

Review of the incidence, prevalence, mortality and causative factors for lung cancer in Europe

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Lung cancer is the most common cancer in the world. It is responsible for approximately 1.6 million or 12.7% of new cancer diagnoses and 1.4 million cancer-related deaths (18.2%) globally each year [1]. Internationally, the economic and social burden of lung cancer is considered to be amongst the highest for any disease, which is significant given that it was still a comparatively rare condition at the beginning of the last century [2,3]. It is now the third most common cancer in Europe after breast and colorectal cancers, with an estimated incidence of 12.2%. These statistics notwithstanding, lung cancer accounts for the largest number of cancer-related deaths in both the European Union and the World Health Organisation's European region, where it is responsible for 19.8% of cancer mortality in both men and women (Table 1) [1]. Incidence varies by country, however, and closely parallels historical trends in tobacco consumption with higher rates in Central, Eastern and Southern Europe in comparison to most Northern European nations.

Lung cancer incidence is still higher in men than in women, with the highest rates being in Hungary, Poland, Croatia, Belgium, the Netherlands, Luxembourg, Italy, Denmark and Greece. The highest ranked countries for women vary slightly, indicating an historical tendency towards larger numbers of women engaging in smoking behaviours in northern states, including Iceland, Denmark, the United Kingdom, Eire, Norway, Sweden and the Netherlands, although Hungary and Poland also have high rates of female lung cancer [4]. Concern has additionally been expressed about recent developments in France and Spain, where increasing numbers of women are beginning to smoke [5].

Mortality, too, varies by country, and ranges from 15 to 28% of all cancer deaths in Europe [6,7], with some countries showing little overall improvement in incidence or mortality rates for either sex, primarily as a result of late referral patterns. One must be wary of drawing too much inference from published international five-year survival rates for patients with

lung cancer, however, since there is variable population coverage in the cancer registries of different European countries [8]. It would appear, however, that whilst public health and other initiatives are beginning to have an impact on smoking-related behaviours, referral patterns, and the stage at which lung cancer is being diagnosed in some countries, it seems unlikely that the European lung cancer epidemic will be over very soon and a great deal remains to be done in relation to lung cancer prevention [4].

In spite of gradual improvements in the diagnosis and treatment of lung cancer worldwide, the prognosis for non-small-cell lung cancer has changed relatively little in recent decades, and lung cancer continues to have one of the lowest five-year survival rates for any group of malignancies at just 12.6% [7]. Survival for lung cancer patients remains poor throughout Europe with one-year survival rates of just 30% and an age-adjusted five-year survival rate of little more than 12% (Table 1) [7,9]. Again, however, there are national differences in survival. The latest statistics from England and Wales indicate that one-year survival is approximately 27% for men and 30% for female lung cancer patients, but these levels fall to 7% and 9% respectively at five years, significantly lower than the European average [10,11], possibly as a result of lower surgical resection rates than countries that show better five-year survivorship outcomes such as Austria, France, Germany, the Netherlands and Spain [12].

However, whilst tobacco consumption is undeniably the greatest preventable cause of lung cancer, it does not account for every incidence of the disease, and many who have never smoked sometimes develop particular forms of lung malignancy. Therefore, in addition to discussing national and international differences in the incidence, prevalence and mortality of lung cancer in relation to smoking patterns in Europe, this teaching session will also consider other factors that have been implicated in the genesis of this complex multi-factorial disease. This will include an examination of the literature on occupational and

Table 1

Age-standardised incidence and death rates (in parentheses) of respiratory tract cancers (trachea, bronchus and lung cancer) per 100,000 population in men and women of all ages in the EU-27 in 2002 according to GLOBOCAN 2007 figures

Country	Male	Female	Country	Male	Female
Austria	42.6 (37.7)	14.3 (12.1)	Lithuania	57.5 (55.9)	5.6 (5.3)
Belgium	75.3 (69.9)	12.2 (10)	Luxembourg	61.3 (49.6)	13.6 (11.8)
Bulgaria	45.6 (39.1)	6.7 (6.9)	Malta	41.1 (37.7)	6.1 (6.7)
Cyprus	26.8 (24.8)	5.7 (5.3)	Netherlands	59.7 (57.6)	17.8 (15.6)
Czech Republic	66.1 (61.8)	13.3 (12.8)	Norway	36.4 (32.7)	18.7 (13.5)
Denmark	45.3 (45.2)	29.7 (27.8)	Poland	82 (68.4)	14.6 (12.3)
Estonia	67.7 (62.2)	9.1 (7.3)	Portugal	34.2 (29.9)	6 (5.3)
Finland	33.4 (34.4)	10.1 (8.2)	Romania	50 (47.1)	8.5 (8.1)
France	52.6 (47.5)	8.8 (8)	Slovenia	57.1 (54)	13.9 (11.9)
Germany	46.7 (42.4)	12.7 (10.8)	Spain	55.8 (49.2)	5.4 (4.7)
Greece	58 (49.8)	8.7 (7.6)	Sweden	21.1 (22.6)	14.4 (12.9)
Hungary	94.6 (83.9)	24.9 (22.3)	Switzerland	44.6 (35.4)	13.8 (10.5)
Iceland	30 (33.1)	30 (25.2)	United Kingdom	48.1 (42.9)	24.9 (21.1)
Ireland	39.8 (37.9)	19.7 (18.1)	EU-15	50.9 (45.7)	13.1 (11.2)
Italy	58 (50.1)	10.7 (8.5)	EU-27	54.3 (48.5)	13 (11.2)
Latvia	60.2 (58.9)	6.4 (6.3)			

environmental risk factors, the possible implications of diet and nutrition, alcohol intake, and the growing body of evidence, which shows that some individuals may have greater genetic susceptibility to certain forms of the disease. Factors that have been posited as having protective benefits such as food supplements, lifestyle changes and exercise will also briefly be discussed.

Conflict of interest statement

The author has no conflict of interest to report.

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