

PHARYNGEAL CANCER

Table 2.1: Characteristics of the cohort

	Males	Females
First primary cancer	2,093	553
Age at diagnosis		
Mean	59.1	59.6
<65 years	1,434	334
=>65 years	659	219
Total person-years	8,207	2,610
Mean follow-up (years)	3.9	4.7
Histological confirmation (%)	97.9	96.4
Squamous and transitional	87.1	80.5
Adenocarcinoma	0.9	1.3
Other specific carcinoma	0.2	0.4
Unspecified carcinoma	9.4	12.5
Sarcomas and soft tissue	0.2	1.3
Other specified types	0.2	0.4
No histological confirmation	2.1	3.8
Second primary cancers		
Non-simultaneous	261	50
Simultaneous	32	6

Table 2.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	1.9	7.6	12.5	15.7	17.4	19.9
	F	1.7	5.2	9.6	11.0	13.2	13.2
Oral Cavity	M	0.0	0.6	1.3	1.3	1.6	1.6
	F	0.2	0.2	0.2	0.2	0.2	0.2
Oesophagus	M	0.2	0.7	1.0	1.1	1.1	1.1
	F	0.2	0.2	0.5	1.0	1.0	1.0
Colon	M	0.2	0.5	0.9	1.0	1.0	1.0
	F	0.0	0.6	0.9	0.9	0.9	0.9
Lung	M	0.5	2.6	4.4	5.3	5.5	6.3
	F	0.2	1.3	3.4	4.4	6.7	6.7
Prostate	M	0.2	0.9	1.5	2.2	3.4	3.4

All other cancers have 10-year cumulative risk of less than 0.5 % for both sexes.

Common second cancers

From Table 2.2 a man's 10-year cumulative risk of contracting a second cancer following pharyngeal cancer is seen to be higher than that for a woman (1 in 8 compared with 1 in 10). Second cancers with a 10-year cumulative risk of at least 0.5% are lung, prostate, oral cavity, oesophagus and colon for men and oesophagus, colon and lung for women

Age-specific Incidence

The principal feature of Figure 2.1 is that the age incidence curves for the second primary cancers are orders of magnitude higher at early ages with rates for second primary cancers declining steeply with increasing age. This indicates that the risk of a second cancer is more strongly associated with an early age at onset of the pharyngeal cancer, an observation consistent with strong early environmental exposures and/or increased genetic susceptibility.

Trends in the SIRs

The trends in Figure 2.2 show increasing SIRs during the first five years following a diagnosis of pharyngeal cancer and steeply declining risks thereafter.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 2.4 (page 62) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs are 2.26 for men and 2.09 for women (both statistically significant).

There was no SIRs less than 1 for men or women but SIRs significantly greater than 1 for many cancers. The statistically significant SIRs for men were for oral cavity 17.74, oesophagus 9.41, soft tissue 6.57, pharynx 6.24, lung 5.21, soft tissue 6.57 and liver 3.42, colorectum 1.54 and other cancers 2.79 and for women were pharynx 25.65, soft tissue 17.21, oesophagus 14.19, oral cavity 9.42 and lung 8.61.

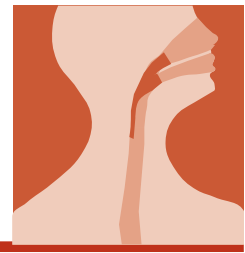


Figure 2.1: Age-specific rates

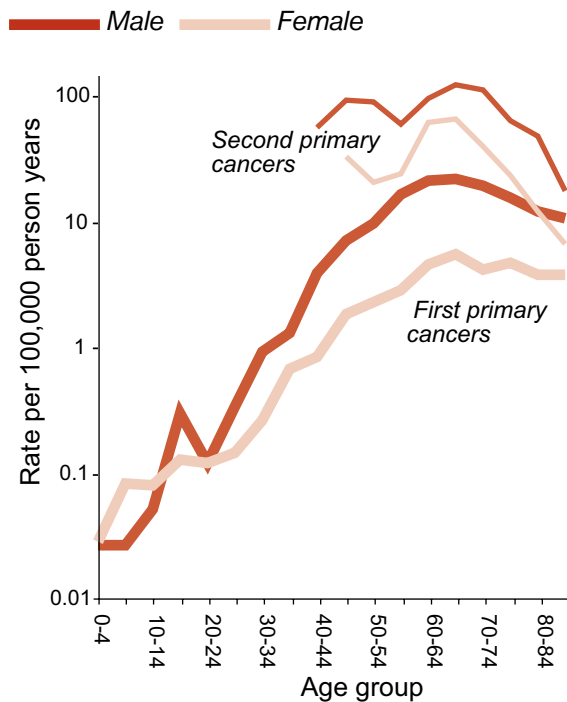
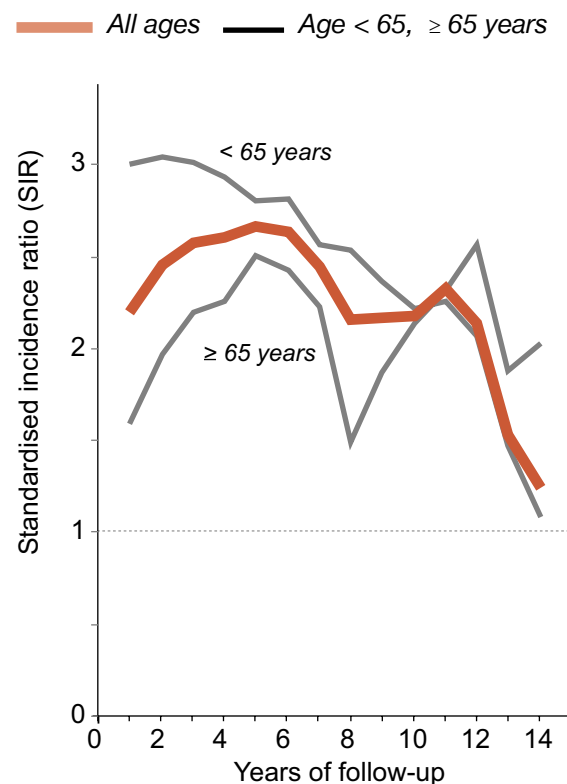


Figure 2.2: Trends in the annual SIR for all second primary cancers



Trends in SIRs with age

In Figure 2.2 the general pattern of decreasing SIRs with increasing follow-up is observed for both age groups, with the under 65 year age group having consistently higher SIRs than older people at any time during follow-up though risks converge over time.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 2.5 (page 63). Men under 65 years have a 40% higher SIR than older men with a smaller increased risk (20%) for younger women than older. The SIRs are 2.59 for men first diagnosed before 65 years of age compared with 1.88 for those diagnosed at an older age. The SIRs for women are 2.26 and 1.88 respectively.

For the under 65 year age group, statistically significant SIRs for men are oral cavity 19.08, pharynx 6.15, oesophagus 8.61, soft tissue 8.79 and lung 6.86. For women under 65 there were statistically significant SIRs for pharynx 39.51, oesophagus 18.26, lung 8.00 and soft tissue 30.29.

Comments

Smoking is a strong risk factor for pharyngeal cancer and for several of the cancers for which the risk is elevated following pharyngeal cancer, including cancer of the oral cavity, larynx, oesophagus and lung. Thus, smoking may underlie the increased risk for these other cancers.

It should be noted that the classification of multiple tumours within the upper respiratory tract is difficult with the distinction between direct spread, tumour recurrence and a new primary tumour not always clear. This may result in under- or over-recording of distinct primary tumours within this region.

STOMACH CANCER

Table 3.1: Characteristics of the cohort

	Males	Females
First primary cancer	5,788	3,250
Age at diagnosis		
Mean	67	69.9
<65 years	2,250	1,010
=>65 years	3,538	2,240
Total person-years	15,364	9,092
Mean follow-up (years)	3	2.8
Histological confirmation (%)	94.5	89.9
Squamous and transitional	1.1	1.4
Adenocarcinoma	86.7	79.2
Other specific carcinoma	0.9	1.5
Unspecified carcinoma	4.0	4.6
Sarcomas and soft tissue	1.6	2.7
Other specified types	0.2	0.3
No histological confirmation	5.6	10.2
Second primary cancers		
Non-simultaneous	280	93
Simultaneous	60	29

Table 3.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	0.8	3.0	4.6	6.0	6.9	6.9
	F	0.7	2.2	3.0	3.6	3.6	3.6
Colon	M	0.1	0.4	0.6	0.7	1.0	1.0
	F	0.1	0.2	0.5	0.5	0.5	0.5
Prostate	M	0.2	0.8	1.4	1.6	1.7	1.7

All other cancers have 10-year cumulative risk of less than 0.5 % for both sexes.

Common second cancers

From Table 3.2 a man's 10-year cumulative risk of contracting a second cancer following stomach cancer is seen to be higher than that for a woman (1 in 22 compared with 1 in 33). The only second cancers to have a 10-year cumulative risk of at least 0.5% are colon and prostate, with men having more colon cancer than women.

Age-specific Incidence

The principal feature of Figure 3.1 is that the age incidence curves for the second primary cancers are orders of magnitude higher at early ages and the curves begin to converge with increasing age. This indicates that the risk of a second cancer is more strongly associated with an early age at onset of the stomach cancer, an observation consistent with strong early environmental exposures and/or increased genetic susceptibility.

Trends in the SIRs

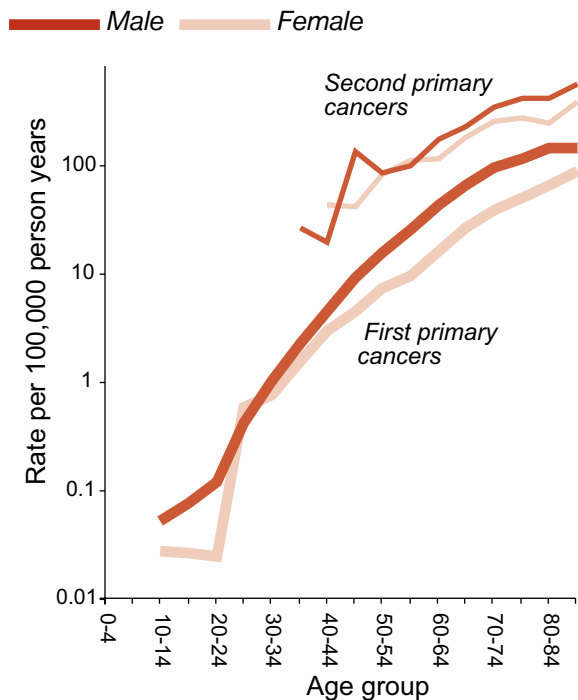
The trends in Figure 3.2 show increased SIRs following a diagnosis of stomach cancer and that these SIRs increase further with each year of follow-up.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 3.4 (page 64) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs are 0.87 for men and 0.79 for women, both significantly less than 1.

The only statistically significant SIR for men was for pancreas 2.12 and there were none for women. SIR significantly less than 1 were seen for stomach and lung for men.



Figure 3.1: Age-specific rates



Trends in SIRs with age

In Figure 3.2 the general pattern of decreasing SIRs with increasing follow-up is observed for both age groups, with the under 65 year age group having consistently higher SIRs than older people at any time during follow-up.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 3.5 (page 65). The SIRs are 1.09 for men first diagnosed before 65 years of age compared with 0.79 for those diagnosed at an older age. The SIRs for women are 0.73 and 0.82 respectively.

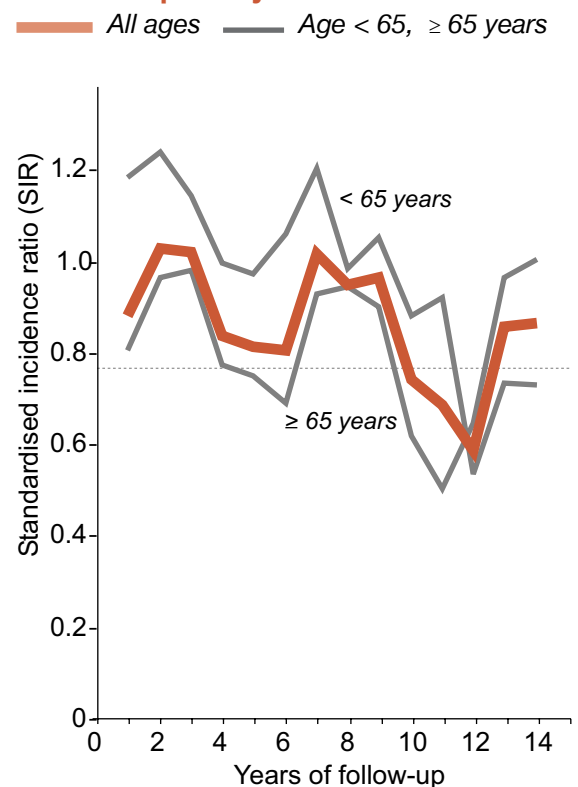
For the under 65 year age group the statistically significant SIRs for men are pancreas 4.03, colon 2.14 and colorectum 1.93. For women the only significant SIR for the younger age group is AML 9.27.

Comments

Overall, the 10-year risk of a second cancer following stomach cancer is not as high as for many other first cancers (less than 5% versus about 10% for all cancers). People diagnosed before age 65 had a higher SIR for second cancer than did those diagnosed later.

Smoking is a risk factor for both stomach cancer and pancreatic cancer and might explain the elevated risk for pancreatic cancer. Both these cancers and colorectal cancer are also associated with a genetic syndrome called Lynch syndrome (see colon cancer), thus part of the excess might be explained by common genetic susceptibility, especially for those diagnosed at an earlier age.

Figure 3.2: Trends in the annual SIR for all second primary cancers



COLON CANCER

Table 4.1: Characteristics of the cohort

	Males	Females
First primary cancer	15,964	16,472
Age at diagnosis		
Mean	67.7	69.6
<65 years	5,945	5,308
=>65 years	10,019	11,164
Total person-years	76,173	83,659
Mean follow-up (years)	4.8	5.1
Histological confirmation (%)	95.1	93.7
Adenocarcinoma	92.3	90.7
Other specific carcinoma	0.6	0.7
Unspecified carcinoma	2.1	2.2
Other specified type	0.1	0.1
No histological confirmation	4.9	6.3
Second primary cancers		
Non-simultaneous	1904	1365
Simultaneous	665	504

Table 4.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	1.9	7.2	12.1	15.3	17.5	19.9
	F	1.3	5.0	8.1	10.5	12.1	12.7
Colon	M	0.4	1.2	1.9	2.3	2.6	3.2
	F	0.3	1.0	1.6	2.0	2.1	2.3
Rectum	M	0.3	0.8	1.0	1.1	1.2	1.2
	F	0.1	0.4	0.5	0.7	0.7	0.7
Lung	M	0.1	0.9	1.5	1.7	1.9	1.9
	F	0.1	0.4	0.8	0.9	1.0	1.1
Melanoma	M	0.1	0.4	0.7	1.0	1.2	1.8
	F	0.1	0.2	0.4	0.6	0.7	0.7
Breast	F	0.3	1.0	1.7	2.3	2.9	3.0
Prostate	M	0.5	1.9	3.6	4.6	5.7	7.0

All other cancers have 10-year cumulative risk of less than 0.5 % for both sexes.

Common second cancers

From Table 4.2 a man's 10-year cumulative risk of contracting a second cancer following colon cancer is seen to be higher than that for a woman (1 in 8 compared with 1 in 12), and a male excess is seen for each of the four principal cancer types to which both sexes are susceptible namely colon, rectum, lung and melanoma.

Age-specific Incidence

The principal feature of Figure 4.1 is that the age incidence curves for the second primary cancers are orders of magnitude higher at early ages and the curves begin to converge with increasing age. This indicates that the risk of a second cancer is more strongly associated with an early age at onset of the colon cancer, an observation consistent with strong early environmental exposures and/or increased genetic susceptibility.

Trends in the SIRs

The trends in Figure 4.2 show increased SIRs following a diagnosis of colon cancer with these SIRs decreasing with each year of follow-up.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 4.4 (page 66) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs overall are 1.07 for men and 1.17 for women. The highest, statistically significant SIRs for men were gallbladder 1.75, kidney 1.58, colorectum 1.55, colon 1.60, rectum 1.49 and melanoma 1.24. The highest, statistically significant SIRs for women were ovary 1.84, colon 1.63, uterus 1.59, colorectum 1.55 and rectum 1.38. There were no SIRs significantly less than 1 for women and only lung (0.82) and ill-defined site for men.



Figure 4.1: Age-specific rates

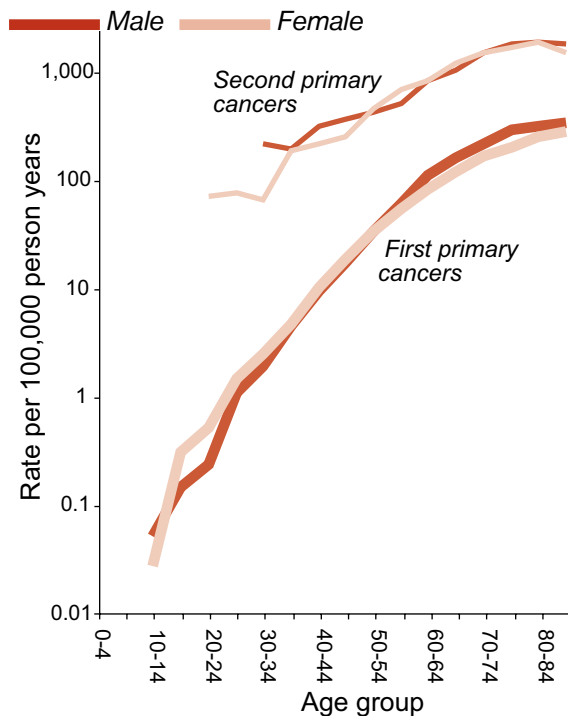
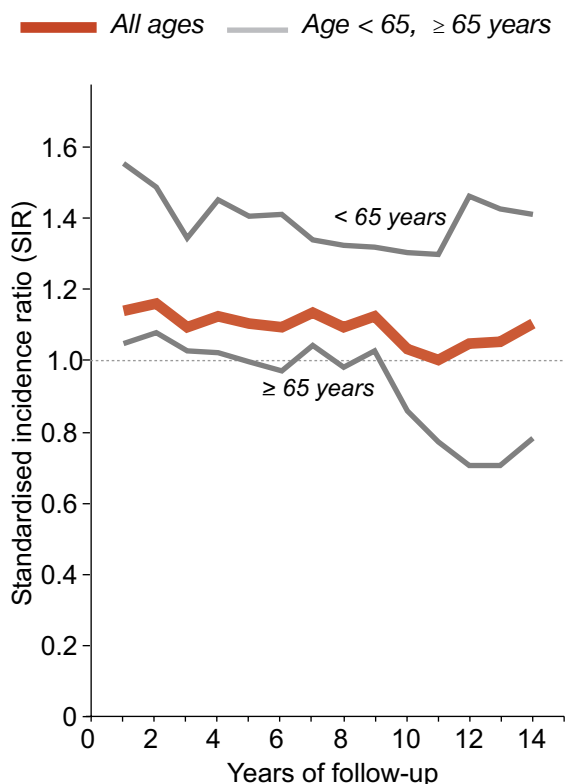


Figure 4.2: Trends in the annual SIR for all second primary cancers



Trends in SIRs with age

In Figure 4.2 the general pattern of decreasing SIRs with increasing follow-up is observed for both age groups though weaker in those under 65 years. The younger age group has consistently higher SIRs than older people at any time during follow-up.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 4.5 (page 67). The younger age group has a 35-50% higher SIRs than the older age group. The SIRs are 1.32 for men first diagnosed before 65 years of age compared with 0.98 for those diagnosed at an older age. The SIRs for women are 1.53 and 1.04 respectively.

For the under 65 year age group the highest SIRs for men are gallbladder 3.39, colon 2.32, colorectum 2.04, rectum 1.72, prostate 1.28 and other 1.75.

For women under age 65 the highest SIRs are ALL 9.71, colon 3.06, colorectum 2.63, ovary 2.31, uterus 2.13, stomach 1.97, rectum 1.77 lung 1.43 and other cancers 1.70.

Comments

The risk of a second cancer following colon cancer is similar to that for all cancers.

An inherited form of colon cancer (Lynch syndrome) is also associated with high risks for some other cancers, including cancers of the rectum, small bowel, uterus, renal pelvis, ureter, stomach, gallbladder, liver, intrahepatic bile ducts and other biliary tract, pancreas, ovary, brain and some skin cancers. This syndrome would account for some of the excess risk for these cancers following a diagnosis of colon cancer, particularly for people diagnosed at an earlier age. Lynch syndrome accounts for about 10% of colorectal cancers occurring in people under 50 years of age but a much smaller proportion of colorectal cancer in older people. The higher SIRs for people diagnosed before age 65 could also be partly due to Lynch syndrome.

Obesity is also a shared risk factor for colon cancer and several other cancers for which there are significantly higher SIRs.

RECTAL CANCER

Table 5.1: Characteristics of the cohort

	Males	Females
First primary cancer	11,333	7,959
Age at diagnosis		
Mean	66.1	67.9
<65 years	5,016	3,048
=>65 years	6,317	4,911
Total person-years	53,193	41,554
Mean follow-up (years)	4.7	5.2
Histological confirmation (%)	96.9	95.9
Squamous and transitional	1.7	3.8
Adenocarcinoma	92.7	88.7
Other specific carcinoma	0.7	1.1
Unspecified carcinoma	1.6	1.8
Other specified type	0.1	0.4
No histological confirmation	3.1	4.1
Second primary cancers		
Non-simultaneous	1088	573
Simultaneous	270	114

Table 5.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	1.4	6.0	9.9	12.8	15.4	16.3
All cancers	F	1.1	4.3	7.1	9.9	11.3	12.0
Colon	M	0.3	1.0	1.4	1.9	2.4	2.6
Colon	F	0.3	1.2	1.8	2.1	2.5	2.5
Lung	M	0.1	0.9	1.6	1.8	1.9	2.1
Lung	F	0.1	0.4	0.8	1.0	1.3	1.3
Melanoma	M	0.1	0.3	0.6	0.9	1.1	1.1
Melanoma	F	0.0	0.2	0.4	0.5	0.8	1.1
Breast	F	0.3	0.9	1.6	2.4	2.8	2.8
Prostate	M	0.4	1.7	2.8	3.8	4.9	5.1

All other cancers have 10-year cumulative risk of less than 0.5 % for both sexes.

Common second cancers

From Table 5.2 a man's 10-year cumulative risk of contracting a second cancer following rectal cancer is seen to be higher than that for a woman (1 in 10 compared with 1 in 14).

Cumulative 10-year risks of > 0.5% are seen for colon, lung, breast and prostate cancers and melanoma.

Age-specific Incidence

The principal feature of Figure 5.1 is that the age incidence curves for the second primary cancers are orders of magnitude higher at early ages with a tendency to converge with increasing age.

Trends in the SIRs

The trends in Figure 5.2 show that SIRs following a diagnosis of colon cancer fluctuate around unity.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 5.4 (page 68) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs are 0.96 for men and 1.04 for women.

Statistically significant SIRs for men include; colon 1.44, bladder 1.32 and ALL 4.68.

Statistically significant SIRs for women include colon 1.77 and colorectum 1.37

Reduced risks of second primary cancers of ill defined site were statistically significant.



Figure 5.1: Age-specific rates

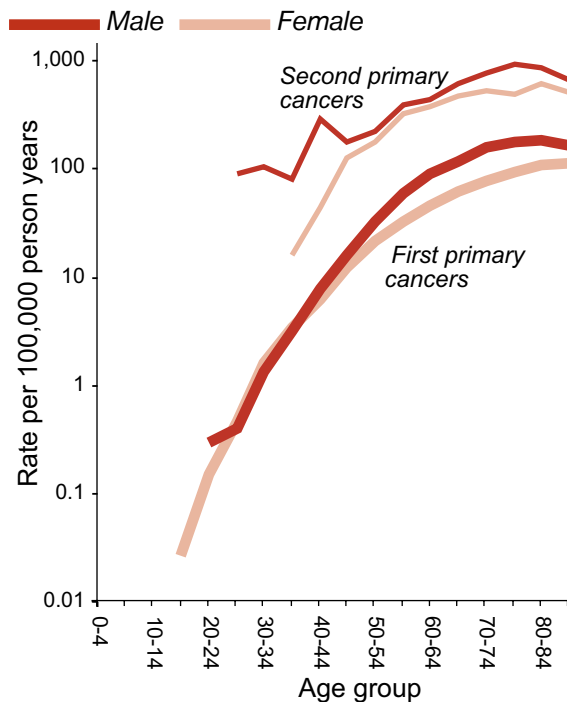
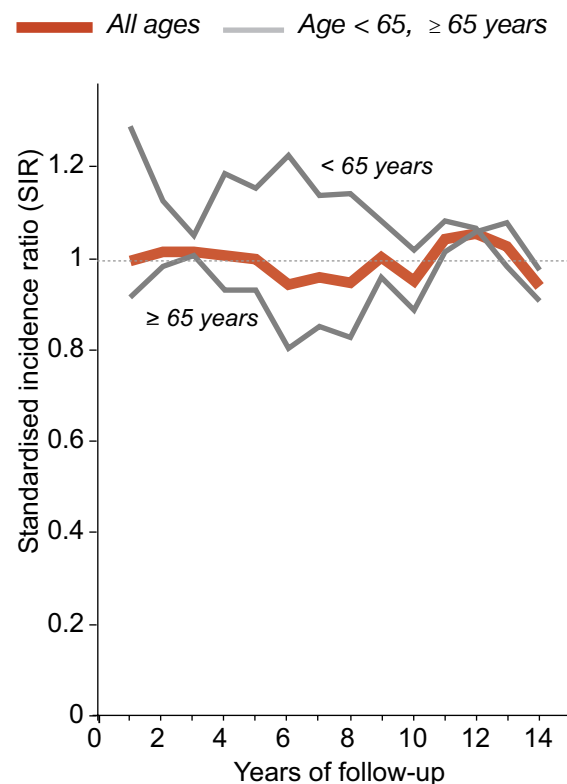


Figure 5.2: Trends in the annual SIR for all second primary cancers



Trends in SIRs with age

In Figure 5.2 it can be seen that SIRs for the under 65 year age group decrease over years of follow-up and converge with those for older persons over time.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 5.5 (page 69). The younger age group has a 15-36% increased SIR compared with the older age group. The SIRs are 1.05 for men first diagnosed before 65 years of age compared with 0.91 for those diagnosed at an older age. The SIRs for women are 1.31 and 0.91 respectively.

For men aged under 65 the highest SIRs are colon 2.19, melanoma 1.51 and colorectum 1.47.

For women under age 65 the highest SIRs are colon 2.58 and colorectum 1.80.

Comments

The risk of a second primary cancer following rectal cancer is similar to that for all cancers.

Second primary rectal cancers have not been considered because treatment of the first primary cancer would usually involve surgical removal of the entire rectum.

An inherited form of rectal cancer (Lynch syndrome) is also associated with high risks for some other cancers, including cancers of the colon, small bowel, uterus, renal pelvis, ureter, stomach, gallbladder, liver, intrahepatic bile ducts and other biliary tract, pancreas, ovary, brain and some skin cancers. This syndrome would account for some of the excess risk for these cancers following a diagnosis of rectal cancer, particularly for people diagnosed at an earlier age. Lynch syndrome accounts for about 10% of colorectal cancers occurring in people under 50 years of age but a much smaller proportion of colorectal cancer in older people. The higher SIRs for people diagnosed before age 65 could also be partly due to Lynch syndrome.

Obesity is also a shared risk factor for rectal cancer and several other cancers for which there are significantly higher SIRs

COLORECTAL CANCER

Table 6.1: Characteristics of the cohort

	Males	Females
First primary cancer	27,173	24,355
Age at diagnosis		
Mean	67	69
<65 years	10,916	8,331
=>65 years	16,257	16,024
Total person-years	128,903	124,917
Mean follow-up (years)	4.7	5.1
Histological confirmation (%)	95.8	94.4
Adenocarcinoma	92.4	90.0
Other specific carcinoma	1.3	2.1
Unspecified carcinoma	1.9	2.1
Other specified type	0.2	0.2
No histological confirmation	4.2	5.6
Second primary cancers		
Non-simultaneous	2975	1930
Simultaneous	930	618

Table 6.2: Cumulative risk (%) of the most common second primary cancers

	Sex	Follow-up years					
		1	5	10	15	20	23
All cancers	M	1.7	6.7	11.2	14.3	16.7	18.5
All cancers	F	1.2	4.8	7.8	10.3	11.8	12.5
Colon	M	0.3	1.1	1.7	2.2	2.6	3.1
Colon	F	0.3	1.1	1.7	2.1	2.4	2.5
Rectum	M	0.2	0.5	0.7	0.8	0.9	0.9
Rectum	F	0.1	0.3	0.4	0.5	0.6	0.6
Lung	M	0.1	0.9	1.6	1.9	2.1	2.1
Lung	F	0.1	0.4	0.8	1.0	1.2	1.2
Melanoma	M	0.1	0.4	0.7	1.0	1.2	1.5
Melanoma	F	0.1	0.2	0.4	0.6	0.7	0.8
Breast	F	0.3	1.0	1.7	2.4	3.0	3.1
Prostate	M	0.5	1.8	3.4	4.5	5.7	6.4

All other cancers have 10-year cumulative risk of < 0.5% for both sexes.

Common second cancers

From Table 6.2 a man's 10-year cumulative risk of contracting a second cancer following colorectal cancer is seen to be higher than that for a woman (1 in 9 compared with 1 in 13). A male excess is seen for each of the four major cancer types to which both sexes are susceptible. The excess is largest for lung cancers, which has strong associations with smoking.

Age-specific Incidence

The principal feature of Figure 6.1 is that the age incidence curves for the second primary cancers are much higher at early ages and begin to converge with increasing age. This indicates that the risk of a second cancer is more strongly associated with an early age at onset of the first primary, an observation consistent with strong early environmental exposures and/or increased genetic susceptibility.

Trends in SIRs

The trends in Figure 6.2 show a slightly increased SIR following diagnosis of the first primary and that this risk decreases over years of follow-up.

Trends in SIRs for specific cancer types by period of follow-up can be found in Table 6.4 (page 72) separately for men and women. Overall 23-year SIRs are given in Table 1.3 (pages 58-61). The overall 23-year SIRs are 1.03 for men and 1.13 for women (significant only for women). SIRs significantly less than 1 were observed for men - lung 0.83, liver 0.56, CLL 0.44 and ill-defined site and women - ill-defined site 0.31.

Statistically significant SIRs are observed for men for colon 1.53, colorectum 1.34, melanoma 1.18, kidney 1.27 and other 1.21. For women the highest are for colon 1.66, colorectum 1.48, uterus 1.44 and ovary 1.52.



Figure 6.1: Age-specific rates

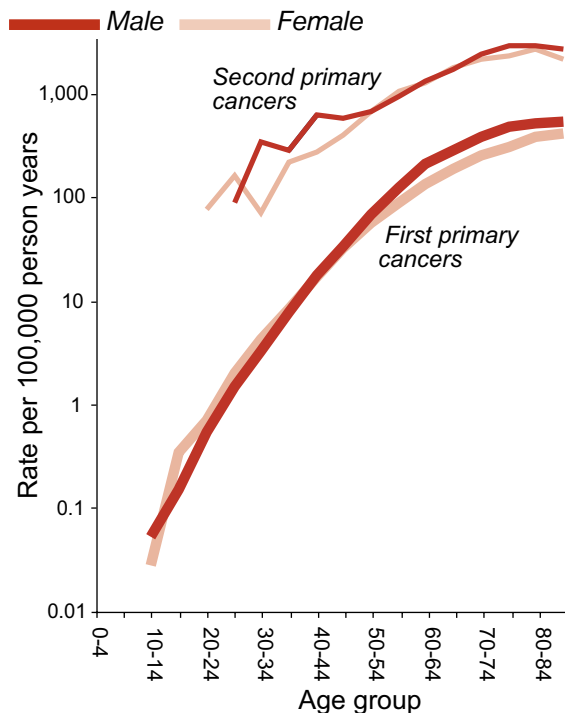
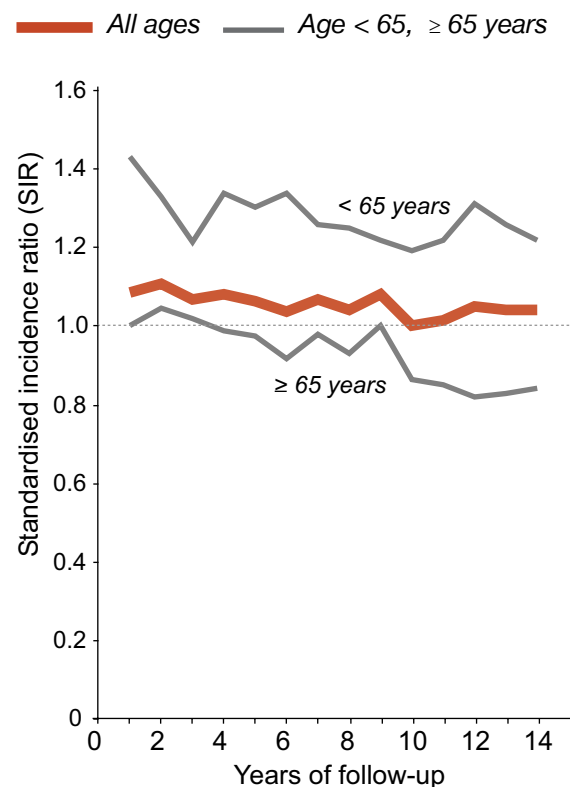


Figure 6.2: Trends in the annual SIR for all second primary cancers



Trends in SIRs with age

In Figure 6.2 the general pattern of decreasing SIRs with increasing follow-up is observed for both age groups, with the under 65 year age group having consistently higher SIRs than older people at any time during follow-up.

Estimates of overall 23-year SIRs by age group and sex are to be found in Table 6.5 (page 71). The younger age group has a 25-45% higher SIR than the older age group. The SIRs are 1.20 for men first diagnosed before 65 years of age compared with 0.95 for those diagnosed at an older age. The SIRs for women are 1.45 and 1.00 respectively.

For the under 65 year age group the highest SIRs for men are - colon 2.26, colorectum 1.80, gallbladder 2.11, melanoma 1.36, prostate 1.13, renal pelvis 2.46 and other 1.53..

For women under age 65 the highest SIRs are stomach 1.81, colon 2.84, colorectum 2.30, lung 1.40, melanoma 1.43, uterus 1.75, ovary 1.89, ALL 6.22 and other 1.60.

Comments

An inherited form of colon cancer (Lynch syndrome) is also associated with high risks for some other cancers, including cancers of the rectum, small bowel, uterus, renal pelvis, ureter, stomach, gallbladder, liver, intrahepatic bile ducts and other biliary tract, pancreas, ovary, brain and some skin cancers. This syndrome would account for some of the excess risk for these cancers following a diagnosis of colon cancer, particularly for people diagnosed at an earlier age. Lynch syndrome accounts for about 10% of colorectal cancers occurring in people under 50 years of age but a much smaller proportion of colorectal cancer in older people. The higher SIRs for people diagnosed before age 65 could also be partly due to Lynch syndrome.

Obesity is also a shared risk factor for colorectal cancer and several other cancers for which there are significantly higher SIRs