

What's in a cost? Comparing economic and public health measures of alcohol's social costs

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Abstract

Studies based on a cost of illness method frequently assert large social costs from a variety of risky activities, the harms from which most typically fall upon the risk-taker himself. Many of these costs are inadmissible in a standard economic framework; consequently, figures derived by the cost of illness method are not comparable with other economic notions of cost and are of very limited policy use.

While all forms of consumption bring both costs and benefits, not all such costs and benefits are socially relevant. Because we expect individuals to discount costs borne by others, consumption of products that can have negative health consequences and that thereby impose costs via the public health system may also require excise taxes to force the internalisation of these otherwise externalised costs.

Measuring correctly the costs that individuals impose on external parties is an important first step in ensuring that tax and regulatory policy is set correctly. Unfortunately, adequate assessment of such costs is the exception rather than the rule.

We here summarise findings from our work¹ comparing the social cost estimation method used in the public health literature with that used in the economic literature. We find the former suffers from a cost-inflating bias. Not only are social costs and private costs conflated, but, in important cases, categories of cost are double-counted.

As exemplar, we analyse studies finding social costs of alcohol in New Zealand of \$4.8 billion² and of \$15 billion in Australia,³ finding that only a fifth of those figures could plausibly be counted as an upper bound measure of actual external, policy-relevant, social cost. Nevertheless, the figures have been influential in policy debate.

While we do not wish to diminish the very real harms of alcohol use, it remains important that policy be based on sound measures that are comparable across different cost areas.

The economic framework for cost analysis allows us to compare the otherwise incommensurable. Stepping too far from that method prevents derived results from being useful for policy purposes and instead generates figures more suited to advocacy.

We illustrate the difference between the economic method and the public health method as we work through categories of cost found in these two influential policy reports. We begin with those tabulated costs that are best viewed as policy-relevant from an economic perspective and then move towards those that are generally inadmissible in an economic analysis. We then discuss the critical difference between marginal and total costs in economic analysis and its relevance for policy.

Policy-relevant costs

Crime and motor-vehicle accidents

Some drinkers go on to commit crimes, or to cause car accidents, that would not have occurred but for intoxication; these costs are imposed by drinkers on others, are significant in magnitude, and policy-relevant. Where the economic method and the public health method diverge is in determination of causality in crime and in setting the boundaries of which costs are policy-relevant among those suffering costs of drink driving accidents.

Both Business and Economic Research Limited (BERL) and Collins & Lapsley (CL) use survey methods to assign the proportion of crime attributable to alcohol. In the New Zealand case, BERL used an existing survey of prisoners who were asked to reveal the extent to which alcohol contributed to their current incarceration. Those answering “some”, “a lot”, or “all” were deemed to have committed a crime that would not have been committed in the absence of alcohol. Positive responses were sorted by category of crime, and that proportion of each crime’s aggregate cost was attributed to alcohol.

CL used two separate pre-existing surveys.^{4,5} Police detainees indicating that they had consumed five or more standard drinks any time in the prior month (three or more for women) and that they had consumed any alcohol at all in the 48-hours prior to detention were deemed to have committed an alcohol-caused crime if they also revealed alcohol dependence through positive answers to three of six indicator questions.

A husband and wife who shared a bottle of wine with dinner the day before committing a jewellery heist, and who indicated signs of alcohol dependence in survey questions, would be deemed to have committed an alcohol-caused crime. Costs of imprisonment are apportioned through use of prisoner self-reports of intoxication at the time of committing the offence.

Neither method is adequate for assessing alcohol’s causal role in crime. Prisoner self-report of intoxication may be viewed as exculpatory if subsequently attending alcohol treatment programmes helps earn early release. In our review of BERL, we downgraded their assessed crime costs by a third to remove those answering “some” to the survey question; in our review of CL, we noted the grave problems with their estimate but did not adjust their figure other than by removing costs attributed to forgone prisoner earnings.

Similarly, costs imposed on others by drink drivers should be tabulated in any economic accounting of the costs of alcohol use. But the public health method diverges from the economic method in determining which costs count.

Consider first the case of a drink driver who dies in a single-vehicle accident in his own car on a little-used road without incidental property damage to others. The public health approach counts as socially relevant the mortality costs falling on the drinker himself and the damage to the drinker’s car; in an economic framework, the only policy-relevant costs are those imposed on emergency services in responding to the accident.

Private and external cost

Why do the two methods so diverge? Economists are not so amoral as to consider it irrelevant that someone has tragically died. But measures of private costs borne by drink drivers are only economically meaningful if offset by the consumption benefits enjoyed by all drinkers who took similar risk and did not have an accident.

Consider, by analogy, skiing, which would be utterly socially wasteful if we counted all of the accident costs suffered by skiers while taking no consideration of that all skiers derive at least some enjoyment from their risky activity. And here, from an economic perspective, the public health literature goes seriously awry.⁶

BERL simply assumes that harmful drinkers enjoy no benefits from their consumption;⁷ they consequently deem all private costs as socially relevant because there are no offsetting private benefits. CL take a rhetorically different but substantially equivalent approach by assuming any potential market failure in alcohol consumption sufficient reason for dismissing all private consumption benefits.⁸

Market failures such as imperfect information can result in excess consumption, and the excess of costs over benefits for the erroneously consumed alcohol can then count as social, but simply assuming away all private benefits because of the potential for market failure is completely at odds with standard economic method. We could similarly assume that imperfect information in the used car market means nobody derives any benefit from buying a vehicle.

This substantial difference results in the biggest divergence between the public health and the economic approach to tabulating the costs of alcohol use. Where public health figures include all of the costs drinkers impose upon themselves, the economic method would either leave those costs to the side or incorporate them only if offsetting private benefits were simultaneously estimated and included.

Drink-driving costs falling upon those external to the vehicle should be counted as policy-relevant from both an economic and a public health perspective. From an economic perspective, costs falling upon the driver should be deemed private and irrelevant for policy unless weight is given to benefits enjoyed by the set of drivers taking similar risk but who suffer no adverse outcome.

Whether those inside the vehicle with the drinker bear public or private costs is less clear. A strict interpretation of the economic approach would hold that passengers' agreement to ride with an intoxicated driver makes them party to the driver's decision; resultant costs or benefits they bear can then hardly be deemed external.⁹ If we wished to take a less strict line, we would again wish to count the benefits enjoyed by the passengers of drink drivers who do not suffer accidents against the costs falling on those who do.

It is easy to scoff at the potential existence of such benefits, but it puts a heavy thumb on the scale if we simply assume them away. In any case, the mortality costs of drink driving accidents falling on those inside the drinker's vehicle other than the driver are a small proportion of overall tabulated mortality costs.

Health care costs

In a strict economic framework, the majority of alcohol-related costs borne by the public health system would be considered a transfer rather than as a true economic cost; only the identity of the payer changes rather than the existence of the cost.

If health care costs fell privately, it is likely that drinkers would take more care in avoiding such costs;¹⁰ the increase of net costs under a public health system as compared to a private system can be considered a real external cost of alcohol use, though whether it should be tallied as a consequence of alcohol consumption or as a consequence of a policy decision that the tax system should be used to defray the health costs of drinking is, at best, debatable.¹¹

We assumed that policy's intention is to offset transfer costs with excise taxes and so included all of these transfer costs as policy relevant.

CL assessed health care costs through alcohol-attributable aetiological fractions applied to total medical and hospital expenditures in Australia. For some disorders, costs to the public health system are reduced because of alcohol consumption – the burden of heart disease is lessened by alcohol consumption while the system bears greater costs of cirrhosis. While we questioned some of their fractions, our report excised only that portion of health care expenditures borne privately by drinkers using private health care.

BERL's method began with CL's aetiological tables, but set equal to zero any disorder's fraction where CL had determined that alcohol reduced rather than increased health costs; BERL assumed that harmful drinking, by definition, cannot improve outcomes on any health dimension. This is clearly out of step with the bulk of the epidemiological literature that finds, in particular, reductions in coronary heart disease even among heavy drinkers.¹²

Overall mortality is certainly increased by heavy drinking, but the net effect is smaller than BERL estimates. We were unable to reverse-engineer BERL's figures to impose CL's fractions; we instead deducted only that portion of the health care bill paid privately by the drinker.

Productivity and absenteeism

If a drinker dies early, he is no longer earning income or producing output. Economists typically find that workers are roughly paid their incremental contribution to the firm's bottom line—their marginal product. In that case, the only economically relevant productivity cost that results is the search cost borne by his employer in finding a replacement. If the death is unanticipated, that search cost is policy relevant. If the employee's heavy alcohol consumption were well known, these cost risks would be already factored into the employee's pay.

Similarly, most taxpayers contribute less than their service cost to the government under progressive taxation regimes where high income earners pay the greatest portion of the cost of government services.¹³ Any forgone tax revenue then needs to be weighed against reduced government liability for superannuation and other benefits that impose cost at the margin. By way of example, the alcoholic who dies prematurely neither contributes tax revenues nor consumes subsidised rest-home care.

Forgone wages plus employer hiring costs then constitute an upper bound on gross productivity losses consequent to premature mortality; policy relevant costs will be those borne unexpectedly by the employer. Both BERL and CL instead effectively take per capita Gross Domestic Product as measure of forgone production – a figure much larger than the aggregate wage bill as GDP includes payments to capital. The difference is substantial—BERL adds over \$650 million to headline costs by using per capita GDP rather than wages.

There are three substantial problems with this approach:

- First, where the death is incurred by the drinker, costs are properly considered internal rather than external; only increased employer search costs are plausibly external.
- Second, using per capita GDP rather than wages as measure of forgone output requires very strong assumptions about worker irreplaceability and about capital-labour complementarity—a method rejected by the World Health Organization (WHO).¹⁴
- Finally, both BERL and CL go on later to include intangible costs of loss of life. As we will discuss in the ‘Intangible costs’ section, below, using both measures together constitutes double-counting.

We consequently made very large adjustments to estimated social costs of productivity losses and absenteeism.

Intangible costs

Premature death is costly; people value their own lives. Pain and suffering associated with alcohol-related disability and disease are real. Intangible costs falling on the victims of alcohol-caused crime and the victims of drink drivers should be tallied in an economic measure of alcohol’s social cost, but costs borne by the drinker can be included only if taken net of private benefits; estimating those private benefits would be a significant task.

We consequently followed the standard economic approach of excluding privately-borne costs. But both reports suffer from an additional substantial problem: private costs are significantly overestimated by inclusion of both intangible costs of life lost and forgone productivity.

Value of statistical life estimates used by both CL and BERL are inclusive figures; they do not provide a value of statistical life net of productivity. CL use Australian Bureau of Transport Economics figures on the Value of a Statistical Life (VSL) based on willingness to pay for incremental safety improvements. That measure weighs all of the benefits from lives saved by those safety initiatives. Adding wages to the VSL measure then is double-counting.

BERL uses New Zealand Ministry of Transport figures that similarly are inclusive of productivity losses with premature mortality. Indeed, the Ministry of Transport tabulation of the cost of road accidents excludes forgone earnings among those killed in road accidents for precisely this reason.¹⁵

BERL therefore double-counts.¹⁶ BERL counts \$1.52 billion (CL: \$4.5 billion) in intangible costs of lives lost and \$1.5 billion (CL: \$3.5 billion) in forgone production, but a substantial portion of the latter is included in the former. It makes little difference to the bottom line in an economic costing as both types of cost are largely excluded as borne by the drinker, but it does matter if we wish an accurate assessment of costs borne privately by drinkers.

Resources used in abusive consumption

Is it a social cost that a drinker spends \$10 on a bottle of wine? Both BERL and CL deem drinkers' expenditures on alcohol to be a social cost. This constitutes a sixth of CL's headline social cost figure, and fifteen percent of BERL's, but none of it is admissible in an economic measure of social cost. The counting of such expenditure as social cost is a curious by-product of assuming all private benefits away.

Summing up

Considering only policy-relevant costs reduced measured social cost substantially. Some \$967 million of BERL's \$4.8 billion could be considered external and policy-relevant as a first cut, though we note substantial problems remain uncorrected, including overestimation of health care costs through their adjustment to CL's aetiological tables.

In CL's case, some \$3.8 billion of their \$15 billion can be considered potentially external, though we also note grave uncorrected problems in assessment of causality in the crime. Both figures are close to collected aggregate alcohol excise tax takes.

Margins and averages

In his address to the New Zealand Police, Sir Geoffrey Palmer¹⁷ contrasted BERL's measured social cost of alcohol with the aggregate excise tax take and took the difference as sufficient justification for large increases in taxation and regulation. Even leaving aside that the difference between the two figures drops considerably when normal economic method is applied to BERL's figure, differences between aggregate social cost and the excise tax take do not necessarily inform discussion of appropriate tax and regulation. Rather, we need to assess the marginal effect of a tax increase.

Alcohol excise taxation is necessarily linear in alcohol consumption while external costs are more plausibly J-shaped; when aggregate excise taxes entirely offset external harms, they necessarily impose too great a cost on moderate drinkers and too small a cost on harmful drinkers.¹⁸ Policy then must weigh the costs imposed on moderate drinkers against the harms avoided when heavy drinkers curtail consumption.

By the best existing estimates,¹⁹ a 10% increase in the price of alcohol induces heavy drinkers to curb their use by only 2.8% while cutting average consumption by 4.4%. If benefits to moderate drinkers matter, then we can do net harm by increasing excise taxes if the cost imposed on moderate drinkers, multiplied by the large number of moderate drinkers, exceeds the aggregate harm avoided by the smaller reduction in heavy drinkers' consumption. Measures targeting heavy drinkers might be preferred

on economic grounds, though any measure would need evaluating on its own merits at the margin.

In short, differences between aggregate social cost and the aggregate excise tax take tell us little about whether alcohol taxation or regulation is too strong or too liberal. Instead, we need to assess whether net marginal harm is reduced by any new measure, while taking seriously the burden those measures impose on drinkers who do not cause harm. And, ideally, we would attempt to devise policy instruments that curtail harms imposed by heavy drinkers at lowest collateral cost to moderate drinkers.

Conclusion

It is easy to generate arbitrarily large figures purporting to tabulate the social costs of any activity if we use a method that never counts benefits while counting all of the costs, and some of those costs twice. While the resulting figure is useful for generating headlines that spur voter demands for action, it otherwise does little to inform policy development.

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