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# Exploring the use of economic evidence to inform investment in disease prevention – a qualitative study

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Evidence-based investment in prevention is crucial in addressing Australia's rising health, economic and social burden from lifestyle-related non-communicable diseases (NCD).<sup>1</sup> Prevention strategies are prominent in the World Health Organization's 'best buys' in addressing this burden.<sup>2</sup> Despite such evidence, investment in prevention of NCDs in Australia is low compared to other countries with similar epidemiological profiles.<sup>3,4</sup> Such disparity in expenditure potentially reflects a low value attached to the evidence around its effectiveness and cost-effectiveness by policy makers in this country. However, we note that a recent report argues that the proportional amount of spending on prevention by a country, compared to others, may be an overly simplistic means to assess its value or worth.<sup>5</sup>

In the past 20 years, the use of economic evidence in Australia has been growing through the pioneering initiatives in the 1990s to introduce cost-effectiveness criterion in the listing of new drugs for government subsidy through the Pharmaceutical Benefits Advisory Committee (PBAC).<sup>6</sup> In spite of the recognised leadership role Australia has played in institutionalising the use of economic evidence in informing investment in healthcare (such as PBAC, as well as the Medical Services Advisory Committee [MSAC]), little has been done to promote

## Abstract

**Objective:** In the context of growing financial pressures on health budgets, cost-effective prevention strategies are needed to address the burden from non-communicable disease in Australia. We explored how decision makers use economic evidence to inform such investment and how such evidence generated can more effectively meet the needs of end users.

**Methods:** Thematic analysis of in-depth interviews with 15 high level stakeholders (Treasury, state health departments and the insurance industry), supplemented by documentary analysis.

**Results:** Types of prevention approaches and economic evidence relevant to decision makers differed by organisational perspective. Capacity building in understanding economic evaluations and research evidence that addresses the differing criteria for investment used by different organisations is needed. The task of determining investment priorities in disease prevention comes with significant challenges including ideological barriers, delayed outcome measures, and implementation uncertainties.

**Conclusions and Implications for public health:** Promoting the greater use of economic evidence in prevention requires more work on two fronts: tailoring the methods used by economists to better match the organisational imperatives of end users; and promoting greater consideration of broader societal and health sector perspectives among end users. This will require significant infrastructure development, monitoring and evaluation, stronger national leadership and a greater emphasis on evidence coproduction.

**Key words:** Health economics, qualitative research, prevention of chronic disease

greater use of cost-effectiveness evidence in NCD prevention.

A reason for this may be that in the prevention space, unlike that of healthcare, policy makers may be less willing to cede discretion over investment decisions to an evidence-based approach that is driven by cost-effectiveness. In principle, the role of economic evidence is to guide the allocation of resources efficiently across population

groups and individuals by identifying programs that optimise social outcomes for given resources.<sup>7</sup> However, economic analysis tends to be underpinned by a reductionist perspective on investment decision making. In this world view, decisions are characterised by a choice to either accept or reject an investment proposal by benchmarking the observed incremental cost per unit of health outcome of the intervention against

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an accepted cost-effectiveness threshold (in Australia this has been posited as being between \$50,000–70,000 per quality adjusted life year gained). The logic underlying this is that with successive decisions made on the basis of this balancing of costs and outcomes, as a community, we are led incrementally toward a hypothetical efficiency ideal (or ‘frontier’).<sup>8</sup> One possible reason for the exception of prevention to this logic is that the outcomes of interventions are often multi-dimensional, long-term and diffuse – affecting sectors outside of health.<sup>9</sup> As such, while this has a high degree of acceptance as a framework for allocating resources in many parts of the health sector, it may be at odds with prevailing norms that govern the way investments are made in prevention.<sup>10–14</sup>

Therefore, gaining a better understanding of key actors’ perspectives (as depicted in Figure 1) is vital in identifying the factors that drive investment decisions and in overcoming any perceived barriers to the implementation of evidence-based prevention strategies into practice and policy.<sup>10,15–17</sup> For this study, we explored how decision makers (policy makers, insurers and funders) use economic evidence to inform investment in the prevention of lifestyle related NCDs, and identified how

economic evidence can better match their needs.

### Methods

Our methods are outlined here according to criteria for qualitative research.<sup>18,19</sup>

#### Approach

The study was carried out and supported by a research collaboration that promotes multi-disciplinary research into chronic disease prevention, with a focus on developing system solutions. The interview guide (Supplementary file 1) was developed by health economists and covered the following key questions: What type of evidence is used when making investment decisions in disease prevention? What role does economic evidence play? What types of analyses are used? Is there scope for generating economic evidence that better matches decision makers’ needs?

#### Setting and sampling strategy

Recruitment of the participants was purposive. We sought to elicit views from individuals within three distinct types of organisations: state health and Treasury

departments and private health insurance companies. The research collaborators helped identify key individuals who were responsible for investment decisions. An ethics-approved information sheet and invitation letter were sent to potential participants. Ethics approval was granted by University of Sydney before commencement of research.

#### Data collection techniques

We conducted semi-structured interviews with these decision makers that lasted between 30 and 45 minutes. All participants provided written informed consent. A health economist took the lead in conducting the face-to-face interviews, accompanied by two public health researchers with backgrounds in medicine and law, respectively. Three interviews were conducted on the phone due to distance. All interviews were recorded with a digital recorder. Any supporting documents referred to by the interviewees were obtained by the team so they could be analysed.

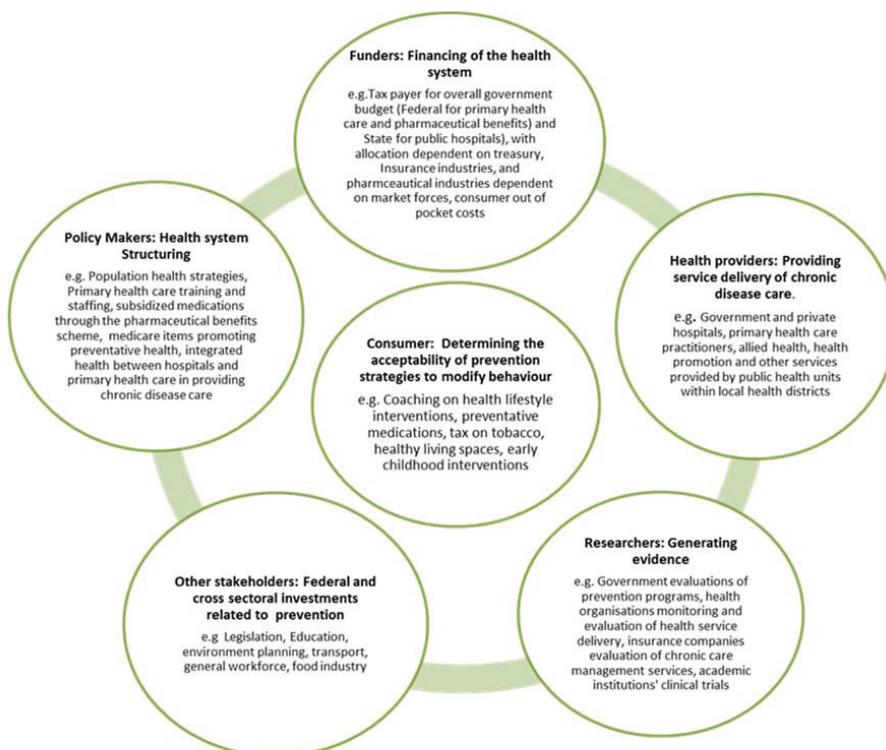
#### Analysis

Interviews were professionally transcribed verbatim and managed by NVivo software. A coding framework (Supplementary file 2) was developed using a ‘ground up’ approach by the two public health researchers using three transcripts and iterative changes made as necessary with the coding of subsequent transcripts. The team met regularly to discuss the emerging themes. Thematic saturation was reached at 15 participants and interviews were stopped. Constant comparison across cases was undertaken as all data coded to each major code was analysed. Documents<sup>20–31</sup> referred to by participants during the interviews were analysed by a senior health economics researcher for the purpose of triangulating the findings.<sup>32</sup> The findings from the documentary analysis are provided in Supplementary file 3.

### Results

We interviewed high-level decision makers; four were from the insurance industry, eight from state health departments and three from a state Treasury department. Three key themes were derived about how organisational perspectives frame types of economic evidence used; the need to increase the accessibility and acceptability of health economics to end users; and the significant barriers to the prevention agenda. Further illustrative quotes are

**Figure 1: Contextual map of stakeholders. The complexities of the provision of prevention strategies by various stakeholders, highlighting their roles and interlocking relationships which impact upon the consumer’s behaviour change.**



presented in Box 1. Table 1 presents a summary of the identified barriers to the use of economic analysis in prevention and our recommendations to address them.

### **Organisational perspectives frame the preferred prevention approaches and types of economic evidence used**

#### *Industry (insurance companies) – business case and return on investment*

The industry perspective focused on the use of economic evidence to justify their business case and stewardship of members' funds. Industry stakeholders wanted evidence relating to the minimisation of hospitalisation for their members and consequently defined 'return on investment' in those terms, as this was the most tangible means of demonstrating value to the business. In comparison, primary prevention or health promotion activities were highlighted by another insurer as part of their 'branding' and marketing campaign. Industry stakeholders also described how cost savings generated by their programs were often realised in the public sector (e.g. reduced pharmaceutical costs through Medicare), but indicated that these were generally not factored into the company's decision making. One option raised was the possibility of cost-sharing arrangements with government in which there were mutual benefits.

#### *Health departments – population health approach*

Health department stakeholders described using an evidence-based approach to demonstrate the potential benefits of a concerted prevention strategy with a 'range of interventions' and indicated that there was a need to incorporate other sectors. These stakeholders recognised that economic evidence would provide greater 'credibility' for what they do, although some described a reticence to use financial outcomes and a preference to only focus on health outcomes. A health policy maker indicated the advocacy value of cost of illness evidence such as "the cost of overweight and obesity being estimated to be 19 billion dollars a year" as a way of effectively framing the problem as a community rather than an individual issue. Economic evidence such as costing data (rather than cost-effectiveness evidence) was used primarily to better inform the implementation of programs, and less so to set broader priorities. Two health policy makers perceived that economic evidence

### **Box 1: Illustrative quotes across themes.**

#### **Organisational perspectives frame the preferred prevention approaches and types of economic evidence used**

"... we are involved in activities which I would probably classify as primary prevention, but it's not a deliberate investment activity, it's more from a brand activity... So, we like to shoot positive health messages out there to the general population in regards to good diet and exercise behaviours..." (Insurer perspective)

"But we don't have those answers. You're getting to sort of where we get frustrated. I mean return on investment, as we are able to use it, gives us some sense of being able to compare, say one cooking program against another cooking program. It's useful in that sense in that we can get some sense of, which is the most technically efficient program if you like. And we can purchase on that basis... we can't compare, one type of approach to another type of approach (for example, advertising, changing environments or in advertising versus, you know, a diabetes risk assessment tool) with the tools that we have available to us or any of the return on investment analysis that I've seen anywhere. And that is the holy grail process." (Health perspective)

"We kind of take the whole of government approach... A program might require investment through the health sectors, through the education sectors, family and community services and it's about understanding holistically... You've got a number of service sectors, sort of involved in this and whilst success in one sector doesn't necessarily mean, you know, success in say, education or family and community services. So, it's about looking at the whole across government, how much is it going to cost across government, what are the benefits across government." (Treasury perspective)

#### **Increasing acceptability and accessibility of health economics to end users**

"I think they (other government agencies) confuse the word economic analysis with financial analysis. There's just no way in reality that the agencies are currently geared up for that kind of thing. Completely missing that capability. We want to build up capability and understanding of those things... So, there's a series of opportunities there to work with government (about what) would be an acceptable kind of framework that we can all agree on so that we can sort of move the debate forward onto then what sort of things we should be funding." (Treasury perspective)

"I think from my perspective I feel like (the use of economic evidence) is an area I hardly know anything about and so I reckon that there's a role for, you know, economic evaluation 101 for senior managers... It would also be really helpful for me... in the area of overweight and obesity or tobacco control or alcohol — preventing alcohol related harm — [to know] what's the current landscape, what in terms of economic evaluation of intervention and policy in those areas, is really helpful for someone in my role." (Health perspective)

"So, then what I'm looking at is my health economists have gone away and done some really nice modelling around the types of people that will be going through [a health program]. So, they're over 60 and they look like this and therefore, on average, and depending on all those variables, we have different combinations, this is what they would expect to cost... I'm going to say that I'm forecasting 30 to 40% reduction in patients re-admitting over a 90-day time frame that go through this program, so therefore how does that stack up?" (Insurer perspective)

#### **Prevention agenda for NCD faces significant challenges**

"So, in tobacco I think there's not so much contention around tobacco as an area where government would intervene. We've got 30 years of evidence in relation to [success], so these policy changes and these programmatic and services are an appropriate mix. Whereas, in overweight and obesity, it's not as well clearly understood, nor is it equally accepted as a place for government intervention." (Treasury perspective)

"Because we would often get a phone call from the (funders) saying okay, you've now spent this huge investment in prevention. How many kids did you stop from becoming obese? Now that's quite a hard question to answer. Not reducing... the number of kids who are (overweight) down into the healthy weight area, but how many did you stop from going up the scale into the unhealthy weight?" (Health perspective)

"In the health space, we know there's a kind of cost trajectory valve, and health costs are going to rise into the future. And you know, we need to be doing more about keeping people out of hospital to start with... there is a recognition that we need to be investing in health. It's a question of what we should be investing in... that the proposed [strategy], you know it's worked elsewhere, is it actually going to work here? Do we have the right conditions, capacity and capability?" (Treasury perspective)

that tackled allocative efficiency questions across different types of prevention strategies would be the 'holy grail' in informing their decisions.

#### *Treasury – whole-of-government and inter-sectoral approach*

Treasury decision makers stated the use of a 'whole-of-government approach' in the assessment of inter-sectoral prevention interventions and indicated they would consider costs and benefits across government. Return on investment and the 'bottom line' did come into play; however, they were also concerned with broader economic dynamics such as inter-sectoral (e.g. transport and education) contributions to investments and their roles in promoting

healthy living and the economic impact of improved health status.

### **Increasing acceptability and accessibility of health economics to end users**

#### *Capacity building in health economics for end users*

Some stakeholders in health and Treasury indicated that the health sectors' capacity to understand economic evidence was limited, and capacity should be built either through collaborations or workshops. A high-level policy maker in health stated, "there's a role for economic evaluation 101 for senior managers". Interviews often ended with requests from the interviewees for documents that synthesised the cost-

effectiveness evidence in obesity, tobacco and alcohol in order to understand the “current landscape”; to be better equipped in economic methods that would suit their needs; and to be able to confidently commission others to do so. In comparison, the insurers did not indicate this request as

they had in-house personnel with skills in economics and modelling.

*Increasing the relevance of health economics methodology*

Many respondents described a need for economic evidence that serves as a predictive

and interactive tool, which also incorporates the complexities of service delivery and health outcomes. Since many of the health insurance stakeholders described return on investment as their key driver, they were keen to have greater links between the intermediate clinical outcomes and cost savings. Another suggestion from a Treasury stakeholder was that early consultation with end users in the development of predictive economic models would be beneficial, as this would be “getting people to use this kind of data [by] helping people to understand how it’s done so that it’s not just a sort of impenetrable black box”.

A few stakeholders in Treasury and the health departments suggested that lessons could be derived from other sectors (e.g. transport) in using economic analysis that included socioeconomic determinants. Indeed, several of the documents referred to by the interviewees (health and Treasury departments) were evaluation frameworks and government strategy documents related to policies both within and external to the health sector. The evaluation framework documents emphasise the importance of economic appraisal for efficient allocations of resources.<sup>20,26</sup> The documents generally recommend using cost benefit analysis (CBA) and endorse the use of cost-effectiveness analyses (CEA) only in some sectors (e.g. health) where it may be more difficult to monetise the benefits.<sup>20,22,23</sup> The strategy documents emphasised the importance of investing in research that includes economic evaluations and implementing cost-effective interventions.<sup>28,30</sup> In addition, health equity and equity in general were highlighted as objectives or guiding principles of their policies,<sup>23,25,27-29</sup> and government evaluation guidelines propose that equity impacts should be described and quantified when possible.<sup>20,22</sup>

**Prevention agenda for NCD faces significant challenges**

*Political and ideological considerations*

Some stakeholders indicated that promoting a prevention agenda is difficult when there is a prevailing ideology that can be characterised as emphasising personal responsibility over government action. A few stakeholders suggested that when there is a change in government, support for prevention programs tends to come under closer scrutiny. As a consequence, investment in individual prevention programs is tied

**Table 1: Identified barriers to the use of economic analysis in prevention and the prevention agenda and our suggested recommendations to overcome them.**

Barriers to the use of economic analysis	Recommendations
Lack of relevance of current economic analysis to end users	For analysts to have a deeper understanding the context of the stakeholders’ perspectives. In Australia: <ul style="list-style-type: none"> <li>• Treasury: managing the governmental budget, thus a whole-of-government approach. Thus, a need for strong evidence and economic analysis including effects across different government sectors.</li> <li>• Health: a need for a holistic approach towards population health, for there to be an increasing appreciation for economic analysis and costs to be included to provide ‘credibility’ for their agenda.</li> <li>• Insurance Companies: Financial bottom line for the insurance companies in regards to reducing hospitalisation for their members.</li> </ul>
Lack of capacity to understand health economics literature	Building capacity through workshops, in-house health economists, or collaboration, or outsourcing through commissioning Better communication of health economic evidence, to help stakeholders understand its significance, such as policy briefs, evaluation frameworks, systematic reviews.
Methodology in prevention is a ‘black box’.	Co-production of economic evidence by including decision makers in the development of models and making assumptions explicit. More development needed in this area to make this economic evidence more accessible to decision makers, e.g. Modelling and links between the behavioural risk factors, the clinical risk factors and life years saved.
Health economics perceived as prioritising costs over health outcomes.	Improving capacity within organisations to understand the fundamentals of health economics (i.e. effectiveness, efficiency and equity). Equity focused economic analysis (e.g. for Indigenous health programs) are needed to provide relevant evidence for decision makers.
Barriers to the Prevention agenda	Recommendations
Difficulty maximising upon the different approaches of prevention as organisational perspectives frame the preferred prevention approaches.	More collaboration across sectors and health funders to provide prevention programs as a concerted effort. Priority setting across stakeholders from different sectors will be beneficial. Established institutional processes for the use of health economics (with standardised methods) in prevention. Develop diverse investment portfolios (i.e. incorporate both high and low-cost interventions with variable levels of available evidence) in prevention that consider the potential need for risk to effect return and encourages innovation.
Prevailing ideology regarding prevention as to whether it is personal responsibility or government action.	Understanding and addressing various stakeholders’ views (consumers, health providers, policy makers, funders) through consultation. Building the evidence base and increasing the public awareness of cost effective prevention strategies addressing lifestyle related risk factors as this will affect political will.
Timing of funding cycle is short but prevention delivers long-term benefits and short-term benefits are less visible.	The need to use intermediate measures to show progress and modelling to show potential benefits. This requires the development of a strong infrastructure for the monitoring and evaluation of prevention strategies as a prevention platform e.g. IT infrastructure, workforce acceptance of performance metrics as part of ongoing monitoring and evaluation, data linkage, use of process data.
Use of evidence is varied across stakeholders	Evidence generated needs to be pragmatic. There should be more evidence in implementation methods, with in-depth contextual understanding. Increasing preference for co-production of evidence between academic institutions, government departments and insurance companies. More synthesis of the evidence, e.g. through reviews of economic evaluations specific to a particular area of prevention such as obesity or tobacco control. Ways to improve knowledge exchange, e.g. use of databases, policy briefs, knowledge brokers.
The need to incorporate other sectors	Including knowledge brokers and the use of economic evidence across sectors Systems approach to prevention which could be incorporated into research (so that it is not single intensity and focused only). This requires a clear picture of the current political influences, health system (private, public, out of pocket expenses), other non-health sectoral influences, e.g. market forces regarding housing, pharmaceuticals.

with an inherent level of uncertainty. In response to this, solid evidence plays a role in addressing these uncertainties. A participant from Treasury described how a strong track record of 30 years of evidence was needed to enable smoking cessation programs to be more acceptable to government decision makers, in contrast to how “in overweight and obesity, it’s not as clearly understood nor is it equally accepted as a place for government intervention”.

*Prevention delivers long-term benefits; short-term benefits are less visible*

There was a general consensus among many stakeholders that the delay for health promotion and early prevention strategies in demonstrating ‘hard’ health outcomes can be problematic, due to the constant pressure to justify investments in light of competing priorities (such as acute care) within short funding cycles. The stakeholders emphasised that infrastructure in acute care allowed for more robust data collection (e.g. number of hospitalisations) than the infrastructure available to monitor and evaluate preventive care. This lack of outcome measures to show progress in prevention meant less leverage for policy makers when trying to sustain funds for prevention as compared to acute care. For example, a stakeholder in health described getting calls from funders asking questions such as: “You’ve now spent this huge investment in prevention. How many kids did you stop from becoming obese? Now that’s quite a hard question to answer”. Health policy advisors suggested that identifying valid “proxies, [such as] people’s behaviour, people’s participation, people’s motivation to change” may be needed to “predict the future [of that] program outcome” and to enable these potentially long-term effects to be reflected in investment decisions.

*Enabling the commitment to prevention requires significant infrastructure*

Another key barrier to the prevention agenda was the generalisability and scalability of effective programs. A Treasury stakeholder recognised that “there’s a kind of cost trajectory valve, and health costs are going to rise into the future” but that the question they had was “what we should be investing in ... you know it’s worked elsewhere, is it actually going to work here? Do we have the right conditions, capacity and capability?”

Most participants emphasised that enabling evidence-based investment in prevention

requires advancements in infrastructure, including the availability of informative (baseline and process) data, processes for ongoing data collection and workforce capacity building. There was also a stated need to leverage other available resources (e.g. from primary healthcare, insurance companies, hospitals, primary health networks). All this would facilitate improved monitoring and evaluation, which would allow for continued funding and expansion of the projects.

## Discussion

Our results highlight the significant political and pragmatic challenges faced by decision makers in investing in prevention. It is within this context that ‘economic’ data can sometimes be in a form that does not resemble the traditional way that cost-effectiveness evidence is defined, even though it is used routinely by stakeholders. The types of evidence used, framed by prevailing organisational perspectives, include forward estimates of budgetary impacts and ‘return on investment’, i.e. range of benefits as specific to the organisational imperatives of the stakeholders (e.g. decrease in hospital admissions for the insurers). Furthermore, economic evidence tends to be used to support activities such as advocacy, financial management and communication between stakeholders, which fall outside the functions economic evaluations are typically designed to inform. Indeed, the finding that prevention is seen as part of the branding activity by health insurers (regardless of prevention’s economic benefit) fits with the observation that decision makers often hold knowledge to have more symbolic value than instrumental value.<sup>33</sup>

The limited capacity of conventional economic evaluation methodologies and cost-effectiveness metrics to provide all the information decision makers need is well recognised in the international literature.<sup>10-12,34,35</sup> A solution may lie in an adoption of an evidence co-production approach,<sup>36</sup> which means that research is characterised as a joint enterprise rather than as the end-product of a process in which it is ‘delivered’ by researchers to a group of decision makers.<sup>37</sup> Conversely, more work can be done to encourage decision makers to look beyond their organisational perspectives and to take on board evidence of societal and sector-wide impacts. This may include

promoting recent initiatives in the health economics literature such as the use of cost consequences analyses of ‘social impact inventories’, which represent evaluation techniques that take multi-dimensional social outcomes into account.<sup>38,39</sup>

Another key implication is that economic evaluation tools could potentially address some of the barriers faced by prevention programs (e.g. short-term benefits are less visible). Thus, an area for further development is for health economic researchers to re-orient analyses in prevention so that evidence can be used to guide future action, rather than as a means of evaluating past decisions. This requires greater use of modelling techniques based on epidemiological evidence to provide decision makers with stronger predictive capabilities. In addition, the use of priority setting tools such as program budgeting and marginal analysis that involve the decision maker in the process<sup>40,41</sup> and studies<sup>41,42</sup> that synthesise existing evidence and incorporate a broader concept of benefit would be useful in prospectively informing investment decisions.

Given the dynamic nature of the political and ideological context around prevention, stronger national leadership and establishing processes for the use of health economics within organisations may be needed.<sup>43,44</sup> Advances in the use of economic evaluations in policy in Australia have mainly been in the field of health technology assessments for drugs and devices. We had expected this to filter through to prevention, but our evidence suggests that this has not happened to any major extent. A reason inferred from the findings was that implementation of prevention programs (e.g. taxation of soft drinks) faces political and ideological challenges and that consumer acceptability is key in this process. While a universal PBAC-type system for assessment of new prevention ‘technologies’ may be challenging given the diversity of funders and organisational imperatives that drive decision making in the prevention sphere, the evolution of the partnership between UK Department of Health and the National Institute for Health and Care Excellence (NICE) to provide evidence-based recommendations for public health practitioners and policy makers indicates that such challenges can be overcome.<sup>6,45,46</sup> As indicated in this study, much of the evidence sought by those charged with investing in prevention falls outside the purview of what is conventionally

considered health economic evidence and is specific to organisation. Part of the solution is in encouraging the application of existing methods of economic analysis that are sympathetic to what it is that prevention achieves, and the other part is to create the incentives for decision makers to factor into their investment decisions outcomes that are broader than their narrow organisational perspectives.<sup>1,7</sup>

A limitation of the study may be the small number of participants, although it should be recognised that our focus was on senior-level decision makers, and that we did achieve thematic saturation. Sampling from the different organisations also provided triangulation from different perspectives given the relevance of the public and private sector in the prevention agenda. It is possible that a level of social desirability may have biased the findings, given that the interviews were led by a health economist. However, we found respondents to be candid and openly critical of economics and often highlighted organisational shortcomings in addressing issues raised.

## Conclusion

To ensure the better use of evidence in investment in prevention in Australia, researchers need to be attuned to the varied organisational imperatives faced by the various organisations who are players in this space. Evidence needs to be fit for such purposes but, at the same time, more can be done to encourage potential funders to take into account cost-effectiveness evidence that highlights cross sector and societal impacts. This will require significant infrastructure development, monitoring and evaluation, stronger national leadership and a greater emphasis on evidence co-production.

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## Supporting Information

Additional supporting information may be found in the online version of this article:

**Supplementary Table 1:** Interview Guide.

**Supplementary Table 2:** Coding Tree.

**Supplementary Table 3:** Documentary analysis.