



The Australian Prevention
Partnership Centre
Systems and solutions for better health

A rapid review of evidence

**Effective whole-of-population strategies
for preventing chronic disease**

January 2017



A rapid review of evidence

Effective whole-of-population strategies for preventing chronic disease

A rapid review of evidence prepared for the Australian Government Department of Health on behalf of The Australian Prevention Partnership Centre.

Contributing authors:

Ms Pippy Barnett

Ms Maria Gomez

Dr Samantha Rowbotham

Associate Professor Sonia Wutzke

Editors:

Ainsley Burgess and Marge Overs, The Australian Prevention Partnership Centre

Acknowledgements:

The authors gratefully acknowledge the contributions of the following in identifying key resources:

- Dr Jo-An Atkinson, The Australian Prevention Partnership Centre
- Professor Louise Baur, The University of Sydney
- Adjunct Professor Bill Bellew, The University of Sydney
- Dr Hayley Christian, The University of WA
- Professor Tim Gill, The University of Sydney
- Professor Amanda Lee, Sax Institute

© The Sax Institute 2017

This work is copyright. It may be reproduced in whole or in part for study and training purposes subject to the inclusions of an acknowledgement of the source. It may not be reproduced for commercial usage or sale. Reproduction for purposes other than those indicated above requires written permission from the copyright owners.

Enquiries regarding this report may be directed to:

The Australian Prevention Partnership Centre

www.preventioncentre.org.au

Phone: +61 2 9188 9520

Suggested citation: Rowbotham S, Barnett P, Gomez M, Wutzke S. Effective whole-of-population strategies for preventing chronic disease. A rapid evidence review prepared for the Australian Government Department of Health on behalf of The Australian Prevention Partnership Centre; 2017.

January 2017

Our funding partners



Co-hosted by



A rapid review of evidence: Effective whole-of-population strategies for preventing chronic disease

Key messages

- This is a rapid review of the evidence for potentially effective interventions that have been the subject of high-quality reviews or meta-analyses since 2010.
- The review indicates which interventions are likely to be effective based on the strength and quality of evidence available for review.
- The review found strong evidence of effectiveness for:
 - o Multicomponent interventions targeting dietary intake in the workplace
 - o Group-based exercise programs and self-monitoring of physical activity in the workplace and broader community
 - o Counselling and support programs for smoking cessation in the workplace and community
 - o Support for employees to change behaviour to manage weight.
- While this review signals which interventions may be effective, complex problems such as chronic diseases do not respond to simple, independent, one-off solutions. Rather, they require a coordinated portfolio of sustained, whole-of-population and inter-sectoral actions.
- Systems thinking and systems tools can help us to understand and manage the complexity of chronic disease. These methods are used to examine system components and the dynamic relationships between them.

Introduction

Chronic diseases are a serious and urgent problem¹ with significant global economic burden.² In Australia, chronic disease is the country's biggest health challenge, responsible for 83% of premature deaths (deaths among people aged less than 75 years)³ and two-thirds of the total burden of disease.⁴

This burden extends beyond impacts on individuals and the health system, to adversely affect workplace productivity, workforce participation and economic growth.⁵⁻⁷

Fortunately, many major chronic diseases are largely preventable. The most prevalent modifiable risk factors for chronic diseases are poor diet, physical inactivity, tobacco use, harmful alcohol consumption and obesity.⁸ These risk factors frequently coexist and interact.⁹

Many of these risks emerge in childhood and adolescence, with the risk of chronic disease accumulating over a lifetime.¹⁰

Purpose of review

Australia has committed to the World Health Organization's Global Action Plan for the Prevention and Control of Non-Communicable Diseases (chronic diseases).¹¹ Despite numerous national frameworks and agenda-setting documents, there is limited evidence that Australia will meet many of the Action Plan's 25 performance indicators.¹²

This challenge is not unique to Australia, with no country showing significant and sustained impacts on the prevention of chronic disease. The reasons for this are many and varied, arguably including challenges of implementation and insufficient investment in preventive action.¹² However, and importantly, contributing to these challenges is a lack of knowledge on what interventions have been shown to have the greatest impact on reducing the most prevalent modifiable risk factors for chronic diseases.

This rapid review is designed to identify, synthesise and interpret the latest evidence to provide a concise summary of the current state of knowledge. Commissioned by the Australian Government Department of Health, it is anticipated that the review will be used to inform future population health policy directions relating to the prevention of chronic diseases.

The review addresses the following question: What whole-of-population prevention interventions have been shown to be most effective, in Australia and or comparable jurisdictions overseas, in:

- Slowing the growth in population levels of obesity
- Preventing the most significant modifiable risk factors contributing to the burden of chronic disease in Australia, namely poor diet, physical inactivity tobacco use and harmful alcohol consumption.

Summary of review method

- The scope of this review was limited to a synthesis of evidence reviews (i.e. systematic reviews, meta-analyses, narrative reviews, scoping reviews and rapid reviews) published in the English language between 2010 and 2016.
- An electronic search was conducted to identify relevant articles from three electronic databases: PubMed, Medline and the Cochrane Database of Systematic Reviews. Online searches were conducted to identify published reports in the grey literature. Sources included government websites, professional organisations and agencies, and non-government agencies. Additional articles were identified through consultation with experts in the field and hand searching reference lists of key papers.
- Following title and abstract screening, full-text papers ($n=120$) were retrieved and assessed in detail to determine if they met the eligibility criteria. Articles were included if they reviewed the effectiveness of interventions targeted at obesity/overweight, smoking, poor nutrition, alcohol or physical activity and delivered at the whole-of-population level or in workplace, education or community settings.
- Articles that met the inclusion criteria ($n=82$) were assessed for quality using a 10-point assessment tool.¹⁴
- High-quality articles ($n=48$) were reviewed to assess the strength of evidence. There were three rating levels (green = strong evidence of effectiveness; amber = moderate evidence of effectiveness; red = weak evidence of effectiveness). Similar interventions were grouped together and findings synthesised for the table.
- In April 2016, The Australian Prevention Partnership Centre produced a high quality and comprehensive synthesis of reviews of chronic disease prevention interventions in children and young adults (aged 0–24 years) for the Australian Government Department of Health.¹³ Due to the extensive coverage of preventive interventions in children and young adults provided by this review (119 studies from 2005–2015), it was agreed that we would not include papers on this topic. For the key points of this review, see 'Additional papers' (page 11).
- Few reviews dealt with elderly people as a separate subgroup, so any results for this population were combined with the 'Adults' group for the purpose of analysis.
- See Appendices 1 and 2 for more detail on the review method.

What this review does

- Provides a rapid review of the evidence for potentially effective interventions that have been the subject of high-quality reviews or meta-analyses since 2010.
- Indicates which interventions are likely to be effective based on the strength of the evidence available for review. This provides a signal as to which interventions may warrant further attention to consider suitability, applicability and likely effectiveness of implementation.

What this review doesn't do

- Provide an exhaustive overview of potentially effective interventions. Time constraints limited this.
- Capture evidence for potentially effective interventions that have not been the subject of high-quality reviews or meta-analyses.
- Provide estimates of the effect size of interventions.
- Consider the impact of follow-up time on the judgment of intervention effectiveness, or consider the cost-effectiveness of interventions.

Summary of key findings

The results of the review are presented in the evidence table on the following pages. Key findings are summarised here.

What works: strong evidence of effectiveness

- Multicomponent interventions targeting dietary intake in the workplace (e.g. education and environmental change).
- Group-based exercise programs and self-monitoring of physical activity in the workplace and community.
- Counselling and support programs for smoking cessation in the workplace and community.
- Support for employees to change behaviour to manage weight (e.g. goal setting, skill development, social support).

What might work: moderate evidence of effectiveness

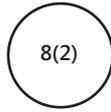
- Restrictions on marketing and advertising of food and beverages
- Interventions that change the price of healthy and unhealthy food and beverages (including taxes on sugar-sweetened beverages)
- Increasing the availability of healthy food in the community and workplace
- Environmental prompts for stair use in the community and workplace
- Smoking bans
- Financial incentives for smoking cessation
- Increasing the price of alcohol and limiting alcohol availability
- Social media to promote healthy behaviours, including healthy eating and physical activity
- Social marketing campaigns targeting healthy behaviours, including healthy eating, physical activity and smoking cessation
- Multicomponent interventions targeting body weight in the community and workplace (e.g. behavioural, educational and environmental strategies).

What might or might not work: weak evidence of effectiveness

- Education, awareness and/or promotion of healthier food and beverage options (i.e. nutrition labelling, point-of-purchase promotion)
- Workplace and community environmental modifications to promote physical activity and weight management (e.g. better access to healthy food, sit-stand desks, health promotion)
- Financial incentives for increased physical activity
- Liability and responsible alcohol service policies
- Counselling and support programs targeting alcohol consumption
- Multicomponent interventions targeting alcohol consumption (e.g. community mobilisation, responsible service policies and stricter enforcement of licensing laws).

Legend

This legend refers to the evidence table on the following page.

Category	Definition
	What works (strong evidence) Indicates strong evidence of the effectiveness of the intervention – further evidence is unlikely to change our judgment of the evidence.
	What might work (moderate evidence) Indicates moderate evidence of the effectiveness of the intervention – further evidence may change our judgment of the evidence.
	What might or might not work (weak evidence) Indicates weak evidence of the effectiveness of the intervention – further evidence is likely to change our judgment of the evidence.
	Indicates the number of studies found that supported this finding – (with number of reviews).

Note: Intervention categories in the evidence table were adapted from the approach used by the World Health Organization (Preventing chronic diseases: a vital investment. Geneva: WHO 2005. Available from: <https://pdfs.semanticscholar.org/60aa/a10eeb5c730b45e1f10e3dfd520f3c2a2c77.pdf>)

Table 1: Evidence table

 Strong evidence of effectiveness	 Moderate evidence of effectiveness	 Weak evidence of effectiveness	 8(2) Number of studies with this finding (reviews)
--	--	--	--

Interventions	Setting	Population group	
		Adults (18+ years)	Whole of population
NUTRITION/DIET			
Laws and regulations			
Restrictions on marketing and advertising of food and beverages	Community		
Tax and price interventions			
Changing price of healthy/unhealthy food and beverages (e.g. tax on sugar-sweetened beverages, price reduction on healthy food)	Community		
Environmental interventions			
Increasing the availability of healthy food (e.g. menu changes, product reformulation)	Workplace	 	
	Community		
Information/education/awareness			
Social media interventions to promote healthy diet (e.g. Facebook, Twitter)	Community		 
Social marketing campaigns to promote healthy diet (e.g. leaflets, mass media campaigns)	Community		
Education, awareness and/or promotion of healthier options (e.g. nutrition labelling, point-of-purchase promotion)	Community		
Behavioural interventions			
<i>No reviews of interventions in this group</i>			
Multicomponent interventions			
Interventions using multiple strategies (e.g. health promotion, education and environmental strategies)	Workplace	 	
PHYSICAL ACTIVITY			
Laws and regulations			
<i>No reviews of interventions in this group</i>			
Tax and price interventions			
Incentives (e.g. financial rewards for engaging in physical activity)	University		
	Workplace		
Environmental interventions			
Urban interventions to promote physical activity (e.g. improving green space, and cycling infrastructure)	Community		 
Incorporation of physical activity into the work environment (e.g. sit-stand desks, walking meetings)	Workplace	 	
Environmental prompts (e.g. motivational posters promoting stair use, signs to indicate direction of stairs)	Community		
	Workplace		
	Multiple	 	

Information/education/awareness			
Social media interventions to promote physical activity (e.g. Facebook, Twitter)	Community		15(2) 12(1)
Social marketing campaigns to promote physical activity (e.g. leaflets, mass media campaigns)	Community	5(1) 8(3)	8(2)
Targeted health information and education programs (e.g. tailored information via telephone)	Community	16(1)	7(2) 2(1)
	Workplace	2(1) 39(1) 3(1)	
	School	2(1)	
Behavioural interventions			
Counselling and support programs to increase physical activity (individual and/or group programs delivered face to face or remotely via telephone or Internet)	Community	8(1) 34(1) 6(2)	
	Workplace	13(1) 13(2)	
Group-based exercise programs (e.g. walking groups)	Community	36(3) 10(1)	10(1)
	Workplace	4(1)	
Self-monitoring (e.g. using pedometers)	Community	9(1)	
	Workplace	9(1)	
Multicomponent interventions			
Interventions using multiple strategies (e.g. exercise sessions, counselling and mass media campaigns)	Workplace	15(2) 35(7)	
	School	7(1)	
Community-based events and programs (e.g. mentoring programs)	Community	23(4)	8(2) 19(1)
SMOKING			
Laws and regulations			
Smoking bans (e.g. in bars and workplaces)	Multiple		37(1)
Tax and price interventions			
Incentives (e.g. financial rewards for smoking cessation)	Multiple	21(1)	
	Workplace	5(1) 1(1)	
Environmental interventions			
Environmental support for smoking cessation (e.g. anti-smoking posters, social support systems)	Workplace	4(1)	
Information/education/awareness			
Social marketing campaigns (e.g. leaflets, mass media campaigns)	Community		14(2)
Behavioural interventions			
Counselling and support programs to support smoking reduction/cessation (e.g. group counselling, computer-tailored messages, Quitline)	Community	16(1) 60(1) 1(1)	
	Workplace	16(2) 8(2)	
Multicomponent interventions			
Interventions using multiple strategies (e.g. counselling and environmental support for smoking cessation)	Workplace	6(1)	
	Not specified	11(1)	

ALCOHOL			
Laws and regulations			
Liability and responsible service policies (e.g. accreditation program, server training, alcohol outlet liability)	Community	21(5)	
Tax and price interventions			
Increasing the price of alcohol (e.g. through taxes)	Community	9(1)	
Environmental interventions			
Limiting alcohol availability (e.g. restricting days of alcohol sales, restricting alcohol outlet density)	Community	4(1) 16(3)	
Information/education/awareness			
<i>No reviews of interventions in this group</i>			
Behavioural interventions			
Counselling and support programs, including education and health protection messaging (e.g. media messages, individual feedback and support)	Community	4(3)	
Multicomponent interventions			
Interventions using multiple strategies (e.g. community mobilisation, responsible service policies and stricter enforcement of licensing laws)	Community	3(1)	
OBESITY AND WEIGHT LOSS			
Laws and regulations			
<i>No reviews of interventions in this group</i>			
Tax and price interventions			
Tax on sugar-sweetened beverages	Community	2(1)	6(1)
Environmental interventions			
Incorporation of healthy behaviours into the work environment (e.g. enhanced access to healthy food, sit-stand desks, workplace health promotion)	Workplace	12(1) 5(1) 12(4)	
Information/education/awareness			
Social media interventions to promote healthy behaviours (e.g. Facebook, Twitter)	Community		14(2) 10(1)
Social marketing campaigns to promote healthy behaviours (e.g. leaflets, mass media campaigns)	Workplace	25(1) 6(1)	
Behavioural interventions			
Nutrition and exercise programs (e.g. nutrition prescriptions)	Workplace	14(1) 1(1)	
Competitions and incentives (e.g. financial rewards for engaging in healthy behaviours)	Workplace	16(1) 1(1)	
Support for employees to change behaviour to manage weight (e.g. goal setting, skill development, social support)	Workplace	47(1) 40(4)	
Multicomponent interventions			
Interventions using multiple strategies (e.g. behavioural, educational and environmental strategies to encourage healthy behaviour)	Multiple settings	8(1)	
	Workplace	13(2) 18(3)	
Whole-of-community approaches (e.g. structural change, environmental change, health promotion programs)	Community	10(1) 1(1)	

A comment on complexity and the value of systems approaches

Internationally, the contemporary view is that chronic diseases and their risk factors are complex. This complexity comes from a dynamic interplay of biological, social, physical, cultural and economic factors that combine in non-linear ways to shape individual choices, exposure, risk factor development and disease incidence and progression.

Despite some successes, notably in tobacco control and associated heart disease mortality, significant and sustained prevention of chronic disease across Australia remains elusive.

Similar to other countries, in Australia much effort to prevent chronic disease has focused on individual behaviour – encouraging people to eat more nutritious food, to move more, to not smoke and to drink less alcohol. However, complex problems such as chronic diseases do not respond to simple, independent, one-off solutions. Rather, they require a deliberately coordinated portfolio of sustained, whole-of-population, inter-sectoral, cross-governmental and systemic actions.

Systems thinking and the use of systems-analytic methods offer promise for tackling complex health problems such as chronic disease. Collectively these methods encourage the examination of system components, for example, the people, processes, activities, settings and structures, and the dynamic relationships between them. With this understanding of the system – its parts and whole – we can make better decisions about where and how to intervene to facilitate change.

Consistent with the insights above, we provide two main observations as an adjunct to this review:

- **Dynamic simulation modelling methods can help to overcome the limitations of traditional evidence reviews.** Traditional evidence reviews, like the one reported here, are static, do not include practice knowledge and do not fully capture the complex and dynamic nature of the problem or potential interventions. Dynamic simulation modelling methods are increasingly being used to support the design of efficient and effective responses to complex population and health care problems and have a number of advantages to traditional evidence synthesis approaches. These methods synthesise existing evidence with expert and local knowledge into a quantitative computer model that is capable of answering ‘what if’ questions about the likely impact of different policy scenarios. The process maps the risk factors and pathways that give rise to a complex problem and how selected policies or interventions might have an effect. In short, dynamic simulation modelling methods are able to model the synergistic effects and unintended consequences of multiple interventions and their effects on a population over time – traditional evidence syntheses do not have this level of sophistication. Box 1 (next page) provides a case study of The Australian Prevention Partnership Centre’s work in using dynamic simulation modelling methods to inform complex policy decisions.
- **In the face of limited empirical evidence, informed opinion is critical.** Few large-scale, comprehensive programs addressing the prevention of chronic disease have been sustained for long enough to allow effective evaluation of the wide range of potential public health strategies. Capturing and making sense of diverse stakeholder views on the importance and feasibility of prevention efforts is essential. Concept mapping, a systems thinking approach, is a structured, mixed-methods way to generate ideas across a group on a topic of interest followed by quantitative synthesis to represent the group’s ideas visually in a series of maps. In a recent application of these methods, The Australian Prevention Partnership Centre received ideas from about 80 experts and stakeholders nationally, in response to the prompt “One specific action we can take in Australia that will improve the prevention of chronic diseases is...”. Areas for immediate national action included: refocusing the health system to prevention over cure; raising the profile of public health with health decision makers; funding policy and practice relevant research; improving communication about prevention; learning from global best-practice and domestic successes and failures; increasing the focus on primary prevention; and developing a long-term prevention strategy with an explicit funding commitment.

Box 1: Informing policy and planning for reducing alcohol-related harm: A case study of dynamic simulation modelling for the NSW population

Alcohol misuse is a complex systemic problem estimated to result in 3.3 million deaths globally each year. Despite the availability of evidence, the complex aetiology of alcohol misuse and uncertainty about the likely effect of different intervention combinations makes the design of effective responses enormously challenging.

A consortium of Australia's leading academics, policy experts, program planners, clinicians and health economists were brought together to collaboratively develop a dynamic simulation model of alcohol consumption behaviour and related harms across the NSW population. The model accounted for real-world characteristics that challenge traditional analytic approaches including interdependencies of risk factors, population and behavioural dynamics, social network influences, and variation in intervention impacts over time. Four policy scenarios were examined against a baseline of business as usual.

Based on a simulated population of about 3.6 million individuals, the model compared combinations of: mandatory 3am closing time of licensed venues; lockouts preventing entry to licensed venues after 1am; and expansion of alcohol treatment services.

It found that combining the scenarios produced a reduction in the incidence of acute alcohol-related harms that multiplied the effect of the interventions alone. This synergistic effect could not have been detected using traditional analytic and evidence synthesis methods.

Additional papers

Due to our strict inclusion criteria and quality ratings, a number of studies are likely to be useful and relevant but did not satisfy the criteria. Some of these studies are summarised briefly here:

- 1. Bauman A, Bellew B, Boylan S, Crane M, Foley B, Gill T, King L, Kite J, Mirhshahi S. Obesity prevention in children and young people aged 0–18 Years: a Rapid Evidence Review brokered by the Sax Institute. Summary Report. Prepared for the NSW Ministry of Health: Physical Activity Nutrition Obesity Research Group, The University of Sydney, 2016.**
 - No single solution creates sufficient impact to reverse childhood obesity: only a comprehensive, systemic program of multiple interventions is likely to be effective.
 - Policy action (especially fiscal policy) to reduce consumption of sugar-sweetened beverages is the single most cost-effective intervention and would save an estimated \$55 for every \$1 invested.
 - Policy action to reduce marketing of energy-dense nutrient-poor foods is the second most cost-effective intervention and would save an estimated \$38 for every \$1 invested.
- 2. Gill T, Hector D, Rissel C, O'Hara B, Bauman A. Whole of government obesity prevention interventions: an Evidence Check rapid review brokered by the Sax Institute for the ACT Government, 2013.**
 - The most promising regulatory strategies to address healthy eating include:
 - o Improving the quality of foods in retail and quick service food outlets
 - o Improving the availability and access to plain drinking water
 - o Improving point-of-purchase nutrition labelling
 - o Reducing point-of-purchase marketing of energy-dense, nutrient-poor foods
 - o Mandating strong nutrition standards for food and beverages in government-run facilities.

- There is a limited evidence base around regulatory or legislative strategies to promote physical activity and active transport. The strongest evidence is for regulatory and environmental strategies to mandate physical activity and improve facilities within schools. Regional or municipal physical activity plans and strong planning regulations around open space, parklands, footpaths and cycle ways are also important strategies to increase physical activity.
 - Regulatory approaches that improve availability and access to appropriate infrastructure for cycling, walking and public transport, as well as traffic calming, safety measures in residential streets, comprehensive behavioural programs to reduce car use, safe routes to school and subsidising public transport costs, have all been shown to be effective.
 - Grey literature broadly supports the effectiveness of multi-component workplace programs using environmental and/or policy changes in addition to individual-level strategies on improving fruit and vegetable intake, reduce fat intake and increase physical activity.
- 3. Gill T, King L, Bauman A, Vita P, Caterson I, Colagiuri S, Colagiuri R, Hebden L, Boylan S, Hector D, Khambalia A, Dickinson S, Gomez M. A “state of the knowledge” assessment of comprehensive interventions that address the drivers of obesity. A Rapid Assessment prepared for the National Health and Medical Research Council (NHMRC). Final report. The Boden Institute of Obesity, Nutrition, Exercise and Eating Disorders, University of Sydney, 2010.**
- There is consistent and promising evidence to support multi-component, community-wide interventions.
 - There is a broad evidence base to support front-of-pack labelling and statutory restrictions on food marketing to children. There is sufficient evidence for menu labelling and changes to the physical environment to increase physical activity.
 - Most studies demonstrate a small but potentially meaningful impact in taxing specific food products such as soft drinks. Taxation disincentives appear to have a stronger impact on behaviour than incentives through subsidies.
- 4. Grunseit A, Bellew B, Goldbaum E, Gale J, Bauman A. Mass media campaigns addressing physical activity, nutrition and obesity in Australia: An updated narrative review. The Australian Prevention Partnership Centre, Sydney, 2016.**
- Most mass media campaigns have only used paid mass media and have not focused on all of the potential marketing elements of an integrated social marketing campaign.
 - Mass media campaigns should be part of an integrated, system-wide approach to chronic disease prevention.
 - Sustained campaign efforts over several years are required to achieve population impact.
 - The review proposes nine recommendations to inform a more coordinated approach to the design, implementation and evaluation of mass media campaigns addressing physical activity, nutrition and obesity in Australia. Better practice can be achieved by implementing a protocol for campaign planning and evaluation.
- 5. Pikora T, Christian H, Trapp G, Villanueva K. Chronic disease prevention interventions in children and young adults: A rapid review prepared for the Australian Government Department of Health on behalf of The Australian Prevention Partnership Centre; 2016.**
- The 10–14 year age range is a critical point for prevention interventions targeting nutrition and physical activity.
 - There is strong evidence for: school-based interventions addressing smoking and physical inactivity in children and adolescents; nutrition interventions delivered across multiple settings (i.e. home and school); and home- and family-based interventions to address alcohol consumption.

6. Vos T, Carter R, Barendregt J, Mihalopoulos C, Veerman JL, Magnus A, Cobiac L, Bertram MY, Wallace AL, ACE-Prevention Team. Assessing Cost-Effectiveness in Prevention (ACE-Prevention): Final Report. University of Queensland, Brisbane; and Deakin University, Melbourne, 2010.

- The most cost-effective prevention opportunities include:
 - A 30% increase in tax on tobacco
 - A tax increase on alcohol
 - A 10% tax on non-core unhealthy foods
 - Mandatory limits on salt in bread, margarine and cereals
 - A shift to screening for absolute cardiovascular risk and targeted treatments with the most cost-effective generic drugs
 - Introduce a low-cost generic polypill (not containing aspirin) for cardiovascular prevention
 - Expand access to lap band surgery to the severely obese.
- Prevention activities with poor cost-effectiveness include:
 - Inefficient current practice in cardiovascular preventive treatment
 - Aspirin for primary prevention of cardiovascular disease
 - Most approaches promoting fruit and vegetable intake and weight loss programs.

7. World Economic Forum, Geneva, and World Health Organization, Geneva. From burden to “best buys”: Reducing the economic impact of non-communicable diseases in low and middle-income countries, 2011.

- Scaled-up implementation of a core set of “best buy” interventions for chronic disease is comparatively cheap: population-based measures for reducing tobacco, harmful alcohol use, unhealthy diet and physical inactivity are estimated to cost less than US\$ 0.40 per person in low to middle-income countries.
- These interventions will result in billions of dollars of additional output. For example, reducing the mortality rate for ischaemic heart disease and stroke by 10% would reduce economic losses in low to middle-income countries by an estimated US\$25 billion per year – three times more than the investment needed for the measures to achieve these benefits.

8. Zapata-Diomedes B, Brown V, Veerman JL. An evidence review and modelling exercise: The effects of urban form on health: costs and benefits. An evidence review commissioned by the Centre for Population Health, NSW Ministry of Health, and brokered by the Sax Institute for The Australian Prevention Partnership Centre, Sydney, 2015.

- There is sufficient evidence that increased walking and cycling have positive monetary health-related benefits in Australia.
- There is compelling Australian evidence linking attributes of the urban form with physical activity among adults. Evidence of a positive association with physical activity was found for:
 - Shorter distance to transit
 - Neighbourhood walkability, which typically included measures of density, land use mix and connectivity
 - The number of destinations within walking or cycling distance, such as transport nodes, shops and recreational facilities
 - Greater diversity in land use.
- There is insufficient evidence to draw conclusions for children and adolescents.

References

1. World Health Organization. Global status report on noncommunicable diseases 2010. Geneva: World Health Organization; 2011. Available from: http://www.who.int/nmh/publications/ncd_report2010/en/
2. Bloom D, Cafiero E, Jané-Llopis E, Abrahams-Gessel S, Bloom L, Fathima S, et al. The global economic burden of noncommunicable diseases. Program on the Global Demography of Aging; 2012. Available from: http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf
3. Australian Institute of Health and Welfare. Australia's Health 2016. Chapter 3.2 - Premature mortality from chronic disease. Canberra: Australian Institute of Health and Welfare; 2016. Available from: <http://www.aihw.gov.au/publication-detail/?id=6012955544>
4. Australian Institute of Health and Welfare. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Canberra: Australian Institute of Health and Welfare; 2016. Available from: <http://www.aihw.gov.au/publication-detail/?id=60129555173>
5. Business Council of Australia. Fit for the job: Adapting to Australia's new healthcare challenges. Melbourne: Business Council of Australia; 2009. Available from: <http://www.bca.com.au/publications/2009-reports-and-papers>
6. Committee for Economic Development of Australia. Australia adjusting: Optimising national prosperity. Melbourne: Committee for Economic Development of Australia; 2013. Available from: <http://www.ceda.com.au/research-and-policy/research/2013/11/austadjusting>
7. Productivity Commission. Potential Benefits of the National Reform Agenda. Canberra: Report to the Council of Australian Governments; 2006. Available from: <http://www.pc.gov.au/research/supporting/national-reform-agenda>
8. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*. 2013;380(9859):224–60. Available from: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(12\)61766-8/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(12)61766-8/abstract)
9. World Health Organization. Global strategy on diet, physical activity and health: a framework to monitor and evaluate implementation. Geneva: World Health Organization; 2006. Available from: <http://www.who.int/dietphysicalactivity/M&E-ENG-09.pdf>
10. World Health Organization. Preventing chronic diseases: a vital investment: Geneva: World Health Organization; 2005. Available from: http://www.who.int/chp/chronic_disease_report/en/
11. World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: World Health Organization; 2013. Available from: <http://www.who.int/nmh/publications/en/>
12. Moodie AR, Tolhurst P, Martin JE. Australia's health: being accountable for prevention. *The Medical journal of Australia*. 2016;204(6):223–5. Available from: <https://www.mja.com.au/journal/2016/204/6/australia-s-health-being-accountable-prevention>
13. Pikora T, Christian H, Trapp G, Villanueva K. Chronic disease prevention interventions in children and young adults: A rapid review prepared for the Australian Government Department of Health on behalf of The Australian Prevention Partnership Centre. 2016. (Appendix 4).
14. Health Evidence. Quality Assessment Tool: Review Articles. 2016. Available from: https://www.healthevidence.org/documents/our-appraisal-tools/QA_Tool&Dictionary_10Nov16.pdf

Appendix 1: Search strategy

This review is based on literature reviews, reports and policy documents published in the English language between 2010 and 2016. The search strategy involved four phases:

1. Systematically searching three electronic databases: Medline, PubMed and Cochrane database of systematic reviews (search strategy adapted from Pikora et al¹³)
2. Identification of evidence from health policy and evidence assessment agencies and national and state/territory chronic disease prevention strategies and policies (see Appendix 2 for agencies searched)
3. Consulting with experts to identify literature
4. Hand searching of key papers and reports.

Database search strategy

MedLine (via OVID)

(exp Diet/ OR exp Food/ OR exp Tobacco Use/ OR exp Tobacco Use Cessation/ OR exp Smoking Cessation/ OR exp Smoking/ OR exp Alcohol Drinking/ OR exp Drinking/ OR exp Drinking Behavior/ OR exp Binge Drinking/ OR exp Exercise/ OR exp Physical Exertion/ OR exp Sedentary Lifestyle/ OR exp Body Weight/ OR exp Overweight/ OR Obesity/ OR exp Body Mass Index/) AND (Exp Primary prevention/ OR exp health promotion/ OR prevention.mp OR intervention.mp) AND (Exp Population/ OR exp Schools/OR exp Workplace/ OR community.mp)

Limit to: English language and review articles and humans and year 2010–2016

Cochrane (via OVID)

(diet.mp OR nutrition.mp OR food.mp OR tobacco use.mp OR tobacco cessation.mp OR smoking cessation OR alcohol drinking.mp OR exercise.mp OR physical endurance.mp OR physical fitness.mp OR sedentary lifestyle.mp OR body weight.mp OR overweight.mp OR obesity.mp OR body mass index.mp) AND (Primary prevention.mp OR health promotion.mp OR prevention.mp OR intervention.mp) AND (Schools.mp OR workplace.mp OR community.mp OR population.mp)

Limit to: full systematic reviews and recently updated reviews and last 5 years

PubMed

(Energy intake OR Nutrition OR Food OR Diet OR Nutrient OR Consumption OR Smoking OR Tobacco OR Drinking Behaviour OR Binge Drinking OR Alcohol Drinking OR Sedentary Lifestyle OR Screen Time OR Physical Exertion OR Physical Activity OR Exercise OR Body Mass Index OR Body Weight OR Overweight OR Obesity) AND (Prevention OR Health Promotion OR Primary Prevention OR intervention) AND (Community OR Workplace OR Schools OR Population)

Filters: Review, Full text, published in the last 5 years, Humans, English

Online agencies searched

Australia: The Australian Prevention Partnership Centre, Australian Health Policy Collaboration, Public Health Association of Australia, National Health and Medical Research Council, National Preventive Health Task Force, Australian Institute of Health and Welfare, Grattan Institute, The Sax Institute.

New Zealand: Ministry of Health New Zealand, Public Health Association of New Zealand, Health Research Council of New Zealand, New Zealand College of Public Health Medicine.

United States: Centers for Disease Control and Prevention, US Preventive Services Taskforce, Johns Hopkins Medicine, Agency for Healthcare Research and Quality, National Academies of Sciences - Health and Medicine Division (formerly IOM), Robert Wood Johnson Foundation.

Canada: Public Health Association of Canada, Health-Evidence-Ca, Effective Public Health Practice Project, Canadian Task Force on Preventive Health Care, Public Health Agency of Canada.

United Kingdom: The National Institute for Health and Care Excellence, Centre for Reviews and Dissemination, UK Government, Evidence for Policy and Practice Information and Coordinating Centre, UK Foresight report and project, Health Technology Assessment), Food Standards Agency, Scottish Government.

International: Organisation for Economic Co-operation and Development, World Health Organization, World Cancer Research Fund International.

Appendix 2: Review process

Article screening and quality appraisal

Articles were screened for inclusion in three phases: 1. Title and abstract screening; 2. Full text review; 3. Quality assessment. Title/abstract and full text screening were performed according to the inclusion and exclusion criteria detailed below.

Quality assessment was performed using a 10-point quality assessment tool¹⁴. Articles were given an overall score out of 10 and classified into three categories: strong (8–10), moderate (5–7) or weak (0–4). Only reviews that were classified as 'strong' were included in this synthesis.

Assessment at each phase was performed by one of three coders (MG, PB or SR). To ensure consistency in coding, a second coder checked a subset (at least 10%) of the first coder's assessment and all discrepancies were discussed and resolved.

Inclusion and exclusion criteria

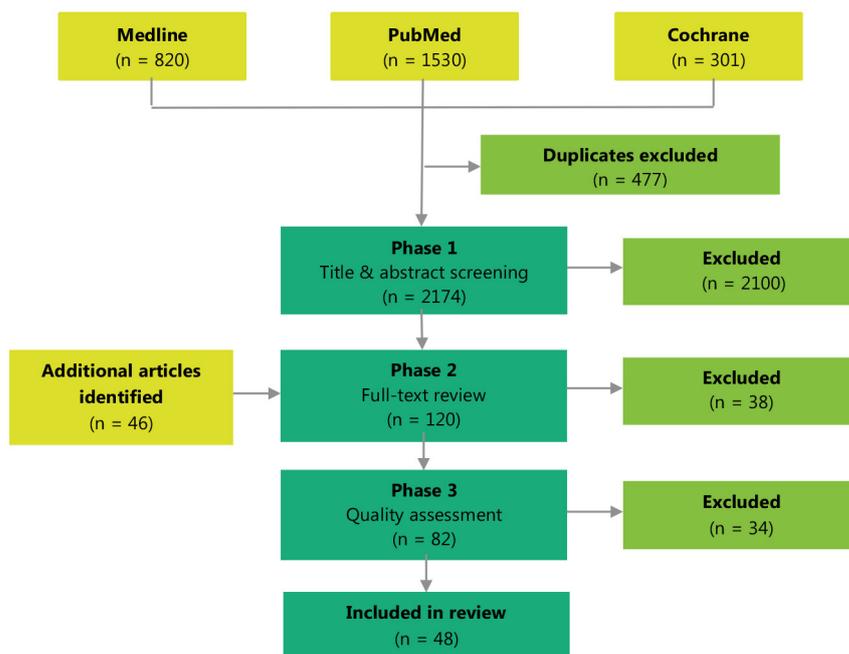
Include:

- Reviews of original research studies (meta-analysis, systematic reviews, scoping reviews, rapid reviews, reviews of reviews)
- Reviews of intervention studies
- Reviews of interventions delivered to whole of population or in workplace, education or community settings
- Reviews of interventions targeted at obesity/overweight, smoking, poor nutrition, alcohol or physical activity
- Reviews that consider intervention effectiveness
- Reviews of interventions in comparable jurisdictions and populations to Australia
- Published 2010–2016.

Exclude:

- Original research articles (e.g. RCTs, observational studies)
- Reviews of reviews
- Reports and policy documents that do not have a review component
- Reviews that do not consider interventions (e.g. reviews of association between sugar consumption and obesity) or intervention effectiveness (e.g. reviews of intervention implementation)
- Reviews of clinical interventions or interventions delivered in clinical settings (e.g. physician-delivered smoking cessation advice, pharmacological interventions for smoking cessation)
- Reviews of interventions targeted at narrow population groups (e.g. pregnant women, adults transitioning to retirement)
- Reviews of 'high-risk' prevention interventions (i.e. those targeted to people identified as having or at-risk of developing chronic disease, e.g. exercise intervention for patients with diabetes) or interventions targeted specifically at 'priority populations' (e.g. Indigenous people, rural and remote communities)
- Reviews of interventions in populations and jurisdictions that are not comparable to Australia (e.g. interventions in developing countries, interventions in Hispanic populations)
- Reviews that only consider cost-effectiveness or economic evaluations
- Reviews published before 2010
- Reviews of interventions directed at children and young adults (due to recent and comprehensive Prevention Centre review in this area)

Flow chart of article selection process



Data extraction and synthesis

Included articles were reviewed to assess the strength of the evidence for effectiveness of the interventions. There were three rating levels: green = 'what works' – strong evidence of effectiveness; amber = 'what might work' – moderate evidence of effectiveness; and red: 'what might or might not work' – weak evidence of effectiveness.

In order to assign these ratings to the evidence for each intervention, we examined each included review to extract information concerning: the nature of intervention(s); intervention effectiveness, including summaries of results from included studies in the review; the number and quality of studies that demonstrated intervention effectiveness; the results of any meta-analyses; and the conclusions of the review.

On the basis of the information extracted from each review, we made a judgment as to the strength of the evidence for the likely effectiveness of the intervention(s) reviewed. It should be noted that the judgment of the evidence for intervention effectiveness does not take effect size or follow-up into account. See below for the criteria for each evidence rating.

Green

What works (strong evidence): This rating reflects strong evidence that the intervention is effective, e.g. meta-analyses or reviews of high-quality studies demonstrating that the intervention is effective.

Amber

What might work (moderate evidence): This rating reflects moderate evidence that the intervention is effective, e.g. reviews that have identified a small number of well-designed studies with few limitations, or a group of less suitable studies (e.g. before and after studies) taken together.

Red

What might or might not work (weak evidence): This rating reflects weak evidence that the intervention is effective, e.g. reviews that indicate either a paucity of studies of reliable quality, mixed evidence for effectiveness, or evidence that there is unlikely to be an effect.

Each review was considered separately. Where a review considered the effectiveness of different interventions, a separate rating was provided for each intervention. Data for similar interventions were then combined to provide a synthesis of the evidence. To avoid bias, where reviews received different evidence ratings for the same intervention, both ratings are provided in the results (i.e. for one intervention there might be one rating for 'strong evidence' and one rating for 'moderate evidence').

To ensure reliability of the judgments, one coder (SR or PB) reviewed each paper and assigned a rating. A second coder (SW) independently reviewed a subset of the data (13 papers; 27%; 42 evidence ratings). Percentage agreement was 88% (37 agreements). Disagreements were discussed and resolved in the team.

Appendix 3: References for included reviews, grouped by intervention category

Nutrition/diet

Laws and regulations

- Queensland University of Technology. Scoping study to inform development of the National Nutrition Policy for Australia. 2013. Available from: [http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/\\$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF](http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF).

Tax and price interventions

- Backholer K, Sarink D, Beauchamp A, Keating C, Loh V, Ball K, et al. The impact of a tax on sugar-sweetened beverages according to socio-economic position: a systematic review of the evidence. *Public Health Nutr.* 2016;1–15.
- Grech A, Allman-Farinelli M. A systematic literature review of nutrition interventions in vending machines that encourage consumers to make healthier choices. *Obes Rev.* 2015;16(12):1030–41.
- Queensland University of Technology. Scoping study to inform development of the National Nutrition Policy for Australia. 2013. Available from: [http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/\\$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF](http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF).

Environmental interventions

- Geaney F, Kelly C, Greiner BA, Harrington JM, Perry IJ, Beirne P. The effectiveness of workplace dietary modification interventions: a systematic review. *Prev Med.* 2013;57(5):438–47.
- Grech A, Allman-Farinelli M. A systematic literature review of nutrition interventions in vending machines that encourage consumers to make healthier choices. *Obes Rev.* 2015;16(12):1030–41.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav.* 2012;39(6):752–76
- Montano D, Hoven H, Siegrist J. A meta-analysis of health effects of randomized controlled worksite interventions: Does social stratification matter? *Scandinavian Journal of Work, Environment & Health.* 2014;40(3):230–4.
- Queensland University of Technology. Scoping study to inform development of the National Nutrition Policy for Australia. 2013. Available from: [http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/\\$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF](http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF).

Information/education/awareness

- Grech A, Allman-Farinelli M. A systematic literature review of nutrition interventions in vending machines that encourage consumers to make healthier choices. *Obes Rev.* 2015;16(12):1030–41.
- Maher CA, Lewis LK, Ferrar K, Marshall S, De Bourdeaudhuij I, Vandelanotte C. Are health behavior change interventions that use online social networks effective? A systematic review. *J Med Internet Res.* 2014;16(2):e40.
- Mita G, Mhurchu CN, Jull A. Effectiveness of social media in reducing risk factors for noncommunicable diseases: a systematic review and meta-analysis of randomized controlled trials. *Nutr Rev.* 2016;74(4):237–47.
- Queensland University of Technology. Scoping study to inform development of the National Nutrition Policy for Australia. 2013. Available from: [http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/\\$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF](http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF).

- Williams G, Hamm MP, Shulhan J, Vandermeer B, Hartling L. Social media interventions for diet and exercise behaviours: a systematic review and meta-analysis of randomised controlled trials. *BMJ Open*. 2014;4(2):e003926

Behavioural interventions

- Nour M, Chen J, Allman-Farinelli M. Efficacy and external validity of electronic and mobile phone-based interventions promoting vegetable intake in young adults: Systematic review and meta-analysis. *J Med Internet Res*. 2016;18(4).

Multicomponent interventions

- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav*. 2012;39(6):752–76

Physical activity

Laws and regulations

- *No reviews of interventions in this group.*

Tax and price interventions

- Hosking J, Macmillan A, Connor J, Bullen C, Ameratunga S. Organisational travel plans for improving health. *Cochrane Database Syst Rev*. 2010(3):CD005575.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav*. 2012;39(6):752–76
- Yang L, Sahlqvist S, McMinn A, Griffin SJ, Ogilvie D. Interventions to promote cycling: systematic review. *BMJ*. 2010;341:c5293.

Environmental interventions

- Bellicha A, Kieusseian A, Fontvieille AM, Tataranni A, Charreire H, Oppert JM. Stair-use interventions in worksites and public settings – a systematic review of effectiveness and external validity. *Prev Med*. 2015;70:3–13.
- Hosking J, Macmillan A, Connor J, Bullen C, Ameratunga S. Organisational travel plans for improving health. *Cochrane Database Syst Rev*. 2010(3):CD005575.
- Hunter RF, Christian H, Veitch J, Astell-Burt T, Hipp JA, Schipperijn J. The impact of interventions to promote physical activity in urban green space: a systematic review and recommendations for future research. *Soc Sci Med*. 2015;124:246–56.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav*. 2012;39(6):752–76
- MacEwen BT, MacDonald DJ, Burr JF. A systematic review of standing and treadmill desks in the workplace. *Prev Med*. 2015;70:50–8.
- Neuhaus M, Eakin EG, Straker L, Owen N, Dunstan DW, Reid N, et al. Reducing occupational sedentary time: a systematic review and meta-analysis of evidence on activity-permissive workstations. *Obes Rev*. 2014;15(10):822–38.
- Shrestha N, Kukkonen-Harjula KT, Verbeek JH, Ijaz S, Hermans V, Bhaumik S. Workplace interventions for reducing sitting at work. *Cochrane Database Syst Rev*. 2016;3:CD010912.
- Soler RE, Leeks KD, Buchanan LR, Brownson RC, Heath GW, Hopkins DH, et al. Point-of-decision prompts to increase stair use. A systematic review update. *Am J Prev Med*. 2010;38(2 Suppl):S292–300.
- Yang L, Sahlqvist S, McMinn A, Griffin SJ, Ogilvie D. Interventions to promote cycling: systematic review. *BMJ*. 2010;341:c5293.

Information/education/awareness

- Blank L, Jones R, Buckley Woods H, Payne N. Systematic review and narrative synthesis of the effectiveness of local interventions to promote cycling and walking for recreational and travel purposes. 2012. Available from: <https://www.nice.org.uk/guidance/ph41/evidence/effectiveness-review-430261597>.
- Bock C, Jarczok MN, Litaker D. Community-based efforts to promote physical activity: a systematic review of interventions considering mode of delivery, study quality and population subgroups. *J Sci Med Sport*. 2014;17(3):276–82.
- Hosking J, Macmillan A, Connor J, Bullen C, Ameratunga S. Organisational travel plans for improving health. *Cochrane Database Syst Rev*. 2010(3):CD005575.
- Maher CA, Lewis LK, Ferrar K, Marshall S, De Bourdeaudhuij I, Vandelanotte C. Are health behavior change interventions that use online social networks effective? A systematic review. *J Med Internet Res*. 2014;16(2):e40.
- Malik SH, Blake H, Suggs LS. A systematic review of workplace health promotion interventions for increasing physical activity. *British Journal of Health Psychology*. 2014;19(1):149–80.
- Mita G, Mhurchu CN, Jull A. Effectiveness of social media in reducing risk factors for noncommunicable diseases: a systematic review and meta-analysis of randomized controlled trials. *Nutr Rev*. 2016;74(4):237–47.
- van Sluijs EM, Kriemler S, McMinn AM. The effect of community and family interventions on young people's physical activity levels: a review of reviews and updated systematic review. *BJSM online*. 2011;45(11):914–22.
- Williams G, Hamm MP, Shulhan J, Vandermeer B, Hartling L. Social media interventions for diet and exercise behaviours: a systematic review and meta-analysis of randomised controlled trials. *BMJ Open*. 2014;4(2):e003926.
- Yang L, Sahlqvist S, McMinn A, Griffin SJ, Ogilvie D. Interventions to promote cycling: systematic review. *BMJ*. 2010;341:c5293.

Behavioural interventions

- Blank L, Jones R, Buckley Woods H, Payne N. Systematic review and narrative synthesis of the effectiveness of local interventions to promote cycling and walking for recreational and travel purposes. 2012. Available from: <https://www.nice.org.uk/guidance/ph41/evidence/effectiveness-review-430261597>.
- Bock C, Jarczok MN, Litaker D. Community-based efforts to promote physical activity: a systematic review of interventions considering mode of delivery, study quality and population subgroups. *J Sci Med Sport*. 2014;17(3):276–82.
- Carlin A, Murphy MH, Gallagher AM. Do interventions to increase walking work? A systematic review of interventions in children and adolescents. *Sports Med*. 2016;46(4):515–30.
- Chau JY, der Ploeg HP, van Uffelen JG, Wong J, Riphagen I, Healy GN, et al. Are workplace interventions to reduce sitting effective? A systematic review. *Prev Med*. 2010;51(5):352–6.
- Davies CA, Spence JC, Vandelanotte C, Caperchione CM, Mummery WK. Meta-analysis of internet-delivered interventions to increase physical activity levels. *The International Journal of Behavioral Nutrition and Physical Activity*. 2012;9:52.
- Hosking J, Macmillan A, Connor J, Bullen C, Ameratunga S. Organisational travel plans for improving health. *Cochrane Database Syst Rev*. 2010(3):CD005575.
- Kassavou A, Turner A, French DP. Do interventions to promote walking in groups increase physical activity? A meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*. 2013;10(1):18.
- Malik SH, Blake H, Suggs LS. A systematic review of workplace health promotion interventions for increasing physical activity. *British Journal of Health Psychology*. 2014;19(1):149–80.
- Shrestha N, Kukkonen-Harjula KT, Verbeek JH, Ijaz S, Hermans V, Bhaumik S. Workplace interventions for reducing sitting at work. *Cochrane Database Syst Rev*. 2016;3:Cd010912.

- van Sluijs EM, Kriemler S, McMinn AM. The effect of community and family interventions on young people's physical activity levels: a review of reviews and updated systematic review. *BJSM online*. 2011;45(11):914–22.

Multicomponent interventions

- Baker RAP, Francis DP, Soares J, Weightman AL, Foster C. Community wide interventions for increasing physical activity. *Cochrane Database Syst Rev*. 2015(1).
- Blank L, Jones R, Buckley Woods H, Payne N. Systematic review and narrative synthesis of the effectiveness of local interventions to promote cycling and walking for recreational and travel purposes. 2012. Available from: <https://www.nice.org.uk/guidance/ph41/evidence/effectiveness-review-430261597>.
- Bock C, Jarczok MN, Litaker D. Community-based efforts to promote physical activity: a systematic review of interventions considering mode of delivery, study quality and population subgroups. *J Sci Med Sport*. 2014;17(3):276–82.
- FreakPoli LAR, Cumpston M, Peeters A, Clemes SA. Workplace pedometer interventions for increasing physical activity. *Cochrane Database Syst Rev*. 2014(1).
- Hosking J, Macmillan A, Connor J, Bullen C, Ameratunga S. Organisational travel plans for improving health. *Cochrane Database Syst Rev*. 2010(3):CD005575.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav*. 2012;39(6):752–76.
- Malik SH, Blake H, Suggs LS. A systematic review of workplace health promotion interventions for increasing physical activity. *British Journal of Health Psychology*. 2014;19(1):149–80.
- Shrestha N, Kukkonen-Harjula KT, Verbeek JH, Ijaz S, Hermans V, Bhaumik S. Workplace interventions for reducing sitting at work. *Cochrane Database Syst Rev*. 2016;3:CD010912.
- To QG, Chen TT, Magnussen CG, To KG. Workplace physical activity interventions: a systematic review. *Am J Health Promot*. 2013;27(6):e113–23.
- Yang L, Sahlqvist S, McMinn A, Griffin SJ, Ogilvie D. Interventions to promote cycling: systematic review. *BMJ*. 2010;341:c5293.

Smoking

Laws and regulations

- Hopkins DP, Razi S, Leeks KD, Priya Kalra G, Chattopadhyay SK, Soler RE, et al. Smokefree policies to reduce tobacco use. A systematic review. *Am J Prev Med*. 2010;38(2 Suppl):S275–89.

Tax and price interventions

- Cahill K, Lancaster T. Workplace interventions for smoking cessation. *Cochrane Database Syst Rev*. 2014(2):Cd003440.
- Cahill K, Hartmann-Boyce J, Perera R. Incentives for smoking cessation. *Cochrane Database Syst Rev*. 2015(5):Cd004307.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav*. 2012;39(6):752–76.

Environmental interventions

- Cahill K, Lancaster T. Workplace interventions for smoking cessation. *Cochrane Database Syst Rev*. 2014(2):Cd003440.

Information/education/awareness

- Bala MM, Strzeszynski L, ToporMadry R, Cahill K. Mass media interventions for smoking cessation in adults. *Cochrane Database Syst Rev*. 2013(11).
- Robinson MN, Tansil KA, Elder RW, Soler RE, Labre MP, Mercer SL, et al. Mass media health communication campaigns combined with health-related product distribution: a community guide systematic review. *Am J Prev Med*. 2014;47(3):360–71.

Behavioural interventions

- Cahill K, Lancaster T. Workplace interventions for smoking cessation. *Cochrane Database Syst Rev.* 2014(2):Cd003440.
- Chen YF, Madan J, Welton N, Yahaya I, Aveyard P, Bauld L, et al. Effectiveness and cost-effectiveness of computer and other electronic aids for smoking cessation: a systematic review and network meta-analysis. *Health Technol Assess.* 2012;16(38):1–205, iii–v.
- Chen D, Wu LT. Smoking cessation interventions for adults aged 50 or older: A systematic review and meta-analysis. *Drug and Alcohol Dependence.* 2015;154:14–24.
- Lindson-Hawley N, Hartmann-Boyce J, Fanshawe TR, Begh R, Farley A, Lancaster T. Interventions to reduce harm from continued tobacco use. *Cochrane Database Syst Rev.* 2016(12).

Multicomponent interventions

- Cahill K, Lancaster T. Workplace interventions for smoking cessation. *Cochrane Database Syst Rev.* 2014(2):Cd003440.
- Cahill K, Hartmann-Boyce J, Perera R. Incentives for smoking cessation. *Cochrane Database Syst Rev.* 2015(5):Cd004307.

Alcohol

Laws and regulations

- Bolier L, Voorham L, Monshouwer K, Hasselt Nv, Bellis M. Alcohol and drug prevention in nightlife settings: a review of experimental studies. *Substance use & misuse.* 2011;46(13):1569–91.
- Jones L, Hughes K, Atkinson AM, Bellis MA. Reducing harm in drinking environments: a systematic review of effective approaches. *Health Place.* 2011;17(2):508–18.
- Kingsland M, Wiggers JH, Vashum KP, Hodder RK, Wolfenden L. Interventions in sports settings to reduce risky alcohol consumption and alcohol-related harm: a systematic review. *Systematic Reviews.* 2016;5:12.
- Rammohan V, Hahn RA, Elder R, Brewer R, Fielding J, Naimi TS, et al. Effects of dram shop liability and enhanced overservice law enforcement initiatives on excessive alcohol consumption and related harms: two Community Guide systematic reviews. *Am J Prev Med.* 2011;41(3):334–43.

Tax and price interventions

- Elder RW, Lawrence B, Ferguson A, Naimi TS, Brewer RD, Chattopadhyay SK, et al. The effectiveness of tax policy interventions for reducing excessive alcohol consumption and related harms. *Am J Prev Med.* 2010;38(2):217–29.

Environmental interventions

- Bryden A, Roberts B, McKee M, Petticrew M. A systematic review of the influence on alcohol use of community level availability and marketing of alcohol. *Health Place.* 2012;18(2):349–57.
- Middleton JC, Hahn RA, Kuzara JL, Elder R, Brewer R, Chattopadhyay S, et al. Effectiveness of policies maintaining or restricting days of alcohol sales on excessive alcohol consumption and related harms. *Am J Prev Med.* 2010;39(6):575–89.

Information/education/awareness

- Bryden A, Roberts B, McKee M, Petticrew M. A systematic review of the influence on alcohol use of community level availability and marketing of alcohol. *Health Place.* 2012;18(2):349–57.

Behavioural interventions

- Bolier L, Voorham L, Monshouwer K, Hasselt Nv, Bellis M. Alcohol and drug prevention in nightlife settings: a review of experimental studies. *Substance Use & Misuse.* 2011;46(13):1569–91.
- Bryden A, Roberts B, McKee M, Petticrew M. A systematic review of the influence on alcohol use of community level availability and marketing of alcohol. *Health Place.* 2012;18(2):349–57.
- Kingsland M, Wiggers JH, Vashum KP, Hodder RK, Wolfenden L. Interventions in sports settings to reduce risky alcohol consumption and alcohol-related harm: a systematic review. *Systematic Reviews.* 2016;5:12.

Multicomponent interventions

- Jones L, Hughes K, Atkinson AM, Bellis MA. Reducing harm in drinking environments: a systematic review of effective approaches. *Health Place*. 2011;17(2):508–18.

Obesity/weight loss

Laws and regulations

- No reviews of interventions in this group

Tax and price interventions

- Backholer K, Sarink D, Beauchamp A, Keating C, Loh V, Ball K, et al. The impact of a tax on sugar-sweetened beverages according to socio-economic position: a systematic review of the evidence. *Public Health Nutr*. 2016:1–15.

Environmental interventions

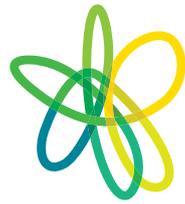
- Archer WR, Batan MC, Buchanan LR, Soler RE, Ramsey DC, Kirchhofer A, et al. Promising practices for the prevention and control of obesity in the worksite. *Am J Health Promot*. 2011;25(3):e12–26.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav*. 2012;39(6):752–76.
- MacEwen BT, MacDonald DJ, Burr JF. A systematic review of standing and treadmill desks in the workplace. *Prev Med*. 2015;70:50–8.
- Montano D, Hoven H, Siegrist J. A meta-analysis of health effects of randomized controlled worksite interventions: Does social stratification matter? *Scandinavian Journal of Work, Environment & Health*. 2014;40(3):230–4.
- Information/education/awareness
- Aceves-Martins M, Llauradó E, Tarro L, Moreno-García CF, Escobar TGT, Solà R, et al. Effectiveness of social marketing strategies to reduce youth obesity in European school-based interventions: a systematic review and meta-analysis. *Nutr Rev*. 2016;74(5):337–51.
- Archer WR, Batan MC, Buchanan LR, Soler RE, Ramsey DC, Kirchhofer A, et al. Promising practices for the prevention and control of obesity in the worksite. *Am J Health Promot*. 2011;25(3):e12–26.
- Maher CA, Lewis LK, Ferrar K, Marshall S, De Bourdeaudhuij I, Vandelanotte C. Are health behavior change interventions that use online social networks effective? A systematic review. *J Med Internet Res*. 2014;16(2):e40.
- Mita G, Mhurchu CN, Jull A. Effectiveness of social media in reducing risk factors for noncommunicable diseases: a systematic review and meta-analysis of randomized controlled trials. *Nutr Rev*. 2016;74(4):237–47.
- Williams G, Hamm MP, Shulhan J, Vandermeer B, Hartling L. Social media interventions for diet and exercise behaviours: a systematic review and meta-analysis of randomised controlled trials. *BMJ Open*. 2014;4(2):e003926.

Behavioural interventions

- Archer WR, Batan MC, Buchanan LR, Soler RE, Ramsey DC, Kirchhofer A, et al. Promising practices for the prevention and control of obesity in the worksite. *Am J Health Promot*. 2011;25(3):e12–26.
- Beauchamp A, Backholer K, Magliano D, Peeters A. The effect of obesity prevention interventions according to socioeconomic position: a systematic review. *Obes Rev*. 2014;15(7):541–54.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav*. 2012;39(6):752–76.
- Verweij L, Coffeng J, van Mechelen W, Proper K. Meta-analyses of workplace physical activity and dietary behaviour interventions on weight outcomes. *Obes Rev*. 2011;12(6):406–29.

Multicomponent interventions

- Boelsen Robinson T, Peeters A, Beauchamp A, Chung A, Gearon E, Backholer K. A systematic review of the effectiveness of whole-of-community interventions by socioeconomic position. *Obes Rev.* 2015;16(9):806–16.
- Groeneveld IF, Proper KI, van der Beek AJ, Hildebrandt VH, van Mechelen W. Lifestyle-focused interventions at the workplace to reduce the risk of cardiovascular disease—a systematic review. *Scandinavian Journal of Work, Environment & Health.* 2010:202–15.
- Hebden L, Chey T, Allman-Farinelli M. Lifestyle intervention for preventing weight gain in young adults: a systematic review and meta-analysis of RCTs. *Obes Rev.* 2012;13(8):692–710.
- Kahn-Marshall JL, Gallant MP. Making healthy behaviors the easy choice for employees: a review of the literature on environmental and policy changes in worksite health promotion. *Health Educ Behav.* 2012;39(6):752–76.
- To QG, Chen TT, Magnussen CG, To KG. Workplace physical activity interventions: a systematic review. *Am J Health Promot.* 2013;27(6):e113–23.
- van Sluijs EM, Kriemler S, McMinn AM. The effect of community and family interventions on young people’s physical activity levels: a review of reviews and updated systematic review. *BJSM online.* 2011;45(11):914–22.
- Verweij L, Coffeng J, van Mechelen W, Proper K. Meta-analyses of workplace physical activity and dietary behaviour interventions on weight outcomes. *Obes Rev.* 2011;12(6):406–29.



The Australian Prevention
Partnership Centre
Systems and solutions for better health

www.preventioncentre.org.au

