

# Population-level interventions for dementia risk reduction: a complex evidence review

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## Introduction

Evidence from high-income countries suggests that age-specific incidence of dementia has fallen in recent decades. Several modifiable risk factors for dementia have been proposed, which could be measured as proxy outcomes for dementia risk, as measuring intervention effects on dementia prevalence itself is rarely feasible. Public health knowledge from other non-communicable diseases suggests that population-level interventions produce greater, and more equitable reductions to disease prevalence, than individual-level interventions. But population-level interventions for dementia risk reduction have received little attention to date. We aimed to develop this evidence base.

## Methods

- (1) We reviewed published definitions of 'population-level interventions' and prevention frameworks, then applied these to evidence on dementia risk reduction to create a definition of population-level dementia risk reduction interventions.
- (2) We conducted a rapid review to identify systematic reviews describing dementia primary prevention interventions, and measured the proportion of included interventions that met our definition.
- (3) We conducted a complex, multi-stage, evidence review to identify high-quality (e.g. Cochrane reviews, WHO literature), empirical evidence on population-level interventions for the modifiable risk factors identified by the 2020 Lancet Commission on dementia. We synthesised and graded evidence, and derived a dementia risk reduction population-level intervention framework for policymakers supported by contextual information and implementation guidance.

## 1) Definition

'Measures applied to **populations**, groups, areas, jurisdictions, or institutions **with the aim of changing the social**, cultural, physical, commercial, economic, environmental, occupational, or legislative **conditions**, to make them **less conducive to the development** or maintenance of the **modifiable lifecourse risk factors for dementia**, and/or more conducive to the development or maintenance of the modifiable lifecourse protective factors for dementia.'

## 2) Existing Evidence

	Number of individual-level interventions	Number of population-level interventions
12 dementia primary prevention systematic reviews	592	3

## 3) Intervention Framework

(Data from [high-income countries only](#), [low-/ middle-income countries](#), or [both](#))

Risk Factor	Fiscal Interventions	Marketing/Advertising Interventions	Availability Interventions	Legislative Interventions
Tobacco	(T1) Excise taxes on tobacco	(T2) Plain packaging, large health warnings (T3) Comprehensive bans on advertising	(T4) Eliminate exposure to second-hand tobacco smoke in all public places	
Excess Alcohol	(A1) Excise taxes on alcohol (A2) Minimum unit pricing	(A3) Comprehensive restrictions on advertising - including targeting young people	(A4) Restrictions on the physical availability of retailed alcohol (e.g. reduced hours of sale)	
Obesity	(O1) Taxation on unhealthy products e.g. sugar-sweetened beverages	(O2) Restrict marketing of unhealthy foods to children (O3) Menu labelling in food service	(O4) Limit portion and package size to reduce energy intake (O5) Public food procurement policies to promote healthy diets	(O6) Reformulation policies for healthier food and beverage products
Physical Inactivity			(P1) Urban and transport planning and design to provide compact neighbourhoods providing mixed-land use and connected networks for walking and cycling and equitable access to public open spaces	
Hypertension			(H1) Public food procurement and service policies to reduce sodium intake	(H2) Reformulation policies for sodium reduction
TBI				(Tr1) Mandate motorcycle helmets (all ages) (Tr2) Mandate bicycle helmets (children)
Low Education	(E1) Remove financial barriers to school attendance		(E2) Free lunches in primary schools, where there would otherwise be a lack of adequate food	(E3) Raise mandatory school leavers age
Air Pollution			(Ai1) Replacement and maintenance programmes providing cleaner cooking stoves for those currently using biomass fuels on traditional stoves or open fires	(Ai2) Reduce density of traffic, including (e.g. low emission zones) (Ai3) Postpone non-essential polluting activities on high-pollution days
Hearing Impairment			(He1) Reduce worksite noise through improving equipment where feasible; and provide adequate hearing protection, with regular monitoring	

## Conclusion

Population-level interventions have the greatest potential to reduce prevalence of, and inequalities in, dementia, but have been neglected. We present the best available evidence on population-level interventions for dementia's modifiable risk factors.