

ACE–PREVENTION PAMPHLETS SERIES

OVERALL RESULTS PAMPHLET 2 COMBINED RESULTS FOR *DOMINANT* AND *VERY* COST-EFFECTIVE PREVENTION INTERVENTIONS

1. MAIN MESSAGES

- There is a great opportunity for considerable health gain from a package of 43 very cost-effective prevention options (listed in Table 1).
- Addressing the inefficiency of current preventive drug treatment for cardiovascular disease (by choosing the most cost-effective drugs and targeting those at absolute risk rather than individual risk factor thresholds) could free up enough resources in the short term to fund most of the 43 recommended interventions.
- Large cost savings in the medium to longer term can be expected by reducing the need to treat disease.
- Implementation of the recommended package calls for political will, particularly for the taxation and regulation interventions. This study provides compelling evidence to make these changes.
- A large number of the recommended interventions are delivered by primary care services and may require a combination of training and incentives to facilitate general practitioners to comply.
- The recommended preventive drug interventions would require a large number of people to take medication for the rest of their lives. Introduction of a polypill for cardiovascular disease prevention could enhance the adherence to multiple preventive drug treatment.

2. BACKGROUND

The ACE-Prevention project evaluated the cost-effectiveness of 123 preventive health interventions, with a near comprehensive focus on lifestyle risk factors and non-communicable chronic diseases. The risk factor and disease interventions have been modelled independently, but many have common disease outcomes. To determine the combined effect of the most cost-effective preventive interventions on the total costs and health outcomes, the 43 most cost-effective interventions (Table 1) have been re-evaluated in a large combined model that integrates all relevant risk factors and disease parameters. This combined modelling takes into account the shared intervention costs (e.g. for general practitioner visits) and shared outcomes (e.g. the effects of blood-pressure lowering drugs, tobacco tax and mandatory salt limits in processed food on stroke and heart disease).

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ACE-PREVENTION

3. INTERVENTIONS

We have evaluated the total intervention costs, cost offsets and health gain associated with implementing the package of interventions that are Dominant (i.e. cost-saving) and the package of interventions that are *Dominant or Very Cost-Effective* (i.e. all interventions with cost-effectiveness less than \$10,000 per DALY). For comparison, we also simulated current practice, which largely reflects the current use and prescribing practices for the blood pressure and cholesterol lowering drugs used for preventing cardiovascular disease.

4. CHOICE OF COMPARATOR

The packages of interventions were evaluated in the combined model in comparison to a partial null ('no intervention') scenario, a hypothetical back-calculation that takes away the impact of current practice.

5. INTERVENTION COST-EFFECTIVENESS

Results are presented over time from the baseline year of 2003 to illustrate the timing of investment in intervention packages (the red bars in Figure 1) and return in the form of population health improvements (the green line in Figure 1) and disease and injury cost offsets (the blue bars in Figure 1). Note that the estimates of costs and outcomes over time pertain only to the 2003 Australian population as they age and eventually die. The modelling does not include younger people from 2003 onwards who become eligible for the interventions.

DOMINANT INTERVENTION PACKAGE

The package of 23 Dominant interventions (Table 1) could avert 1 million DALYs over the lifetime of the 2003 Australian population (as represented by the area under the green curve in Figure 1). Eighty percent of this health gain could be achieved with the taxation and regulation interventions on salt, alcohol and tobacco, and the polypill (cheap generic blood pressure and cholesterol lowering drugs in a single pill) for cardiovascular disease prevention.

The package of *Dominant* interventions would cost \$4.6 billion (the sum of each of the red bars in Figure 1), but could avert \$11 billion in health care costs (the sum of the blue bars in Figure 1). Fourteen percent of the investment would be required in the first year, with lower annual costs thereafter for the on-going delivery of drugs for cardiovascular disease prevention (Figure 1). The health care costs saved would reach a peak around 12 years after intervention. The extension of life from implementing this set of interventions would lead to a small net additional disease treatment cost from 2059 only.

Figure 2 shows an overlay of costs (the purple bars in Figure 2), health impact (the orange curve in Figure 2) and disease treatment costs saved (the light blue bars in Figure 2) by current practice in prevention on the previous graph. The costs of implementing the *Dominant* package of interventions are substantially less than is currently spent on blood pressure and cholesterol lowering drugs and lifestyle management for preventing cardiovascular disease. Current assessment and management practices are more costly and lead to less health gain and less treatment costs averted than could be achieved with the *Dominant* intervention package. In part, this is because of the inefficiency of current practice in blood pressure and cholesterol lowering due to a preference for expensive drugs and the inadequate targeting of people at risk based on individual risk factor levels rather than absolute cardiovascular risk. Also, the taxation and regulation interventions in the Dominant intervention package reduce the need for preventive cardiovascular disease drugs which remain expensive even if prescribed most efficiently.

Figure 1: Intervention costs, cost offsets and health gain with the package of Dominant (cost-saving) preventive interventions.

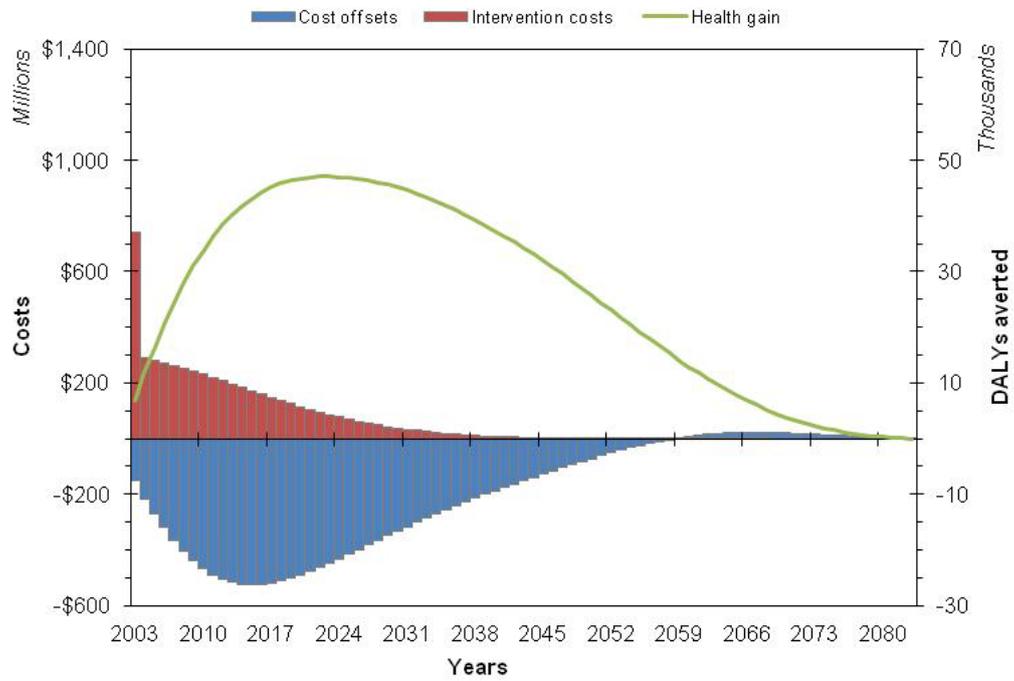
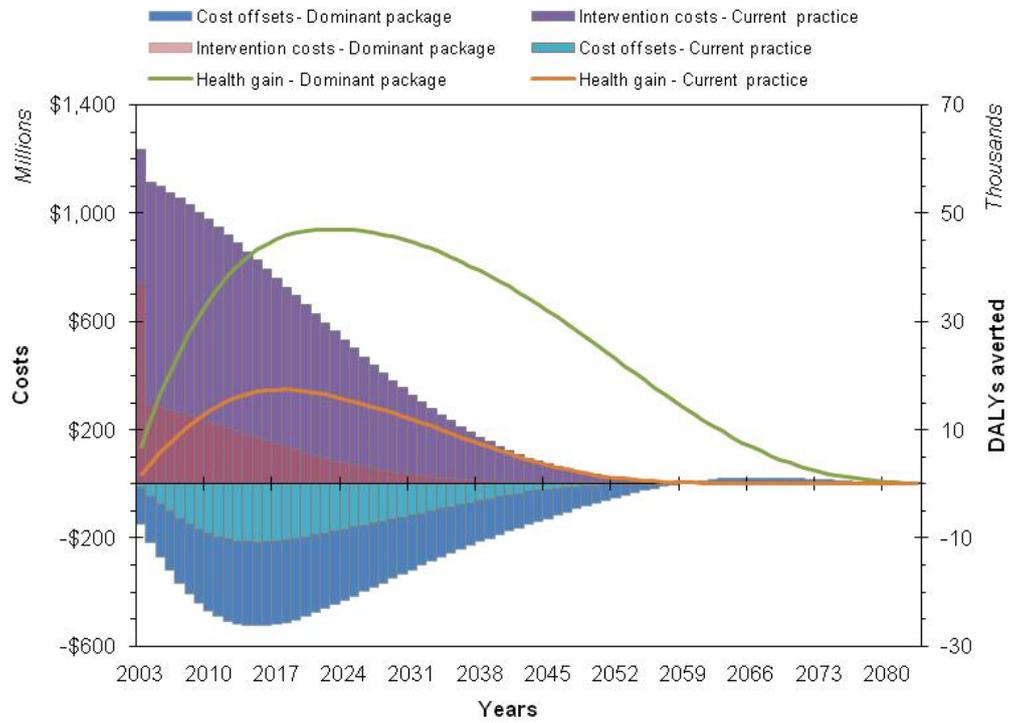


Figure 2: Intervention costs, cost offsets and health gain with the package of Dominant (cost-saving) preventive interventions and current practice.



VERY COST-EFFECTIVE INTERVENTION PACKAGE

Adding Very Cost-Effective interventions with cost-effectiveness between zero and \$10,000/DALY (Table 1) to the package of Dominant interventions leads to substantially greater up-front costs of intervention (the orange bars in Figure 3a). Total cost of the package of *Dominant* and *Very Cost-Effective* interventions would be \$13 billion (the sum of the orange bars), but this would be more than matched over time by \$14 billion in reduced costs of health care (the sum of the light blue bars).

A total of 1.4 million DALYs would be averted by the package of *Dominant* and *Very Cost-Effective* interventions, which is 400,000 DALYs more than the *Dominant* package alone (the difference between the purple and green curves in Figure 3a). A large proportion of the additional health gain is attributable to the Polypill interventions, which include delivery to people at more than 5% absolute risk or at least 55 years in age, or the individual cardiovascular disease drugs if the polypill is not implemented (compare graphs (a) and (b) in Figure 3).

6. CONCLUSIONS

There is a great opportunity for considerable health gain from a package of 43 very cost-effective prevention options. Addressing the inefficiency of current preventive drug treatment for cardiovascular disease (by choosing the most cost-effective drugs and targeting those at absolute risk rather than individual risk factor thresholds) could free up enough resources in the short term to fund most of the 43 recommended interventions. It may not be easy to redirect these resources as the savings to the Pharmaceutical Benefits Scheme are not easily identified as funds that can be redirected to other prevention efforts.

Large cost savings in the medium to longer term can also be expected by reducing the need to treat disease. Also here, it may not be so easy to redirect the saved treatment costs from hospitals into prevention. Therefore, while there are compelling economic arguments to implement this prevention package, implementation calls for political will. This is particularly the case for the taxation and regulation interventions.

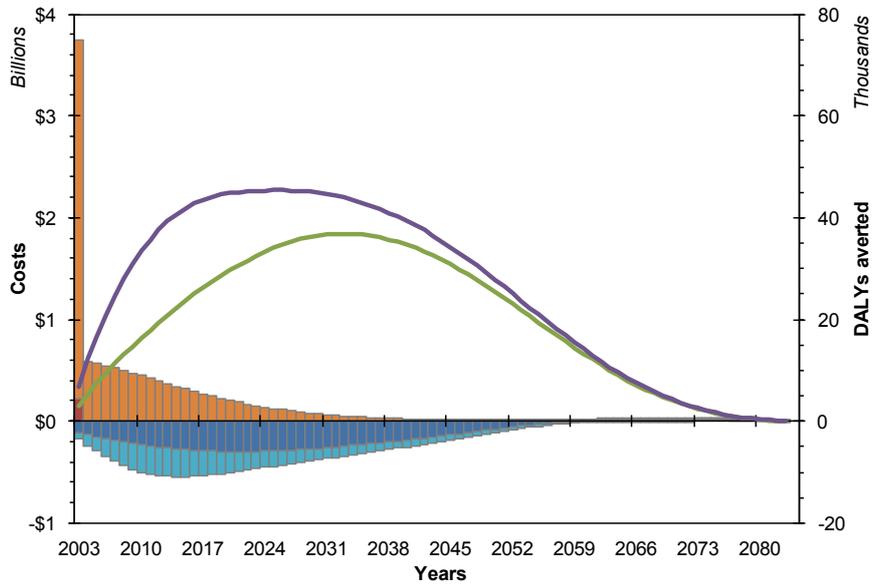
A large number of the recommended interventions are delivered by primary care services and may require a combination of training and incentives to facilitate general practitioners to comply. We have not costed such measures as separate interventions but instead have made 'realistic' uptake and adherence assumption as we would expect under routine health care circumstances.

The recommended preventive drug interventions would require a large number of people to take medication for the rest of their lives and this may meet resistance or lead to poor adherence. Introduction of a polypill for cardiovascular disease prevention could enhance the adherence to multiple preventive drug treatment.



Figure 3: Intervention costs, cost offsets and health gain with the package of Dominant and Very Cost-Effective (0 to \$10,000/DALY) preventive interventions: (a) including the Polypill; (b) including individual blood pressure and cholesterol lowering drugs instead of the Polypill.

(a)



(b)

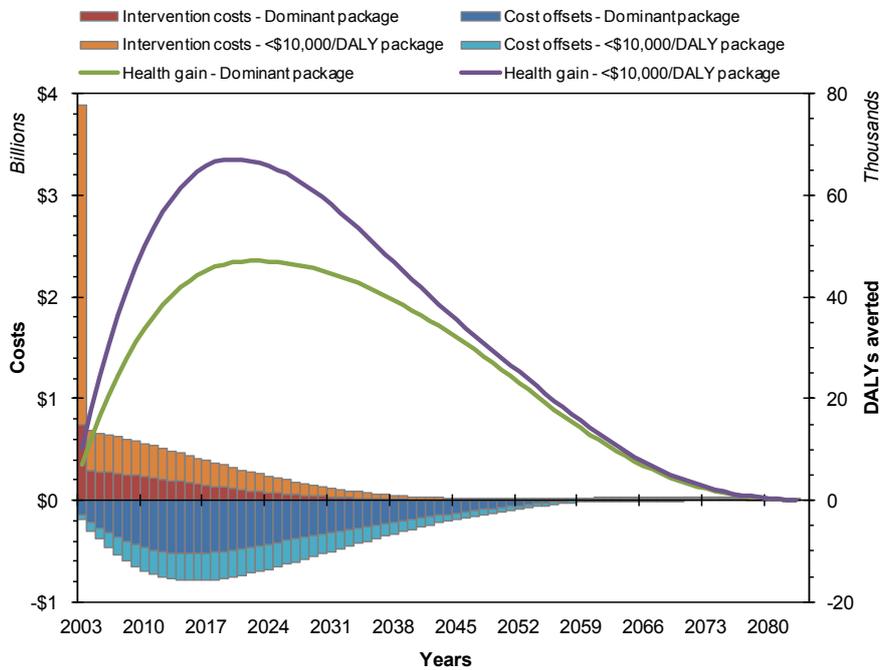


Table 1: Dominant and Very Cost-Effective interventions

Topic area	Dominant interventions	Very Cost-Effective interventions
Alcohol	<ul style="list-style-type: none"> • Volumetric tax • Tax increase 30% • Advertising bans • Raise minimum legal drinking age to 21 	<ul style="list-style-type: none"> • Brief alcohol intervention GP with or without telemarketing and support • Licensing controls
Tobacco	<ul style="list-style-type: none"> • Tax increase 30% (with or without indexation) 	<ul style="list-style-type: none"> • Cessation aids: varenicline, bupropion and nicotine replacement therapy
Physical activity	<ul style="list-style-type: none"> • Pedometers • Mass media 	<ul style="list-style-type: none"> • GP Green Prescription • Internet intervention
Nutrition	<ul style="list-style-type: none"> • Community fruit and vegetable intake promotion • Voluntary salt limits • Mandatory salt limits 	<ul style="list-style-type: none"> • Information mail-out, multiple re-tailored to promote fruit and vegetable intake
Body mass	<ul style="list-style-type: none"> • 10% tax on unhealthy food 	<ul style="list-style-type: none"> • Gastric banding for severe obesity
Blood pressure and cholesterol	<ul style="list-style-type: none"> • Community heart health program • Polypill \$200 for >5% CVD risk 	<ul style="list-style-type: none"> • Low-dose diuretics >5% CVD risk • CCBs >10% CVD risk • ACE inhibitors >15% CVD risk • Polypill \$200 to ages 55+
Mental disorders	<ul style="list-style-type: none"> • Problem-solving post-suicide attempt • Treatment for individuals at ultra-high risk for psychosis 	<ul style="list-style-type: none"> • Screen and bibliotherapy to prevent adult and childhood depression • Screen and psychologist to prevent childhood/adolescent depression • Responsible media reporting for the reduction of suicide • Parenting intervention for the prevention of childhood anxiety disorders
Osteoporosis	<ul style="list-style-type: none"> • Screen women aged 70+ and alendronate 	
Hepatitis B	<ul style="list-style-type: none"> • Vaccine and immunoglobulin to infants born to carrier or high-risk mothers • High-risk infant vaccination • Selective vaccination of infants with mothers from highly endemic countries 	<ul style="list-style-type: none"> • Universal infant vaccination
Kidney disease	<ul style="list-style-type: none"> • Proteinuria screen and ACE inhibitors for diabetics 	
Oral health	<ul style="list-style-type: none"> • Fluoridation drinking water, non-remote 	

ACE, angiotensin-converting enzyme; CCB, calcium channel blocker; CVD, cardiovascular disease

ACE–PREVENTION PAMPHLETS

6. ABOUT ACE-PREVENTION

To aid priority setting in prevention, the Assessing Cost-Effectiveness in Prevention Project (ACE-Prevention) applies standardised evaluation methods to assess the cost-effectiveness of 100 to 150 preventive interventions, taking a health sector perspective. This information is intended to help decision-makers move resources from less efficient current practices to more efficient preventive action resulting in greater health gain for the same outlay.

PAMPHLETS IN THIS SERIES

Methods:

- A. The ACE-Prevention project
- B. ACE approach to priority setting
- C. Key assumptions underlying the economic analysis
- D. Interpretation of ACE-Prevention cost-effectiveness results
- E. Indigenous Health Service Delivery

Overall results

1. League table
2. Combined effects

General population results

1. Adult depression
2. Alcohol
3. Blood pressure and cholesterol lowering
4. Cannabis
5. Cervical cancer screening, Sunsmart and PSA screening
6. Childhood mental disorders
7. Fruit and vegetables
8. HIV
9. Obesity
10. Osteoporosis
11. Physical activity
12. Pre diabetes screening
13. Psychosis
14. Renal replacement therapy, screening and early treatment of chronic kidney disease
15. Salt
16. Suicide prevention
17. Tobacco

Indigenous population results

1. Cardiovascular disease prevention
2. Diabetes prevention
3. Screening and early treatment of chronic kidney disease