7	1060	11.2
40-59		2154	5.3	141	1.5
≥60		881	2.2	41	0.4
Missing		1635		472	
	Mean (Std)	15.8 (15.5)		9.0 (10.4)	
Alcohol consumption					
Never		9067	9.8	24259	33.0
Monthly		8813	9.5	17630	24.0
Weekly		45123	48.8	25492	34.6
Daily		29466	31.9	6191	8.4
Missing		6325		9476	
Body Mass Index (kg/m²)					
Underweight	<18.5	503	0.6	1798	2.7
Normal weight	18.5-24.9	31138	35.8	33487	49.7
Overweight	25.0-29.9	41896	48.2	22711	33.7
Obesity	≥30.0	13364	15.4	9336	13.9
Missing		11893		15716	
Retired					
No		54235	54.9	37129	44.7
Yes		44559	45.1	45919	55.3
Duration of affiliation (in years)					
3-9		23205	23.5	18444	22.2
10-19		18955	19.2	15940	19.2
20-29		17124	17.3	14440	17.4
30-39		27540	27.9	21898	26.4
≥40		11970	12.1	12326	18.8
	Mean (Std)	23.7 (13.7)		24.2 (14.0)	

Abbreviations: Std = Standard deviation.

475

476 Table 2: Occupational characteristics of cohort members, AGRICAN, 2005-2007.

	Men (n= 98794)		Women (n= 83048)	
	n	%	n	%
Work on farm				
Ever	76933	87.1	59512	85.9
Other agricultural activities	2016	2.3	220	0.3
Never (mainly services sector)	9378	10.6	9520	13.8
Incomplete job history	10467		13796	
Among people who ever worked on farm				
Occupational status				
Farmowners	51351	66.7	31412	52.8
Farmworkers	25582	33.3	28100	47.2
Pesticide use				
Pesticides on crops	53435	84.2	10314	34.3
Herbicides in farmyard	44048	69.4	11038	36.7
Insecticides on animals	28642	45.1	6913	23.0
Only herbicides in farmyard or insecticides on animals	5912	9.3	7881	26.2
No pesticide use	4129	6.5	11851	27.0
Missing	13454		29466	

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479 Table 3: Standardized incidence ratio (SIR) for all sites, upper aero-digestive tract, respiratory and digestive cancers, 2005-2011

	All (n= 98794)		No work on farm (n= 9378)		Work on farm (n= 76933)		Occupational status: Farmowners (n= 51351)		Occupational status: Farmworkers (n= 25582)		Pesticide use: Pesticides on crops (n= 53435)		Pesticide use: Other pesticides (n= 4598)		Pesticide use: No pesticides (n= 3312)	
	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]
Men																
All sites	7304	0.99 [0.97-1.01]	645	1.02 [0.95-1.10]	5748	0.98 [0.95-1.00]	3619	**0.93 [0.90-0.96]**	2129	**1.07 [1.03-1.12]**	3611	**0.94 [0.91-0.97]**	400	**0.89 [0.81-0.99]**	362	1.09 [0.98-1.21]
Upper aero-digestive tract and respiratory cancers:																
Oral cavity and pharynx	192	**0.61 [0.53-0.70]**	22	0.69 [0.43-1.04]	140	**0.57 [0.48-0.67]**	82	**0.48 [0.38-0.60]**	58	**0.76 [0.58-0.99]**	83	**0.48 [0.38-0.60]**	8	**0.42 [0.18-0.83]**	7	0.54 [0.22-1.11]
Larynx	62	**0.56 [0.43-0.72]**	6	0.57 [0.21-1.24]	40	**0.46 [0.33-0.62]**	22	**0.37 [0.23-0.57]**	18	0.63 [0.37-1.00]	21	**0.35 [0.22-0.54]**	3	0.46 [0.09-1.33]	3	0.63 [0.13-1.85]
Trachea, bronchus and lung	625	**0.58 [0.54-0.63]**	74	**0.78 [0.61-0.97]**	466	**0.55 [0.50-0.60]**	282	**0.50 [0.44-0.56]**	184	**0.63 [0.55-0.73]**	278	**0.49 [0.44-0.55]**	33	**0.51 [0.35-0.72]**	26	**0.54 [0.35-0.78]**
Squamous cell	208	**0.63 [0.54-0.72]**	27	0.94 [0.62-1.37]	155	**0.59 [0.50-0.69]**	97	**0.56 [0.45-0.68]**	58	**0.64 [0.49-0.83]**	95	**0.55 [0.45-0.67]**	11	**0.54 [0.27-0.97]**	6	**0.40 [0.14-0.86]**
Adenocarcinoma	192	**0.54 [0.47-0.62]**	26	0.77 [0.51-1.13]	142	**0.51 [0.43-0.60]**	84	**0.45 [0.36-0.55]**	58	**0.62 [0.47-0.80]**	85	**0.45 [0.36-0.55]**	11	**0.53 [0.26-0.95]**	9	0.57 [0.26-1.09]
Mesothelioma	17	**0.36 [0.21-0.58]**	1	0.29 [0.00-1.60]	14	**0.37 [0.20-0.62]**	9	**0.36 [0.16-0.69]**	5	**0.38 [0.12-0.89]**	8	**0.33 [0.14-0.65]**	2	0.72 [0.08-2.61]	1	0.49 [0.01-2.72]
Digestive organs:																
Oesophagus	150	**0.78 [0.66-0.92]**	12	0.73 [0.38-1.27]	113	**0.74 [0.61-0.89]**	72	**0.70 [0.55-0.88]**	41	0.82 [0.59-1.11]	58	**0.57 [0.44-0.74]**	8	0.69 [0.30-1.35]	10	1.23 [0.59-2.26]
Stomach	217	0.90 [0.78-1.02]	10	0.56 [0.27-1.04]	169	0.87 [0.74-1.01]	102	**0.79 [0.65-0.96]**	67	1.00 [0.78-1.27]	114	0.93 [0.77-1.12]	8	0.53 [0.23-1.05]	9	0.81 [0.37-1.54]
Colon	609	**0.87 [0.80-0.94]**	66	1.25 [0.96-1.59]	465	**0.82 [0.75-0.90]**	275	**0.75 [0.67-0.85]**	190	0.95 [0.82-1.09]	299	**0.82 [0.73-0.92]**	31	0.76 [0.52-1.08]	26	0.82 [0.53-1.20]
Rectum	396	0.99 [0.89-1.09]	27	0.84 [0.55-1.22]	317	0.98 [0.88-1.10]	212	1.00 [0.87-1.14]	105	0.95 [0.78-1.15]	188	0.90 [0.78-1.04]	26	1.07 [0.70-1.57]	15	0.83 [0.47-1.37]
Liver and intrahepatic bile ducts	257	**0.80 [0.70-0.90]**	21	0.76 [0.47-1.16]	197	**0.77 [0.66-0.88]**	138	**0.82 [0.69-0.97]**	59	**0.67 [0.51-0.86]**	120	**0.70 [0.58-0.84]**	17	0.92 [0.53-1.47]	8	0.58 [0.25-1.15]
Pancreas	179	**0.81 [0.70-0.94]**	14	0.77 [0.42-1.30]	145	**0.82 [0.69-0.97]**	97	0.85 [0.69-1.03]	48	0.78 [0.57-1.03]	89	**0.77 [0.62-0.95]**	11	0.85 [0.42-1.52]	10	1.01 [0.49-1.87]
Anus	6	0.47 [0.17-1.03]	1	0.92 [0.01-5.11]	4	0.40 [0.11-1.01]	2	0.31 [0.03-1.11]	2	0.56 [0.06-2.03]	3	0.45 [0.09-1.31]	1	1.37 [0.02-7.62]	0	-
Women																
All sites	3763	0.98 [0.95-1.02]	342	1.08 [0.97-1.20]	2708	**0.95 [0.91-0.98]**	1346	**0.93 [0.88-0.98]**	1362	0.97 [0.92-1.02]	474	0.97 [0.88-1.06]	303	**0.88 [0.79-0.99]**	533	1.01 [0.92-1.09]
Upper aero-digestive tract and respiratory cancers:																
Oral cavity and pharynx	30	**0.48 [0.33-0.69]**	4	0.65 [0.17-1.66]	20	**0.44 [0.27-0.68]**	9	**0.37 [0.17-0.70]**	11	**0.53 [0.26-0.94]**	1	0.13 [0.00-0.71]	1	0.17 [0.00-0.96]	5	0.57 [0.18-1.32]
Larynx	7	0.78 [0.31-1.61]	0	-	7	1.06 [0.43-2.19]	3	0.82 [0.16-2.40]	4	1.37 [0.37-3.51]	0	-	0	-	1	0.78 [0.01-4.36]
Trachea, bronchus and lung	150	**0.66 [0.56-0.77]**	15	0.73 [0.41-1.20]	100	**0.59 [0.48-0.72]**	47	**0.54 [0.40-0.72]**	53	**0.64 [0.48-0.83]**	16	**0.54 [0.31-0.88]**	14	0.69 [0.38-1.15]	18	**0.56 [0.33-0.88]**
Squamous cell	17	**0.54 [0.31-0.86]**	2	0.75 [0.08-2.70]	9	**0.38 [0.17-0.72]**	6	0.50 [0.18-1.09]	3	**0.26 [0.05-0.75]**	1	0.25 [0.00-1.36]	3	1.06 [0.21-3.10]	1	0.23 [0.00-1.27]
Adenocarcinoma	96	0.82 [0.66-1.00]	10	0.91 [0.43-1.67]	65	**0.75 [0.58-0.96]**	32	0.72 [0.49-1.01]	33	0.79 [0.54-1.11]	13	0.87 [0.46-1.49]	7	0.67 [0.27-1.38]	12	0.73 [0.37-1.27]
Mesothelioma	7	0.74 [0.30-1.52]	1	1.65 [0.02-9.20]	6	0.83 [0.30-1.81]	3	0.83 [0.17-2.42]	3	0.84 [0.14-2.45]	3	2.60 [0.52-7.59]	1	1.24 [0.02-6.91]	0	-
Digestive organs:																
Oesophagus	24	0.73 [0.47-1.08]	2	0.85 [0.10-3.06]	17	0.68 [0.40-1.10]	6	0.50 [0.18-1.10]	11	0.85 [0.42-1.52]	3	0.73 [0.15-2.15]	1	0.34 [0.00-1.89]	5	1.11 [0.36-2.60]
Stomach	100	1.05 [0.85-1.28]	6	1.13 [0.41-2.46]	82	1.12 [0.89-1.39]	35	1.02 [0.71-1.42]	47	1.21 [0.89-1.61]	11	0.91 [0.45-1.62]	7	0.83 [0.33-1.72]	17	1.32 [0.77-2.11]
Colon	424	0.95 [0.86-1.05]	23	0.87 [0.55-1.31]	319	0.94 [0.84-1.05]	153	1.01 [0.85-1.18]	166	0.89 [0.76-1.03]	60	1.04 [0.80-1.34]	31	0.83 [0.56-1.17]	55	0.91 [0.69-1.19]
Rectum	162	**0.84 [0.72-0.98]**	14	1.08 [0.59-1.81]	122	0.84 [0.69-1.00]	55	0.79 [0.60-1.03]	67	0.88 [0.68-1.11]	19	0.78 [0.47-1.22]	21	1.24 [0.77-1.90]	15	**0.58 [0.32-0.95]**
Liver and intrahepatic bile ducts	43	**0.71 [0.51-0.95]**	4	1.04 [0.28-2.66]	32	**0.70 [0.48-0.98]**	14	0.69 [0.38-1.16]	18	0.70 [0.41-1.11]	9	1.16 [0.53-2.20]	4	0.79 [0.21-2.02]	6	0.73 [0.27-1.59]
Pancreas	157	0.93 [0.79-1.09]	13	1.27 [0.67-2.16]	118	0.92 [0.76-1.10]	38	**0.67 [0.48-0.92]**	80	1.12 [0.89-1.39]	22	1.01 [0.63-1.53]	9	0.63 [0.29-1.19]	21	0.91 [0.57-1.40]
Anus	14	**0.55 [0.30-0.93]**	2	0.90 [0.10-3.26]	8	**0.42 [0.18-0.84]**	6	0.61 [0.22-1.34]	2	0.22 [0.02-0.80]	2	0.63 [0.07-2.28]	1	0.43 [0.01-2.42]	1	0.28 [0.00-1.57]

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481

482 Table 4: Standardized incidence ratio (SIR) for reproductive and endocrine system cancers, 2005-2011

	All (n= 98794)		No work on farm (n= 9378)		Work on farm (n= 76933)		Occupational status: Farmowners (n= 51351)		Occupational status: Farmworkers (n= 25582)		Pesticide use: Pesticides on crops (n= 53435)		Pesticide use: Other pesticides (n= 4598)		Pesticide use: No pesticides (n= 3312)	
	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]
Men																
Breast	20	1.02 [0.62-1.58]	1	0.60 [0.01-3.33]	19	1.22 [0.73-1.90]	12	1.18 [0.61-2.05]	7	1.30 [0.52-2.68]	11	1.07 [0.53-1.92]	2	1.75 [0.20-6.31]	0	-
Prostate	2538	**1.07 [1.03-1.11]**	207	0.97 [0.84-1.11]	2032	**1.07 [1.03-1.12]**	1286	1.02 [0.97-1.08]	746	**1.17 [1.09-1.26]**	1345	**1.09 [1.03-1.15]**	125	0.85 [0.71-1.02]	136	**1.27 [1.06-1.50]**
Testis	16	0.78 [0.44-1.26]	5	2.25 [0.72-5.24]	10	0.65 [0.31-1.20]	6	0.59 [0.22-1.28]	4	0.77 [0.21-1.98]	8	0.69 [0.30-1.35]	0	-	0	-
Thyroid	39	0.79 [0.56-1.07]	6	1.14 [0.41-2.47]	24	**0.62 [0.40-0.93]**	15	**0.58 [0.32-0.96]**	9	0.71 [0.32-1.35]	19	0.69 [0.41-1.07]	1	0.36 [0.00-2.00]	2	0.96 [0.11-3.45]
Women																
Breast	1086	**0.89 [0.84-0.95]**	139	1.08 [0.91-1.28]	749	**0.84 [0.79-0.91]**	426	**0.88 [0.80-0.97]**	323	**0.80 [0.72-0.89]**	105	**0.70 [0.57-0.84]**	94	0.82 [0.66-1.00]	181	1.05 [0.91-1.22]
Cervix uteri	38	**0.70 [0.50-0.96]**	3	0.49 [0.10-1.42]	25	**0.64 [0.42-0.95]**	11	**0.53 [0.27-0.96]**	14	0.77 [0.42-1.29]	5	0.72 [0.23-1.69]	2	0.39 [0.04-1.40]	6	0.78 [0.29-1.70]
Corpus uteri	213	1.03 [0.90-1.18]	18	1.05 [0.62-1.66]	159	1.03 [0.87-1.20]	78	0.97 [0.77-1.21]	81	1.08 [0.86-1.34]	27	1.02 [0.67-1.49]	16	0.87 [0.50-1.41]	32	1.12 [0.77-1.59]
Ovary	145	1.06 [0.89-1.24]	15	1.33 [0.74-2.19]	103	1.00 [0.81-1.21]	52	0.94 [0.70-1.23]	51	1.06 [0.79-1.40]	22	1.28 [0.80-1.93]	10	0.79 [0.38-1.45]	19	1.01 [0.61-1.57]
Thyroid	101	1.05 [0.86-1.28]	16	1.11 [0.63-1.79]	69	1.04 [0.81-1.32]	47	1.21 [0.89-1.61]	22	0.80 [0.50-1.21]	12	1.04 [0.54-1.82]	11	1.22 [0.61-2.18]	21	1.44 [0.89-2.20]

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485 Table 5: Standardized incidence ratio (SIR) for lip, cutaneous cancers and other solid tumors, 2005-2011

	All (n= 98794)		No work on farm (n= 9378)		Work on farm (n= 76933)		Occupational status: Farmowners (n= 51351)		Occupational status: Farmworkers (n= 25582)		Pesticide use: Pesticides on crops (n= 53435)		Pesticide use: Other pesticides (n= 4598)		Pesticide use: No pesticides (n= 3312)	
	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]
Men																
Lip and cutaneous cancers:																
Lip	27	1.38 [0.91-2.01]	0	-	27	**1.69 [1.11-2.45]**	12	1.11 [0.57-1.94]	15	**2.87 [1.61-4.74]**	21	**2.05 [1.27-3.13]**	1	0.83 [0.01-4.60]	0	-
Skin melanoma	178	0.96 [0.83-1.12]	17	1.05 [0.61-1.69]	137	0.94 [0.79-1.11]	75	**0.78 [0.61-0.98]**	62	1.24 [0.95-1.59]	96	0.98 [0.80-1.20]	12	1.14 [0.59-2.00]	6	0.74 [0.27-1.62]
Other solid tumours:																
Central nervous system	87	0.96 [0.77-1.18]	3	0.37 [0.08-1.09]	76	1.06 [0.83-1.32]	56	1.17 [0.88-1.52]	20	0.83 [0.51-1.28]	52	1.09 [0.81-1.43]	5	0.90 [0.29-2.11]	2	0.50 [0.06-1.79]
Gliomas	81	1.00 [0.79-1.24]	3	0.40 [0.08-1.18]	70	1.09 [0.85-1.38]	50	1.16 [0.86-1.53]	20	0.94 [0.57-1.45]	48	1.12 [0.83-1.48]	5	1.00 [0.32-2.33]	2	0.55 [0.06-1.98]
Glioblastomas	56	1.04 [0.78-1.35]	3	0.60 [0.12-1.76]	48	1.12 [0.83-1.49]	36	1.26 [0.88-1.74]	12	0.85 [0.44-1.48]	32	1.12 [0.77-1.59]	3	0.91 [0.18-2.66]	2	0.81 [0.09-2.93]
Bladder	278	**0.67 [0.60-0.76]**	32	1.04 [0.71-1.47]	217	**0.65 [0.57-0.75]**	133	**0.62 [0.52-0.74]**	84	**0.70 [0.56-0.87]**	124	**0.59 [0.49-0.70]**	14	**0.58 [0.31-0.97]**	18	0.93 [0.55-1.47]
Kidney	301	0.99 [0.88-1.11]	27	1.05 [0.69-1.52]	236	0.97 [0.85-1.10]	157	0.99 [0.84-1.15]	79	0.94 [0.75-1.18]	151	0.94 [0.80-1.11]	16	0.91 [0.52-1.47]	17	1.23 [0.71-1.97]
Women																
Lip and cutaneous cancers:																
Lip	4	0.75 [0.20-1.92]	0	-	1	0.24 [0.00-1.35]	1	0.58 [0.01-3.20]	0	-	0	-	1	2.24 [0.03-12.45]	0	-
Skin melanoma	169	**1.23 [1.05-1.43]**	18	1.36 [0.80-2.14]	123	**1.21 [1.01-1.45]**	61	1.14 [0.87-1.46]	62	**1.30 [1.00-1.66]**	26	1.50 [0.98-2.19]	10	0.80 [0.38-1.48]	18	0.93 [0.55-1.46]
Other solid tumours:																
Central nervous system	52	0.96 [0.72-1.26]	3	0.66 [0.13-1.92]	40	0.99 [0.71-1.35]	16	0.80 [0.46-1.30]	24	1.18 [0.76-1.76]	10	1.45 [0.69-2.66]	8	1.68 [0.72-3.31]	5	0.67 [0.22-1.56]
Gliomas	43	0.94 [0.68-1.26]	3	0.72 [0.15-2.12]	31	0.91 [0.62-1.29]	14	0.78 [0.43-1.32]	17	1.04 [0.61-1.67]	8	1.37 [0.59-2.71]	5	1.22 [0.39-2.85]	4	0.63 [0.17-1.62]
Glioblastomas	26	0.88 [0.58-1.29]	2	0.78 [0.09-2.80]	20	0.91 [0.55-1.40]	9	0.76 [0.35-1.45]	11	1.07 [0.54-1.92]	5	1.32 [0.42-3.07]	4	1.56 [0.42-3.99]	2	0.49 [0.05-1.77]
Bladder	60	0.79 [0.61-1.02]	2	0.51 [0.06-1.82]	43	0.74 [0.54-1.00]	24	0.95 [0.61-1.42]	19	**0.58 [0.35-0.91]**	10	1.00 [0.48-1.83]	5	0.79 [0.26-1.85]	5	0.49 [0.16-1.13]
Kidney	118	0.99 [0.82-1.18]	8	0.92 [0.39-1.81]	86	0.95 [0.76-1.18]	46	1.02 [0.74-1.36]	40	0.89 [0.64-1.21]	18	1.16 [0.68-1.83]	7	0.68 [0.27-1.39]	13	0.80 [0.42-1.37]

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488 Table 6: Standardized incidence ratio (SIR) for haematological malignancies, 2005-2011

	All (n= 98794)		No work on farm (n= 9378)		Work on farm (n= 76933)		Occupational status: Farmowners (n= 51351)		Occupational status: Farmworkers (n= 25582)		Pesticide use: Pesticides on crops (n= 53435)		Pesticide use: Other pesticides (n= 4598)		Pesticide use: No pesticides (n= 3312)	
	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]	N obs	SIR [95%CI]
Men																
Hodgkin Lymphoma	24	1.28 [0.82-1.90]	2	1.18 [0.13-4.27]	19	1.29 [0.78-2.02]	10	1.04 [0.50-1.92]	9	1.75 [0.80-3.33]	10	0.97 [0.46-1.78]	2	1.88 [0.21-6.79]	3	3.81 [0.77-11.14]
Non Hodgkin Lymphoma	644	**1.09 [1.01-1.18]**	57	1.23 [0.93-1.59]	516	1.09 [1.00-1.19]	336	1.10 [0.98-1.22]	180	1.08 [0.92-1.25]	310	1.01 [0.90-1.12]	40	1.16 [0.83-1.58]	32	1.23 [0.84-1.73]
Chronic lymphocytic leukaemia/lymphocytic lymphoma	151	1.09 [0.93-1.28]	13	1.21 [0.64-2.07]	124	1.12 [0.93-1.33]	80	1.11 [0.88-1.38]	44	1.12 [0.82-1.51]	69	0.97 [0.75-1.22]	12	1.45 [0.75-2.53]	7	1.12 [0.45-2.30]
Follicular lymphoma	29	**0.67 [0.45-0.97]**	4	1.00 [0.27-2.56]	22	**0.65 [0.40-0.98]**	17	0.75 [0.44-1.20]	5	0.44 [0.14-1.03]	13	**0.56 [0.30-0.95]**	2	0.82 [0.09-2.97]	2	1.11 [0.12-3.99]
Malignant lymphoma, large B-cell, diffuse	116	1.12 [0.93-1.34]	8	1.02 [0.44-2.01]	92	1.10 [0.89-1.35]	57	1.06 [0.80-1.37]	35	1.19 [0.83-1.65]	50	0.93 [0.69-1.23]	6	0.98 [0.36-2.14]	8	1.74 [0.75-3.42]
Mantle cell lymphoma	21	0.96 [0.59-1.47]	2	1.12 [0.13-4.05]	13	0.74 [0.39-1.27]	9	0.80 [0.36-1.52]	4	0.64 [0.17-1.63]	7	0.62 [0.25-1.27]	3	2.31 [0.46-6.75]	1	1.00 [0.01-5.54]
Marginal zone lymphoma	35	1.02 [0.71-1.42]	1	0.36 [0.00-2.00]	27	0.98 [0.65-1.43]	15	0.86 [0.48-1.41]	12	1.21 [0.62-2.11]	16	0.90 [0.51-1.46]	2	0.97 [0.11-3.51]	2	1.29 [0.14-4.65]
Multiple myeloma and plasmocytoma	157	**1.38 [1.18-1.62]**	13	1.49 [0.79-2.54]	129	**1.42 [1.18-1.68]**	93	**1.59 [1.29-1.95]**	36	1.10 [0.77-1.52]	88	**1.49 [1.19-1.84]**	8	1.23 [0.53-2.42]	5	0.98 [0.32-2.29]
Lymphoplasmacytic lymphoma/Waldenström	49	1.03 [0.77-1.37]	4	1.15 [0.31-2.93]	44	1.15 [0.83-1.54]	29	1.16 [0.78-1.66]	15	1.12 [0.63-1.86]	28	1.12 [0.75-1.62]	3	1.10 [0.22-3.22]	2	1.00 [0.11-3.61]
NK/T-cell lymphoma	40	1.16 [0.83-1.58]	5	1.71 [0.55-3.99]	28	1.02 [0.68-1.48]	14	0.79 [0.43-1.33]	14	1.45 [0.79-2.43]	17	0.94 [0.55-1.50]	2	1.02 [0.11-3.68]	2	1.32 [0.15-4.77]
Mycosis fungoides	11	0.99 [0.49-1.77]	2	2.03 [0.23-7.34]	8	0.91 [0.39-1.80]	3	-	5	1.56 [0.50-3.65]	5	0.85 [0.28-1.99]	0	-	1	1.95 [0.03-10.84]
Non Hodgkin Lymphoma NOS	29	0.87 [0.58-1.25]	4	1.78 [0.48-4.55]	24	0.89 [0.57-1.32]	14	0.81 [0.44-1.36]	10	1.02 [0.49-1.87]	13	0.73 [0.39-1.26]	1	0.57 [0.01-3.15]	2	1.43 [0.16-5.17]
Acute myeloid leukaemia	64	1.00 [0.77-1.28]	8	1.68 [0.72-3.31]	50	0.97 [0.72-1.28]	29	0.88 [0.59-1.27]	21	1.12 [0.69-1.72]	25	0.76 [0.49-1.12]	4	1.09 [0.29-2.79]	4	1.38 [0.37-3.53]
Chronic myeloproliferative disorders	72	0.86 [0.67-1.08]	5	0.74 [0.24-1.73]	62	0.93 [0.71-1.19]	31	0.71 [0.48-1.01]	31	1.32 [0.89-1.87]	29	**0.66 [0.44-0.95]**	10	2.01 [0.96-3.69]	6	1.61 [0.59-3.50]
Myelodysplastic syndrome	122	0.93 [0.77-1.11]	6	0.73 [0.27-1.59]	96	0.90 [0.73-1.10]	67	0.99 [0.77-1.26]	29	0.74 [0.50-1.07]	59	0.91 [0.69-1.18]	5	0.63 [0.20-1.48]	7	1.10 [0.44-2.27]
Cutaneous lymphoma	25	1.02 [0.66-1.50]	2	0.97 [0.11-3.49]	19	0.97 [0.59-1.52]	11	0.87 [0.43-1.56]	8	1.16 [0.50-2.29]	11	0.84 [0.42-1.51]	4	2.95 [0.79-7.56]	1	0.94 [0.01-5.23]
Women																
Hodgkin Lymphoma	10	1.10 [0.52-2.01]	2	1.84 [0.21-6.65]	6	0.93 [0.34-2.02]	4	1.20 [0.32-3.07]	2	0.64 [0.07-2.32]	2	1.75 [0.20-6.32]	1	1.18 [0.02-6.55]	0	-
Non Hodgkin Lymphoma	367	1.05 [0.94-1.16]	29	1.21 [0.81-1.74]	262	0.99 [0.87-1.11]	110	0.89 [0.73-1.08]	152	1.07 [0.91-1.25]	48	1.10 [0.81-1.45]	32	1.05 [0.72-1.49]	56	1.18 [0.89-1.54]
Chronic lymphocytic leukaemia/lymphocytic lymphoma	67	0.94 [0.73-1.19]	5	1.06 [0.34-2.48]	51	0.94 [0.70-1.23]	22	0.86 [0.54-1.30]	29	1.01 [0.67-1.45]	13	1.48 [0.79-2.53]	5	0.80 [0.26-1.86]	9	0.93 [0.43-1.77]
Follicular lymphoma	33	1.02 [0.70-1.43]	2	0.68 [0.08-2.44]	25	1.04 [0.67-1.53]	12	0.92 [0.47-1.60]	13	1.18 [0.63-2.01]	7	1.76 [0.70-3.62]	4	1.36 [0.36-3.47]	4	0.89 [0.24-2.27]
Malignant lymphoma, large B-cell, diffuse	70	0.97 [0.75-1.22]	6	1.32 [0.48-2.88]	43	0.78 [0.57-1.05]	17	0.69 [0.40-1.10]	26	0.86 [0.56-1.26]	7	0.76 [0.31-1.58]	4	0.65 [0.17-1.65]	12	1.23 [0.64-2.15]
Mantle cell lymphoma	7	1.10 [0.44-2.27]	0	-	6	1.24 [0.45-2.71]	2	0.81 [0.09-2.93]	4	1.69 [0.46-4.34]	1	1.28 [0.02-7.12]	1	1.70 [0.02-9.47]	1	1.18 [0.02-6.57]
Marginal zone lymphoma	27	1.10 [0.73-1.60]	1	0.56 [0.01-3.09]	22	1.19 [0.75-1.80]	7	0.80 [0.32-1.64]	15	1.55 [0.87-2.55]	5	1.65 [0.53-3.86]	4	1.87 [0.50-4.79]	5	1.49 [0.48-3.48]
Multiple myeloma and plasmocytoma	97	**1.26 [1.02-1.54]**	9	1.79 [0.82-3.41]	75	**1.29 [1.01-1.61]**	35	1.33 [0.92-1.85]	40	1.25 [0.89-1.70]	11	1.12 [0.56-2.01]	8	1.21 [0.52-2.39]	15	1.46 [0.81-2.40]
Lymphoplasmacytic lymphoma/Waldenström	24	1.18 [0.76-1.76]	0	-	16	1.03 [0.59-1.67]	6	0.89 [0.32-1.93]	10	1.14 [0.54-2.09]	2	0.79 [0.09-2.87]	2	1.18 [0.13-4.24]	3	1.12 [0.22-3.27]
NK/T-cell lymphoma	24	1.40 [0.90-2.08]	6	**4.45 [1.63-9.69]**	13	1.01 [0.54-1.72]	7	1.11 [0.44-2.28]	6	0.91 [0.33-1.99]	0	-	2	1.33 [0.15-4.79]	4	1.72 [0.46-4.40]
Mycosis fungoides	2	0.51 [0.06-1.84]	1	2.45 [0.03-13.61]	0	-	0	-	0	-	0	-	0	-	0	-
Non Hodgkin Lymphoma NOS	14	0.66 [0.36-1.11]	0	-	8	**0.49 [0.21-0.97]**	1	**0.16 [0.00-0.87]**	7	0.71 [0.28-1.47]	1	0.37 [0.00-2.06]	0	-	3	1.04 [0.21-3.04]
Acute myeloid leukaemia	40	1.05 [0.75-1.43]	3	1.10 [0.22-3.23]	26	0.91 [0.59-1.33]	8	0.60 [0.26-1.17]	18	1.18 [0.70-1.86]	7	1.43 [0.57-2.95]	3	0.91 [0.18-2.66]	6	1.15 [0.42-2.49]
Chronic myeloproliferative disorders	58	1.08 [0.82-1.40]	8	2.07 [0.89-4.09]	40	0.99 [0.71-1.35]	27	1.38 [0.91-2.00]	13	0.63 [0.33-1.07]	5	0.74 [0.24-1.72]	4	0.83 [0.22-2.14]	11	1.51 [0.75-2.71]
Myelodysplastic syndrome	97	**1.34 [1.08-1.63]**	5	1.47 [0.47-3.43]	78	**1.40 [1.10-1.74]**	40	**1.57 [1.12-2.13]**	38	1.25 [0.89-1.72]	14	1.45 [0.79-2.44]	9	1.48 [0.67-2.80]	12	1.22 [0.63-2.13]
Cutaneous lymphoma	14	1.04 [0.57-1.75]	4	**3.79 [1.02-9.70]**	7	0.69 [0.28-1.43]	2	0.43 [0.05-1.54]	5	0.92 [0.30-2.16]	1	0.59 [0.01-3.28]	2	1.76 [0.20-6.36]	0	-

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