

# Smoke gets in your eyes:

The economic welfare effects  
of the World Bank-World Health Organisation  
global crusade against tobacco

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# Contents

**Foreword**

**The author**

**1 Introduction**

**2 Tobacco's net benefits**

**3 "Public health" and private health**

**4 From fantasy to fact**

**5 Conclusions**

**Appendix**

**References**

## Foreword

The purpose of FMF *Monographs* is to use the analytic method of political economy to shed light on how best the promotion of free markets will improve the workings of the South African economy. In particular, authors are urged to apply the microeconomic approach of studying how individuals, firms and households behave in response to either naturally occurring or regulatory induced incentives. This requires that they display a sound institutional knowledge and understanding of their theme. It also implies that authors pursue their analysis in a logical fashion to policy proposals, unencumbered by preoccupation as to what is or is not politically acceptable at any given time. Few writers are more “politically incorrect” than those who are sympathetic to the consumption of tobacco. Professor Lal unapologetically adopts this stance and supports it with impartial economic logic supported by empirical evidence.

Of course, there have always been well-meaning people burdened with superior wisdom about what others should do with their lives. They have typically found government clout more convenient than persuasion as a means of sharing their wisdom. As Lal points out, a pervasive example of such anti-liberalism is the continuous, ubiquitous and increasing pressure to ban or regulate smoking, to ban or control the advertising of cigarettes, and to tax or restrict the sale of tobacco products. This pressure comes not least from the World Health Organisation, and Professor Lal’s former employer, the World Bank.

Certainly there has been a worldwide swing in middle-class consumer tastes away from smoking. Increasingly smoking is a pleasure enjoyed by the less articulate, lower-income groups. Whatever the real motives of the anti-tobacco lobby, it is easier for its members to argue their case for taxes and regulations when they can claim these will benefit society by reducing the economic costs of smoking. Such arguments sound more noble than do outright paternalistic claims, elitist assertions, the desire for more tax income by government, or simply anti-cancer lobbies or medical researchers looking for official funds.

Many studies have argued that smoking imposes enormous costs on society. In one estimate the South African Medical Research Council put the figure at R1.4bn. Yet such figures – accurate or not – are entirely irrelevant for policy makers. What is the cost of climbing mountains or of sunbathing? Manufacturers of hiking boots and suntan lotions will be deeply interested, but the answers have no policy significance. Every activity has costs. As long as those who engage in it pay the costs, they can themselves best assess the benefits and decide how much or little they will pay for what they want. Only if it can be established that the full cost is not being borne by the consumer (but by someone else) is there a case for taxing an activity or restricting its use. So the relevant policy question regarding smoking is not how much it costs. It is instead how much, if any, of the costs non-smokers have to bear. The evidence suggests there is no support for the claim that smokers are not paying their own way. Those who incur the costs of growing tobacco, transporting, processing and packaging it receive full compensation when the smoker exchanges cash for cigarettes. But what about the indirect costs of lost productivity due to illness or premature death? What about the medical treatment costs of smoking-induced diseases?

The medical literature in the field does not unanimously support the alleged links between smoking and ill health. However, even if it is assumed – for reasons of conservatism – that the link exists Lal argues that it is smokers, and not society as a whole, who bear most of the social (or indirect) costs of smoking. It is smokers who pay the costs of ill health and earlier mortality through actuarially linked insurance and health care schemes. And where government provides health and other benefits it is smokers, through the taxes and excise they pay on cigarettes, who more than cover the costs of care. In respect of lost productivity, once more it is the smoker himself who suffers through the loss of salary and income in the event of temporary or permanent unemployment.

There is of course the problem of environmental smoke. This, however, is similar to ghetto-blasting, CD players or barking dogs. Common courtesy can deal with it, or employers, restaurateurs or cinema proprietors who wish to maximise their own profit by attracting a non-

smoking labour force or clientele can voluntarily impose a ban on smoking. Government *diktat* is not required. Otherwise how could a restaurant owner attract – if he so wished – a smoking clientele?

And the point is that there does exist a smoking clientele which benefits from smoking while dining, or finds it relaxing while working. A peculiarity of most of the articles on the cost of smoking is that few, if any, mention these benefits. Privately enforced smoking bans by individual private sector property owners who have the incentives to ban (or permit) the activity accommodate the continued co-existence of smokers and non-smokers. The private sector permits pluralism of taste and behaviour. Governmentally enforced edicts eliminate smoking altogether. Markets encourage diversity and social harmony. Regulation compels conformity. Public policy on smoking – or anything else – is necessary only if there are external costs which cannot be internalised, that is, do not have to be paid for by private property owners. Since smoking usually occurs on private properties it is an illogical leap to argue that government should reduce the right of the property owners to permit smoking if they so wish. If private property owners can reach agreement, government has no business in telling others what to do. And if they cannot reach agreement there is still no *prima facie* case for official intervention. The question is always whether such intervention imposes more or less costs on society than the activity which is being “corrected”.

How can anti-smoking lobbies have such a disproportionate amount of media space and time? The lobbies are often backed by research groups with much to gain if they can bend government’s ear. Economist Mancur Olson points out that if a small number of people have a lot to gain by a particular action, while a large number have little to lose, then the gainer will be likely to support it. The small number of gainers will significantly increase their income or wealth, while the cost to the losers will be spread so thinly that individuals will not feel it is in their interest to oppose the measures. In short, lobbies representing small interest groups such as those opposing smoking are likely to have a disproportionately large effect on decision-making, while organisations representing large groups such as smokers – particularly since they are so diverse in character and come from the less articulate sections of the community – are likely to be impossibly costly to organise and so be under-represented in the corridors of political power.

Lal suggests that, if consumers willingly buy a commodity, it indicates that society wishes its resources to be used to produce that commodity rather than some alternative they have refrained from buying. (To pre-empt the argument that the purchase is not voluntary because of tobacco’s addictive nature, one need only look at the large numbers of people who have quit smoking. The numbers are so large that the notion that they have somehow ceased non-voluntary behaviour as opposed merely to have given up a bad habit is difficult to accede to.) Producers are then motivated to allocate society’s scarce resources to their most highly prized uses as indicated by consumers’ preferences. In exercising their choice to buy and smoke cigarettes, consumers weigh up the costs (including possible health hazards) against the pleasure derived from smoking. Only if they judge the net result as positive will they dig into their pockets. Along this line, Lal shows that there are substantial net benefits from smoking above the health hazard costs and above the money price paid. His evidence holds across 13 countries including South Africa. The numbers, however, are not crucial.

The key issue is whether private incentives harmonise social interaction. Professor Lal’s discussion suggests they do.

As in all FMF publications, the views expressed in this *Monograph* are those of the author and are not necessarily shared by the members, directors or staff of the Foundation.

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Professor Lal is the author of numerous articles and books on economic development and public policy including: *Methods of Project Analysis* (1974); *Prices for Planning* (1980); *The Poverty of 'Development Economics'* (1983, 1997); (with P Collier) *Labour and Poverty in Kenya* (1986); *The Hindu Equilibrium* (2 vols, 1988, 1989); and (with H Myint) *The Political Economy of Poverty, Equity and Growth* (1996).

# 1 Introduction

The publication of the World Bank's report in collaboration with the World Health Organisation (WHO), entitled *Curbing the epidemic – governments and the economics of tobacco control*, and the issuance of a provisional draft for a WHO framework convention on tobacco control (WHO, 2000) marks the unfortunate entry of these hitherto respected and technically proficient UN agencies into the West's current internal cultural wars. For complex reasons which we cannot go into here (but see Harris, 1998) many in the West have sought to demonise a perfectly legal but risky and addictive good which provides solace and comfort (summarised in the economist's notion of 'utility') to millions. It is illegitimate for international institutions which have been set up to provide technically sound advice to the international community to try and legislate the emerging tastes of many in the West to the rest of humankind. How well does this report stand up by technical standards, is the main question we shall investigate. As the report purports explicitly to be about the *economics* of tobacco control, it is with this aspect, and in particular with the wholly neglected effects on economic welfare with which we will be primarily concerned.

Chapter 2 sets out the traditional welfare economic framework for looking at the costs and benefits of tobacco control, with particular reference to developing countries. Chapter 3 critically examines a central theme of this and other reports put out by the so-called public health professionals that there is some 'public health' interest which overrides the conventional economist's welfare measures. Chapter 4 presents estimates that we have made (see Lal *et al*, 2000) of the net welfare effects of tobacco taxation – the central policy recommendation of the report. Finally Chapter 5 provides our conclusions.

At the outset, however, it should be noted that as many reviewers of the report have noted it does not follow even minimal scientific or academic standards in deriving or documenting most of its conclusions (see Tren and High, 2000). Though the final report has removed some of the more extreme and indeed laughable assertions of the draft report (draft 4, Feb.1999) – see Lal (1999a) for some examples – the latter in many ways provides a clearer indication of the 'ideological' nature of the research and even more disturbingly of where these institutions want to take policy towards tobacco in the third world – for instance in the recommendation in the draft report that tobacco taxes be increased by 10% per annum for 10 years, which has now been moderated to be a once for all increase of the tax by 10%. In our empirical estimates for the five countries and regions that we were able to get readily available and usable data – India, Korea, South Africa, Japan and the European Union – we therefore calculate the net welfare effects of both these policies as well as the welfare effects of the existing taxes in these countries or regions.



## 2 Tobacco's net benefits

The economic welfare effects of tobacco controls can be set out in terms of a simple supply-demand diagram (see Figure 1).

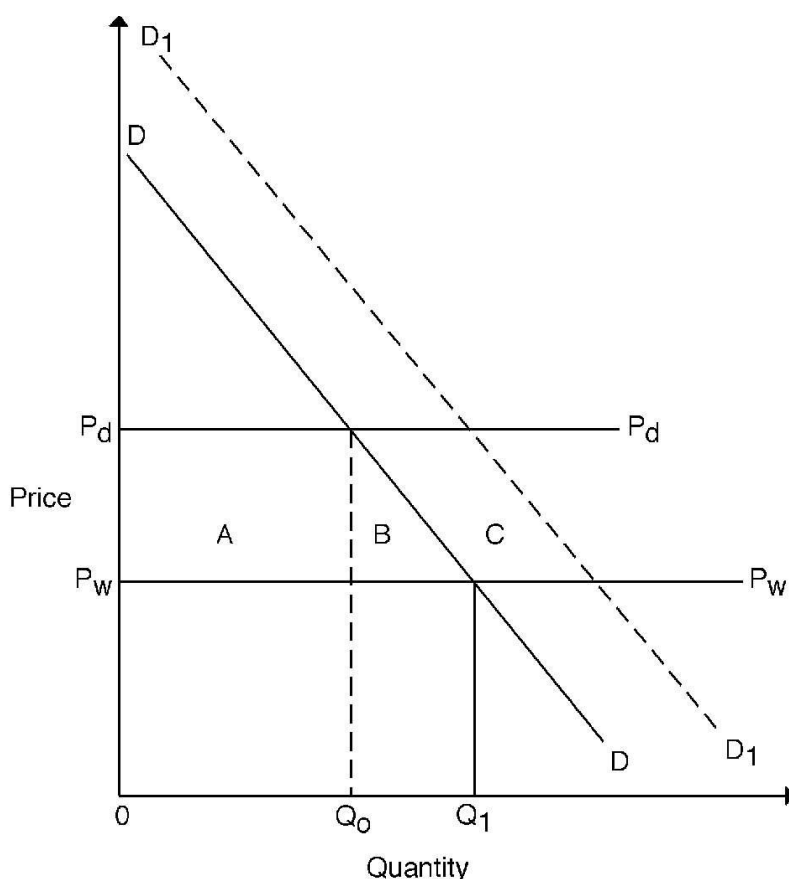


Figure 1

To simplify matters – and to avoid the problem of having to compute the effects on domestic production of various policies – assume that cigarettes can be bought at a given world price  $P_w$ . These imports always supplement domestic supply, so that any change in domestic demand merely effects imports. With the existing taxes, the domestic price is  $P_d$ , and the loss in consumer surplus (CS) is the area  $A + B$ , where the former gives the tax revenue, and the latter the dead-weight loss associated with the tax.

If taxes are handed back to consumers in lump-sum fashion, or the value of a rand of public funds is assumed to be at least equal to the value of a rand to the consumer, then the tax burden  $A$  can be neglected as a social cost, and the net welfare cost will be the dead-weight loss  $B$ . But the social value of this tax burden depends crucially upon the character of the government to whose coffers it accrues. If the government consists of Platonic Guardians then it is plausible to say that a rand of public funds is worth more than a rand of lost consumption, and in some cases could be worth even more. But if most governments, particularly those in the Third and second worlds are predatory (see Lal, 1988, Lal-Myint, 1996), then the social value of this transfer of a rand to the government will be less than a rand and may even be worthless. Given the World Bank's ongoing crusade against corruption and for improved governance in many of its borrowers, implicitly it must ascribe the predatory rather than platonic end of this political spectrum to the character of the governments it advises. It would thus be best to look upon the tax burden as it is clearly to consumers – a burden – and which can only in special and specific cases and countries be set off as a social gain. We will therefore in our international comparisons eschew these political judgements

and look upon the whole of the consumer surplus loss ( $CS = A+B$ ) as a welfare loss to the consumer from taxation of cigarettes.

It should also be noted that the proposed taxation also violates the principles of horizontal and vertical equity recommended by traditional public finance principles. Horizontal equity requires equals should be treated uniformly. It is unfair to treat someone who is the same as everyone else, except for being a smoker, differently. Vertical equity requires that taxes should not be regressive. As the poor are predominantly smokers, tobacco taxes are inherently regressive. Against these principles of classical public finance which establish the case for uniform taxation, there is an argument based on modern public economics for non-uniform taxation which could be used in favour of tobacco taxation. This is the so-called Ramsey rule, which says that the excess burden of a tax (the dead-weight consumer surplus loss (B) in Fig.1) is minimised by taxing goods in relatively inelastic demand – and the demand for tobacco is relatively inelastic. However, as Harberger (1987) has noted “to tax salt more heavily than sugar, simply and solely because it has a lower elasticity of demand is at least as capricious (from the standpoint of equity) as taxing people differently according to the colour of their eyes”. Underlying these differences are different philosophies of government – the classical liberal view which favours neutrality defined as uniformity of taxation and the ‘social engineering’ view which defines it on the Ramsey principle. We return to this important contrast in the next section.

What are the benefits from controlling tobacco? The most immediate is the reduction in cigarette consumption and the effects this may have on increased life expectancy. This is again a benefit which accrues to the consumer. What value can we impute to this possible extension of life? There has been an interminable and inconclusive debate on the value to be placed on human life and hence on the value of years of life saved.<sup>1</sup> Two things need to be noted in forming a judgement on this issue. First, the diseases and hence deaths resulting from smoking occur late in life and hence the costs associated will only occur if life expectancy is already fairly high – which is in turn related to relative affluence. For many Third World countries where the traditional infectious diseases are still widespread and lower life expectancies, the smoker may well die off from other causes well before his smoking habit kills him. Here the World Bank report’s egregious assumption that the normal life expectancy for everyone is that associated with the longest lived population – Japan’s – allows it to define premature deaths from smoking in middle age to include deaths up to 69 years. As I remarked of this “It is ripe to tell a landless labourer in rural India that he is dying prematurely at the age of 69 because of his addiction to ‘bidis’” (Lal, 1999a). Correspondingly its headline grabbing figure of the 10 million lives to be saved by its tobacco crusade are not credible.

Second, just as in national income accounting, despite the various complaints that have been made over the years that it does not provide a true measure of welfare (largely because of its neglect of distributional considerations – see Lal-Myint, 1996), GDP per capita remains a fairly robust and objective measure of the wealth of nations, the actual income and equivalent consumption lost as a result of reduced life expectancy is the simplest and most readily defensible value to be placed on the benefits of tobacco control. This is the measure we will use in deriving our estimates in Chapter 4.

Are there any other costs and benefits? For developed countries with publicly funded health care and pension systems various additional social costs and benefits have been identified. For the US it has been estimated (Viscusi, 1998) that in 1993 the social costs and benefits (including the dubious cost of second hand smoke – on which more below) were as follows: Social costs – medical care \$0.55, sick leave \$0.01, group life insurance \$0.14, fires \$0.02, second hand smoke \$0.25, local taxes on earnings foregone \$0.40. Total costs to society were therefore \$1.37. Social Benefits – nursing home savings \$0.23, pensions and social security payments saved \$1.19, excise taxes paid \$0.53. The total social benefits were \$1.95, yielding a *net social benefit* of \$0.58 per pack of cigarettes. If, as we see below, the wholly spurious social costs of second hand smoke of \$0.25 are disregarded, the net social benefit rises to \$0.83 per pack!

For developing countries, as the World Bank report accepts, most of these purported social costs and benefits are irrelevant as they do not have extensive publicly or group funded health,

insurance and pension systems. Apart from second hand smoke, most of the other social costs and benefits adduced above are privately borne. Also this estimate takes no account of the consumer surplus changes associated with smoking and its taxation.

Moreover, even for developed countries most of the adduced social costs and benefits are pecuniary externalities which are Pareto-irrelevant (see Buchanan and Stubblebine). Thus, as in standard cost-benefit analysis all transfers including those relating to pensions, life insurance etc should be netted out. This leaves only the true external costs namely the costs associated with environmental smoke and probably from fires. As the latter are fairly small we will ignore them so that the only truly Pareto-relevant external effect – if it was proven – would be second hand smoke which damaged the health of others. In fact the moral crusade against tobacco in the West has been fuelled by the claims made in a US Environmental Protection Agency report in 1992, which claimed there was scientific evidence of health damage from passive smoking. This was thoroughly discredited by a US federal court in 1998 for being inherently biased.<sup>2</sup> As the only source of externalities remains damage from secondary smoke, it maybe useful to summarise the available evidence on this.

The evidence, such as it is, is based on epidemiological studies. The scientific status of epidemiology is questionable (see Chapter 3), but be that as it may, Gori and Luik's (1999) survey of all the available environmental tobacco smoke studies shows (see their Tables 11, 12, 13) that the evidence from spousal studies, those of non-smokers exposed to smoke in the work place and of children exposed to ETS shows no increased risk to non-smokers and for work place and childhood exposure suggest reduced risk or *protection* (p.43).<sup>3</sup>

How can the World Bank report then claim that the health effects include “disease in children and adults chronically exposed to second-hand smoke” (p.32). While its claim that the other effects “include low birth weight and increased risk of various diseases in the infants of smoking mothers” even if true provides no basis for taxing tobacco. There are numerous risks that infants face the most important arising from poverty – and particularly in developing countries from infectious diseases and unsafe water supplies. Should the poor then be taxed for having babies because of the differential health costs their children will have to bear?

Thus there is no credible Pareto-relevant externality<sup>4</sup> (see Buchanan and Stubblebine) arising from smoking, and no need to go beyond the private costs and benefits we have already taken into account. The WB-WHO report's argument that there is a nuisance from tobacco smoke which is an externality is absurd.<sup>5</sup> There are many things which individuals do which others find annoying and irritating. For instance I find the smell of cheap perfume very irritating. But that is no reason to ban or tax it. In fact much of civilisation has evolved as a system of manners which allow many personal habits to be self-controlled in public places (see Elias). Most civilisations thus teach children not to break wind in public and to feel a sense of shame when they do. With divergent tastes and habits, the purpose of these manners is to allow us all to move in the communal spaces we inhabit with consideration for others. Not taxation or prohibition is the answer to the annoyance of tobacco for non-smokers, but perhaps a course from Miss Manners in which smokers learn to ask in a public space: “Do you mind if I smoke?”.

Equally, tendentious is the report's claim that consumers of tobacco in developing countries are ill informed of the risks involved. The best empirical study found that in the US, smokers over estimated the risks of smoking (Viscusi, 1992). The report cites no evidence for its claim. But even if it were true this would merely justify a public information program, not taxation or prohibition.

The argument that cigarettes are addictive and thus pose a special risk to the young is also without any merit. The addictive nature of tobacco can be taken into account in estimating the demand, as is done in our estimates (see Chapter 4, and appendix). That the young should be saved from risky behaviour which only hurts themselves, because they habitually underestimate the risks would mean banning them from all risky activity such as bungee jumping, riding, boxing, skate boarding, rugby and much more. Moreover, as the report notes that much of teenage behaviour is based on rebellion, and as the evidence on the effects of bans and price increases in preventing

teenage initiation into the tobacco habit is at best equivocal,<sup>6</sup> perhaps instead the rebellious urge could be put to use – by adults telling children how nice cigarettes are instead of how nasty!

It should be clear that as far as the economic welfare effects of tobacco policies are concerned, for the developing world we do not need to go beyond the simple net consumer surplus change measure we presented at the outset.

- 1 Chaloupka and Warner (1999) provide a comprehensive survey though with an irritating politically correct ‘spin’ of the economics of smoking, which provides references to this literature. The reason for the spin becomes clear when it is noted that Chaloupka is credited as the co-leader of the team which produced the World Bank report! For the illogicalities in the attempts made to provide some quantifiable measure of the closely related QALYs (quality of life years) and DALYs (disability adjusted life years) saved by various medical interventions see Broome (1993) and Lal (1994).
- 2 The judgement is given in full in Gori and Luik (1999), and provides a devastating critique of this report.
- 3 The biological reason for this is that many toxins are beneficial in small doses, e.g. toning up the immune system through immunisation. see RM Neese and GC Williams: *Why we get sick*.
- 4 Pareto-relevant externalities are sometimes called ‘technological’ externalities which are not mediated through the price mechanism in contrast with Pareto-irrelevant externalities also called ‘pecuniary’ which are so mediated.
- 5 It writes: “Other direct costs” to non-smokers “include irritation and nuisance from smoke and the cost of cleaning clothes and furnishings” (p.32)!
- 6 See the references to these studies in Chaloupka and Warner, though for the reason given earlier their assessment of these studies is dubious.

### 3 “Public health” and private health

It has been claimed in the draft of the World Bank report, and in Chaloupka and Warner (1999) that there is a separate “societal interest in the public’s health” (p.17) which it is the purpose of the public health community to foster. On the face of it this seems unexceptional, as clearly economists too recognise that there are externalities involved in many *infectious* diseases, which require public health measures from improved sanitation to immunisation if a health epidemic is to be avoided. But this legitimate aim has now been stretched by the use of persuasive language to include people’s life style choices, which only effect their own health and not those of others. A typical example is provided in the very title of the World Bank report – *Curbing the Epidemic* (emphasis added). Cigarette smoking maybe widespread and growing, and it may lead to disease in later life but it is not in itself a disease (any more than anal intercourse which is implicated in transmission of the HIV virus leading to AIDS) and hence cannot in itself be an epidemic which the Concise Oxford dictionary defines as “a widespread occurrence of a *disease* in a community at a particular time”. By using the persuasive term ‘epidemic’ the impression is created that smoking itself is a disease, like the flu, which can be transmitted to others.

But, the public health riposte will be that it is the responsibility of the public health authorities to prevent premature deaths, and hence it is justified in prohibiting or taxing personal behaviour which might lead to one’s own premature death. But here the analogy with anal intercourse and AIDS is telling. Should the public health authorities ban anal intercourse which even if consensual and in full knowledge of the consequences could lead homosexuals to their premature deaths? Even more, the addiction and ‘seduction of youth’ argument used against smoking applies equally to homosexuality. In many countries (including the UK) the age of consent for homosexuality has been lowered to allow teenagers to be seduced by homosexuality. Just as with smoking there is a combination of tastes and heredity which make people homosexual and hence in danger of dying prematurely from AIDS. By converting teenagers to homosexuality there maybe a similar “addictive” effect as with smoking that might lead to their premature deaths. But does this mean that there is a public health interest in banning homosexuality – as has been common in many parts of the world through most of history – or should people with their homosexual tastes and proclivities be free to choose – as liberal societies have rightly insisted – with the only public health function being to provide the necessary information about the risks involved?

This pinpoints the spuriousness and the ‘ideological’ nature of the arguments for prohibiting and taxing smoking by the public health profession. Just as liberal societies do not ban homosexuality on public health grounds even if it causes those who practice it possible health damage, similarly there is no separate public health case (apart from the standard economic arguments based on externalities) for banning or taxing tobacco. Smokers are now like homosexuals of yore, being punished for their tastes not shared by the majority of their fellows. There is thus a deep contradiction in the attitudes of supposedly liberal societies to these two different ‘afflictions’.

The ‘public health’ case against tobacco, moreover, harks back to a paternalism which was the bedrock of those planned societies and economies we now know to have failed. The difference between it and the liberal view which has triumphed – and which at least in its other manifestations the World Bank promotes – is best expressed by the contrasting views of the liberal JS Mill and the socialist Douglas Jay.

As is well known Mill in his famous essay “On Liberty” had stated one of the bedrock principles of liberalism, which is worth quoting in full. Mill wrote: “ The object of this essay is to assert one very simple principle, as entitled to govern absolutely the dealings of society with the individual in the way of compulsion and control, whether the means used be physical force in the form of legal penalties, or the moral coercion of public opinion. That principle is, that the sole end for which mankind are warranted, individually or collectively, in interfering with the liberty of action of any of their number, is self-protection. That the only purpose for which power can be rightfully exercised over any member of a civilised community, against his will, is to prevent harm

to others. His own good, either physical or moral, is not a sufficient warrant. He cannot rightfully be compelled to do or forbear because it will be better for him to do so, because it will make him happier, because, in the opinion of others, to do so would be wise, or even right. There are good reasons for remonstrating with him, or persuading him, or entreating him, but not for compelling him, or visiting him with any evil in case he do otherwise. To justify that, the conduct from which it is desired to deter him must be calculated to produce evil to someone else. The only part of the conduct of any one, for which he is amenable to society, is that which concerns others. In the part which merely concerns himself, his independence is, of right, absolute. Over himself, over his own body and mind, the individual is sovereign” (pp.72-3).

By contrast Douglas Jay memorably summed up the paternalism underlying the ‘public health’ position when he wrote: “Housewives on the whole cannot be trusted to buy all the right things, where nutrition and health are concerned. This is really no more than an extension of the principle according to which the housewife herself would not trust a child of four to select the week’s purchase. For in the case of nutrition and health, just as in the case of education, the gentleman in Whitehall really does know better what is good for people than the people themselves”. This was the nub of the case for the planned society and economy. It is ironical that when the World Bank is advising these failed economies to move away from these dysfunctional beliefs it should have lent support to the ‘public health’ arguments which are based precisely on the same beliefs.

For a liberal society there is no separate public health justification for preventing people from slowly killing themselves by smoking. There is no evidence as we have noted that they damage others – even less so than homosexuals. In both cases banning, controlling or taxing the indulging of these private tastes is a sign of an illiberal society.

Furthermore, there are more serious reasons to doubt the ‘public health’ argument that is being used to effect people’s personal life style choices. As we have seen, public health is rightly concerned with infectious diseases, and at least in the developing world there remains much work to be done by conventional public health measures to eliminate these scourges. But in the developed world where this battle has at least been temporarily won, the public health professionals have invented a new set of scourges – life styles which purportedly kill us prematurely. The ‘scientific’ basis for their identification is provided by the statistical techniques of epidemiology. But as is becoming increasingly apparent within the medical profession, the scientific standing of these findings is a sham. It is useful to explain why, because it was the respectable epidemiological study of smoking by Sir Richard Doll and his associates which gave credence to this technique, but which has since been grossly misused, not least in the EPA report on passive smoking discussed above.

In 1981 Sir Richard Doll – who in the 1950s with Sir Austin Bradford Hill had used the statistical techniques of epidemiology to show the link between cigarette smoking and lung cancer – published *The causes of cancer*, claiming that apart from tobacco, food caused 70 per cent of cancers. His basic argument was that comparing the incidence of cancers recorded in the Connecticut Cancer registry with the lowest incidence of the same cancers in the world, different diets could be the only explanation for the differential incidence (e.g. he found there were 60.2 per million cases of pancreatic cancer in Connecticut, compared with 21 per million in India). He completely omitted to examine the relationship between ageing and cancer even though “an eighty old has a thousand-times greater risk compared to when he was a teenager. This is *fifty* times greater than the twenty-fold increase Hill and Doll had found in the risk of lung cancer for smokers compared to non-smokers.” (Le Fanu: *the rise and fall of modern medicine*). Though Doll subsequently conceded the weaknesses of his case he never retracted it, and it has become the core of the claims still made by public health lobbies to make us change our life styles. But what is the scientific validity of these claims?

The first thing to note is that epidemiology on which these claims are based is a purely statistical ‘science’. But for economists who have been trained in modern econometrics the inferences drawn by epidemiologists will appear to be jejune at best. They often make the elementary mistake of identifying correlation with causation.

The major problem all sciences of statistical inference face is what econometricians call the problem of 'identification'. Despite various purported advances by econometricians in solving the problem, it does ultimately depend upon accepting the form of induction recommended by the Reverend Thomas Bayes in a posthumous paper in 1763. Bayes famous theorem shows how given some prior belief about a *general* proposition (in terms of what would today be called subjective probabilities), current *particular* evidence will lead to revision of these prior beliefs, so that with this constant revision as evidence accumulates we will reach the true general proposition from particular experiences. Frank Ramsey, Keynes' young protege in his famous *The foundations of mathematics and other logical essays*, showed this was the only coherent form of inference. Incidentally, Karl Popper who misunderstood Bayes was wrong to deny probabilistic induction. For economists, economic theory and their general knowledge of the world provide these prior beliefs, an aspect forgotten by the army of economic researchers currently throwing the cross section data put together by Summers and Heston, for a large number of countries since the 1950's, into a computer and then trying to find *any* statistically significant relationship without any theoretical justification.

The same is true of epidemiologists, for whom the mantra is a 5 per cent significance level, using the multiple correlation methods recommended by the Cambridge mathematician and geneticist Ronald Fisher. He thought he had found a way around the inevitable subjectivity involved in prior beliefs associated with Bayesian methods. He claimed that, once the raw data was converted into a number giving the probability of getting the same correlations as the researcher found by mere fluke, then, if this probability level were below 1 in 20 yielding a significance level of 5 per cent, chance could be ruled out as the explanation. But as another mathematician Harold Jeffrey's asked: why 5 per cent, and does this significance level imply that the chance that the effects are just a fluke is only 5 per cent? On the first, Fisher decided on 5 per cent because it was 'mathematically convenient'. On the second the definition of significance values is the convoluted one that it gives the probability of obtaining just as impressive results *assuming* pure chance is their cause. It does not tell the researcher whether the effect is *really* just a fluke. To do that there is no way to avoid Bayes theorem, as the mathematician Richard Cox showed as early as 1946 (*Am J Physics*, vol.14, no.1).

To see the difference this makes consider the chances of the correlations being nothing more than a fluke even if the significance level is 5 per cent, applying Bayes theorem. Suppose that the prior belief is agnostic so that there is a 50-50 expected chance of the effects being real. Then the chance of the correlation being a fluke given a 5 per cent significance level is 22 per cent. So that at least around a quarter of the results which are significant at a 5 per cent level are meaningless flukes!. Much worse if the prior belief is that the presumed effects are extremely unlikely. Say this initial level of plausibility is 1 in 100, then the chance of the 5 per cent significant results being mere flukes rises to 96 per cent (see RAJ Matthews: "Statistical snake-oil", *Prospect*, Nov.1998).

Thus, consider the analysis of 37 published studies of passive smoking by Hackshaw *et al.*, which found an increased risk to those living with smokers of 26 per cent (*British Medical Journal*, vol.315, no.629, 1997). Once however, studies of real-life measures of exposure to cigarette smoke are used to determine the risk, it falls to a negligible 2 per cent, largely because unlike the 25 cigarettes a day passive smokers were assumed to be exposed to by Hackshaw *et al*, Phillips *et al* found that in real life the exposure was 1/50<sup>th</sup> of a cigarette a day! (*Int Arch Occup Environmental Health*, vol.71, no.379, 1998.)

These problems do not plague the epidemiology of *infectious diseases*, as there 'identification' is possible as these "diseases occur only after exposure to specific bacteria, viruses and parasites. Indeed, it would be grossly unfair to lump all epidemiology together in view of the spectacular successes with infectious diseases – successes that have been possible precisely because absolutely undeniable causes could be identified and controlled. This is not the case for the study of most cancers and other conditions that are linked to a multitude of risk factors, none of which could be positively labelled as a cause" (Gori and Luik, 1999, p.7).

Sir Richard Doll himself was aware of the pitfalls of drawing causal inferences from epidemiology. He wrote: "Epidemiological observations...have serious disadvantages...they can seldom be made according to the strict requirements of experimental science and therefore may be open to a variety of interpretations. A particular factor may be associated with some disease merely because of its association with some other factor that causes the disease, or the association may be an artefact due to some systematic bias in the information collection...these disadvantages limit the value of observations in humans, but...until we know exactly how cancer is caused and how some factors are able to modify the effects of others, the need to observe *imaginatively* what actually happens to various different categories of people will remain (Doll and Peto, 1981, p.1218 – emphasis added). The emphasised word underlines the subjective nature of the resulting causal inferences drawn in epidemiological studies of non-infectious or 'life-style' diseases. This in turn has been justified by another epidemiologist, who says: "...despite philosophic injunctions concerning inductive inference, criteria have commonly been used to make such inferences. The justification offered has been that the exigencies of public health problems demand action and that despite imperfect knowledge causal inferences must be made" (Rothman, 1986, p.17). But as Gori (1998) has rightly remarked about this view it is circular as it invokes exigencies of public health to justify these inferences which sustain the exigencies in the first place!

Not surprisingly, therefore not only medical practitioners but also researchers are now beginning to question the scientific basis of epidemiology. Ultimately it can only be credible if the basics of biology are used, in the language of econometrics, to 'identify' the model. Most of the 5 per cent statistically significant results impugning nearly every aspect of our diets and life styles go against basic biology (see Le Fanu, 1998 and Lal, 1999b,c) and hence the attempts to control or prevent disease by lecturing us on how we live is nothing short of statistical witchcraft.<sup>1</sup>

<sup>1</sup> In this context it should be noted that there is now conclusive evidence that peptic ulcers which were supposed to be caused by stress in certain personality types are now known to be caused by the helicobacter bacillus, while there is growing evidence that heart disease is due to a new strain of the bacterium chlamydia. (see Le Fanu, 1998) While the two massive trials of heart disease in the US (the MRFIT study) and Europe in which an 'intervention' group was made to change its life style unlike a control group which continued to live its rotten lifestyle have finally exploded this life style view of heart disease. The results showed that for every 1000 subjects in the intervention group 41 died of a heart attack while for every 1000 in the control group 40 died! (S Ebrahim, *British Medical Journal*, 1197, vol.314). As Le Fanu (1998) explains, the social and dietary theory of disease is doomed to failure as the body's mechanisms are like a thermostat, so that changing the *exterieur* (e.g. the amount and type of food consumed) will not change the *milieu interiur*, the physiological functions such as the level of cholesterol.



## 4 From fantasy to fact

We have derived estimates of the net economic welfare effects of taxation of cigarettes in the technical appendix for 5 countries/regions for which we are able to get the relevant data. Three of these are developing countries – India, Korea and South Africa. The arguments we have given for ignoring the social costs and benefits associated with public pensions and health systems are readily applicable to these countries. In addition we have also provided estimates for two developed countries/regions: Japan and the European Union (the 9 major countries in it viz. Belgium, Denmark, France, Germany, Ireland, Italy, Netherlands, Spain and the United Kingdom). These estimates too are derived on the same basis as for the developing countries. They can be interpreted as the true social costs and benefits net of transfer payments, or if the current erroneous practice of taking account of pecuniary externalities is maintained as the effects which would occur if the public health and pension systems were privatised and individuals bore the relevant costs and benefits themselves.

In deriving these estimates we have to take account of the addictive nature of cigarettes in estimating their demand. Till recently most estimates of cigarette demand were based on assuming consumers were irrational or myopic. In the irrational case (see e.g. Schelling, 1978) a sort of divided self was posited, with stable but inconsistent preferences with the ‘short run’ self adoring tobacco while the ‘long run’ self wanted clean lungs and a long life. In the myopic models, current consumption depends on the ‘stock of habits’ which is given by the depreciated sum of all past consumption (see e.g. Houthakker and Taylor, 1966). So current consumption depends on past consumption but not future consumption. The rational addiction models repair this omission and show how, even with addictive goods, consumers maximise utility over their life cycle taking account of the future consequences of their action (see Becker and Murphy, 1988, Becker *et al*, 1991). These models capture many of the well known features of addiction to tobacco. Due to reinforcement, consumption in adjacent time periods are complements. So that current consumption of the good is related not only to the current price but also all past and future prices. The long run effect of a permanent price change will exceed that in the short run, as will that of an anticipated price change from one which is unanticipated. These models also lead to bimodal distributions of consumption echoing the ‘binge’ and ‘cold turkey’ type behaviour found among addicts. Also the model implies that temporary events like a price cut, peer pressure, stress etc can lead to permanent addiction. Finally, the responsiveness to price changes will also depend upon the individual’s rate of time preference – the rate at which he/she discounts the future. The rational addiction model would thus seem to capture all the features that supposedly make cigarettes ‘different’ from other consumption goods.

We have estimated our demand curves for the five countries and regions for both the myopic and rational addiction models, and invariably the latter performs better. So our estimates of the welfare effects of tobacco taxation is based on the estimated rational addiction demand curves for each of our countries.

Next we estimated the consumer surplus lost per smoker as a result of the current level of taxation, i.e. the area A+B in Figure 1 (p.3). With unchanging income, this CS annual loss would accrue for each of the year’s the consumer continues to smoke. Assuming that most addicts get hooked on their habit at the age of 20 and then never give up, this gives us CS losses in the years till they die of their smoking related diseases. This does not take account of those smokers who quit, as we do not have any data on this.

Manning *et al* (1989) have used data from the Centre of Disease Control and US life tables to estimate the relative risk of smoking for two hypothetical cohorts of men and women from age 20 to death: one cohort smokes, the other does not. From this they derive the figure that, for each pack of cigarettes smoked, life expectancy at age 20 declines by 137 minutes. We use this figure to estimate the duration of life saved by the reduction in tobacco consumption caused by the current tax rates. As explained in section one, we value this savings in terms of the yearly per capita income ( $y(T)$ ) that the person would have had if they had lived their normal life expectancy ( $E$ ). So for each

pack not consumed, at the date  $T = E - 20$  (as we assume that all our smokers start at 20 years of age) there will be a benefit of  $[137 / (60 \times 24 \times 365)] y(T)$ . This of course does not take account of the fact that with cigarettes there are threshold effects as at a low daily consumption, numerous studies have found that, there maybe no significant risk for smokers as compared with non-smokers (see Gori and Mantel, 1991).

Without any income growth, therefore, the net welfare benefit of the tobacco taxes will be the CS losses from age 20 till the normal life expectancy in that country, against which have to be set the benefits of the extra years of life gained (valued at the per capita income) in the year  $T$ . But as a rand given up today is not equivalent to a rand gained tomorrow, we will have to discount these dated costs and benefits. The rational addiction model estimates, provide the rates at which our average smoker discounts the future, but to take account of the 'misperception of risk' argument currently used against smoking, we will be using much lower 'social' discount rates, namely 2, 5, and 10 per cent to determine the net present values from the alternative levels of taxation of cigarettes.

Finally, we need to take account of the fact that per capita income will increase in the future. This will effect both the costs and benefit calculations. In terms of Figure 1, the demand curve will now shift in each year because of income growth. So in each year we will have the additional consumer surplus loss given by area C added on. This is readily derived from our demand curve estimates. Also the per capita income in year  $T$  when the benefits from increased life accrue will also be higher.

If  $n$  is the percentage of a year saved by not smoking a pack of cigarettes, and per capita income is growing at the rate of  $g$  per year, and  $d$  is the discount rate, then the present value of the benefits (PVB) from tobacco taxation is the reduction in cigarette packs per smoker ( $N$ ) induced at our assumed starting age of 20, so:

$$(1) \text{ PVB} = N \cdot [ n \cdot y (1+g)^T ] / (1+d)^T$$

The present value of the consumer surplus (PVC) lost in each year  $C^n$  is:

$$(2) \text{ PVC} = N \cdot [ \sum_{n=0}^T C^n / (1+d)^n ]$$

The net present benefit NPB is then given by:

$$(3) \text{ NPB} = (1) - (2)$$

In the Appendix these estimates have been made for (a) the current level of taxation in each of the 5 countries (b) a 10% increase in taxation as recommended by the World Bank report (c) a 10% increase p.a. for 10 years as recommended in the draft World Bank report.

Table 1, summarises the estimates for each of these policies for each of the countries on the best guesses about the likely value of  $g$ , and assuming  $d=2$ . We give the figures for each smokers change in welfare, and for the country in aggregate. The per capita income and GDP is also given for each country to allow a comparison of these net benefits to be appropriately scaled.

By any standard, the economic welfare losses from existing tobacco taxes are huge, and will further rise if the taxes are raised on either of the two policy recommendations. Thus for Korea the per smoker loss from current taxation is nearly 15% of current per capita income, and the aggregate loss from current and future taxation (of a 10% p.a. increase for 10 years) would amount to 12% of current GDP. For India, the per smoker loss from current taxation is nearly twice per capita GDP, and the aggregate loss from current and future taxation (of a 10% increase for 10 years) would be a massive 80% of current GDP. For South Africa, the per smoker loss from current cigarette taxation

is about 11% of per capita income, and the aggregate loss from current and future taxation (of a 105 increase for 10 years) is 41% of current GDP.

As the smokers who incur these losses are admitted by the World Bank report to be relatively poor, and if we were to apply the World Bank's project evaluation methodology (Squire and van der Tak), we would have to apply distributional weights to them, so that a R1 loss to these poor would be socially more costly than a R1 loss to some one at the same per capita income. We have not made this adjustment as we do not have any income distributional data on smokers. But this does suggest that our estimates are likely to be under-estimates of the true social losses from tobacco taxation in developing countries.

## 5 Conclusions

Our conclusions can be brief. The World Bank report provides no cogent reasons for its crusade against tobacco in the developing world. With most of the costs and benefits being privately borne in these countries, the only case for intervention would be on the grounds of an externality. We have seen there are no such grounds. This crusade as so much of past development policy is based on an implicit contempt for the poor masses of the Third World. The conclusion of my survey of these *dirigiste* economic policies in 1983, is as applicable to this social dirigisme of the WB-WHO. In my *The poverty of 'development economics'*, I concluded:

At its bluntest, behind at least part of the *dirigiste* case is a paternalistic attitude born of a distrust of, if not contempt for, the ordinary, uneducated masses of the Third World. This attitude is not confined entirely, nor primarily, to Western outsiders; it is shared by many in the ruling elites of the Third World. As a leading development economist [Paul Streeten] has observed about Gunnar Myrdal, one of the Western economists to have fuelled the *Dirigiste Dogma*:

'As a proud somewhat unSwedish Swede...he [Myrdal] finds it easier to identify with liberal Americans than with the English or French, and easier with Englishmen than with the Indian masses. It is partly for this reason that *An American dilemma* is an optimistic book, and *Asian drama* a pessimistic one. He once said how kindred American aspirations and ideals, and the "American creed", were to his own beliefs, and how he could identify with these ideals when writing the book on the black problem; and how, in contrast, when he visited an Indian textile factory, the thin, half-naked brown bodies struck him as utterly alien' (Streeten, p.425).

It is easy to suppose that these half-starved, wretched and ignorant masses could not possibly conform, either as producers or consumers to the behavioural assumptions of orthodox neo-classical economics...it is the hall-mark of much of development economics – together with the assertion that some ethereal and verbally sanitised entity (such as 'government', 'planners' or 'policy makers') which is both knowledgeable and compassionate can overcome the defects of these stupid or ignorant producers and consumers and compel them to raise their living standards through various *dirigiste* means" (Lal, 1983, p.104).

And so it is with the WB-WHO report. The attempt to inflict the estimated large losses of economic welfare on poor people is wicked and shameful, when for so many of these poor the noxious weed is one of the only sources of pleasure in lives which remain 'nasty, brutish and short'.

# Appendix

**TABLE 1: Summary of net economic benefits  
of cigarette taxes – net present values (US\$)**

Country/region	Current taxes	10% increase	10% a year incr. for 10 years
1. <b>KOREA</b> (2% pa. y incr, d=2%)			
a) per smoker	-1495	-251	-2463
b) aggregate (billions)	-23	-4	-37
<i>per capita income: 10 641; GDP (billions): 489.38</i>			
2. <b>INDIA</b> (3% pa. y incr, d=2%)			
a) per smoker	-455	-20	-280
b) aggregate (billions)	-99.9	-5.64	-61.69
<i>per capita income: 209; GDP (billions): 196.23</i>			
3. <b>SOUTH AFRICA</b> (3% pa. y incr. d=2%)			
a) per smoker	-822	-153	-2104
b) aggregate (billions)	-36.3	-6.8	-92.8
<i>per capita income: 7 186; GDP (billions) 316.90</i>			
4. <b>JAPAN</b> (2% pa. y incr. d=2%)			
a) per smoker	-3190	-529	-4309
b) aggregate (billions)	-106	-18	-273
<i>per capita income: 29 404; GDP (billions): 3 717.00</i>			
5. <b>EUROPEAN UNION (9 countries)</b> (0% pa. y incr. d=2%)			
a) per smoker	-1998	-354	-6597
b) aggregate (billions)	- 273	-48	-900
<i>per capita income: 17 697; GDP (billions): 5892.00</i>			

Source: Lal, Kim, Lu and Prat (2000)

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