The Health Consequences Of Smoking

CARDIOVASCULAR DISEASE

a report of the Surgeon General

1983

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TO THE READERS OF THIS VOLUME:

Provisions of the Public Health Cigarette Smoking Act of 1969 (P.L. 91-222) require the Secretary of Health and Human Services to submit an annual report to the Congress on the health consequences of smoking. Attached is the 1983 report, Health Consequences of Smoking: Cardiovascular Disease. This volume is an indepth analysis of the scientific evidence of the relationship between cigarette smoking and multiple cardiovascular diseases. This relationship is quantitatively the most serious of the health consequences of smoking, but is poorly recognized by the public.

This report represents the consolidated work of many widely-recognized experts known for their contribution to understanding cardiovascular disease. It is a scientific reference document to serve as a state-of-the-art source for medical and behavioral scientists and researchers.

Smoking-related cardiovascular disease is estimated to account for more deaths than any other smoking-related disease, including cancer. This report clearly establishes that cigarette smoking increases the risks for a number of cardiovascular diseases, particularly coronary heart disease, the largest single cause of deaths in the United States. In addition, smoking is related to an increased risk for stroke, atherosclerosis, and other circulatory diseases.

The report clearly demonstrates that cigarette smoking is a major risk factor for coronary heart disease in the United States. There are 55 million persons who smoke, a larger population than those who have hypertension or elevated cholesterol, the other major risk factors for this disease. Smokers' death rates from coronary heart disease are 70 percent greater than those of non-smokers. Simply by quitting smoking, these men and women dramatically reduce their risk of premature death from this disease.

The economic and social toll these smoking-related deaths extract from the Nation's health is immeasurable. The report's findings re-emphasize the importance of this Department's continued educational efforts to enable a fully-informed choice by individuals on whether to begin or to continue to smoke.

In my view, this volume is a solid scientific work and a contribution to the prevention efforts of this Department.

Margaret M. Heckler

Margaret M. Heckler
Secretary

FOREWORD

The 1983 Report is the second volume in *The Health Consequences of Smoking* series that focuses on specific diseases. The 1982 Report reviewed in depth the association between tobacco use and various cancers; the 1983 Report is a comprehensive review of the relationship between smoking and cardiovascular disease.

The ability to draw a conclusion from the scientific evidence on the causal relationship between smoking and cardiovascular disease was reached more recently than it was from the evidence on the relationship between smoking and cancer. The latter relationship was first established scientifically 30 years ago, particularly for lung cancer. At the time the Advisory Committee on Smoking and Health was formed in 1962, the scientific evidence linking tobacco use, particularly cigarettes, with respiratory cancers was overwhelming. A causal link between cigarette use and lung cancer was both clear and compelling. A number of epidemiological studies on the relationship between smoking and coronary heart disease (CHD) existed at that time, but the Committee felt that the evidence was insufficient to make a judgment of a causal relationship.

Nevertheless, the Committee found the evidence compelling enough to caution that even though the causal role of cigarette smoking in coronary heart disease was not proved, countermeasures were warranted, and the Committee counseled against postponing action until no uncertainty remained. The evidence was reviewed again in the 1971 Surgeon General's Report and was, by this time, clearly strong enough to establish cigarette smoking as a major risk factor for coronary heart disease in men. By 1979, when the 15th year anniversary Report of the Surgeon General was published, there was no longer any doubt that cigarette smoking was directly related to coronary heart disease for both men and women in the United States.

The Importance of Cardiovascular Disease

The importance of cardiovascular disease, particularly coronary heart disease, to the health of the American public is evident. In 1980 cardiovascular disease accounted for approximately half of all U.S. deaths—960,000 out of 1,980,000 total deaths. Of these, slightly

over 565,000 were due to coronary heart disease; that is, approximately 30 percent of all deaths and almost 60 percent of all cardiovascular deaths were due to CHD. The age-adjusted CHD death rate peaked in 1963, and by 1980 had declined 30 percent. In the period between 1968 and 1978 alone, the age-adjusted rate declined 26.5 percent, with a greater decline noted for the younger age groups.

In comparison, the total number of all cancer deaths was slightly over 416,000 in 1980. Thus, deaths from CHD exceeded all cancer deaths, and deaths from all cancers numbered less than one-half the total of all cardiovascular deaths.

Last year this Department issued a report in which it was estimated that tobacco use, particularly cigarette smoking, was related to 30 percent of all cancer deaths in the United States—a projected 129,000 premature deaths. The findings of this year's Report, however, should be considered even more alarming, in that the number of cardiovascular deaths that are reasonably estimated to be cigarette related is even higher. A number of investigators[1] have estimated that 30 percent, or more, of CHD deaths could be attributed to cigarette smoking because of the higher CHD death rates experienced by eversmokers compared with neversmokers. If 30 percent of coronary heart disease deaths are attributed to cigarette smoking, 170,000 Americans will die prematurely of CHD each year. Smokers also experience increased death rates owing to other cardiovascular diseases such as stroke, peripheral vascular disease, aortic atherosclerosis, and other vascular problems.

Findings of the 1983 Report—Coronary Heart Disease and Cigarette Smoking

Each of the three major risk factors poses approximately the same increase in risk of CHD for the person with the risk factor, but cigarette smoking is far more prevalent as a risk factor for CHD in the American population than either hypertension or elevated serum cholesterol. Thus, the overall finding of this Report is clear: **Cigarette smoking should be considered the most important of the known modifiable risk factors for coronary heart disease in the United States.**

For over 25 years, cigarette smoking has been linked epidemiologically with an increased risk of dying from coronary heart disease. As early as 1954, a strong, statistically significant association between cigarette use and CHD was demonstrated. In the intervening years, additional studies have confirmed this association. An examination of only the major prospective studies, involving more than 20 million

[1]Report of the Royal College of Physicians, London, 1978; Rogot and Murray, Public Health Reports, 1980; Garfinkel, Proceedings of the Fourth World Conference on Smoking and Health, Stockholm, 1980. See Section 3 for additional discussion.

person-years of observation, indicates that smoking has been consistently shown to elevate CHD mortality rates. Overall, smokers have a 70 percent greater CHD mortality than nonsmokers. Heavy smokers, those who consume more than two packs per day, experience CHD mortality rates almost 200 percent greater than nonsmokers.

In the National Pooling Project study, a unique study that combined data from five of the Nation's largest incidence studies on heart disease, smokers of a pack or more per day were found to have a greater than 2.5-fold increased risk of developing a major coronary event compared with nonsmokers. This study also found that smokers who have other major risk factors experience a greater increased risk than would be expected from the summation of the independent risks. Thus, cigarette smoking interacts with the other major risk factors in a manner that greatly increases the risk of CHD.

The risk of developing and dying from CHD is directly related to the total dosage of cigarette smoke exposure. A dose–response relationship has been established for the number of cigarettes smoked per day, the total years of cigarette smoking, and the degree of inhalation; CHD risk is inversely related to the age of initiation. CHD mortality ratios are also greater at the younger age groups; thus, preventive efforts could truly have a decided impact on extending life-expectancy—if large numbers of smokers could be persuaded to quit smoking. The decrease in elevated CHD risk with cessation, coupled with the prevalence of smoking as a risk factor in the U.S. population, means that the elimination of cigarette usage could have a greater impact on CHD morbidity and mortality than any other preventive measure.

Sudden Cardiac Death

Smokers are at a two to four times greater risk for sudden cardiac death (SCD) than are nonsmokers. The risk for sudden death increases with increasing daily exposure, as measured by the number of cigarettes consumed per day.

Stroke

The association between cigarette smoking and cerebrovascular disease (CVD) is largely confined to the younger age groups, with little evidence of an effect after age 65. The number of stroke deaths in 1980 totaled 170,000; even a small percentage of such deaths represents thousands of premature deaths.

Women

For women who both smoke cigarettes and used oral contraceptives, a strong association exists between their use and one form of stroke—subarachnoid hemorrhage. Smoking and oral contraceptive use appear to interact synergistically to greatly increase the risk of subarachnoid hemorrhage and of CHD, compared with the risk for those women who neither smoke nor use oral contraceptives.

Other Cardiovascular Disease

Cigarette smoking contributes to the development of aortic atherosclerosis and arteriosclerotic peripheral vascular disease (APVD). Ninety percent of patients with APVD are cigarette smokers, and the successful management of this disease includes complete smoking cessation by such patients.

Changing Trends in Smoking Behavior and Coronary Heart Disease

Demographers have noted a reduction in mortality rates from heart disease for several years. However, a sharp decline in these rates occurred in the late 1960s for reasons that are not entirely known. Significantly, declines in cigarette smoking prevalence among adults were first noted in 1964, the year of the first Surgeon General's Report, with declines in prevalence accelerating between 1966 and 1970. By 1980, overall adult smoking prevalence had declined by nearly 25 percent. While the magnitude of the impact of these changes in smoking behavior on the decline in CHD death rates is uncertain, the direction and nature of that impact is not. The substantial changes in smoking behavior that have occurred over the last 20 years have exerted, and will continue to exert, a substantial beneficial effect on the incidence of CHD in the U.S. population.

We know from cohort mortality studies, incidence studies, and, more recently, intervention trials that smoking cessation results in a reduction in CHD mortality.

Data from the Multiple Risk Factor Intervention Trial (MRFIT) have shown that those cigarette smokers who reported quitting at their first-year interview (after an average of 6 years of followup) reduced their relative risk for CHD mortality by almost half compared with those smokers who continued to smoke. Mortality from all causes was almost 30 percent lower among those who quit smoking compared with those who continued to smoke. These data correlate well with those observed in the cohort mortality studies, which have consistently shown a decline in CHD mortality among former smokers compared with continuing smokers. In some studies

a substantial improvement in mortality within the first few years after smoking cessation was demonstrated.

Public Perception of the Scientific Link Between Cigarette Smoking and CHD

A recent staff report by the Federal Trade Commission revealed that a substantial proportion of the American public is not aware of the link between cigarette smoking and heart disease. When asked to respond to the statement "Cigarette smoking is a major cause of heart disease," 40 percent of adults responded "false" or "don't know," including almost half of the adult smokers (45 percent). This concurs with results from a 1980 Roper survey, which found that 53 percent of the population and 58 percent of smokers did not know that smoking causes *many* cases of heart attack; a surprising 20 percent were not even aware that smoking causes *some* cases.

It is apparent that for a significant segment of the general public, a large gap exists in its understanding of the relationship between cigarette smoking and heart disease, a relationship that accounts for the largest number of excess deaths of all the diseases associated with cigarette smoking.

In last year's Report, I stated that the education of our citizens regarding the health hazards of smoking cannot be left solely to government. The findings of this Report and previous ones compel me again to ask for an increased commitment by the health care community, voluntary health agencies, schools, and other groups in our society to join this Department and the Public Health Service in our continuing efforts to reduce the premature death and disability associated with cigarette smoking through renewed efforts of education and information.

Edward N. Brandt, Jr., M.D.
Assistant Secretary for Health

PREFACE

In 1982, the Public Health Service's Report on the health consequences of smoking dealt with the relationship between smoking and cancer. This 1983 Report turns its attention to the relationship between cigarette smoking and cardiovascular disease, one that imposes an even greater burden of disease and premature death.

In preparing this Report, the Public Health Service has reviewed a world literature that goes back more than 40 years and has examined the results of epidemiological observations covering many millions of person-years. This evidence permits us to affirm again what was said in our 1979 Report and what is the consensus of other scientific bodies here and across the world. Cigarette smoking is causally related to heart disease; it and elevated levels of serum cholesterol and hypertension constitute the major risk factors for contracting and dying from this disease.

Since 1979, much additional information has accumulated to support this judgment. From a public health viewpoint, the most important is the new and further evidence presented in this volume that when one quits smoking, the risk of dying from heart disease begins to recede almost immediately and eventually becomes no greater than that experienced by someone who has never smoked at all. This is an encouragement to personal action and a justification for much greater research and program effort by government and voluntary agencies in helping people to quit smoking.

As in all previous Reports, the Public Health Service has turned to many people and agencies within the research and clinical community in developing this statement. On behalf of the Service, I express my respect and gratitude to them.

C. Everett Koop, M.D.
Surgeon General

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