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BRONCHIOGENIC AND LUNG CANCER IN THE SOUTH PACIFIC

by

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In the past, smoking in the South Pacific region was confined almost entirely to the male members of the community. Depending on the island, the older generations of females smoked seldom or not at all. The material smoked included specially selected leaves, partially cured wild tobacco and trade twist tobacco.

Over the past decade, two changes have taken place in smoking habits. Among the older generations, more imported tobacco is being smoked in manufactured cigarettes by the males; and in the urban areas, manufactured cigarettes are being smoked almost exclusively. In the towns also, women are smoking much more commonly than ever before. Smoking habits in both males and females are being acquired earlier in life, since all grades and qualities of imported tobacco and manufactured cigarettes are advertised extensively and can be bought comparatively cheaply. The smoking of "King Size" cigarettes is regarded as an equality symbol and is now firmly established. The principle of reciprocal giving, which governs traditional social systems, and the availability of imported cigarettes sold loose and not necessarily in packets, ensure a wide consumption even for those with low income.

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In the United States a report of the Surgeon General of the US Public Health Service revealed in 1964 that:

Smokers have a 70% greater risk than non-smokers of dying prematurely in their 40's and 50's.

They have a 1000% greater risk that this early death will be from lung cancer;

a 500% greater risk that this early death will be from bronchitis or emphysema;

a 70% greater risk that they will die from coronary heart disease.

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These risks are higher for those who have started smoking at an early age and for those who are heavy smokers.

In men, cigarette smoking is causally related to lung cancer. The importance of the effects of cigarette smoking far outweighs all other factors. The data for women point in the same direction.

The risk of developing lung cancer increases with duration of smoking and the number of cigarettes smoked per day and is diminished by discontinuing smoking. In comparison with non-smokers, the average male smoker of cigarettes has approximately a nine-to-ten-fold risk of developing lung cancer while heavy smokers have at least a 20-fold risk.

The risk of developing cancer of the lung for the combined group of pipe smokers, cigar smokers and pipe and cigar smokers is greater than for non-smokers, but much less than for cigarette smokers.

As far as other respiratory diseases are concerned, cigarette smoking is the most important cause of chronic bronchitis. A relationship exists between pulmonary emphysema and cigarette smoking, but it has not been established that the relationship is causal. Cough and sputum production or the two combined are consistently more frequent among cigarette smokers than among non-smokers. Cigarette smoking is associated with a reduction in ventilatory function. Among males cigarette smokers have a greater prevalence of breathlessness than non-smokers.

Moreover the causal relationship of the smoking of a pipe to the development of cancer of the lip appears to be established. Cigarette smoking is a significant factor in the causation of laryngeal cancer in the male. The evidence on the tobacco-oesophageal-cancer relationship supports the belief that an association exists. Epidemiological studies indicate an association between cigarette smoking and peptic ulcer which is greater for gastric than for duodenal ulcer. Available data suggest an association between cigarette smoking and urinary bladder cancer and there seems to be a strong association between excessive cigarette smoking and adenocarcinoma of the kidney. No reasonable doubt now remains that smoking in pregnancy has adverse effects on the developing foetus. It exerts a retarding influence on foetal growth and the possible implication of smoking in relation to the increase of foetal loss among smoking mothers is under discussion.

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The majority of the tumorigenic agents in tobacco smoke are found in the particulate matter "tar". 0.03% of the smoke particulate is made up of polynuclear aromatic hydrocarbons with two or more rings, concentrates of which may produce significant cytological changes in

mouse trachea and human foetal lung when grown in organ culture. Seven of these polycyclic aromatic compounds have been established as cancer producing (carcinogenic). Other substances in tobacco and smoke, though not carcinogenic themselves, promote cancer production or lower threshold to a known carcinogen. Several toxic or irritant gases in tobacco smoke produce experimentally the kinds of non-cancerous damage seen in the tissues and cells of heavy smokers. This includes suppression of ciliary action which normally cleanses the trachea and bronchi, damage to the lung air sacs, and to mucus glands and goblet cells which produce mucus.

Present evidence does not indicate that tobacco alkaloids are carcinogenic. An exception may be cotinine, which has been reported to induce malignant tumors in rats and adenomas of the bladder in mice.

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The preponderance of the higher risk of lung cancer in smokers lies in the categories of epidermoid carcinoma and anaplastic small cell carcinoma. Well differentiated squamous cell carcinomas, small cell carcinomas and adenocarcinomas show a dose response relationship to cigarette smoking.

However the most significant point is the overwhelming pre-dominance in males of squamous cell carcinomas. This is the histological type of cancer which accounts for most of the global increase in the disease incidence over the past few decades. There is little doubt that the cause of this type of cancer is environmental in origin. Regional difference may be explained on the basis that lung cancer occurs more frequently where economic opportunities are better.

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The chief symptoms to seek for are cough, blood stained sputum, dyspnea and pain in the chest. Pleural effusion occurs in about 50 per cent of the cases and is often blood stained. Fever and leucocytosis are occasional symptoms which tend to confuse the diagnosis. The diaphragm on the affected side is drawn up as may be seen in the roentgen ray film. The film often fails to indicate any tumor, merely showing such effects of the tumor as atelectasis, pleural effusion and enlarged mediastinal glands.

- Bronchoscopic examination is of great value; it may show a definite tumor, mucosal roughening, stenosis or merely interference with the normal movements.

- Biopsy through the bronchoscope is to be performed.

- The breath sounds are absent over the affected area, even though the bronchi may not be correspondingly narrowed on bronchoscopic examination.

- Tumor cells may be found in sputum examined by the wet film method (smear fixed wet in corrosive sublimate).

- Hypersecretion of antidiuretic hormone may be found in the case of small cell carcinoma.

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In the South Pacific area there are no grounds for optimistic belief that early diagnosis of lung cancer may eventuate in the near future since it seems clear that non-specific symptoms of lung disease are often accepted with unconcern and are not regarded as serious until some urgency is imposed by such events as haemoptysis or chest wall pain. This is not surprising in countries where chronic obstructive airways disease is common.

Following are the figures we have collected concerning bronchiogenic and lung cancer in the territories covered by the South Pacific Commission.

Trachea, bronchiae, lungs

PNG	W.S.	Tonga	Fr.Pol.	Fiji	N.Cal.	GEI	Guam	TTPI	A.S.	Cooks
13,6	5	2.9	11	6	31*	6	31*	28	11	5

* Guam and N.C. exceed the world average for cancer of the lungs.

It is clear that in these countries and territories symptoms of respiratory disease are not connected in the mind with those arising from metastases of lung cancer although these are the ones which account for the presentation of the majority of patients for diagnosis. Bone pain, superficial gland enlargement, abdominal discomfort, hoarseness, congestion of the head and neck are the signs which compel attention.

The above table shows that the figures relating to New Caledonia are the highest in the region. The fumes of the nickel smelting works in this territory have often been suspected of causing cancer. However, no research so far has confirmed or disproved this assumption.

While the US National Research Council has demonstrated that inhaling air containing nickel could cause cancer among animals, it has also proved that smoking 40 cigarettes a day resulted in the absorption of one to five milligrammes of nickel per year. It is therefore recommended that surveys be undertaken with a view to identifying possible relations with the development of cancer of the respiratory system.

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PREVENTIVE MEASURES

The consequences of tobacco smoking are very clear, and equally plain is the certain increase in the incidence of lung cancer, if the present increase in tobacco consumption and change in smoking habits is maintained, and, as seems likely on the present evidence, accelerated. This increase in lung cancer could well reach the epidemic proportions seen today in the more developed countries.

It is usually advanced as a probable solution to the problem that the consumer should be educated in the risks of tobacco smoking, particularly cigarette smoking, and that attempts to restrict consumption should be made by increasing the price of cigarettes and restricting advertising. None of these control measures has succeeded anywhere in significantly decreasing the consumption of tobacco in the developed communities, nor have they stemmed the increase in morbidity and mortality from lung cancer. In the United Kingdom, for instance, where these measures are applied, it is predicted that the present mortality rate from lung cancer of 15,000 per annum will reach 45,000 per annum in 1980 if present smoking habits continue. This is ten times the annual death rate which could be anticipated if there was no smoking at all.

Several studies have confirmed the finding that selection of tobacco and the use of tobacco sheets and filters can lead to significant reduction of tar nicotine, polynuclear aromatic hydrocarbons and tumorigenicity of cigarette smoke.

The development of safer cigarettes by the design of selective filters has received much attention. Cigarette smoke consists of an aerosol of oily droplets (particulate phase) suspended in a mixture of atmospheric and non-atmospheric gases (vapour phase). Non-selective filters which are now incorporated in filter cigarettes cut down the amount of particulate matter drawn into the mouth, but they remove only between 25 and 55 per cent of particulate matter.

Selective filtering has been developed to limit the vapour phase constituents such as phenols and ciliostatic gases. It is not clear whether the presence of those agents affects the carcinogenicity of the smoke, but the removal of the ciliostatic gases might be of some value in diminishing the bronchitis risk.

If smoking habits are to be changed, health education must be combined with much more stringent measures of public control than are at present contemplated in most communities. The measures which would need to be adopted now in this region to limit what appears at this time to be an inevitable increase in the incidence of lung cancer in the immediate future would need to be severe if they were to have any chance of success.

Short of total prohibition, the measures would include the intensive education of children to whom it should be made clear that the habit of smoking is a demeaning one, and totally unacceptable socially, the smoker being invariably depicted in the advertising media as materially prosperous, socially acceptable and sexually successful. It should be made clear that on the contrary, more often than not these depicted qualities are the needs rather than the attributes of smokers, who are not outstandingly successful materially, socially and sexually.

While governments which levy taxes on the sale of cigarettes are understandably reluctant to forego such an income, they might not have reckoned the cost of all respiratory diseases to their Health Departments. Attitudes vary in the Pacific. Some territories impose a limitation on publicity for cigarettes, while others authorize new sales counters or automatic dispensers.

Smoking is forbidden in certain meeting places. It was in fact demonstrated that in such places, those sitting close to a smoker absorb a significant quantity of the toxic matter contained in the smoke. It would be most desirable that imports be limited to those cigarette packs bearing an indication of the nicotine and tar contents, together with a warning to consumers of the health hazard involved. This would be a first step towards mass education.

However, as in other aspects of preventive health education, such campaigns should be undertaken by experts who would use tried techniques to approach the smokers problem. It should be recalled, however, that in spite of such coercive measures as taxes, prohibition, etc., tobacco imports have increased in the Pacific region by 40 per cent between 1969 and 1974, when the foreign exchange so spent could have been used to purchase capital equipment for development purposes.

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