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Lung cancer: Still a significant problem among Queensland men & an increasing problem among Queensland women

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Background

Because the epidemic of tobacco use occurred earlier in men than women, much of our understanding of lung cancer has come from a time when most of the cases involved men. The pattern of lung cancer in women is different from what we have seen so far in men and the epidemiology of lung cancer in men is also changing. The aim of this Circular is to examine changes in the pattern of lung cancer in Queensland and to consider their implications.

Summary of results

- In the 16 years from 1982 to 1997, nearly 19,000 Queenslanders died from lung cancer.
- Between 1982 and 1997, the incidence (i.e., new cases) of lung cancers increased by 58% for women and decreased by 25% for men.
- If current trends in mortality continue unchanged to 2002, lung cancer will have overtaken breast cancer as the leading cause of cancer death in women.
- If current trends in incidence continue unchanged to 2006, more women than men will be diagnosed with lung cancer.
- Between 1982 and 1997, the incidence of adenocarcinoma of the lung increased by 87% in women and 14% in men. Adenocarcinoma is currently the most common type of lung cancer in women (38.4%) and the second most common type of cancer in men (30.2%) after squamous cell carcinoma (32.2%).

Summary of implications

- Although lung cancer is still one of the most significant public-health problems for men, it is increasingly becoming a women's health issue.
- Experts think that the increase in adenocarcinomas is related to the use of low-tar, low nicotine cigarettes, which require the smoker to inhale deeply to obtain enough nicotine to make smoking a pleasurable experience. Deep inhalation transports carcinogens to the outer areas of the lung, where adenocarcinomas often arise. This suggests that there is no such thing as a *'safer'* cigarette. Mistaken beliefs about the safety of light and ultra-light cigarettes might reduce intentions to quit.

Overview of lung cancer in Queensland

Lung cancer is the third most common new cancer diagnosed in men (after prostate cancer and colorectal cancer) and the third most common new cancer diagnosed in women (after breast cancer and colorectal cancer).

Throughout the world, survival from lung cancer is poor. The five-year relative survival is only 12%[1]. Long-term survival occurs almost exclusively among patients with early-stage disease who have complete surgical removal of the cancer[2]. Survival has improved marginally since the early 1980s, but this mainly because of improved perioperative care for patients undergoing lung resection, rather than advances in early detection, treatment or secondary prevention[3].

Because survival is so poor, lung cancer is the leading cause of death from cancer in Queensland, Australia, and the rest of the western world. In Queensland, it currently accounts for 21% of cancer deaths and 6% of all deaths. In the 16 years from 1982 to 1997 18,910 Queenslanders died from lung cancer.

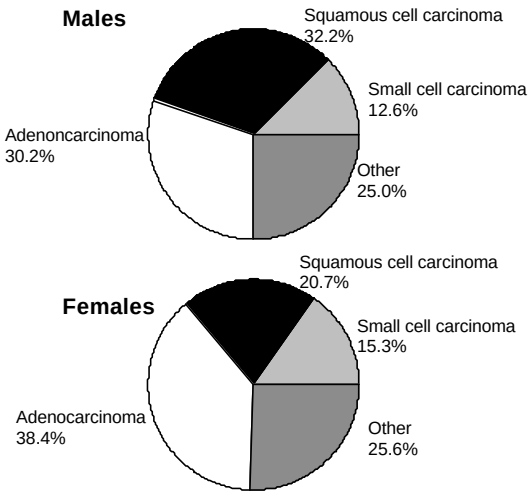
Types of lung cancer

Lung cancers are classified according to the type of cell involved (Figure 1).

Adenocarcinoma is the most common type of lung cancer in women and will soon become the most common type in men (see next section). Adenocarcinoma is different from some other types

of lung cancer in that it tends to occur in the outer areas of the lung, rather than in the central areas.

Figure 1: Type of lung cancer in males and females, Queensland, 1993 to 1997



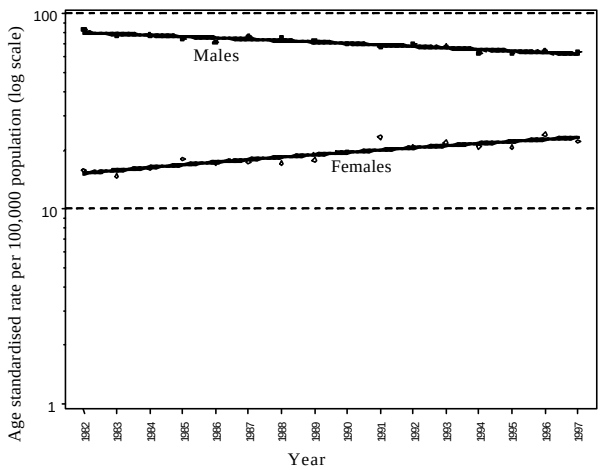
Large cell tumours were included in the *'Other'* category and not as a separate category because they are classified variably by pathologists[4]. Other analyses have also made use of this simplified classification[5].

Trends in lung cancer

Overall

In the period 1982 to 1997, the annual incidence rates for all lung cancers combined decreased by 25% in men, but increased by 58% in women (Table, p5 & Figure 2).

Figure 2: Trends in the directly age standardised incidence rates for lung cancer in Queensland



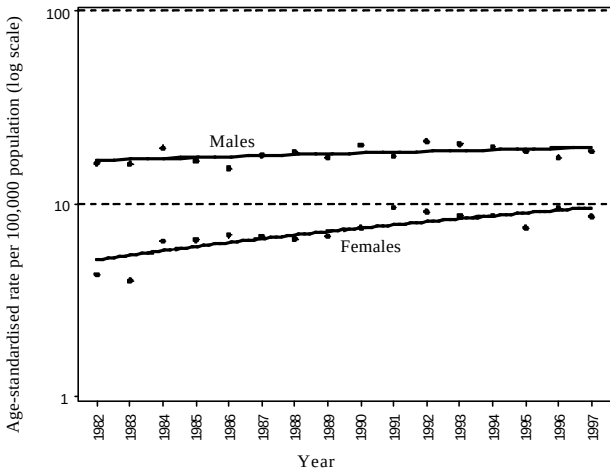
Hopefully the increasing trend for lung cancer in women will stabilise, but it is difficult to predict when this will occur. If the current trends in mortality continue unchanged to 2002, lung cancer will have overtaken breast cancer as the leading cause of cancer death in women. Continuation of current trends in incidence to 2006 would mean that more women than men will be diagnosed with lung cancer.

Types

For men there were decreases in incidence of all types of lung cancer, except adenocarcinoma, for which there was a 14% increase between 1982 and 1997. The type of cancer with the largest decrease was squamous cell carcinoma, which had a decrease of 40% (see Table, p5 & Figure 3).

For women, there were increasing trends for all types of cancer ranging from 17% for squamous cell carcinoma to 87% for adenocarcinoma (Table, p5 and Figure 3).

Figure 3. Trends in incidence of adenocarcinoma of the lung, Queensland.



Possible explanations for the increase in adenocarcinomas

Changes in the pattern of lung cancer lag by more than 20 years behind changes in tobacco consumption[6]. Changes in the design of cigarettes in the 1960s, specifically the change to low-tar, low-nicotine cigarettes, could explain the change in the

pattern of lung cancer. Smokers need to inhale the smoke of these cigarettes more deeply to obtain a certain dose of nicotine. Deep inhalation causes up to 50% of the smoke particles to settle in the outer parts of the lung where most of the adenocarcinomas occur[5].

Another hypothesis is that the incidence of adenocarcinoma may have increased because diganostic advances have made it easier to perform biopsies in the small airways in the outer parts of the lung. However, current thinking is that the increase in adenocarcinoma is more consistent with changes in the design of cigarettes than with diagnostic advances[5].

Smoking and trends in lung cancer

More than 90% of the cases of lung cancer are caused by smoking and only about 2% of people with lung cancer are life-long non smokers[7]. Ex-smokers have an increased risk of lung cancer, compared with non smokers, for about 15 years after quitting, particularly in the first five years[8].

Researchers have estimated that the prevalence of smoking among men in Australia was as high as 72% in the years after World War II[9]. Since the early 1980s we have seen a decrease in the rates of lung cancer in men associated with declines in the prevalence of smoking in the 1960s. Unfortunately, about 26% of Queensland men still smoke[10] and lung cancer will remain an important disease among men for many more years.

The prevalence of smoking in women never reached the peak of that for men[11]. Perhaps 30% of women in Queensland were smoking in the 1960s and the prevalence did not start to decline until the late 1970s[12]. We have not yet seen the effect of this in the rates of lung cancer.

The available data suggests that the decline in the prevalence of smoking for both men and women has slowed in recent years[13]. Data from the National Drug Strategy Household Surveys found that the proportion of Queensland males, 14 years or older, who smoke regularly did not change much between 1995 (26.2%) and 1998 (25.5%)[11]. For Queensland females the proportions increased: 1995 (20.2%), 1998 (23.4%)[11]. This is consistent with data from the Statewide Health Surveys conducted by the Health Information Centre, Queensland Health in 1993 and 1998[14,15] and is also consistent with national trends[13]. In general, whenever national surveys are conducted, Queensland tends to have smoking rates that are among the highest of all the states, although the differences are not large[11,16].

There is now evidence that female smokers are more susceptible to developing lung cancer than male smokers[17]. The risk of lung cancer for a woman with a 40-a-day smoking history is 28 times that of a woman who does not smoke, whereas for man the risk is only 10 times greater. The biological reasons for this are unclear. Women may also find it more difficult to quit smoking than men[19]. Further, the available evidence suggests that in Queensland, as in the rest of Australia, young women and especially teenage girls are taking up smoking at rates similar to, if not higher than, those for young males[20].

Implications

Cigarette for cigarette, women are biologically more susceptible to lung cancer than men. Lung cancer is an important problem in women's health. If current trends continue, lung cancer will become the leading cause of cancer death among Queensland women by the year 2002 and more women will be diagnosed with lung cancer than men by the year 2006.

Cigarette companies have appealed to women with so-called light and ultra-light cigarettes. The increasing trends in adenocarcinoma suggest that there is no *safe* cigarette. The major reason why men and women smoke is their continuing and increasing dependence on nicotine. To get their required level of nicotine, smokers of low tar and low nicotine cigarettes tend to take more and longer puffs per cigarette, inhale more deeply, and block ventilation holes in the filter, which thereby negates their reason for switching to low tar brands. Studies in the United States suggest that smokers' perceptions of tar yields may be influenced by misleading advertising terms such as light and ultra-light and that mistaken beliefs about low-tar brands may reduce intentions to quit[21].

Appendix: Materials and Methods

Data were obtained from the Queensland Cancer Registry (QCR) for the period 1982 to 1997. All rates were directly age standardised to the 1991 Australian standard population. Trends were assessed using Poisson regression models with a linear term for year and indicator variables for 5-year age groups. Statistically signficant results are those where the 95% confidence interval does not include zero. Types of lung cancer were based on histology reports, which are coded by the QCR using internationally agreed conventions and codes (ICD-O).

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Table: Trends in the incidence rates for types of lung cancer, Queensland, 1982 to 1997

	Males		Females	
	Annual percentage (95% CI)	**Total percentage change1982 to 1997 (95% CI)**	**Annual percentage change (95% CI)**	**Total percentage change, 1982 to 1997 (95% CI)**
Small cell carcinoma	-1.9 (-2.9 to –0.9)	-26.6 (-37.8 to –13.1)	2.1 (0.5 to 3.7)	38.4 (7.8 to 77.6)
Squamous cell carcinoma	-3.1 (-3.8 to –2.5)	-40.0 (-46.1 to –33.2)	1.0 (-0.3 to 2.3)	17.2 (-5.1 to 44.5)
Adeno-carcinoma	0.8 (0.2 to 1.5)	14.4 (3.1 to 26.9)	4.0 (2.9 to 5.1)	86.9 (57.8 to 121.5)
Other	-2.4 (-3.1 to –1.6)	-31.7 (-40.1 to –22.2)	2.4 (1.2 to 3.7)	47.3 (20.8 to 79.6)
Total	-1.7 (-2.1 to –1.4)	-24.5 (-28.5 to –20.2)	2.9 (2.2 to 3.6)	58.0 (41.5 to 76.8)