

# 31 years of lung cancer in the Canton of Zurich, Switzerland: Incidence trends by sex, histology and laterality

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## Background

Lung cancer belongs to the most common cancer sites worldwide with one of the leading causes of cancer death. The purpose of this study was to examine trends in lung cancer incidence since 1980 in the Canton of Zurich with focus on sex, histology and laterality.

## Methods

Cancer Registry data were analysed consisting of 16,798 lung cancer cases in the Canton of Zurich from 1980 to 2010. They were classified into five histological subtypes. Age-standardized (European standard) incidence rates (IR), male-to-female incidence rate ratio (IRR) and left-to-right lung IRR were calculated.

Variable	All cases N= 16798 (100%)	Adenocarcinoma N= 5357 (31.9%)	Squamous cell carcinoma N= 4895 (29.1%)	Small cell carcinoma N= 2592 (15.4%)	Carcinoid tumour N= 250 (1.5%)	Large cell carcinoma N= 1065 (6.3%)	Others and NOS N= 2639 (15.7%)	p-value
<b>Age (years)</b>								
Mean ± SD	67.5 ± 11.2	66.2 ± 11.3	68.1 ± 9.9	66.0 ± 10.6	62.1 ± 16.4	65.2 ± 11.4	71.9 ± 11.5	<0.0001
Median	68.2	66.5	68.8	66.5	65.7	65.4	72.9	
Range	7-103	20-97	7-94	29-92	20-92	32-92	28-103	
Quantile 25%; 75%	60.0; 75.8	58.3; 74.7	61.4; 75.5	58.8; 73.9	51.3; 74.6	57.6; 73.5	64.5; 80.7	
<b>Sex [n (%)]</b>								
Women	4652 (100%)	2034 (43.7%)	720 (15.5%)	701 (15.1%)	141 (3.0%)	305 (6.6%)	751 (16.1%)	<0.0001
Men	12146 (100%)	3323 (27.4%)	4175 (34.4%)	1891 (15.6%)	109 (0.9%)	760 (6.3%)	1888 (15.6%)	
Men/Women ratio [m/f]	2.61	1.63	5.80	2.70	0.77	2.49	2.51	
<b>Period of diagnosis [n (%)]</b>								
1980-1989	4796 (100%)	1088 (22.7%)	1962 (40.9%)	889 (18.5%)	49 (1.0%)	228 (4.8%)	580 (12.1%)	<0.0001
1990-1999	5342 (100%)	1623 (30.4%)	1594 (29.8%)	829 (15.5%)	93 (1.7%)	386 (7.2%)	817 (15.3%)	
2000-2010	6660 (100%)	2646 (39.7%)	1339 (20.1%)	874 (13.1%)	108 (1.6%)	451 (6.8%)	1242 (18.6%)	
<b>Left-right-ratio [IR left/ IR right]</b>								
Women	0.7	0.6	0.8	0.8	0.8	0.8	0.7	<0.0001
Men	0.8	0.8	0.9	0.8	1.0	0.8	0.9	
<b>Laterality unknown [n (%)]</b>								
Women	584 (12.6%)	185 (9.1%)	40 (5.6%)	97 (13.8%)	17 (12.1%)	42 (13.8%)	203 (27.0%)	<0.0001
Men	1284 (10.6%)	301 (9.1%)	178 (4.3%)	197 (10.4%)	6 (5.5%)	75 (9.9%)	527 (27.9%)	<0.0001

**Table 1:** Frequencies of different histologic types of lung cancer by age, sex, period of diagnosis, left-right-ratio and laterality, 1980-2010, Canton of Zurich

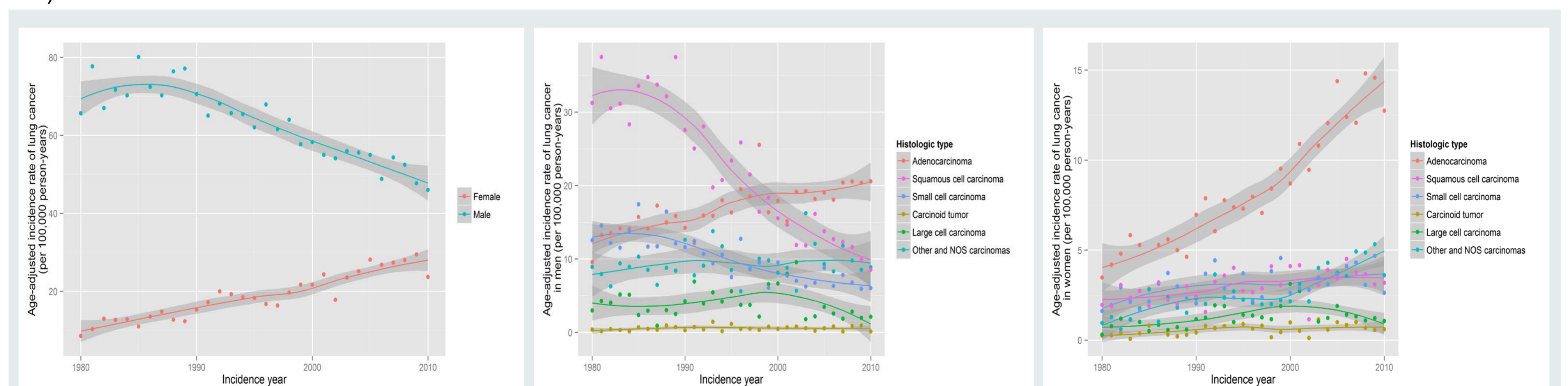
## Results

Of all lung cancer cases, 72% were men, 28% were women with a mean age of 67.5 ± 11.2 years. Overall male-to-female ratio was 2.61, the highest ratio of 5.8 for squamous cell carcinoma, the lowest of 0.77 for carcinoid tumour. Adenocarcinoma were most common (31.9%) followed by squamous cell carcinoma (29.1%), small cell carcinoma (15.4%), large cell carcinoma (6.3%) and carcinoid tumour (1.5%). Other/unspecified subtypes were 15.7% (table 1). Over the time, there was a decrease of the IR for squamous cell carcinoma in men from 34.2/100,000 (95% CI 32.5-35.9) to 12.8/100,000 (95% CI 12.0-13.6) and an increase in women from 3.4/100,000 (95% CI 2.7-4.0) to 4.0/100,000 (95% CI 3.4-4.5).

For adenocarcinoma IR increased in women from 5.1/100,000 (95% CI 4.1-5.8) to 12.6/100,000 (95% CI 11.8-13.4) and in men from 15.1/100,000 (95% CI 14.0-16.3) to 19.4/100,000 (95% CI 18.4-20.4) (figure 2,3). All histologic subtypes showed a higher susceptibility of the right lung, which was more distinct in women than in men (table 1).

## Conclusion/Discussion

Our data reflects the global increase of lung cancer in women. Adenocarcinoma increased over time in women and men, whereas squamous cell carcinoma decreased markedly among men. These trends in histological subtypes are probably due to the changing smoking behaviour and the changed composition of cigarette ingredients.



**Figure 1:** Age-adjusted incidence rates (European Standard) of lung cancer by sex, 1980-2010, Canton of Zurich

**Figure 2:** Age-adjusted incidence rates (European Standard) of lung cancer in men by histologic type, 1980-2010, Canton of Zurich

**Figure 3:** Age-adjusted incidence rates (European Standard) of lung cancer in women by histologic type, 1980-2010, Canton of Zurich