

A C O M P E N D I U M O F  
E P I D E M I O L O G I C A L S T U D I E S

PART I: SCIENTIFIC PAPERS

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## P R E F A C E

There are many papers which interpret the statistical association between smoking and various diseases on a cause and effect basis, and there are many comprehensive reviews of such papers.

This compilation covers papers which relate to the same diseases but which consider factors other than smoking, and papers which reinterpret some of the claimed associations between smoking and disease.

In all cited papers the views expressed are not necessarily those of British-American Tobacco Company Limited or the compiler. The compiler would like to thank all those who provided papers and/or were willing to describe and discuss their research with him. The compiler would also like to thank all those who helped in the preparation of the compendium and particularly Mrs. Lesli Piper for her word processing skills.

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*P R O L O G U E*

*Sherlock Holmes closed his eyes and placed his elbows upon the arms of his chair, with his finger-tips together. "The ideal reasoner" he remarked "would, when he had once been shown a single fact in all its bearings, deduce from it not only the chain of events which led up to it but also all the results which would follow from it. As Cuvier could correctly describe a whole animal by the contemplation of a single bone, so the observer who has thoroughly understood one link in a series of incidents should be able to accurately state all the other ones, both before and after."*

*Sir Arthur Conan Doyle,  
The Five Orange Pips.*

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## 1. INTRODUCTION

Tobacco has a long history of use and in some communities it has been used in one form or another for several thousand years. Indeed, the history of man's first use of tobacco are lost in the mists of time. The spread of its use from countries such as Mexico and from what is now the U.S.A. dates from the exploration of the "New World" by European Adventurers during the fifteenth and sixteenth centuries. Once introduced into a country tobacco use becomes established and it has been said that no civilisation that has taken up the habit has ever voluntarily stopped using tobacco in one form or another. The introduction of tobacco has been reviewed in detail by Mangan and Golding, (1984).

Although in earlier centuries there were one or two celebrated outcries against the use of tobacco, and its use was sometimes proscribed by severe penalties, these views were largely based on social judgements and it was not until early this century that the possibility that smoking was related in some way to the incidence of certain diseases was first raised.

Subsequently many studies have been described in the medical and scientific literature which claim a statistically significant relationship ("association") between the incidence of a particular disease and the habit of smoking. This, in turn has led to judgements that smoking actually causes certain diseases such as lung cancer.

However, there is a well-known scientific principle that without further evidence one should not proceed to the conclusion that there is a causal relationship between any two factors that are statistically associated.

Thus, the validity of judgements on smoking have been repeatedly criticised. Independently-minded scientists such as the late Sir Ronald Fisher (1959) have warned against the uncritical acceptance of the view that smoking

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smoking causes the diseases with which it is associated and have drawn attention to inconsistencies in the statistical data and on the lack of fundamental knowledge of disease mechanisms. Nevertheless, over the last 20-30 years the judgement that the relationship between smoking and disease is a causal one has become almost a tenet of belief in medical opinion and is now widely accepted by governments and the general public, such that legislation and ordinances affecting smoking are widespread.

However, in the period that has passed since the original judgements were made there have been numerous developments in relevant fields of science and mathematics, e.g. epidemiology, data processing and biology. With the use of powerful computers the statistical analysis of possible associations between diseases and various factors has advanced considerably. Substantial progress has been made in unravelling the complexities of the process by which cells become cancerous and some knowledge has accumulated on the processes leading to other diseases, e.g. genetic abnormalities leading to emphysema have been identified. A book describing a complete model for the development of many diseases has been published by Burch (1976) based on the concept of spontaneous changes in cells due to their inherent instability. Recently more conventional models for certain forms of cancer have been proposed, based on virally or chemically derived alterations to cells, reviewed in Nature (1984).

It is the purpose of this compilation to list the recent research which might be considered as 'anomalous' in the sense that the reported results do not sit comfortably with the causal model of the relationship between smoking and certain diseases. It is acknowledged that there are many papers which are interpreted by the authors on a causal basis, but these have been extensively reviewed in documents such as those produced by the Royal College of Physicians in the UK and the Surgeon General in the USA. Certain summaries

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from these reports are cited but the basic papers are not listed, nor is it intended to weigh up the two sides of the arguments about smoking and health or to make any judgements.

'Anomalies' should, of course, be regarded as indicative of human ignorance. It must be theoretically possible to develop a comprehensive model accommodating all the correct facts, but, in the case of smoking and its claimed relationship to disease, the complexity of the problem and its intellectual challenge are formidable obstacles to rapid progress.

Epidemiological methods are discussed briefly in Chapter 2, as a necessary background to the individual studies listed later, while Chapter 3 describes advances in the knowledge of the biological processes related to diseases.

Chapters 4 and 5 describe various aspects of disease. A standard format is used for cited papers, the conclusions or abstracts given being those of the original authors. The cited papers are readily identified by being printed on blue paper. In addition, summaries from review papers are cited in the text.

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