

# Platform

## Costs and "benefits" of cigarette smoking in Canada

MARY E. THOMPSON, PH D  
WILLIAM F. FORBES, PH D, D SC

There have been numerous studies on the costs and "benefits" of cigarette smoking. In Canada Shillington<sup>1</sup> estimated selected economic consequences of cigarette smoking, and a federal government study estimated the potential number of years of life lost that could be attributed to smoking and hazardous drinking.<sup>2</sup> In other countries studies have summarized the various economic costs and benefits associated with smoking.<sup>3-6</sup> Generally, health agencies stress the costs of medical and hospital bills incurred because of cigarette-related illnesses; an example is the report submitted in the United States by the National Commission on Smoking and Public Policy.<sup>7</sup> On the other hand, reports published by the tobacco industry stress the value of that industry to a country.<sup>8</sup>

There are two main difficulties associated with a risk- or cost-benefit analysis of cigarette smoking.<sup>9</sup> First is the problem of identifying an appropriate point of view for the analysis (i.e., the individual, the family or society). Second is the problem of estimating for each of the economic consequences the portion in some unit of measurement that is to be associated with smoking.

This paper will assess the main economic benefits and costs associated with smoking in Canada. We will take the point of view of society as a whole. This excludes items that are sometimes cited as being of major importance to the individual and the family, such as the perceived personal benefits of smoking to the individual and the reduced enjoyment of life because of illness; these items have little direct influence on societal well-being. We will assume that consequences of smoking are benefits if they increase the standard of living (as measured by per capita disposable income) and are costs if they decrease it. A number of relatively minor items, such as the cost to society of fires caused by smoking,<sup>1</sup> have been omitted although they are a social nuisance and a public danger. Also omitted are the tobacco-product excise and sales taxes paid by smokers since these are transfer payments, in that if the revenues were not obtained from smoking they would be raised in other ways and neither the gross national product (GNP) nor the average standard of living would be affected.

### Costs

#### *Health care costs*

In another paper (unpublished) we estimated the costs of

---

From the World Health Organization collaborating centre for reference on the assessment of smoking habits, faculty of mathematics, University of Waterloo, Waterloo, Ont.

Reprint requests to: Dr. William F. Forbes, Professor of statistics, Faculty of mathematics, University of Waterloo, Waterloo, Ont. N2L 3G1

physicians' services and hospital care associated with smoking in Canada in 1980 at a total of about \$1 billion (1974), or about 11.5% of the total cost of physicians' services and hospital care for the population. If we assume that a similar proportion of other health care expenditures (e.g., drugs and administrative services) is associated with smoking, then since the total health care expenditure for Canada that year was about \$21 billion or 7.3% of the GNP (\$288.1 billion)<sup>10,11</sup> the health care costs associated with smoking were about \$2.4 billion (1980).

#### *Losses in productivity*

Current unemployment rates in Canada are high. Seldom is there an appreciable loss in productivity when a smoker dies before retirement, except possibly during the period in which his or her successor is being trained. Most of the productivity losses associated with smoking arise from short-term absenteeism or from performance at less than full efficiency because of respiratory problems or other smoking-related ailments. Several studies in the United States have shown that smoking workers have higher absenteeism rates than nonsmoking workers.<sup>7</sup> Unfortunately, in these studies smokers and nonsmokers were not matched by occupation, social class or other lifestyle variables. As a result it is practically impossible to estimate worker absenteeism, or more generally the loss of productivity, attributable to smoking in Canada.

In a period of slow economic growth it is difficult to predict the real increase in productivity that would presumably result if the population gave up smoking, but it could be substantial. If the 1980 GNP were increased by as little as 0.5% per capita the total increase would be about \$1.5 billion.<sup>11</sup>

It seems likely and rather ironic that in times of economic growth and full employment the negative impact of smoking on productivity may be even greater; the current undesirable economic situation limits the impact of smoking.

### Benefits

#### *Savings in pension payments from premature deaths of smokers*

This is an item that is usually overlooked<sup>3,6,7,12,13</sup> or cited as an illustration of the doubtful value of making a cost-benefit analysis of smoking.<sup>14</sup> In fact, this substantial "benefit" from smoking depends on the premature death of a large number of smokers. Promoting this would certainly be a highly undesirable social aim and could not form part of any social policy.

We have constructed the age distribution of a hypothetical nonsmoking population similar to the actual population of Canada in 1980 (unpublished data). Briefly, in the two populations the groups under 29 years old are the same size, but for the older groups in the hypothetical population we

inflated the size of the groups in the actual population by age- and sex-specific factors reflecting reduced mortality.

Using the total expenditure on pensions in 1980 of about \$7 billion,<sup>11</sup> we estimate the increased expenditure in the hypothetical population at about \$565 million. This assumes that if the dead smokers had lived, their pension payments in 1980 would have been approximately the same as those that were being received. The increase in pension payments to the hypothetical population would be slightly offset by a small increase, about 105 000, in the number of people aged 20 to 64 who paid taxes.

#### *Income from the tobacco industry*

An estimate of the economic impact of spending on tobacco products in 1977, including the direct impact of spending on tobacco products (\$724.5 million), indirect impact (\$327.6 million) and various induced types of impact (\$580.5 million), amounts to \$1632.6 million (1977).<sup>15</sup> This figure includes household income, wages and salaries, the net income of unincorporated business, investment income and business income — that is, business surplus and depreciation allowances.

Clearly, if tobacco growing were phased out many of these incomes would be generated in other ways, particularly those listed under indirect and induced impact. Individuals growing tobacco would presumably replace their tobacco crops by other crops, and the various persons distributing and marketing tobacco products would distribute and market the new crops and other products.

It seems almost impossible to arrive at a reliable figure to allow for the effect of replacing tobacco by other crops. Many alternatives, at least initially, would not have the stable market and distribution systems that make tobacco farming productive.<sup>16</sup> We may assume, however, that the "real" economic benefit of the tobacco industry is somewhere between nothing and \$1632 million (1977) annually. If we assume that the actual value is about halfway between these figures, namely \$816.3 million, and then use the consumer price index<sup>11</sup> to adjust this figure to 1980 levels, we can estimate the annual value of the tobacco industry to be about \$1 billion.

#### **Discussion**

The situation assumed in this paper is somewhat artificial since it compares the present situation in Canada with one in which there are no smokers. In fact, if a transition towards no smoking occurred it would be gradual, and the calculations presented in this paper would not apply to any intermediate situation. Also, the estimate of the relevant costs will vary appreciably over time. Specifically, health care expenditures have increased as a proportion of the GNP. Likewise, contributions to the economy from growing and manufacturing tobacco will change as the number and size of farms and the wages of farmers alter. In fact, there are indications of substantial decreases in numbers and production of tobacco farms, as well as in the numbers of their employees.<sup>16-19</sup> Another trend that must be considered is the projected increase over the next few years in the numbers of people eligible for pensions. Hence, the imbalance between the various costs and benefits could alter and may possibly increase the costs relative to the benefits of smoking.

We have not included as a benefit taxes on tobacco products paid directly or indirectly by smokers since they represent transfer payments. However, tobacco taxes, like the revenue from the sale of lottery tickets, are voluntary taxes that can be collected without undue difficulty. Such forms of taxation have psychologic and political advantages, and governments perceive them as a readily available source of income. Although we maintain that taxes should not be considered a

benefit in a cost-benefit analysis, if they were included the benefits associated with cigarette smoking might be increased by about \$1 billion annually. We arrived at this figure by converting the reported tobacco taxes in 1977 of \$1340.8 million<sup>15</sup> to \$1756 million (1980), and then assumed that approximately half of this could not be raised in other ways. Even if taxes were included in this way our calculations would still show an imbalance in favour of costs. Other papers have also indicated that the costs of cigarette smoking are greater than the benefits.<sup>6,7</sup>

Our results refute the view held by some government officials and widely proclaimed by the tobacco industry that smoking benefits a country's economy. These findings are particularly important for Canada, which has one of the highest total rates of tobacco consumption per adult.<sup>20</sup>

We gratefully acknowledge the helpful comments of Drs. Jennifer A. Jackson and Roberto Masironi.

This investigation received financial support from the World Health Organization.

#### **References**

1. SHILLINGTON ER: *Selected Economic Consequences of Cigarette Smoking* (monograph ser, no 2), Dept of National Health and Welfare, Ottawa, 1977
2. OUELLET BL, ROMEDER J-M, LANCE J-M: *Premature Mortality Attributable to Smoking and Hazardous Drinking in Canada*, vol 1, summary, Dept of National Health and Welfare, Ottawa, 1977
3. ATKINSON AB, MEADE TW: Methods and preliminary findings in assessing the economic and health services consequences of smoking, with particular reference to lung cancer. *J R Stat Soc* 1974; 137: 297-312
4. ATKINSON AB, TOWNSEND JL: Economic aspects of reduced smoking. *Lancet* 1977; 2: 492-494
5. GARNER DW: Cigarettes and welfare reform. *Emory Law J* 1977; 27: 269-335
6. KRISTEIN MM: Economic issues in prevention. *Prev Med* 1977; 6: 252-264
7. National Commission on Smoking and Public Policy: *A National Dilemma: Cigarette Smoking OR The Health of Americans*, American Cancer Society, New York, 1978
8. KORNEGAY H: The antismoking campaign — its goals and effects. *Tob Rep* 1977; 104: 37-39
9. THOMPSON ME, FORBES WF: The methodology of estimating economic benefits and losses associated with cigarette smoking. *Math Sci* 1982 (in press)
10. *Fiscal Federalism in Canada. The Report of the Parliamentary Task Force on Federal-Provincial Fiscal Arrangements*, House of Commons, Ottawa, 1981
11. *Reference Canada. Selected Economic & Social Statistics*, 1981-82 ed, Statistics Canada, Ottawa, 1982
12. HEDRICK JL: The economic costs of cigarette smoking. *HSMHA Health Rep* 1971; 86: 179-182
13. PESTON MH: Economics of cigarette smoking. In *The Proceedings of the 2nd World Conference on Smoking and Health*, Pitman Pr, London, 1971: 100-110
14. PETO J: A question of mortality (E). *Thorax* 1978; 33: 409-410
15. *Economic Impact of the Tobacco Industry in Canada*, Canadian Tobacco Manufacturers' Council, Montreal, 1979: 247
16. ADAMS F: Vegetable and fruit crops: viable alternatives for tobacco farmers. In FINGER WR (ed): *The Tobacco Industry in Transition*, Lexington Bks, Lexington, Mass, 1981: 93-102
17. Some Canadian tobacco statistics. *Tob Int* 1978; Dec 22: 25-27
18. *Tobacco and Tobacco Products Statistics. October-December 1978*, cat no 32-014, Statistics Canada, Ottawa, 1979
19. *Tobacco Products Industries 1980*, cat no 32-225, Statistics Canada, Ottawa, 1982
20. COX H: *Trends in Tobacco Consumption in 15 OECD Countries*, unit for the study of health policy, Guy's Hospital Medical School, London, 1982