

EDITORIAL

Publicity, Price, and Puffing

A Health Economics Contribution to Disease Prevention*

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Since the late 1970s, disease prevention has been enjoying something of a renaissance in the developed countries of the world, re-emerging on the health policy stage following decades of virtual isolation in the wings. The actual role of prevention in the contemporary health care drama remains quite limited and may not warrant the prominent billing it has received. Nevertheless, the resources and especially the lip service devoted to prevention have increased significantly in recent years. In the U.S. this is expressed in both the rhetoric of politicians and the line items of governmental health budgets, in a public 'jogging mania', and in a significant decrease in cardiovascular mortality.

Interest in prevention is also reflected in the growing volume of professional literature on the subject, in health economics as well as in many other disciplines. Health economists' concern with the economics of prevention is not new; rather, like prevention itself, it is simply enjoying a period of rediscovery. Some prominent early work by health economists focused on prevention issues and was produced by scholars who emerged as leaders in defining the field of health economics [e.g., Fuchs and Leveson (1967), Klarman (1965), Weisbrod (1961)].

Today's rejuvenated interest in prevention is manifested in at least two kinds of research by economists. The more prevalent is examination of the economic costs and/or benefits of a health behavior, or of policy interventions intended to affect a health behavior. The other is application of economic analytical techniques to assess the effectiveness of policy tools, many of which are evaluated in fundamentally non-economic dimensions. In the latter instance, economists lend their analytical armamentarium and

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unique perspective to evaluate prevention issues that traditionally have been the concern of specialists in other disciplines.

The present issue of this journal contains an excellent example of this phenomenon. Leu (1984) employs demand analysis to assess the determinants of consumption of cigarettes and the effectiveness and efficiency of policies intended to discourage smoking. In examining the impact of publicity on behavior, the study thrusts Leu, the economist, into the domain of social scientists interested in health education. Traditionally, this has been the province of social psychologists and related social scientists. There is nothing of qualitative importance that functionally distinguishes an assessment of the consumption impact of anti-smoking publicity from that of a cigarette excise tax,¹ but there is something substantively different.

Economists have much to offer in this endeavor, a contribution that can and should complement the work of colleagues in other disciplines. By training (and perhaps disposition), we may have little to contribute to such matters as the specific design of health education campaigns; but we do have a policy perspective and a set of analytical and statistical tools that are uniquely well-suited to disentangling the myriad complexities in evaluation of a program or policy that occurs over time, concurrent with other influences, in a non-experimental social setting. In this capacity, the work of economists has made a valuable contribution to the non-economists — the social scientists and policy makers — responsible for designing and implementing anti-smoking campaigns in the mass media.

Leu's study follows in a moderately long line of economic analyses of the impact of anti-smoking publicity on cigarette consumption. The first studies to investigate the issue date from the early 1970s [Hamilton (1972), Atkinson and Skegg (1973), Kellner (1973)], a decade after major governmental proclamations that smoking was hazardous to health [Royal College of Physicians (1962), USDHEW (1964)] and, more importantly, a period only a few years removed from prominent publicity in the mass media. The late 1970s and early 1980s saw a spurt of new studies, perhaps prompted in the U.S. by Joseph Califano's anti-smoking initiative in 1978, itself the object of considerable media interest, and by a desire of scholars to take advantage of the earlier work and the passage of time to develop a more refined understanding of the effects of publicity on smoking behavior [e.g. Warner (1977, 1981), Ippolito et al. (1979), Fujii (1980), Lewit et al. (1981), Klein et al. (1981)].

¹In regression analyses, the conventional treatment of publicity does differ qualitatively from that of taxation and other common economic policy tools (e.g. advertising expenditures). The latter are commonly expressed in continuous monetary measures or indexes (dollars of advertising expenditure or real price index, for example), while publicity typically has been entered as a 0-1 dummy variable. There is no conceptual reason, however, why publicity could not be measured in some dollar equivalent or in some other continuous metric [e.g., column-inches of newspaper space or minutes of broadcast air time or numbers of anti-smoking messages; see Lewit et al. (1981)].

The body of literature does not afford the reader an unequivocally clear and consistent assessment of the consumption effects of publicity. For the most part, the studies concur that anti-smoking publicity influences cigarette consumption, but opinions diverge as to the nature of the impact [and to a lesser extent its magnitude: see McGuinness and Cowling (1975) and Fujii (1980)]. For example, Atkinson and Skegg (1973) argued that publicity following two smoking-and-health reports of the Royal College of Physicians (1962, 1971) reduced cigarette consumption in England by 5 to 7 percent, but only in a transitory manner: consumption returned to trend shortly after each of the events. Leu, by contrast, finds that publicity produced permanent consumption decreases in Switzerland. Analyzing U.S. data, I have concluded that the consumption impact of individual publicity 'events' has receded over time, but that the cumulative impact of years of anti-smoking publicity has been a substantial and almost certainly permanent one [Warner (1981)]. There could be real differences across countries, but the findings of intra-country studies diverge as much or more than the cross-national comparisons.

Leu makes a valuable contribution to the literature in identifying an indirect effect of publicity. He estimates nominal price elasticity at -1.0 , failing to find a significant effect in real price changes. He explains this apparent anomaly by attributing the response to nominal changes as an indirect response to the adverse publicity on smoking and health: '[A]nti-smoking publicity has contributed greatly to public awareness of the dangers of smoking and has created an increasingly negative climate towards smoking. As a result, the majority of smokers would prefer to quit. Cigarette price increases, therefore, seem to have provided the final trigger for many to drop the habit.'

Leu's finding of a non-significant real price elasticity is disturbing because it flies in the face of virtually the entire literature on the demand for cigarettes. In the U.S., a number of studies in recent years have derived estimates of price elasticity quite similar to each other, with a consensus at about -0.4 [Lyon and Spruill (1977), Lewit and Coate (1982)]. Studies in Great Britain also have found elasticities to be significant and inelastic [Atkinson and Skegg (1973, 1974), Russell (1973)]. Logically, one would expect elasticity to be a function of the price level and its relation to disposable income, with countries having relatively high-priced cigarettes and low incomes exhibiting more elastic demand, as income effects come into play. Data on smoking behaviors in Third World countries are consistent with this, as is evident from a new study that finds the absolute value of elasticities inversely related to social class in England [Townsend (1983)]. Given Switzerland's position on the international cigarette price/disposable income scale, one would expect to find a significant, inelastic coefficient of elasticity. Leu's addition of nominal price to the demand equation raises some intriguing questions; the matter appears to warrant further attention.

Leu's strong finding of substantial publicity effects on smoking and no real price effects diverges from the conventional wisdom on this subject. The one common analytical thread running through all of the above-mentioned studies has been a concern with both price and publicity; other variables have not been included so uniformly.² The statistical handling of price and publicity has varied widely across studies,³ but in general almost all studies have identified both price and publicity effects on consumption. The relative importance of these two policy levers has differed from one study to another and even within individual studies, across variables such as age and sex. For example, Atkinson and Skegg (1973) concluded that publicity had a greater effect than price on cigarette consumption by men, while the reverse held for women. Lewit and his colleagues have found that price responsiveness varies inversely with age, with teenagers having a highly elastic price response (elasticity = -1.4) [Lewit et al. (1981)] and younger adults having more a elastic demand than older adults (with an overall adult elasticity of -0.4) [Lewit and Coate (1982)].

Analysis of cigarette price elasticities is both a difficult undertaking, for a number of subtle reasons, and a most important research activity, because it represents an area in which economists can make an enormously useful contribution to health policy. Its importance derives from the growing recognition in health policy circles that an excise tax can be a valuable tool of health policy. In the past, health professionals looked with disdain on the use of monetary incentives to influence health behavior. In the U.S. today, however, the constant emphasis on health care cost containment, the debate over 'pro-competitive' versus regulatory strategies, the introduction of DRGs, and the widely-held (if unestablished) belief that prevention may be an effective and efficient route to cost containment — all of these factors have combined to create a climate in which manipulation of economic incentives to influence health behavior has acquired an aura of legitimacy.

Analyses of U.S. cigarette demand elasticities have yielded what must constitute a politically ideal configuration of findings: (1) demand has some elasticity, meaning that real price increases can be expected to decrease cigarette consumption — the health professional's interest; (2) overall, demand is inelastic, so tax increases will yield revenue increases — the

²For example, some studies include income and advertising expenditure variables, while others do not, for want of data or because estimated effects have been determined to be non-significant.

³Price has commonly been entered as a real price index. At least two authors have chosen to use exogenous estimates of price elasticity [Hamilton (1972), Warner (1977)]. Publicity commonly has been entered as a series of dummy variables, though specifications have differed substantially from one study to the next. Several studies have used 0-1 dummies: in some of these, the variable is assigned the value of 1 in the year of a major publicity event, 0 in other years; in other studies, the value of 1 is assigned for the year of the event and all succeeding years; in still others, a decay factor is built into the dummy for post-event years. Lewit et al. (1981) measured the number of anti-smoking messages on TV during the Fairness Doctrine era. As noted earlier, other logical measures are conceivable but have not been employed.

legislator's and budget manager's concern; (3) teenagers' demand is quite price elastic, with the vast majority of the price response reflecting smoking participation decisions ('Do I smoke or not?'), rather than the quantity of cigarettes consumed by the continuing smoker. This third finding pleases the health professional — if people do not smoke as teens, they are most unlikely ever to smoke — and it does not disturb the deficit-conscious legislator: smoking by teens accounts for such a small percentage of aggregate cigarette consumption that decreases in teenage consumption will not reduce excise tax revenues to any significant degree in the short run. A decreasing prevalence of smokers would have a significant impact on revenues in the long run, but politicians tend to heavily discount the future (i.e., beyond the next year's election).

Research by economists has played a direct role in the decisions of several state legislatures to raise excise taxes in recent years. The findings of elasticity studies have been cited in the halls of Congress, as well as in many statehouses. In the next year or so, as maintenance of the current federal cigarette excise tax comes up for debate in Congress,⁴ the work of economists will be called upon to justify continuation of the current rate and perhaps to increase it. Economists have made estimates of substantial aggregate consumption and revenue changes associated with various plausible tax increases, based on recent elasticity calculations [Harris (1982), Warner (1982)], and the estimates have gained credibility as the federal tax jump in 1983 produced the largest decrease in cigarette consumption in history [USDA (1983)].

Leu raises a legitimate concern often expressed when excise tax increases are proposed: the effects of a cigarette excise tax increase would appear to be highly regressive. As Leu observes: 'Cigarette smoking is increasingly correlated with social class, both in terms of the percentage of smokers and the number of cigarettes smoked.' But Townsend's (1983) findings of elasticities inversely correlated with social class mute this concern, as do several points made by Harris (1982): (1) the very poorest income groups smoke less than middle-income groups; (2) among women, smoking rates appear to be positively correlated with income; (3) many smokers labeled low-income are teenagers and young adults who are only temporarily poor.

Attempts to assess cigarette price elasticities date back many years [see, for example, Sackrin (1962)], but interest in taxation as a direct tool of health policy is a phenomenon of the past decade. The best analytical work on cigarette demand elasticities has been published only in the past three years and this work has an explicit health policy theme [Lewit et al. (1981), Lewit and Coate (1982)]. Analysis of alternative taxation schemes, such as differen-

⁴As a revenue measure, the federal tax was doubled from 8 cents to 16 cents per pack effective after December 31, 1982, the first increase in the federal tax in over 30 years. For the increase to be politically acceptable, it had to be made temporary. The legislation returns the tax rate to 8 cents after three years.

tial excises tied to tar and nicotine levels, also has been motivated by an interest in health policy [Harris (1980)]. Nevertheless, as the authors of this work would undoubtedly agree, the final word on cigarette price elasticities has yet to be offered. A wide variety of technical problems seriously complicates the task of estimating price elasticities, and elasticities are subject to change over time, given such factors as changes in income levels and trends in the social acceptability of smoking (in general or in particular groups, such as women).

The technical problems range from eliminating the potential bias introduced in most studies by failure to account for cigarette bootlegging [Advisory Commission on Intergovernmental Relations (1977), Lewit and Coate (1982)] to the fundamental problem of defining and measuring the product: the basic structure and composition of the cigarette have undergone profound changes in the past three decades. Thirty-five years ago the cigarette consisted of largely untreated tobacco rolled in ordinary cigarette paper. Today's product contains 'puffed' tobacco and hundreds of additives rolled in chemically-treated papers, tipped with a wide array of 'high-tech' filters. The amount of tobacco in each cigarette has been reduced substantially [USDHHS (1981)]. The product has changed in large part in response to demand changes reflecting consumers' health concerns. Yet consumers' behavior is neither rational nor well-informed: they buy cigarettes rated lower in tar and nicotine and then, to compensate for the reduced nicotine yields, they smoke more cigarettes, inhale deeper, puff more frequently, and even subvert the low-tar filtration technologies, often unknowingly [Kozlowski et al. (1980), Benowitz et al. (1983)]. Health scares alter demands which lead to product changes which influence consumption patterns. A problem of endogeneity exists that no author has addressed successfully.

Despite these remaining problems, we have learned a great deal about cigarette price elasticities, knowledge that is informing health and fiscal policy debates around the world. Compared with this knowledge, our understanding of the consumption impacts of anti-smoking publicity is primitive. Nevertheless it, too, is informative and has influenced government policy makers. Research on the effects of a variety of policy options is establishing an integral role for health economists in the area of disease prevention policy. The needs now are multiple:

— We need to refine our analyses of such generic policy categories as 'publicity': What is it? How can we distinguish and measure different kinds of publicity? In the case of the anti-smoking campaign, 'publicity' has included such diverse items as popularized articles on smoking and health in *Reader's Digest*; scientific tomes on smoking and health, such as the reports of the Surgeon General, and the ensuing mass media coverage; anti-smoking 'commercials' on television and radio; and local media coverage of grassroots

non-smokers' rights initiatives. Yet despite this diversity, the economic studies have treated all of these forms of publicity as a homogeneous, undifferentiated good.

— We need to extend the work begun on the subject of cigarette smoking to other issues of health behavior, including, for example, automotive safety, alcohol abuse, and exercise. The literature is not devoid of contributions in these areas, but it is not nearly as rich as it is in the case of smoking. With a much smaller base of published research on which to build, authors produce studies that, on average, are less sophisticated and typically unconfirmed by related work.

— We need to develop a cohort of health economists who will have a sustained and sophisticated interest in prevention. Today's prevention renaissance in the health economics literature owes in part to the existence of relatively favorable funding opportunities and to the perception of prevention as a weapon in the battle against health care cost inflation. If we view prevention as offering substantial potential to contribute to the public's health, and we consider the betterment of health to be a central concern of health economics, then we must have a cohort of prevention-oriented health economists who will weather the vagaries of funding and changes in the perceived role of prevention in cost containment.

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