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## The cost of harmful alcohol use in South Africa: A reply to Murray and Barr (2022)

**To the Editor:** Not only was 'The cost of harmful alcohol use in South Africa: A commentary' by Murray and Barr[1] in the March issue of *SAMJ* oddly timed, appearing some 8 years after the original article,[2] but its content was also highly questionable. The commentary's major flaws included the incorrect selection and inappropriate application of methods, combined with confused conceptual arguments. This led to the authors' erroneous conclusion that the costs of alcohol harms had been substantially overestimated in our study. As authors of the original research we are compelled to respond, not only to the shortcomings of Murray and Barr's analysis and to address any misconceptions that may arise, but also to alert the *SAMJ*'s readership to undeclared conflicts of interest that may have influenced their findings.

Murray and Barr focus their efforts on revising the value of a statistical life (VSL) that we applied to estimate the cost of premature mortality and morbidity, the single largest contributor to the intangible costs of alcohol harm in our study. Their revised VSL estimate equates to ~7% of our original cost – a 13-fold decrease. In addition, they ignore all other intangible costs and assert that their revised VSL calculation represents intangible costs in their entirety, before proclaiming their revised estimate to be 'the most credible and robust' in the absence of any additional scientific evidence to buttress this claim.

Despite Murray and Barr's own findings being presented in letter format, which as per *SAMJ* editorial policy is a format not subjected to peer review,[3] they assert that there has been little interrogation of our costing estimate's derivation or the assumptions required to justify its use. They ignore the facts that our costing followed contemporaneous best practice as per the guidelines prepared by the World Health Organization's Regional Office for Europe,[4] and that it was subjected to rigorous peer review, not only by the *SAMJ*, but also ahead of its earlier appearance in the baseline study of the liquor industry including the impact of the National Liquor Act 59 of 2003.[5] This comprehensive report, which sets out costs and contributions, was commissioned by the Department of Trade and Industry and in itself provides the justification for the use of our costing estimate for South Africa (SA) in both research and policy development.

Murray and Barr question whether the countries we used to derive the VSL estimate, namely China, Thailand, Chile and Poland, are appropriate comparators. The only concern they state with this choice of comparators is that it does not include any sub-Saharan countries. This is an odd rationale, since the countries used in our analysis were selected on the basis of their having a similar GDP per capita to SA. This is patently not the case for most sub-Saharan countries, a sample of which would provide a much less appropriate comparison.

Murray and Barr propose an alternative methodology to estimate the intangible costs associated with premature mortality and morbidity, which they derive from a recent SA healthcare costing study that applied a marginal productivity approach to calculate cost per disability-adjusted life year (DALY) in order to compare the health opportunity costs of government spending on different healthcare interventions.[6] These methods – VSL and marginal productivity – are distinctly different and have different applications, which Murray and Barr neglect to explain.

Edoka and Stacey's[6] application of a marginal productivity approach is utilised to assist with resource allocation in a health department within a fixed health budget. This cost per DALY estimate can then be used to assist health managers in making resource allocation decisions for competing interventions within budgetary constraints so as to increase the cost-efficiency of existing health spending. As such, this represents the public health system's *capacity to pay* for health, specifically obtained through health system interventions.

In contrast, a VSL valuation of health represents society's *willingness to pay* for optimal health and wellbeing (or alternatively consumption of non-health goods that it is willing to forego), in recognition that society values health outside of simply healthcare costs. The VSL approach unsurprisingly produces higher *willingness to pay* estimates,[7,8] because it is based on a broader concept of the value of health and wellbeing and particularly because the marginal productivity approach needs to take into account government's budgetary constraints. These constraints are of course exacerbated when marginal productivity analysis is restricted to a single sector, as is the case in Murray and Barr's correspondence, which considers just health sector spending. It is worth noting that healthcare costs were already accounted for and contributed just over 30% of total *tangible costs* of alcohol harm in our original analysis. The marginal productivity approach relies on estimating a causal relationship between health spending and population health outcome, estimated as health spending elasticity.[6] However, Murray and Barr's estimate of health spending elasticity is significantly biased, resulting in an underestimation of cost per DALY,[7] which reduces rather than increases the accuracy of their estimate.

As to which method is more appropriate, it depends entirely on the question. Our original submission set out to provide a comprehensive estimate of the *societal* cost of alcohol, which required our use of a VSL approach. Our approach explicitly includes elements such as the social costs to society of premature mortality. Murray and Barr's critique is therefore misplaced: we were not interested in the cost to the public health sector, but to society more broadly. Reliance on a marginal productivity approach to derive societal costs implies that, by Murray and Barr's reckoning, marginal state expenditure equates to marginal social value. This is clearly ludicrous. The state is not the only actor invested in prolonging and enriching the lives of citizens, as evinced by the amounts spent by ordinary citizens and business on health and medical expenses, recreational and other wellness activities, health insurance, security, and a variety of structural and social investments to improve living environments.

The marginal cost per life estimated by Murray and Barr is the *shadow price* of public health spending, i.e. the expected change in a unit of health for a one-unit increase in the health budget, and not the broad societal value of life, which is better represented using an approach that captures societal *willingness to pay*,[8,9] i.e. a VSL approach. It is unsurprising that, by applying a marginal productivity approach, restricting costing to a single sector, exaggerating health spending elasticity and ignoring all other costing dimensions, Murray and Barr have produced an estimate that significantly underestimates the societal cost of alcohol. Why would the authors seek to do this, almost 8 years after our article's first publication, during which time no questions about our methodology have been raised, despite the work being extensively read and quoted? We believe that the authors have chosen to underplay the impact of alcohol harm at a societal level because of sympathies with the alcohol industry that raise concerns about potential conflicts of interest that were not declared in their commentary.

We note that Michael Murray collaborated with Ian McGorian, of the data modelling group PANDATA, on a report commissioned and funded by the Distell Foundation[10] that sought to counter research suggesting that a national decline in non-natural deaths was associated unequivocally with a series of alcohol sales bans during SA's various stages of lockdown.[11] The report has been extensively used by the alcohol industry to oppose any restrictions on alcohol sales. Graham Barr was listed as the 'peer reviewer' of this research. Barr is also on record in August 2020 as having taken a position against any alcohol bans long before any data were available to assess their impact,[12] and is

also cited as having provided statistical commentary to a South African Liquor Brand owners Association release in July 2021 disputing the central role of alcohol bans in the decline of unnatural deaths during lockdown.[13] Indeed, recent commentary by Barr[14] in the journal *Health Policy and Planning* confirms current funding by 'the South African Liquor Brands Association'.

We also note that *SAMJ* has a strict conflict of interest (CoI) policy, which is intended '… to ensure that, in such cases [of publication], readers have all the information they need to enable them to make an informed assessment about a publication's message and conclusions'.[15] A 2017 *SAMJ* editorial on the nature of CoI in scientific publication specifically noted that with major public health policies such as legislation on alcohol advertising looming, we can expect intense lobbying by vested interests to shape public opinion.[16] Given the substantial methodological flaws in the Murray and Barr commentary, the errors of fact, and the undeclared links with and funding from the alcohol industry, we express our concern that their commentary has no value in contributing to the evidence base to improve the science around alcohol costing. Noting that the current moment brought about by the experience of alcohol sales bans during the COVID-19 has presented a unique political 'window of opportunity' to affect changes in alcohol policy,[17] we need to ensure that research evidence is not undermined by the self-serving interests of the alcohol industry.

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