STATES OF JERSEY

CANCER IN JERSEY: REPORT OF THE PUBLIC HEALTH ENGLAND KNOWLEDGE AND INTELLIGENCE TEAM (SOUTH WEST), FOR THE JERSEY MEDICAL OFFICER OF HEALTH

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STATES GREFFE

Cancer in Jersey

July 2013

Produced by the Public Health England Knowledge and Intelligence Team
(South West), for the Jersey Medical Officer of Health

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The National Cancer Intelligence Network (NCIN) is a UK-wide partnership operated by Public Health England. The NCIN coordinates and develops analysis and intelligence to drive improvements in prevention, standards of cancer care and clinical outcomes for cancer patients.

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Introduction by Jersey Medical Officer of Health

In 2012 I commissioned this independent scoping report from the then South West Public Health Observatory (now Public Health England Knowledge and Intelligence Team South West), after Jersey's States Assembly had adopted a proposition asking for a detailed study of Jersey's cancer rates (Proposition 144/2011).

Proposition 144/2011 was based on the concerns of former Deputy Paul le Claire about the significantly higher rates of certain cancers in Jersey in the 2011 Channel Islands Cancer Registry Report. Concern was also expressed by the Deputy about the role of radon in cancer causation locally.

This report examines those cancers for which Jersey has significantly higher incidence rates (as compared with the south-west of England) and their major risk factors. It explores whether these higher incidence rates are reasonably explained by the known risk factors, and whether a more in-depth epidemiological research study is warranted.

Dr Susan Turnbull
Jersey Medical Officer of Health

Executive summary

Incidence of cancer on the whole is around 6% higher in Jersey than the south-west region of England with around 28 more new cases annually than would be expected in our population, based on rates in the South West. There were 2,450 cancers in 2005-2009 (Table 1) compared to 2,307 expected, an average of 28 excess per year. In particular there were 15 more cases of head and neck cancers (including cancers of the mouth, tongue, larynx and the thyroid gland) 14 more malignant melanoma and 11 more lung cancer cases than would be expected if the south west rates applied. This is counterbalanced by other cancers with lower numbers than might be expected.

In the view of the authors the higher incidence rates of certain cancers in Jersey's population can be readily explained by the main risks associated with the particular cancer. Those risk factors are predominantly smoking, UV exposure (sunshine) and alcohol consumption. In an island with high sunshine hours, a legacy of cheap tobacco products and high per capita alcohol consumption, the increased incidence of cancers linked to these risk factors is not unexpected (for example, lung cancer, oral cancer, malignant melanoma).

The only cancer where radon is a known risk factor is lung cancer. This risk is very small (0.5% of all lung cancer deaths) when compared with the lung cancer risk associated with smoking (83% of all lung cancer deaths). We would estimate that there is likely to be one case of lung cancer every three to four years caused solely by radon in Jersey's population and around two deaths per year due to the combination of smoking and exposure to radon gas. The greatest risk from radon gas is to those who are also smokers, who by virtue of smoking already have a high risk of lung cancer. In this situation radon can exert a small incremental effect. The lifetime risk of lung cancer of those who smoke and are exposed to radon is over 30 times higher than for a non smoker with the same exposure. Thus smoking poses a far higher risk than exposure to radon gas.

The main risk factors for most head and neck cancers are smoking and excessive alcohol use. These risks are multiplicative, meaning that the risk to someone who smokes and drinks heavily is more than the sum of the individual risk factors. Analysis has shown that one particular group of head and neck cancers (oral cavity and pharynx) is caused by smoking in 70% of cases. The high use of alcohol and smoking in Jersey is consistent with the higher rates of these cancers.

Jersey's high sunshine hours are the most likely cause of the high rates of skin cancer. However, there are other contributing factors such as the coastal nature of the entire island, outdoor leisure activities and a general increase in holidays in sunny countries. These all play a part in the increased and increasing incidence.

On the basis of this analysis of the Jersey data and our experience of trying to identify an environmental risk linked to cancer clusters or increased cancer rates (SWPHO factsheet No18: http://www.swpho.nhs.uk/resource/item.aspx?RID=9108), there is no evidence to support the need for a more in-depth epidemiological study.

Background

Public Health England's Knowledge and Intelligence Team (KIT) South West (formerly the South West Public Health Observatory) analyses data on cancers diagnosed in residents of Jersey, on behalf of the Public Health department in Jersey. As part of this process it produces an annual report on the basic statistics on cancer in the Channel Islands.

The States of Jersey requested the Public Health department to investigate the high incidence of certain types of cancer, and they asked KIT South West to produce an additional, more detailed, report on cancer in Jersey.

KIT South West have cancer data for the Channel Islands to 2009, plus data for the south-west of England and England. Additional data on health behaviours and risk factors are obtained from secondary sources.

Methods

Cancer incidence (new cases) data is presented for the years 2005 to 2009 inclusive. It is necessary to use a wider range of years than we would use for a much larger population, for example, England because of the smaller number of cancers arising from this small island population. Data is presented for adults aged 20 and over, with paediatric and young persons' cancers shown as a separate group.

The risk of developing cancer is strongly influenced by age and sex, and so the makeup of the population in an area will affect the number of cases. To allow a fair comparison between different areas or the same area through time, directly age-standardised rates (ASRs) are calculated. This method looks at the occurrence of cancer in the population of interest, and calculates what the rate would be in a pre-determined population (known as the standard population), controlling for age. If the same standard population is used for all populations analysed, then the rates are directly comparable with each other to measure whether there are any differences of significance. Rates are standardised to the 1976 European Standard Population.

A disadvantage of ASRs is that the number produced has no intrinsic meaning with regard to the number of cases of a cancer in a population. A similar technique called a standardised incidence ratio (SIR) is used to help understand the impact in terms of cases. An SIR is calculated by applying a background rate (for example, the England rate) to the population of interest, controlling for age. This yields a total expected number of cases, which can be compared to the observed cases. Any difference is expressed as a ratio of the two numbers, commonly multiplied by 100, so that an SIR of 110 would mean 10% more cases were observed than expected.

When ASRs and SIRs are reported, the 95% confidence intervals are also reported (Lower Confidence Interval: LCI, Upper Confidence Interval: UCI). The confidence interval is a statistical concept which defines the degree of variation in a rate which can be considered normal. Occurrence of a disease depends on complicated relationships between a multitude of risk factors, so there are fluctuations over time or geography which do not necessarily reflect a real increase or decrease in a rate. As the population of interest becomes smaller, an increase or decrease of just one or two cases has a larger effect on the rate. Hence the smaller the population and the smaller the number of cases, the larger the confidence interval.

Generally speaking, if the confidence interval of two ASRs overlap it is not possible to say that there is a statistically significant difference between the area investigated and the comparison area. 95% confidence intervals mean that out of 100 comparisons/tests we could expect five to show a significant difference when none exists, or vice versa.

For some data, more sophisticated statistical tests are used. These report the likelihood that two rates are not significantly different (for example, that the observed differences could have occurred by chance) as a p-value. It is convention to accept a p-value of 0.05 or less as evidence that the rates are significantly different.

Cancer Incidence

Overview

Higher Incidence

Incidence of cancer on the whole is higher in Jersey than the South West (Table 1). There are around 28 more cases than would be expected annually for the size of Jersey's population. This is 6% higher than the South West.

The rate of head and neck cancers is significantly higher in Jersey than in the South West . This group includes cancers of the mouth, tongue, larynx and the thyroid gland. There are around 15 extra cases per year over the expected number. This is 92% higher than the rate in the South West, but the observed number is still fairly small at 31 cases per year.

Lung cancer rates are significantly higher in Jersey compared to the South West . There are about 59 cases each year, compared to an expected number of 48. This is 25% higher than the South West incidence rate for this cancer.

Skin cancer rates are significantly higher in Jersey than the South West (which itself has a significantly higher rate than the England average). Skin cancer is analysed as two distinct groups: malignant melanomas and non melanoma skin cancers (NMSC). Malignant melanoma is less common, but is the more life-threatening type. NMSC is very common, but only rarely leads to death. NMSC can also recur frequently, but cancer registries only record the first instance in each year.

There are about 14 more cases of malignant melanoma than expected each year in Jersey: 60% higher than the South West rate.
There are about 86 more cases of NMSC than expected each year in Jersey: 41% higher than the South West rate.

Lower Incidence

The incidence of cancer of the uterus (womb) is lower in Jersey than the South West, but this is an uncommon cancer in the UK as a whole. There were four cases less than expected each year: This is 36% lower than the South West rate.

Cancers of the kidney and ureter occurred less frequently than expected in Jersey. There were just under 11 cases each year, with nearly 14 expected. Although statistically significant, this only represents three fewer cases each year.

Any cancer which is not within the major cancer groups has been counted in an 'other sites' group. The incidence of cancers in other sites is lower than in the South West, with about nine cases less than expected each year.

There are no obvious explanations for these lower cancer rates but as numbers are so low it is unlikely that the impact on clinical services would be noticeable.

Table 1: Incidence of cancer in Jersey, age-standardised rate per 100,000, with comparison to the South West, 2005 to 2009

Cancer site/category (ICD-10 code)	Jersey						South West					ASR Difference test	
	Count	Expected count	ASR	LCI	UCI	Crude rate	Count	ASR	LCI	UCI	Crude rate	p-value	High/Low
All malignancies (C00-C97 excl C44)	2,450	2,307	597.7	573.5	622.0	675.8	149,992	559.9	556.8	562.9	755.0	<0.01	High
Head & neck (C00-C14, C30-C32, C73)	153	80	40.7	34.2	47.2	42.2	4,803	20.6	20.0	21.2	24.2	<0.01	High
Upper gastrointestinal (C15-C16, C25)	170	163	39.9	33.8	46.1	46.9	11,114	37.9	37.2	38.7	55.9	0.26	-
Colorectal (C18-C21)	297	290	68.8	60.7	76.8	81.9	19,555	67.6	66.6	68.6	98.4	0.39	-
Hepatobiliary (C22-C24)	41	36	10.2	7.3	13.8	11.3	2,378	8.4	8.0	8.7	12.0	0.14	-
Lung (C33-C34)	293	234	70.0	61.8	78.2	80.8	15,831	55.4	54.5	56.3	79.7	<0.01	High
Malignant melanoma (C43)	181	113	46.3	39.4	53.1	49.9	6,813	29.0	28.3	29.7	34.3	<0.01	High
Other skin (C44)	1,479	1,047	354.8	336.2	373.4	407.9	69,555	248.2	246.2	250.2	350.1	<0.01	High
Female breast (C50)	363	384	173.2	154.8	191.5	194.9	23,515	186.0	183.4	188.5	228.7	0.09	-
Uterus (C54-C55)	38	59	17.3	12.3	23.8	20.4	3,801	28.5	27.6	29.5	37.0	<0.01	Low
Ovary (C56)	51	55	23.4	17.4	30.8	27.4	3,498	26.0	25.1	27.0	34.0	0.22	-
Other gynaecological (C51-C53, C57-C58)	34	38	17.3	12.0	24.2	18.3	2,198	19.2	18.3	20.1	21.4	0.27	-
Prostate (C61)	325	305	167.1	148.7	185.4	184.3	20,631	155.9	153.7	158.1	215.2	0.12	-
Kidney and ureter (C64-C66)	53	68	13.2	9.9	17.2	14.6	4,407	16.7	16.1	17.2	22.2	0.03	Low
Bladder (C67)	78	71	17.3	13.6	21.5	21.5	4,934	16.6	16.1	17.1	24.8	0.38	-
Male urogenital excl. prostate (C60-C63 excl C61)	26	25	14.3	9.3	21.0	14.7	1,293	14.0	13.3	14.8	13.5	0.46	-
Brain and CNS (C70-C72)	35	38	9.4	6.5	13.1	9.7	2,288	9.8	9.4	10.3	11.5	0.39	-
Lymphoma (C81-C85, C96)	99	106	24.8	20.1	30.2	27.3	6,689	26.2	25.6	26.9	33.7	0.29	-
Leukaemia (C91-C95)	75	60	17.5	13.8	22.0	20.7	4,016	14.3	13.8	14.8	20.2	0.06	-
Other sites (Other Cs)	138	182	33.5	27.8	39.2	38.1	12,227	42.5	41.7	43.3	61.5	<0.01	Low
Paediatric – 0-19 years (C00-C97)	17	16	16.9	9.8	27.0	17.1	936	15.8	14.8	16.8	15.7	0.40	-

Source: Public Health England, Knowledge and Intelligence Team (South West)

Specific cancer types with significantly higher incidence

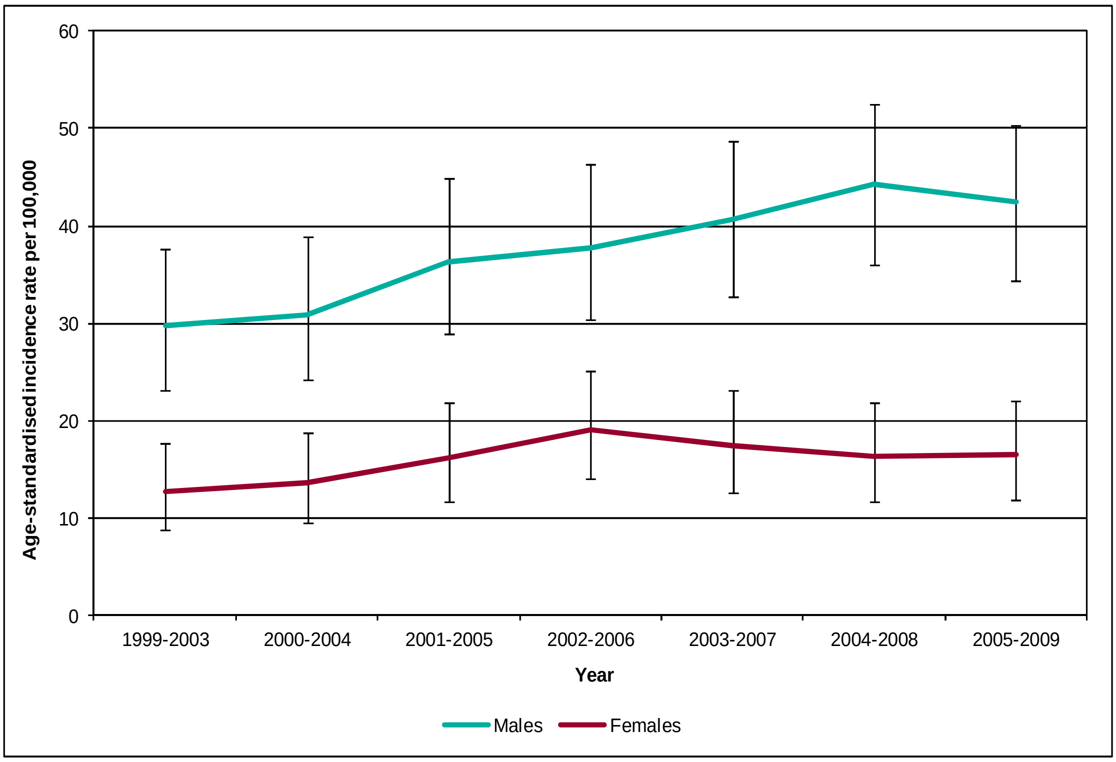
Head and neck cancers

Most head and neck cancers are associated with a history of exposure to smoking.

There has been an increase in numbers of head and neck cancers in the decade after the millennium year 2000, compared with the decade before.

Cancers of the larynx and tongue show a proportional decrease and slight reduction in numbers. These have a strong link to smoking and the combination of alcohol and tobacco use.

Figure 1: Incidence of head and neck cancers in Jersey, age-standardised rate per 100,000, 1999 to 2009 five-year rolling averages



Source: Public Health England, Knowledge and Intelligence Team (South West)

This group comprises cancers of the: lip, mouth, tongue, pharynx, nasal cavity, sinuses, larynx, and the thyroid gland. The most commonly occurring of these sub-sites in Jersey is the larynx, followed by thyroid and tongue. In the South West, cancer of the larynx is also most common, but tongue cancer is very nearly as common; then thyroid. In England overall, thyroid cancer is the most common followed by larynx then tongue.

Tables 2 and 3 provide a breakdown of types of head and neck cancer in Jersey. Data from the last decade and previous decade is shown, to examine if there has been a change in pattern of incidence. Ten-year averages are required because of smaller numbers. Figure 1 shows age-standardised rates of incidence for men and women over time. Population data (required for ASRs) are only available from 1999 onwards.

Overall numbers of head and neck cancers have increased in 2000 to 2009 compared with 1990 to 1999. The top three sub-sites have not changed, but the proportion of the total contributed by cancers of the larynx and tongue has dropped from 40% to 33%. This is important as cancers of the larynx and tongue are linked to smoking and excessive alcohol use, whereas these are not risk factors for cancer of the thyroid gland.

Analysis of rates is only possible for more recent years, therefore we cannot know if the increased number of cases in 2000 to 2009 reflects population changes or true changes in incidence. It is not possible to be certain that rates have changed since 1999 due to large confidence intervals induced by small numbers.

Cases of thyroid cancer have doubled and it is now the second most common head and neck cancer. This is in line with thyroid cancer rates in England and the South West which have been increasing since the early 1990s (National Cancer Intelligence Network, 2011). It has been suggested that the increase is due to better clinical imaging detecting small tumours.

Smoking is the major risk for all head and neck cancers, apart from thyroid cancer. As mentioned above, the combination of smoking and alcohol use is a risk for cancers of the mouth and tongue, and the larynx. Other factors known to be a risk for certain head and neck cancers are: the Human Papillomavirus (HPV), vitamin A deficiency, the Epstein-Barr virus, certain chemicals, and radiotherapy for a previous cancer.

Thyroid gland cancer is not linked to smoking. Risk of this cancer is increased by radiotherapy treatment to the head (especially in those who received it when a child) ,by certain thyroid diseases, a bowel disease called Familial Adenomatous Polyposis (FAP), and by family history.

Table 2: Incidence of head and neck cancers in Jersey, by sub-site, 1990 to 1999

1990 to1999		
Site	**Number**	**Percentage of all**
Malignant neoplasm of larynx	46	24%
Malignant neoplasm of other and unspecified parts of tongue	26	14%
Malignant neoplasm of thyroid gland	22	12%
Malignant neoplasm of tonsil	15	8%
Mal neo oth ill-def sites lip/oral cavity/pharynx	13	7%
Malignant neoplasm of floor of mouth	10	5%
Malignant neoplasm of pyriform sinus	10	5%
Malignant neoplasm of other and unspecified parts of mouth	9	5%
Malignant neoplasm of palate	6	3%
Malignant neoplasm of parotid gland	6	3%
Malignant neoplasm of accessory sinuses	5	3%
Malignant neoplasm of base of tongue	<5	2%
Malignant neoplasm of oropharynx	<5	2%
Malignant neoplasm of lip	<5	2%
Malignant neoplasm of gum	<5	2%
Malignant neoplasm of nasopharynx	<5	2%
Maligt neoplasm of oth and unspec major saliv glands	<5	1%
Malignant neoplasm of nasal cavity and middle ear	<5	1%
Malignant neoplasm of hypopharynx	<5	1%
Total head and neck cancers	**190**	**100%**

Source: Public Health England, Knowledge and Intelligence Team (South West)

Table 3: Incidence of head and neck cancers in Jersey, by sub-site, 2000 to 2009

2000 to 2009		
Site	**Number**	**Percentage of all**
Malignant neoplasm of larynx	46	17%
Malignant neoplasm of thyroid gland	43	16%
Malignant neoplasm of other and unspecified parts of tongue	22	8%
Mal neo oth ill-def sites lip/oral cavity/pharynx	22	8%
Malignant neoplasm of tonsil	21	8%
Malignant neoplasm of base of tongue	19	7%
Malignant neoplasm of floor of mouth	15	6%
Malignant neoplasm of oropharynx	12	5%
Malignant neoplasm of pyriform sinus	12	5%
Malignant neoplasm of gum	9	3%
Malignant neoplasm of parotid gland	9	3%
Malignant neoplasm of palate	8	3%
Malignant neoplasm of other and unspecified parts of mouth	8	3%
Malignant neoplasm of lip	6	2%
Malignant neoplasm of nasopharynx	<5	2%
Malignant neoplasm of hypopharynx	<5	2%
Malignant neoplasm of nasal cavity and middle ear	<5	1%
Malignant neoplasm of accessory sinuses	<5	1%
Maligt neoplasm of oth and unspec major saliv glands	<5	0%
Total head and neck cancers	**265**	**100%**

Source: Public Health England, Knowledge and Intelligence Team (South West)

Lung cancer

Squamous cell lung cancers (those most closely associated with smoking risk) have decreased proportionally more quickly than other types of lung cancers. The proportional decrease of squamous cell lung cancers is most likely to be due to a reduction in the rate of smoking. The percentage of lung cancers classified with a generic cancer description (for example, with the cancer cell type not specified) has steadily fallen, likely due to better pathology reporting.

As well as cancer of the lung tissue itself, cancers of the bronchus and the trachea are counted in this group. The primary cause of lung cancer is smoking but different types of lung cancer exhibit different strengths of association with smoking, and have different prognoses. The lung is a frequent site for secondary spread of cancers from other parts of the body. This analysis only refers to primary lung cancers.

Small-cell lung cancers (SCLC) have the strongest link to smoking and the worst prognosis (van Meerbeeck, 2011). Non small-cell lung cancers (NSCLC) are made up of several types, principally: adenocarcinomas, large-cell carcinoma, and squamous cell carcinoma. They have a better (but still poor) prognosis. Squamous cell cancer is important as it has a strong link to smoking (Kenfield, 2008), and is more common than SCLC. Adencarcinomas most often occur in smokers, but are also the most common type of lung cancer in non-smokers.

Table 4 shows the types and numbers of lung cancers diagnosed in Jersey over the last 20 years. Due to the strong smoking link, squamous cell carcinomas are reported separately from others in the group of NSCLC. Although there are always fluctuations in numbers in a small population like Jersey, on the whole the number of cases diagnosed annually has been falling. As a proportion of the total, there has been a drop in squamous cell carcinoma diagnoses. The proportion of cases which were classified as other NSCLC has risen, while SCLC has remained consistent. However analysis of these changing proportions is confounded by the reduction in number of cases which are classified under a general 'carcinoma' heading. This reduction is caused by improvements in pathology reporting to the cancer registry.

The main risk for lung cancer is smoking, with a fairly long delay between exposure and outcome: up to 20 years. The second largest well-understood risk factor is exposure to Radon gas, but the magnitude of risk is much smaller than that caused by smoking. This is explained in detail in the 'Risk factors for cancer' section of this report.

The fall in incidence of the main type of lung cancer is the plausible consequence of reduction in smoking prevalence. Had radon played any important role in the genesis of this cancer, there would be no reason to expect such a reduction.

Table 4: Incidence of lung cancer in Jersey, by type, 1990 to 2009

	1990/92	1991/93	1992/94	1993/95	1994/96	1995/97	1996/98	1997/99	1998/00	1999/01	2000/02	2001/03	2002/04	2003/05	2004/06	2005/07	2006/08	2007/09
Squamous cell lung cancers	73	67	61	51	50	46	42	37	36	37	29	33	30	33	36	43	41	29
As percentage of all	37%	35%	33%	26%	26%	25%	24%	21%	19%	22%	22%	24%	19%	18%	19%	23%	22%	18%
NSCLC	90	85	83	88	105	108	97	90	83	89	70	89	94	111	119	120	118	93
As percentage of all	45%	44%	44%	44%	54%	58%	55%	50%	43%	53%	53%	64%	60%	62%	63%	63%	64%	58%
Small-cell lung cancers	21	20	24	26	27	21	21	32	33	26	17	15	19	23	26	24	20	23
As percentage of all	11%	10%	13%	13%	14%	11%	12%	18%	17%	16%	13%	11%	12%	13%	14%	13%	11%	14%
Generic classification	86	85	78	83	64	56	56	57	75	51	45	31	39	42	41	42	43	41
As percentage of all	43%	44%	42%	42%	33%	30%	32%	32%	39%	31%	34%	22%	25%	23%	22%	22%	23%	26%
Total lung cancers	**270**	**257**	**246**	**248**	**246**	**231**	**216**	**216**	**227**	**203**	**161**	**168**	**182**	**209**	**222**	**229**	**222**	**186**

Note: NSCLC: Non-small-cell lung cancers (includes squamous cell carcinoma, adenocarcinoma, large-cell lung cancer and generic non-small-cell lung cancer)
Source: Public Health England, Knowledge and Intelligence Team (South West)

Malignant melanoma

The main risk factor for malignant melanoma is exposure to UV through sunlight or sun beds. Coastal areas worldwide have higher malignant melanoma rates. Malignant melanoma incidence has more than doubled since the 1990s in Jersey. This may be partially explained by better awareness and vigilance leading to earlier diagnosis. Behaviour changes and more frequent travel to hot sunny countries are also likely to increase an individual's risk. Malignant melanoma is the most common cancer for those aged 20-39.

Malignant melanoma is a type of skin cancer. It is less common than basal cell carcinoma and squamous cell carcinoma of the skin, but accounts for almost all skin cancer deaths.
Malignant melanoma incidence increases with age, but it is also the most common cancer in people aged 20-39 and hence is an important health issue in young adults.

Traditionally the site of occurrence of malignant melanoma differed between men and women, due to differing exposure. Tables 5 and 6 illustrate this difference, and also how it is changing. In all sites of presentation there has been an increase in the number of cases between 1990 to 1999 and 2000 to 2009.

Men most often develop a malignant melanoma on the trunk, which could be linked to spending time outside without a shirt: either for work or leisure. In the 2000s, compared to the 1990s, the proportion of melanomas which presented on the trunk and face, head and neck increased.

The most common site of presentation for women is the lower limb and hip. This could be linked to bare legs in the summer months. The proportion of cases in this group has decreased in the last decade, compared to the previous decade. There has been a corresponding increase in the proportion of cases presenting on the trunk, upper limbs and face, head and neck.

These changes in site of presentation may reflect changing habits of leisure activities, or changes in type of clothing worn.

The main risk factor for malignant melanoma is exposure to UV radiation through sunlight or sun beds. A particular risk is intermittent exposure, where the skin is suddenly exposed without any natural protection having built up. The overall increase in cases is linked both to an overall increase in UV exposure and to an increasing tendency for people to have intermittent sun exposure; as they are less likely to work outdoors and more likely to take a foreign holiday. The aging population will also contribute to increasing numbers of malignant melanoma.

Table 5: Incidence of malignant melanoma in Jersey, by site of occurrence, 1990 to 1999

1990 to 1999					
Males			**Females**		
Site	**Number**	**Percentage of all**	**Site**	**Number**	**Percentage of all**
Malignant melanoma of trunk	18	29%	Malignant melanoma of lower limb, including hip	31	46%
Malignant melanoma of lower limb, including hip	15	24%	Malignant melanoma of trunk	13	19%
Malignant melanoma of upper limb, including shoulder	12	19%	Malignant melanoma of upper limb, including shoulder	11	16%
Malignant melanoma of skin, unspecified	10	16%	Malignant melanoma of face, head and neck	7	10%
Malignant melanoma of face, head and neck	8	13%	Malignant melanoma of skin, unspecified	<5	6%
Overlapping malignant melanoma of skin	0	0%	Overlapping malignant melanoma of skin	<5	1%
Total malignant melanoma	**63**	**100%**	**Total malignant melanoma**	**67**	**100%**

Source: Public Health England, Knowledge and Intelligence Team (South West)

Table 6: Incidence of malignant melanoma in Jersey, by site of occurrence, 2000 to 2009

2000 to 2009					
Males			**Females**		
Site	**Number**	**Percentage of all**	**Site**	**Number**	**Percentage of all**
Malignant melanoma of trunk	80	50%	Malignant melanoma of lower limb, including hip	73	40%
Malignant melanoma of face, head and neck	27	17%	Malignant melanoma of trunk	40	22%
Malignant melanoma of upper limb, including shoulder	26	16%	Malignant melanoma of upper limb, including shoulder	38	21%
Malignant melanoma of lower limb, including hip	17	11%	Malignant melanoma of face, head and neck	23	13%
Malignant melanoma of skin, unspecified	11	7%	Malignant melanoma of skin, unspecified	8	4%
Total malignant melanoma	**161**	**100%**	**Total malignant melanoma**	**182**	**100%**

Source: Public Health England, Knowledge and Intelligence Team (South West)

Non melanoma skin cancer

> Non melanoma skin cancer (NMSC) has the highest incidence of all cancers in Jersey but rarely results in death.
>
> Its link to sun exposure means this is not unexpected in Jersey and the high incidence is probably due to a combination of elevated risk and better awareness.
>
> It typically arises on the face, head and neck.

Non melanoma skin cancer (NMSC) is primarily one of two types: basal cell carcinoma or squamous cell carcinoma. It is the most common cancer in the UK, but very rarely leads to death. However, it causes a significant burden on the health system as it recurs frequently and can require complex intervention and/or reconstructive surgery.

Current practice within UK cancer registries is to record only the first occurrence of NMSC each year for a person.

Numbers of NMSC diagnosed in Jersey have increased from 123 per year in the 1990s to 270 per year in the 2000s. Unlike malignant melanoma the age distribution of NMSC cases is weighted towards the elderly. 29% of first cases of NMSC in England in 2010 were in those aged 80 and over, compared to 15% of malignant melanoma and 24% of all cancers. Only 2% of NMSC occur in those aged 20-29, compared to 12% of malignant melanoma and 3% of all cancers. This means that the growing elderly population will have an increasing effect on the number of these cancers in the future.

For both men and women the most common site of occurrence is the face, head and neck (Tables 7 and 8). This is reflective of the long-term UV exposure which is the main risk factor for developing NMSC. The trunk is also a major site for men, and probably linked to outdoor working. Determining whether patterns of site of presentation are changing is made difficult by an increase in unclassified NMSC. This increase is due to a change in automated recording implemented by the South West Public Health Observatory (SWPHO) in 2006 and 2007 which recorded all basal cell carcinomas as 'unspecified'.

There is a slight difference in the pattern of UV exposure which is most risky for squamous cell and basal cell carcinomas. Basal cell carcinoma is more strongly linked to intermittent exposure and episodes of sunburn, while squamous cell carcinoma is more linked to lifetime, regular, sunlight exposure. This is why the face, head and neck are the site of presentation in half of cases. Also, those who work/have worked outside are particularly at risk.

Certain pre-existing skin conditions, immune system diseases, and industrial chemicals are also risk factors for NMSC.

Table 7: Incidence of non melanoma skin cancer in Jersey, by site of occurrence, 1990 to1999

1990 to 1999					
Males			Females		
Site	**Number**	**Percentage of all**	**Site**	**Number**	**Percentage of all**
Skin of face, head and neck	366	56%	Skin of face, head and neck	308	54%
Skin of trunk	131	20%	Skin of lower limb, including hip	85	15%
Skin of upper limb, including shoulder	78	12%	Skin of trunk	78	14%
Malignant neoplasm of skin, unspecified	35	5%	Skin of upper limb, including shoulder	75	13%
Skin of lower limb, including hip	35	5%	Malignant neoplasm of skin, unspecified	22	4%
Overlapping lesion of skin	13	2%	Overlapping lesion of skin	5	1%
Total non melanoma skin cancer	**658**	**100%**	**Total non melanoma skin cancer**	**573**	**100%**

Source: Public Health England, Knowledge and Intelligence Team (South West)

Table 8: Incidence of non melanoma skin cancer in Jersey, by site of occurrence, 2000 to 2009

2000 to 2009					
Males			Females		
Site	**Number**	**Percentage of all**	**Site**	**Number**	**Percentage of all**
Skin of face, head and neck	727	52%	Skin of face, head and neck	603	46%
Malignant neoplasm of skin, unspecified	252	18%	Malignant neoplasm of skin, unspecified	228	17%
Skin of trunk	243	17%	Skin of trunk	191	15%
Skin of upper limb, including shoulder	125	9%	Skin of lower limb, including hip	155	12%
Skin of lower limb, including hip	53	4%	Skin of upper limb, including shoulder	128	10%
Overlapping lesion of skin	<5	0%	Overlapping lesion of skin	<5	0%
Total non melanoma skin cancer	**1401**	**100%**	**Total non melanoma skin cancer**	**1306**	**100%**

Source: Public Health England, Knowledge and Intelligence Team (South West)

Risk factors for cancer

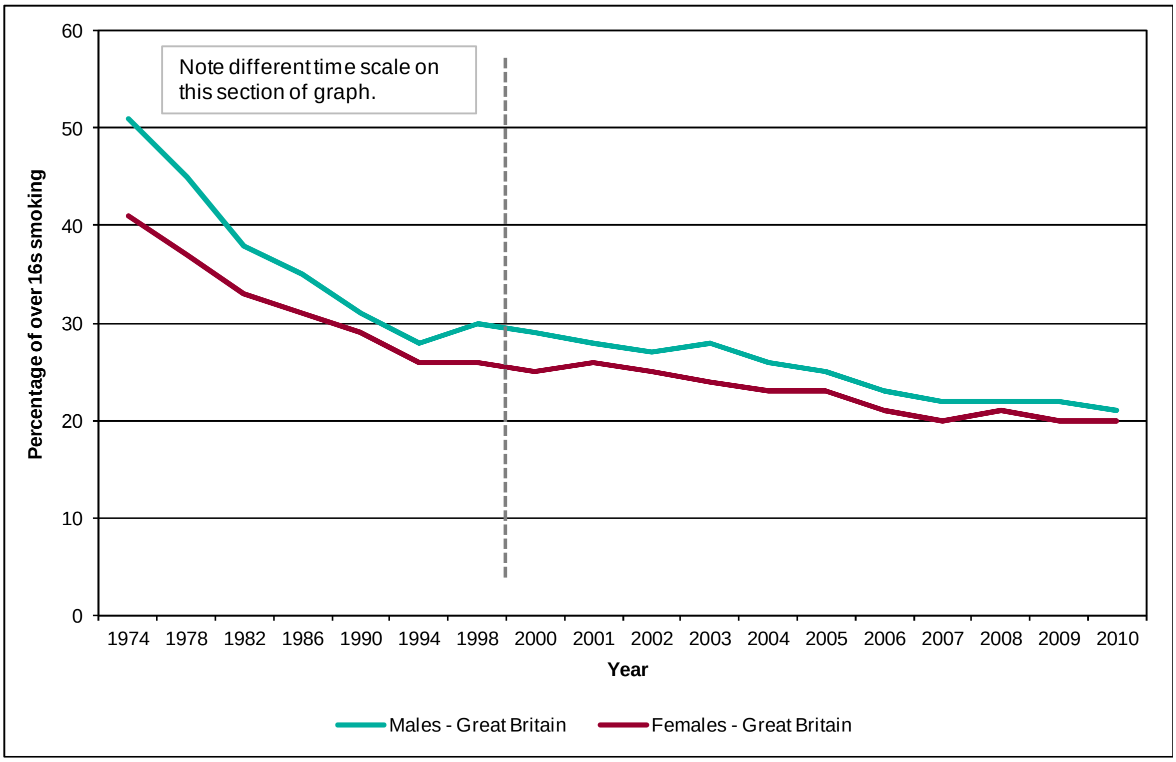
Smoking

Smoking was first identified as the major risk factor for lung cancer in the 1950s. Both the daily number of cigarettes smoked and number of years for which a person smokes increase the risk of developing lung cancer, but length of time smoking has the stronger effect (Peckham, 1995).

Around 86% of lung cancer deaths in the UK in 2006 were attributed to active smoking (Health Protection Agency, 2009). The effect of passive smoking is more difficult to quantify, but a separate study estimated that a quarter of lung cancer cases in non smokers were related to passive smoking, equivalent to about 2% of the total lung cancer cases (Parkin, 2011a).

As well as lung cancer, smoking is a risk for several other cancers. Head and neck cancers are related to tobacco use (including chewing tobacco), with 70% of oral cancers smoking related. Smoking is an important factor in bladder cancer, causing around 35% of cases. The decrease in bladder cancer incidence in the UK is related to decreases in smoking prevalence. An estimated 22% of stomach cancers are caused by smoking. Kidney cancer can be caused by smoking: an estimated 29% in men and 15% in women.

Figure 2: Smoking prevalence in Great Britain, 1974 to 2010



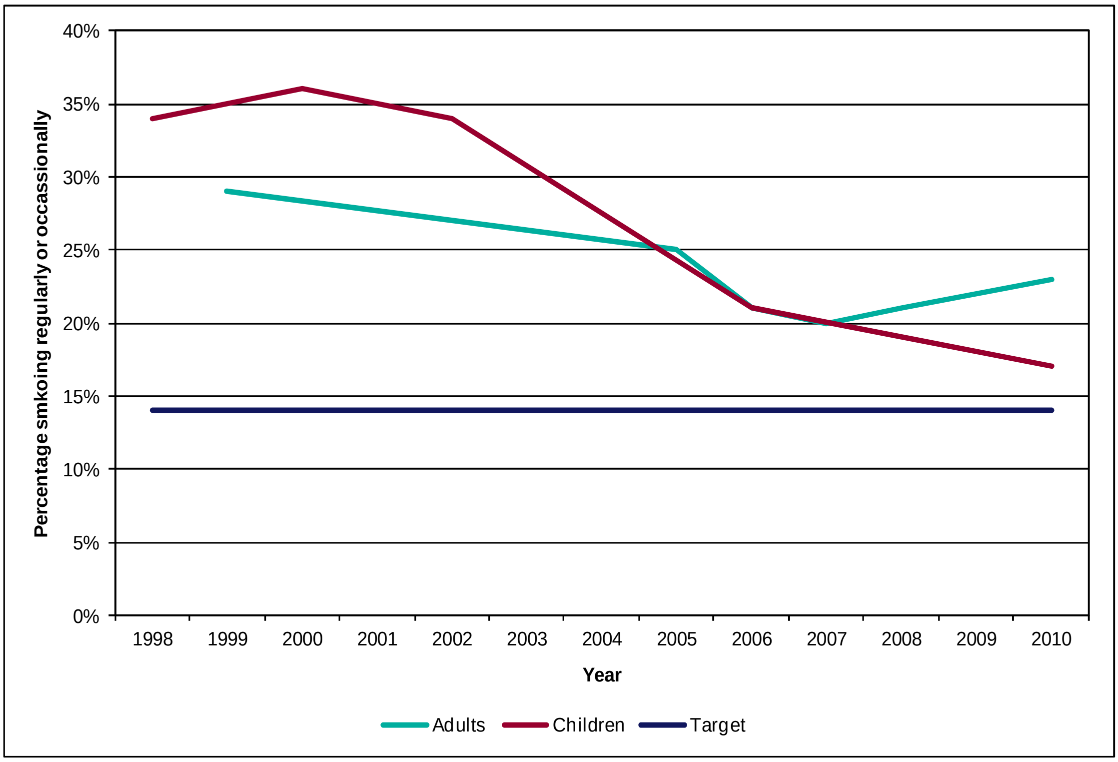
Source: Office for National Statistics (General household survey/General lifestyle survey)

Smoking also increases the risk of cervical, bowel and liver cancers, and some types of leukaemia.

Smoking in adults in Great Britain has decreased substantially over the last 40 years (Figure 2). In 1974, 51% of men and 41% of women were smokers, but there was a large reduction in the following decade, with 35% of men and 31% of women smoking in 1986. Since the mid-1980s the decrease in proportion of people smoking has been slower but steady, and in 2010, 21% of men and 20% of women were smokers. Jersey has shown a similar reduction in smoking (Figure 3). In 1974 over 50% of men and 40% of women were smoking. In 2012 this had reduced to 23% of the population. This proportion has remained between 20-23% over the last five years.

The length of time which can elapse between exposure and diagnosis of cancer means that the decrease in smoking-related cancer incidence and mortality currently occurring in the UK and in Jersey is likely to be driven by smoking reductions in the 1980s and 1990s. As smoking cessation slowed in the 2000s it is likely that future decreases in rates of smoking-related cancer incidence and mortality will be incrementally smaller. There is evidence that in certain population groups the rate of lung cancer incidence has ceased to decrease (SWPHO, 2009).

Figure 3: Smoking prevalence in Jersey, 1999 to 2010



Source: Jersey Health and Social Services Unit

Radon Gas

Radon is a naturally occurring gas, produced by decay of minute amounts of uranium in certain rocks. Some parts of the UK, particularly the South West, are known to have higher amounts of radon due to large granite deposits. Much of a person's exposure is in their place of residence and strongly depends on the precise details of their home for example, ventilation, pipe work, and the underlying ground structure. There are examples of neighbouring houses with widely differing radon measurements.

The wide range of radon exposure in small geographical areas means that studies based on where people live (ecological studies) can be unreliable in drawing conclusions on how radon affects risk of cancers.

The type of radiation which radon produces does not penetrate deeply and is blocked by human skin. However, the membranes lining the lung are much thinner, and any radiation emitted by inhaled radon gas can damage the cells of the lung. This is why radon is a risk factor for lung cancer. Even in a high radon concentration there needs to be a sequence of events occurring to cause the lung cancer. The risk of a single exposure causing lung cancer can be discounted and the risk levels for exposure are all calculated on a lifetime exposure to radon.

Although radon is a risk factor for lung cancer, the magnitude of risk is very much lower than the risk induced by smoking. However, those exposed to higher radon levels who are also smokers have an added risk as the two factors multiply together. A report by the Health Protection Agency (HPA) in the UK (HPA, 2009) concluded that the lifetime risk of lung cancer for a non-smoker when exposed to long-term radon levels of 0, 100, 200 and 400 Bq m^{-3} (a measure of radon concentration) was 0.4, 0.5, 0.5 and 0.7%. In contrast the risk for a smoker at the same levels is 15, 17, 19 and 23%.

A recent study (ref HP 2011/12 report) in Jersey showed that radon occurs across the island. On a sample of premises 64% had radon level less than100 Bq m^{-3}, 19% levels between 100-200 Bq m^{-3} and 17% had levels over 200 Bq m^{-3}. There were no 'hot spots' identified and even neighbouring buildings were shown to have very different radon levels. The HPA data shows that at levels of 100 Bq m^{-3} a smoker in Jersey exposed to radon is over 30 times more likely to contract lung cancer than a non smoker and this is true at the higher radon levels.

The UK HPA report attributed only 0.5% of lung cancer deaths in 2006 to radon exposure alone, with a further 2.8% attributed to radon and smoking in combination – that is, if either radon exposure or smoking were avoided, the death would not occur. Based on this data, it suggests that in Jersey around two lung cancer deaths a year could be the result of radon exposure in tandem with smoking and an additional one lung cancer death every 3-4 years could be a consequence of radon alone. This is very small when compared with the total of around 60 lung cancer deaths a year due to other causes (predominantly smoking). This again shows that the risk of dying from lung cancer linked to radon exposure is greatly increased in smokers.

The current 'action levels' for radon exposure in the UK are 200 Bq m^{-3} in residential buildings and 400 Bq m^{-3} in workplaces. Jersey Health Protection recommendations are that advice is given to those living in houses with high levels of radon on how the levels affect a smoker's risk of lung cancer (including advice and support to quit) and on how to reduce levels of radon in their homes.

The HPA report also examined other studies of the relationship between radon and cancer. It concluded that if radon does have a relationship with cancers of other organs, it is so small as to be undetectable in practical terms.

Alcohol use

Alcohol consumption has been linked to several cancers. The parts of the body mostly affected are those through which alcohol is processed: mouth and oesophagus, liver and bowel. Breast cancer risk is also increased by increased alcohol consumption.

Evidence suggests that even consumption within guidelines increases risk of head and neck, breast and bowel cancers (Parkin, 2011b). An estimated 11% of bowel cancers and 30% of mouth and oropharynx cancers are alcohol-related. The latter are often also associated with smoking.

The risk of developing liver or pancreatic cancer appears to be increased by sustained high alcohol consumption. These cancers are linked to other liver diseases, such as cirrhosis, for which heavy drinking is the main causative factor.

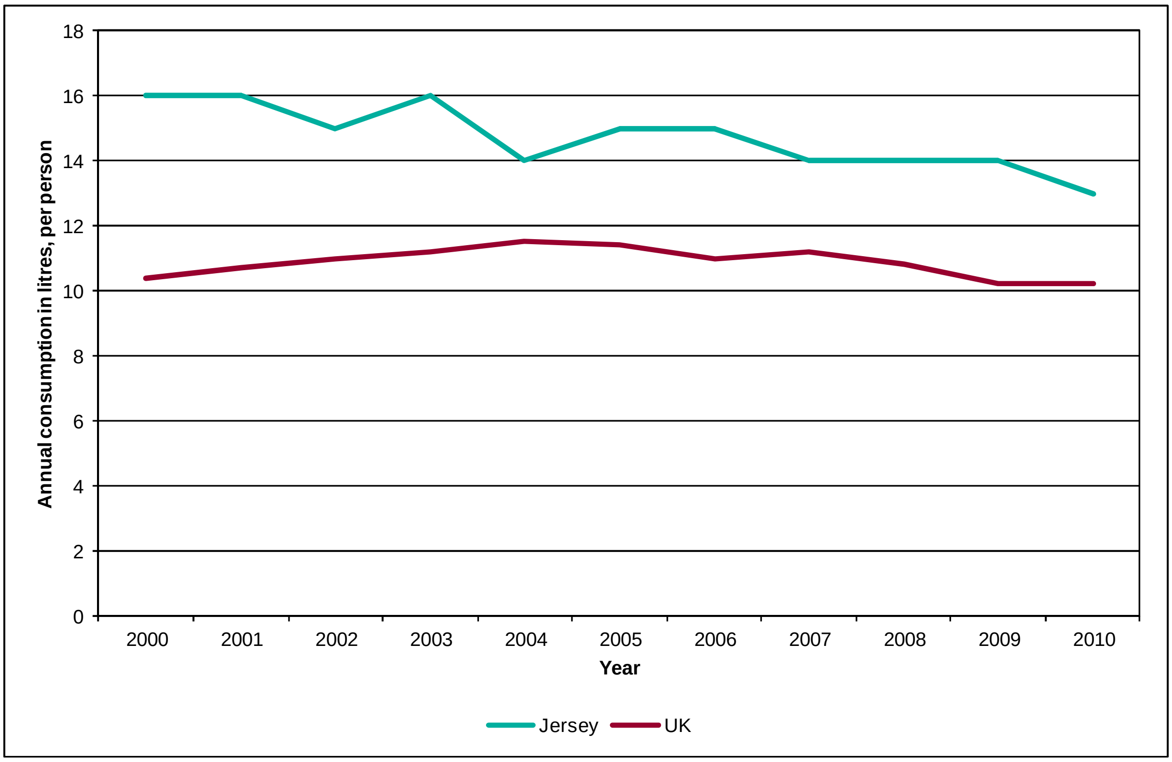
Alcohol in combination with tobacco use increases the risk for cancers of the mouth, tongue and larynx. About 80% of cancers of the larynx are related to alcohol and tobacco use.

In Great Britain alcohol consumption appears to have risen slightly in the last two decades (Office for National Statistics, 2011). The increase is more noticeable in women than men. The average weekly consumption for men in 2009 was 16 units, and for women was 8 units. This is equivalent to 8.3 litres annually for men and 4.2 litres for women. Per capita consumption in the UK is shown in comparison to Jersey in Figure 4, using data from a different source (Organisation for Economic Co-operation and Development, 2012).

In Jersey alcohol consumption has been reducing but is still one of the highest per capita consumption levels in the world at 12.8 litres per capita, per year. The health risks from drinking alcohol increase dramatically for men who regularly exceed 7-8 units in one session and for women who exceed 5-6 units in one session. Surveys indicate that 18% of men and 10% of women in the Jersey population are currently drinking at this level at least once a week and 5% of the population are likely to be dependent drinkers.

A separate survey conducted by the Office of National Statistics (ONS) establishes how many people are drinking above the weekly recommended limits of 21 units for men and 14 units for women. In the UK this proportion has fluctuated in men, but appears to show a sustained rise in women. In 2009 this percentage was the same for men and women, at about 22%. In Jersey 20% of men and 10% of women report drinking over recommended weekly limits. The overall high consumption of alcohol is likely to impact on Jersey's rates of cancers of the liver, pancreas, and other alcohol-related cancers. Alcohol consumption is very likely to account for some of the excess of head and neck cancers observed in Jersey (i.e. more new cases than would be expected if SW regional rates applied).

Figure 4: Per capita alcohol consumption in the UK and Jersey, 2000 to 2010



Source: Organisation for Economic Co-operation and Development and Jersey Statistics Unit

UV Exposure

Exposure to ultra-violet (UV) light, from natural sunshine or sun beds, is the principal cause of skin cancers. It is not thought to be a risk for any other type of cancer, and no other risk factors are considered to play any important role in the causation of skin cancer.

The amount of UV exposure a person receives is dependent on several factors including latitude, atmospheric ozone, and surrounding landscape. The shading effect of tall buildings will reduce UV exposure in urban environments. The sun is stronger closer to the equator, increasing UV dose. In certain environments, such as snow or near bodies of water, a significant amount of UV is reflected off the ground, which increases exposure. Atmospheric ozone absorbs UV and hence has a protective effect, but there is evidence that reductions in the ozone layer have caused UV intensity to increase (McKenzie, 1999).

Generally speaking, the higher the number of sunshine hours an area experiences, the higher the amount of UV exposure will be. The Met Office has published annual average sunshine hours for 1961 to 1990. The average for Jersey is 1,915 hours compared with the highest average in England of 1,752 hours (Isle of Wight). In the south-west of England the area with highest sunshine hours is Dorset with an average of 1,600 per year.

Work done previously by the SWPHO found a difference in the malignant melanoma rates in the South West between rural and urban areas, and coastal and inland areas. Rates in rural coastal areas were 16% higher than rural inland areas, and in urban coastal areas were 39% higher than urban inland areas. In that study a coastal area was defined as less than 15km to the sea. Under this definition the whole of Jersey is a coastal area, and largely rural. The higher rates are likely to be linked to the environmental factors discussed above.
As well as exposure in place of residence the increasing numbers of people holidaying in foreign countries means people are more likely to have intermittent intense exposure or sunburn. This is a particular risk for malignant melanoma.

Table 9 indicates that foreign travel very nearly tripled in two decades from 1981 to 2001. For certain countries the increase was even larger, particularly Spain and Portugal. Short holidays in these countries, particularly as many resorts are in coastal areas, have a high risk of intense UV exposure.

Table 9: UK residents visiting foreign countries each year, 1981 to 2009

Country	1981	1991	2001	2008	2009
Spain	2.9	4.4	10.8	12.3	10.0
France	3.5	5.4	7.0	7.7	6.9
Italy	0.8	0.8	1.5	2.3	1.9
United States	0.7	1.5	2.3	2.3	1.9
Portugal	0.4	1.0	1.5	2.3	1.5
Greece	0.9	1.7	3.1	1.8	1.5
Turkey		0.2	0.8	1.8	1.5
Ireland	0.5	0.6	1.5	1.4	1.2
Cyprus	0.1	0.4	1.5	0.9	0.8
Netherlands	0.3	0.8	1.2	0.9	0.8
Other countries	3.0	4.2	7.7	11.8	9.6
Total	**13.1**	**21.0**	**39.1**	**45.5**	**37.7**

Source: Office for National Statistics (International Passenger Survey)

Conclusions

The cancers in Jersey which occur more frequently than in the south-west of England are head and neck, lung, and all types of skin cancer.

These particular cancers have well-understood lifestyle-related risk factors. Smoking increases risk of certain head and neck cancers, particularly in combination with alcohol. Smoking is the predominant cause of lung cancer. Skin cancer is caused by exposure to UV radiation through sunlight or sun beds. Long-term and intense short-term exposure both increase risk.

The data suggest that all these lifestyle risk factors are more prevalent in Jersey than the south-west of England, and the UK as a whole. The higher rates of these specific cancers, and cancer as a whole, can be attributed to the historical and current high levels of smoking and alcohol consumption, and the greater UV exposure due to sunshine hours and the geography of Jersey.

In particular, smoking increases risk for over 20 cancers, and alcohol for several cancers. This increased risk is avoidable by stopping smoking and keeping alcohol consumption within recommended sensible levels. The use of sunscreen, head coverings, avoidance of strong sunlight and ensuring that children never burn would profoundly reduce the occurrence of skin cancer in the future.

Members of the public often express concern about the links between cancer and radon gas. Radon increases the risk of developing lung cancer, but for non-smokers the baseline risk is so small that the increase caused by radon is very low indeed. The main risk of radon gas in homes is to people who are smokers. Stopping smoking has the most potential to reduce cancer risk.

It can be concluded that to reduce the burden of cancer in Jersey, the public health focus should be on reducing smoking prevalence, reducing alcohol consumption (especially in those drinking more than recommended amounts), and promoting sun protection measures.

Based on this analysis and the scoping study, the cancers for which Jersey has a significantly higher incidence than the South West are readily explained overall in terms of known, and largely remediable, risk factors. On this basis a further in-depth epidemiological study as recommended in proposition 144/2011, is not regarded as warranted.

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