

European **Observatory** on Health Systems and Policies Series

# Promoting Health, Preventing Disease

The economic case

Edited by

**David McDaid**

**Franco Sassi and**

**Sherry Merkur**



**World Health  
Organization**

REGIONAL OFFICE FOR **Europe**



# **Promoting Health, Preventing Disease**

## **The Economic Case**



The European Observatory on Health Systems and Policies supports and promotes evidence-based health policy-making through comprehensive and rigorous analysis of health systems in Europe. It brings together a wide range of policy-makers, academics and practitioners to analyse trends in health reform, drawing on experience from across Europe to illuminate policy issues.

The European Observatory on Health Systems and Policies is a partnership between the World Health Organization Regional Office for Europe, the Governments of Austria, Belgium, Finland, Ireland, Norway, Slovenia, Sweden, the United Kingdom, and the Veneto Region of Italy, the European Commission, the World Bank, UNCAM (French National Union of Health Insurance Funds), the London School of Economics and Political Science, and the London School of Hygiene & Tropical Medicine.

# Promoting Health, Preventing Disease

## The Economic Case

Edited by

**David McDaid, Franco Sassi and  
Sherry Merkur**

Open University Press  
McGraw-Hill Education  
McGraw-Hill House  
Shoppenhangers Road  
Maidenhead  
Berkshire  
England  
SL6 2QL

email: [enquiries@openup.co.uk](mailto:enquiries@openup.co.uk)  
world wide web: [www.openup.co.uk](http://www.openup.co.uk)

and Two Penn Plaza, New York, NY 10121-2289, USA

First published 2015

Copyright © World Health Organization 2015 (acting as the host organization for, and secretariat of, the European Observatory on Health Systems and Policies).

The views expressed by authors or editors do not necessarily represent the decisions or the stated policies of the European Observatory on Health Systems and Policies or any of its partners. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the European Observatory on Health Systems and Policies or any of its partners concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitations of its frontiers or boundaries. Where the designation 'country or area' appears in the headings of tables, it covers countries, territories, cities, or areas. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the European Observatory on Health Systems and Policies in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters. The European Observatory on Health Systems and Policies does not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the OECD or of the governments of its member countries.

Rights to translate into German, Spanish, French and Russian should be sought from WHO at WHO Regional Office for Europe, Marmorvej 51 DK- 2100 Copenhagen, Denmark or by email at [translationrights@euro.who.int](mailto:translationrights@euro.who.int). Rights to translate into all other world languages should be sought from Open University Press.

All rights reserved. Except for the quotation of short passages for the purpose of criticism and review, no part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher or a licence from the Copyright Licensing Agency Limited. Details of such licences (for reprographic reproduction) may be obtained from the Copyright Licensing Agency Ltd of Saffron House, 6–10 Kirby Street, London EC1N 8TS.

A catalogue record of this book is available from the British Library

ISBN-13: 978-0-335-26226-7  
ISBN-10: 0-335-26226-0  
eISBN: 978-0-335-26227-4

Library of Congress Cataloging-in-Publication Data  
CIP data applied for

Typeset by RefineCatch Limited, Bungay, Suffolk

Fictitious names of companies, products, people, characters and/or data that may be used herein (in case studies or in examples) are not intended to represent any real individual, company, product or event.

The opinions expressed, and arguments employed herein are those of the author and do not necessarily reflect the official views of the OECD or of the governments of its member countries. This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

## European Observatory on Health Systems and Policies Series

*The European Observatory on Health Systems and Policies* is a unique project that builds on the commitment of all its partners to improving health systems:

- World Health Organization Regional Office for Europe
- Government of Austria
- Government of Belgium
- Government of Finland
- Government of Ireland
- Government of Norway
- Government of Slovenia
- Government of Sweden
- Government of the United Kingdom
- Veneto Region of Italy
- European Commission
- World Bank
- UNCAM
- London School of Economics and Political Science
- London School of Hygiene & Tropical Medicine

### **The series**

The volumes in this series focus on key issues for health policymaking in Europe. Each study explores the conceptual background, outcomes and lessons learned about the development of more equitable, more efficient and more effective health systems in Europe. With this focus, the series seeks to contribute to the evolution of a more evidence-based approach to policy formulation in the health sector.

These studies will be important to all those involved in formulating or evaluating national health policies and, in particular, will be of use to health policymakers and advisers, who are under increasing pressure to rationalize the structure and funding of their health system. Academics and students in the field of health policy will also find this series valuable in seeking to better understand the complex choices that confront the health systems of Europe. The Observatory supports and promotes evidence-based health policymaking through comprehensive and rigorous analysis of the dynamics of health care systems in Europe.

### **Series Editors**

*Josep Figueras* is the Director of the European Observatory on Health Systems and Policies, and Head of the European Centre for Health Policy, World Health Organization Regional Office for Europe.

*Martin McKee* is Director of Research Policy and Head of the London Hub of the European Observatory on Health Systems and Policies. He is Professor of European Public Health at the London School of Hygiene & Tropical Medicine, as well as a Co-director of the School's European Centre on Health of Societies in Transition.

*Elias Mossialos* is a Co-director of the European Observatory on Health Systems and Policies. He is Brian Abel-Smith Professor in Health Policy, Department of Social Policy, London School of Economics and Political Science and Director of LSE Health.

*Richard B. Saltman* is Associate Head of Research Policy and Head of the Atlanta Hub of the European Observatory on Health Systems and Policies. He is Professor of Health Policy and Management at the Rollins School of Public Health, Emory University in Atlanta, Georgia.

*Reinhard Busse* is Associate Head of Research Policy and Head of the Berlin Hub of the European Observatory on Health Systems and Policies. He is Professor of Health Care Management at the Berlin University of Technology.



## **European Observatory on Health Systems and Policies Series**

**Series Editors: Josep Figueras, Martin McKee, Elias Mossialos, Richard B. Saltman and Reinhard Busse**

### **Published titles**

*Health policy and European Union enlargement*

Martin McKee, Laura MacLehose and Ellen Nolte (eds)

*Regulating pharmaceuticals in Europe: striving for efficiency, equity and quality*

Elias Mossialos, Monique Mrazek and Tom Walley (eds)

*Social health insurance systems in western Europe*

Richard B. Saltman, Reinhard Busse and Josep Figueras (eds)

*Purchasing to improve health systems performance*

Josep Figueras, Ray Robinson and Elke Jakubowski (eds)

*Human resources for health in Europe*

Carl-Ardy Dubois, Martin McKee and Ellen Nolte (eds)

*Primary care in the driver's seat*

Richard B. Saltman, Ana Rico and Wienke Boerma (eds)

*Mental health policy and practice across Europe: the future direction of mental health care*

Martin Knapp, David McDaid, Elias Mossialos and Graham Thornicroft (eds)

*Decentralization in health care*

Richard B. Saltman, Vaida Bankauskaite and Karsten Vrangbak (eds)

*Health systems and the challenge of communicable diseases: experiences from Europe and Latin America*

Richard Coker, Rifat Atun and Martin McKee (eds)

*Caring for people with chronic conditions: a health system perspective*

Ellen Nolte and Martin McKee (eds)

*Nordic health care systems: recent reforms and current policy challenges*

Jon Magnussen, Karsten Vrangbak and Richard B. Saltman (eds)

*Diagnosis-related groups in Europe: moving towards transparency, efficiency and quality in hospitals*

Reinhard Busse, Alexander Geissler, Wilm Quentin and Miriam Wiley (eds)

*Migration and health in the European Union*

Bernd Rechel, Philipa Mladovsky, Walter Deville, Barbara Rijks, Roumyana Petrova-Benedict and Martin McKee (eds)

*Success and failures of health policy in Europe: four decades of divergent trends and converging challenges*

Johan P. Mackenbach and Martin McKee (eds)

*European child health services and systems: lessons without borders*

Ingrid Wolfe and Martin McKee (eds)

*Implications for health system performance and accountability*

Cheryl Cashin, Y-Ling Chi, Peter C. Smith, Michael Borowitz and Sarah Thomson (eds)

*Health System Performance Comparison: An Agenda for Policy, Information and Research*

Irene Papanicolas and Peter Smith (eds)

*Facets of Public Health in Europe*

Bernd Rechel and Martin McKee (eds)

*Paying For Performance in Healthcare: Implications for Health System Performance and Accountability*

Cheryl Cashin, Y-Ling Chi, Peter Smith, Michael Borowitz and Sarah Thomson (eds)

# Contents

	List of contributors	ix
	List of tables, figures and boxes	xiii
	Foreword	xvii
	Executive summary	xxi
	Acknowledgements	xxv
	List of abbreviations	xxvii
<b>Part I</b>	<b>Introduction</b>	
<b>one</b>	<b><i>Introduction to the economics of health promotion and disease prevention</i></b>	<b>3</b>
	<i>Franco Sassi, Sherry Merkur and David McDaid</i>	
<b>two</b>	<b><i>Supporting effective and efficient policies: the role of economic analysis</i></b>	<b>19</b>
	<i>David McDaid, Franco Sassi and Sherry Merkur</i>	
<b>three</b>	<b><i>Measurement challenges in the economic evaluation of public health interventions</i></b>	<b>33</b>
	<i>Silvia Evers, Marie-Jeanne Aarts and Adrienne Alayli-Goebbels</i>	



<b>Part II</b>	<b><i>Making the economic case for tackling key risk factors to health</i></b>	
<b>four</b>	<b><i>Curbing tobacco smoking</i></b> <i>Joy Townsend</i>	<b>53</b>
<b>five</b>	<b><i>Tackling alcohol-related harms</i></b> <i>Peter Anderson</i>	<b>81</b>
<b>six</b>	<b><i>Promoting physical activity</i></b> <i>Michele Cecchini and Fiona Bull</i>	<b>101</b>
<b>seven</b>	<b><i>Improving the quality of nutrition</i></b> <i>Corinna Hawkes and Franco Sassi</i>	<b>135</b>
<b>eight</b>	<b><i>Addressing environmental risks for child health</i></b> <i>Leonardo Trasande and Zachary Brown</i>	<b>169</b>
<b>nine</b>	<b><i>Preventing road-related injuries</i></b> <i>Rob Anderson, David McDaid and A-La Park</i>	<b>191</b>
<b>ten</b>	<b><i>Protecting mental health, preventing depression</i></b> <i>Filip Smit, Pim Cuijpers, Ionela Petrea and David McDaid</i>	<b>215</b>
<b>Part III</b>	<b><i>Broader perspectives on the economics of health promotion and disease prevention</i></b>	
<b>eleven</b>	<b><i>Social determinants of health: early childhood development and education</i></b> <i>Marc Suhrcke and Don Kenkel</i>	<b>237</b>
<b>twelve</b>	<b><i>Health promotion, disease prevention and health inequalities</i></b> <i>Cristina Hernández-Quevedo and Helen Weatherly</i>	<b>259</b>
<b>Part IV</b>	<b><i>Translating evidence into policy</i></b>	
<b>thirteen</b>	<b><i>Evidence into policy: the case of public health</i></b> <i>Michael P. Kelly and Natalie Bartle</i>	<b>279</b>
<b>fourteen</b>	<b><i>Making an economic case for intersectoral action</i></b> <i>David McDaid and Matthias Wismar</i>	<b>293</b>
<b>fifteen</b>	<b><i>The economics of health promotion and disease prevention: the way forward</i></b> <i>Sherry Merkur, David McDaid and Franco Sassi</i>	<b>313</b>
	<b>Index</b>	<b>325</b>

## List of contributors

**Marie-Jeanne Aarts** is Post-doctoral Researcher, School for Public Health and Primary Care, Maastricht University, the Netherlands.

**Adrienne Alayli-Goebbels** is Researcher in Health Economics, Maastricht University, the Netherlands.

**Peter Anderson** is Professor of Substance Use, Policy and Practice, Institute of Health and Society, Newcastle University, UK and Extraordinary Professor of Alcohol and Health in the Faculty of Health, Medicine and Life Sciences, Maastricht University, the Netherlands.

**Rob Anderson** is Professor of Health Economics and Evaluation, University of Exeter Medical School, United Kingdom.

**Natalie Bartle** is Business Development Manager, Derby Hospitals NHS Trust, Derby, United Kingdom.

**Zachary S. Brown** is Environmental and Resource Economist, North Carolina State University, Raleigh, North Carolina, USA and Assistant Professor, Department of Agricultural and Resource Economics, Cluster Faculty in the Genetic Engineering and Society Program, USA. He was previously Environmental and Resource Economist, OECD, Paris, France.

**Fiona Bull** is Professor/Director, Centre for the Built Environment and Health, School of Population Health, University of Western Australia, Crawley, Australia.

**Michele Cecchini** is a Health Economist and Policy Analyst, Health Division, Directorate for Employment, Labour and Social Affairs, OECD, Paris, France.

**Pim Cuijpers** is Professor of Clinical Psychology, VU University Medical Centre, Amsterdam, the Netherlands.

**Silvia Evers** is Professor of Public Health Technology Assessment, Department of Health Services Research, Maastricht University, the Netherlands.

**Corinna Hawkes** is Head of Policy and Public Affairs at World Cancer Research International.

**Cristina Hernandez-Quevedo** is a Health Economist and Policy Analyst, European Observatory on Health Systems and Policies, London School of Economics and Political Science, United Kingdom.

**Michael P. Kelly** is former Director of the Centre of Public Health Excellence, National Institute of Health and Care Excellence, London, United Kingdom.

**Don Kenkel** is Professor of Economics, College of Human Ecology, Cornell University, USA.

**David McDaid** is Senior Research Fellow in Health Economics and Health Policy, Personal Social Services Research Unit and European Observatory on Health Systems and Policies, London School of Economics and Political Science, United Kingdom.

**Sherry Merkur** is Research Fellow and Health Policy Analyst, European Observatory on Health Systems and Policies, London School of Economics and Political Science, United Kingdom.

**A-La Park** is Research Fellow and Health Economist, Personal Social Services Research Unit, London School of Economics and Political Science, United Kingdom.

**Ionela Petrea** is Head of the Department of International Mental Health Development, Trimbos Institute, Utrecht, the Netherlands.

**Franco Sassi** is Senior Health Economist, Health Division, Directorate for Employment, Labour and Social Affairs, OECD, Paris, France.

**Filip Smit** is Professor of Evidence-based Public Mental Health, Department of Epidemiology and Biostatistics, VU University Medical Centre, Amsterdam, the Netherlands and Director of Science at the Centre of Prevention and Early

Intervention, Trimbos Institute (Netherlands Institute of Mental Health and Addiction), Utrecht, the Netherlands.

**Marc Suhrcke** is Professor of Global Health Economics, Centre for Health Economics, University of York, United Kingdom.

**Joy Townsend** is Emeritus Professor of Health Economics, Epidemiology and Health Services Research, London School of Hygiene and Tropical Medicine, United Kingdom.

**Leonardo Trasande** is Associate Professor, Department of Population Health, Environmental Medicine and Paediatrics, New York University, New York, USA.

**Helen Weatherly** is Senior Research Fellow, Centre for Health Economics, University of York, United Kingdom.

**Matthias Wismar** is Health Policy Analyst, European Observatory on Health Systems and Policies, WHO Regional Office for Europe, Brussels, Belgium.

# List of tables, figures and boxes

## Tables

3.1	Types of economic evaluation	34
3.2	Challenges and solutions for economic evaluation of public health interventions	46
4.1	Prevalence of smoking any tobacco product among adults aged 15+ in selected WHO European Region countries (2009)	55
4.2	Cost for different policies adjusted to 2010 US\$ per disability-adjusted life-year (DALY)	65
5.1	Cost and cost-effectiveness of interventions relating to different target areas for alcohol public health policy	87
5.2	Summary of costs and benefits of alcohol policy	92
6.1	WHO recommended levels of physical activity (PA) by age group	106
A.1	Mass media campaigns	129
A.2	School-based interventions	130
A.3	Primary-care interventions	131
A.4	Worksite interventions	131
A.5	Active travel interventions	132
A.6	Whole-of-community interventions	134
7.1	Nutrient and food-based dietary guidelines	136
7.2	Examples of key changes in the economic organization of the food supply chain and implications for the consumer food environment	139

## **xiv** List of tables, figures and boxes

7.3	Taxonomy of policies to target the consumer food environment	141
8.1	Data available on blood lead levels in children/adults in European population surveys	173
8.2	Summary of impacts of selected environmental risks to children's health	176
8.3	Economic burden of children's exposure to hazardous chemicals alongside intervention costs, effectiveness and potential benefits	181
9.1	Examples of major road safety interventions and their effectiveness	195
9.2	Road safety intervention areas where economic evaluations have been published	198
10.1	Population-level cost-effectiveness for two prevention scenarios versus a base-case scenario without prevention: health care perspective over five years	226
11.1	Key dimensions of early childhood development intervention programmes	240
11.2	Benefits of early childhood development interventions delivered in the United States to children and adults	242
11.3	Effects of years of education on health and mortality (from selected studies)	250
12.1	Examples of approaches to tackle health inequality among EU member states	260
12.2	Examples of research on social determinants of health in Europe	262

## **Figures**

3.1	EuroQoL questionnaire	39
4.1	Cigarette consumption and lung cancer (United Kingdom)	54
4.2	Tobacco use is a risk factor for six of the eight leading causes of death	56
4.3	Cigarette consumption is sensitive to changes in real price (Italy)	59
4.4	Tax and tax revenue (million PLN) Poland, 1996–2007	60
4.5	Price most sold (US\$PPP) by per cent male smokers, data from WHO 2011	62
4.6	Product substitution as a way to avoid tax	63
4.7	Youth smoking prevalence and cigarette price United States, 1991–2005	70
5.1	Relationship between recorded adult per capita alcohol consumption and GDP for 189 countries across the world	85
6.1	Prevalence of people with insufficient levels of physical activity in the European Region, 2008	102
6.2	Relationship between wealth and level of physical activity, 2008	103
6.3	Mortality, morbidity and share of the burden of disease attributable to physical inactivity for major noncommunicable diseases in the European Region, 2004	104

6.4	Type of policies (and their frequency) currently applied by countries in the European Region	109
6.5	Cost of interventions to tackle physical inactivity in the European sub-regions and selected countries (2005 \$PPP)	116
8.1	Disability life-year losses in children <5 years of age, by country within the European Region	174
9.1	Traffic accident deaths (age standardized death rates per 100,000) in selected countries, 1980–2010	192
9.2	Rates of motor vehicle traffic accidents across the WHO European Region (latest available year)	193
11.1	Return per dollar invested by age of entry into intervention	247

## Boxes

2.1	Economic questions to inform policymaking and practice	21
2.2	The role of economic modelling for health promotion and disease prevention	25
4.1	Case study on smoking in the EU 2002–7	63
4.2	Case study: UK plan to reduce smoking prevalence	65
6.1	Development of physical culture and sports in the Russian Federation 2006–15	109
6.2	Bike sharing in Paris, France	110
6.3	Causes of insufficient action on physical activity	117
14.1	Barriers to the cross-sectoral implementation of health-promotion measures	296
14.2	Different approaches to joint budgeting	305



## Foreword

Today, the economic case for investing in health promotion and non-communicable disease prevention is stronger than it has ever been. Chronic noncommunicable diseases are the main cause of death and disability. Yet the main risk factors associated with chronic diseases are largely preventable, and this book provides compelling evidence that addressing those risk factors is an efficient use of governments' money. In particular, the book presents the case for investing upstream, prior to the onset of illness and before health care services are required.

Actions to improve people's health by making their behaviours and consumption choices healthier are starting to receive more attention in European countries' public health policies. Countries are increasingly reluctant to accept the detrimental consequences of tobacco smoking, harmful use of alcohol, unhealthy diets and sedentary lifestyles, among other risk factors. This book shows that governments can have a major impact on these behaviours by raising the price of unhealthy choices, and making them less affordable, by regulating business conduct in ways that would limit commercial influences on individual choices and ensure that healthier products are placed on the market, and by informing and educating people about healthier lifestyles. The following are some examples from the work presented in this book:

- Raising cigarette prices across Europe to the European Union (EU) average of \$5.50 would save hundreds of thousands of lives each year – 100,000, in the Russian Federation alone.
- Over 10,000 years of life in good health could be gained in western Europe each year, and even more in central and eastern Europe, at a negligible cost,

by limiting children's exposure to advertising of foods and beverages high in salt, sugar and fat.

- Cutting salt intake through regulation and food product reformulation led to a gain of 44,000 life-years in good health in England, with savings in health care expenditures largely offsetting implementation costs.
- Road traffic accidents cost European countries as much as 3 per cent of GDP; measures to cut this burden pay for themselves within 5 to 10 years.
- The value of the health and economic benefits generated by regulating chemical hazards for children and adults is ten times larger than the costs of implementing regulatory measures.

All this can be achieved in partnership with a wide range of state and non-state partners, while it is essential that verifiable targets are set, and progress towards key health objectives is closely monitored and evaluated.

This book is the result of a collaborative effort between the European Observatory on Health Systems and Policies, the Organisation for Economic Co-operation and Development, and the World Health Organization (WHO) Regional Office for Europe. The economics of health promotion and noncommunicable disease prevention features prominently in our two organizations' agendas. We have been working together, in a cross-disciplinary way, to present the best available evidence on what countries should be doing to prevent unhealthy behaviour.

The evidence of this study has informed the development of the new WHO European region policy framework and strategy for health and well-being – *Health 2020*. The OECD's Economics of Prevention Programme has made a major contribution to the evidence base for tackling leading risk factors for chronic diseases. The Programme aims at enhancing public health and creating the conditions for economic growth and development. By shaping environments conducive to healthier consumption choices, people's health and life expectancy will be improved, health care systems will be relieved of a meaningful share of the burden of treating chronic diseases, the economy will benefit from a healthier and more productive workforce, and society will enjoy greater welfare and fairer health outcomes.

Developing the evidence base on what works to promote better health and well-being, in different contexts, and at what cost, is a key element in achieving progress towards national health policy goals. *Health 2020* is value- and evidence-informed, and aims at improving the health and well-being of populations, reducing health inequalities, strengthening public health and ensuring sustainable people-centred health systems. It envisages actions and outcomes well beyond the boundaries of the health sector and beyond the remit of health ministries.

This book has benefited from wide consultations with Member States and experts that have taken place over the last two years. It shows that promoting health and preventing chronic diseases through interventions aimed at modifying lifestyle risk factors is possible and cost-effective. However, this often requires fundamental changes in individual and collective behaviours. As this joint work by the OECD, the WHO European Region and the European Observatory on Health Systems and Policies shows, such changes can only

be triggered by wide-ranging promotion and prevention strategies addressing multiple determinants of health across social groups.

*Zsuzsanna Jakab, WHO Regional Director for Europe*

*Angel Gurría, Secretary General, Organisation for  
Economic Co-operation and Development*

## **Executive summary**

Health promotion and disease prevention have a major role to play in health policy worldwide, yet they are underused, partly because evidence to support a strong case for action is difficult to gather. Aimed at a broad audience of policymakers, practitioners and academics, this book is designed to provide an economic perspective on the challenges to better health promotion and chronic disease prevention. Chronic noncommunicable diseases, including cardiovascular conditions, cancers, mental disorders, chronic respiratory conditions and diabetes, are the main cause of disability and death worldwide. Some of the disease burden associated with these diseases can be avoided through health promotion and disease prevention. A key question is whether or not there is an economic case for action, rather than treating poor health when it arises.

The first chapters of the volume look at how economics can contribute to our understanding of the pathways through which chronic diseases are generated, and of the choices and behaviours involved in those pathways. They include a discussion of basic concepts and theories, including the economic rationale for action, as well as a practical illustration of the methods, and measures of cost and outcome, that are typically used in economic analysis.

One key conclusion is that many different market failures create a compelling economic rationale for government intervention in health promotion and disease prevention, as a way of improving social welfare. Behaviours conducive to poor health may entail costs that are not borne by those who engage in such behaviours. Externalities associated with their adverse impacts go beyond the individual. They affect families and can put a strain on public services. Examples

include the harms caused by passive smoking, violent and disorderly behaviour associated with alcohol abuse, and road traffic injuries resulting from reckless driving. Prices are unlikely to reflect these impacts in a free market.

There may be a lack of information for consumers to make rational and efficient choices, often compounded by uncertainty or miscommunication on the health benefits and harms of different lifestyle choices. And, people do not always act rationally when making choices, sometimes because their behaviours may be addictive, or habit-forming, as with smoking and gambling, sometimes because they can be myopic, choosing to ‘enjoy’ an unhealthy lifestyle today, either dismissing future risk or intending but failing to change future behaviour. Choices are also influenced by the way in which products are advertised or displayed in shops, and by peer pressures.

The core of the book contains reviews of the economic evidence for tackling specific behavioural risk factors, including tobacco smoking, harmful alcohol use, physical inactivity and unhealthy diets, as well as selected risk factors related to the environment, roads and mental health and well-being. Cross-cutting themes, including interventions on selected social determinants of health, with a focus, in particular, on education and early life interventions, the distributional implications of policy interventions and key implementation issues are then considered in subsequent chapters.

A central message is that there is strong evidence of the cost-effectiveness of at least some actions in all of the thematic areas examined. In many of these areas, a combination of measures involving fiscal policies, regulation and improved access to health-relevant information are more cost-effective than any one measure in isolation. In the case of tobacco control, for instance, taxation is the single most cost-effective action; but even greater health benefits can be obtained by combining this with legislation on smoke-free environments, banning advertising, making use of warning labels and running mass media campaigns, still with favourable cost-effectiveness.

Efficient alcohol policies include restricting access to retailed alcohol, enforcing bans on alcohol advertising, including on social media, raising taxes and instituting a minimum price per gram of alcohol. More expensive, but still cost-effective measures include enforcing drink-driving laws through breath testing, delivering brief advice for higher risk drinking, and providing treatment for alcohol-related disorders. Media campaigns, on their own, and school-based health promotion programmes, do not appear to be cost-effective. A strategy that combines interventions is likely to generate additional health benefits, while still remaining cost-effective.

There is also evidence for actions that improve the quality of people’s diets. Taxes on foods high in salt, sugar and fat are consistently cost saving, but tend to be regressive. They may need to be designed carefully to avoid undesirable substitution effects – for instance, by coupling them with subsidies targeting healthy food and drinks, or disadvantaged consumers. Policies aimed at reducing salt content in processed foods have favourable cost-effectiveness in several studies, but evidence on other reformulation (e.g. to reduce trans-fat content) is very limited. Policies aimed at making fruit and vegetables more available in schools can have a positive, albeit modest effect. Food labelling schemes can be cost-effective, but they have only been assessed in a handful

of studies. A few studies support restrictions on food advertising to children, which are found to work better, and to be more efficient, when implemented on a mandatory basis rather than through self-regulation.

The promotion of physical activity through mass media campaigns is cost-effective and relatively inexpensive. However, returns in terms of health outcomes may be lower than those provided by more targeted interventions – for instance, those set in the workplace. Changes in the transport system and increased access to opportunities for physical activity in the wider environment, such as the provision of bicycle trails, also have potential benefits, but require careful evaluation to ascertain affordability and feasibility. Actions targeting the adult population and individuals at higher risk tend to produce larger effects in a shorter time frame than actions targeted at children and young people.

The economic case for mental health promotion and disorder prevention is encouraging. Evidence suggests a favourable return on investment from many actions across the life course, starting from early actions in childhood to strengthen social and emotional learning, coping skills and improved bonds between parents and children. There are also economic arguments supporting investment in workplace initiatives to promote better psychological health, with much of the benefits falling on employers. Cost-effective prevention programmes can also be targeted at high-risk groups of the population, including isolated older people and new mothers.

Actions to prevent road traffic accidents, including road design modification, urban traffic calming and camera and radar speed enforcement programmes, are supported by sound economic evidence, especially when applied in higher-risk areas. Active enforcement of legislation to promote good road safety behaviours, including measures to reduce drink-driving, can also be highly cost-effective.

Favourable economic studies support action to tackle environmental chemical hazards. Examples include the comprehensive reform of the 2007 Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) in Europe; the removal of lead-based paint hazards; the abatement of mercury pollution from coal-fired power plants and reduced vehicle emissions in high-traffic areas, e.g., through congestion charging schemes. These measures can reduce health care and other costs associated with childhood asthma, bronchiolitis and other early life respiratory illnesses.

A further key message is that adequate implementation and monitoring are essential to realize the cost-effectiveness potential of many interventions reviewed. Steps need to be taken to help facilitate implementation of actions that must be delivered outside of the health sector. These could include voluntary or mandatory partnerships across sectors, possibly with the sharing of financial risks and rewards of investment to overcome narrow sector-specific interests.

Finally, it is crucial that expectations concerning the benefits of health promotion and disease prevention remain realistic. Reducing health expenditure should not be regarded as the sole goal of prevention. An economic case should be made in the same way as for other health interventions. This volume indicates that prevention and health promotion can help improve health and well-being, with a cost-effectiveness that is as good as, or better than, that of many accepted forms of health care.

# Acknowledgements

This book is the result of collaboration between the European Observatory on Health Systems and Policies and the Organisation for Economic Co-operation and Development. We are especially grateful to all the authors for their valuable contributions.

We are also very grateful to the reviewers of this volume: Kenneth Warner, University of Michigan; Falk Mueller-Riemenschneider, Charite University; Bruce Traill, Reading University; Dan Chisholm, WHO Headquarters; Timothy Taylor, University of Exeter School; Rune Elvik, Transport Institute; Anne Ludbrooke, University of Aberdeen; and Richard Cookson, University of York for their very helpful comments and suggestions.

Finally, this book would not have appeared without the hard work of the production team led by Jonathan North, with the able assistance of Caroline White.



## List of abbreviations

\$Int	international dollars (currency)
A\$/AUD	Australian dollars (currency)
ACI	activated carbon injection
ACSM	American College of Sports Medicine
BBBF	Better Beginnings, Better Futures
BCSP	Bowel Cancer Screening Programme
BDI	Becks Depression Inventory
BHPS	British Household Panel Survey
BLLs	blood lead levels
BMI	body mass index
C\$	Canadian dollars (currency)
CAAA	Clean Air Act Amendments
CAP	Common Agricultural Policy
CBA	cost-benefit analysis
CBT	cognitive behavioural therapy
CCA	cost-consequence analysis
CDI	Children's Depression Inventory
CE	cost-effectiveness
CEA	cost-effectiveness analysis
CIS	Commonwealth of Independent States
CMA	cost-minimization analysis
COI	cost of illness
CSDH	Commission on Social Determinants of Health
CUA	cost-utility analysis

CV	contingent valuation
CVD	cardiovascular diseases
DALYs	disability-adjusted life-years
DCE	discrete choice experiment
DKK	Danish krone (currency)
DRNCDS	diet-related chronic noncommunicable diseases
ECD	early childhood development
EPA	Environmental Protection Agency
EU	European Union
EUPASS	European Physical Activity Surveillance System
EuroNCAP	European New Car Assessment Programme
FCTC	Framework Convention on Tobacco Control
FOBT	faecal occult blood test
FSU	former Soviet Union
FYRR	first year rates of return
GDA	guideline daily allowance/amount
GDP	gross domestic product
GP	general practitioner
GPAQ	global physical activity questionnaire
HDA	Health Development Agency
HDL	high-density lipoprotein
HEHA	Healthy Eating, Healthy Action
HEPA	Health-Enhancing Physical Activity [Network]
HPV	high production volume
ICAP	International Centre for Alcohol Policies
ICECAP	ICEpop CAPability measure
ICER	incremental cost-effectiveness ratio
IPAQ	international physical activity questionnaire
IQ	intelligence quotient
ISA	Intelligent Speed Adaptation
IY	[Webster-Stratton] Incredible Years
MATS	Mercury and Air Toxics Standards
NGOs	non-governmental organizations
NCDs	noncommunicable diseases
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NIS	newly independent states
NOPA	European Database on Nutrition, Obesity and Physical Activity
NRT	nicotine replacement therapy
OECD	Organisation for Economic Co-operation and Development
PA	physical activity
PLN	Polish zloty (currency)
PPP	purchasing power parity
PUFA	polyunsaturated fats
QALYs	quality-adjusted life-years
RCT	randomized controlled trial
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals

ROI	return on investment
RUR	Russian rouble (currency)
RWJF	Robert Wood Johnson Foundation
SAPM	Sheffield Alcohol Policy Model
SDH	social determinants of health
SDR	standardized death rate
SEG	socioeconomic group
SEK	Swedish krona (currency)
SES	socioeconomic status
TSCA	Toxic Substances Control Act
TTCs	transnational tobacco companies
UKK	Urho Kaleka Kekkonen walking test
UN	United Nations
UNEP	United Nations Environment Programme
WIC	Women, Infants and Children [Fruit and Vegetable Voucher Campaign]
WEMWBS	Warwick–Edinburgh Mental Well-being Scale
WHO	World Health Organization
WTO	World Trade Organisation
VAS	visual analogue scale
VAT	valued-added tax
YLL	years of life lost
YLD	years lived with disability