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chapter fifteen

The economics of health promotion and disease prevention: the way forward

Sherry Merkur, David McDaid and Franco Sassi

At a time when public resources continue to be constrained, the role of economic evaluation in health promotion and disease prevention is an important consideration for policymakers to ensure that they are spending public money wisely. Helping people to achieve healthier lifestyles through effective policy action is imperative, particularly when markets fail. Market inefficiencies in these areas include, but are not limited to, externalities (when one's health-related behaviours entail costs that are borne by others), and information challenges (when sound reliable information is limited or inaccessible). These inefficiencies mean that we cannot leave health promotion to markets alone.

Other research has shed light on behavioural failures which can be important in understanding people's decision-making capabilities, the effects of influence, and inconsistencies in their preferences overtime. However, directly working to correct these types of failures may interfere with individual choice and be less acceptable to the public (see Chapter 1). Despite this, government intervention may be justified when health-related behaviours are addictive or habit-forming, and interventions may help to improve health and prevent disease.

This concluding chapter seeks to synthesize the evidence to make the economic case for investing upstream – that is, prior to the onset of noncommunicable diseases, and before health care services are required. It summarizes some of the most efficient health promotion and disease prevention policies for each of the major risk factors, discusses gaps in the evidence, highlights assumptions and potential limitations of the study, and presents trends in the use of cost-effective interventions. Finally, it looks at the economics of health promotion and disease prevention in the future, and proposes an agenda for future research.

Summary of the evidence

This book has brought to light actions that can be supported by sound economic analyses to limit the risks produced by tobacco smoking, alcohol consumption, unhealthy diet, childhood exposure to environmental hazards and road-related injuries, and to promote physical activity and mental health. It has gone further to look at some of the social determinants of health by discussing the benefits of improved early childhood development and education. It also discussed the impact of these prevention programmes on health inequalities, the challenges of policy implementation, and the importance of intersectoral actions. The main messages of each chapter are captured in the evidence statements presented in the tables in the Policy Summary document online (Merkur et al. 2013: 48–72). Below, we have summarized some of the most important findings of the study by looking at important interventions and policy actions aimed at combating the major risk factors.

In the topic areas presented below, which focus on health-promoting interventions, it is necessary to recognize that we are not usually talking about interventions in isolation, but packages of actions – this can be seen most clearly in the smoking, alcohol, diet, and physical activity chapters, but applies more generally. The marginal benefits of expanded packages of actions often would still be considered cost-effective.

Tobacco smoking

The most cost-effective single tobacco control policy has been identified as raising taxes. The most cost-effective health care intervention to tackle smoking includes brief opportunistic advice from a general practitioner, along with telephone or self-help material. Pregnant women provide a particularly important group where low-cost smoking cessation interventions would be cost saving. An effective area towards raising awareness and changing attitudes, particularly in emerging economies, is the use of mass media campaigns, but these are often neglected. Other actions, such as labelling, smoking restrictions in public places and full advertising bans, often generate savings in health care expenditures which offset implementation costs. Importantly, the most effective means of reducing youth smoking is to reduce adult smoking via the mechanism of price increases, smoke-free policies, and of good, well-directed multimedia programmes.

Alcohol

Economic efficiency can be improved in the alcohol market when the negative externalities due to alcohol consumption can be reduced and where the socially optimum level of alcohol is sold and consumed in society. The three most cost-effective alcohol policies for reducing alcohol-related harm, and ones which correct some of alcohol's market failures, are price increases, restrictions on availability, and bans on advertising. Impediments to implementing effective

policy in this area include failure to regulate the alcohol industry and to engage it in reducing harm in any meaningful way.

Physical inactivity

There is a strong economic case for investing in the promotion of physical activity. This is a leading contributor to good health, but more than one-third of Europeans are not sufficiently active. Mass media campaigns have been shown to have a positive, moderate effect on the increase of physical activity in targeted populations with a good cost-effectiveness ratio, and could even be cost saving. Brief primary care interventions to encourage physical activity, despite the higher cost, have been shown to be cost-effective. Some school-based interventions, particularly those that combine actions on physical activity and diet, seem to be more efficient than interventions on a single domain. Community-based interventions focussing on walking in particular (using pedometers) have been shown to be effective as well as cost-effective in the short term.

Unhealthy diets

When looking at policy actions to address unhealthy diets, taxes on foods high in salt, sugar, fat, and on junk food, are consistently cost saving and have a favourable health impact at the population level; both effectiveness and distributional impact of taxes appear to be enhanced by coupling them with subsidies targeting healthy foods or disadvantaged consumers. When designing interventions, one must be mindful of the challenge of product substitution when tax is used as an instrument, as consumers may switch to products that are also not healthy (as discussed later on). Policies aimed at the market environment for food choices, including making fruit and vegetables more available in schools, were found to have positive though modest effects on dietary intake and were cost-effective. Product reformulation policies (i.e. reducing salt in processed foods) were found to be cost saving or cost-effective, but the economic evidence on other efforts (e.g. to reduce trans-fat content) is very limited. The economic evidence on information campaigns is mixed, though food labelling schemes (especially mandatory ones) were found to perform better in terms of cost-effectiveness.

Environmental hazards for children

Because children are uniquely vulnerable to many common exposures in the environment, tackling environmental pollutants can help to protect children's health. Abating mercury emissions by burning less or cleaner coal at power plants, or by capturing mercury during combustion, can reduce mercury hazards where the forecast health benefit is four times the cost. Similarly, lead decontamination in homes provides benefits in terms of avoided cost of illness. Positive health impacts have also been shown from reducing outdoor air pollution

from, for example, ozone and fine particulate matter, with efforts including congestion-charging schemes. In line with the objectives of the European Commission's REACH (Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals) legislation, lots of damage can be avoided by shifting the burden of proof towards those proposing the introduction of a new, poorly understood chemical, and away from those analysing the negative health impacts of chemicals.

Road-related injuries

Cost-effective road safety policies have the potential to reduce injuries and deaths caused by road traffic accidents. Many interventions in this area are not only cost-effective, but likely to be cost saving from a societal perspective. These include road environmental modifications (i.e. traffic-calming measures, speed limit zones), police/technological enforcement of traffic regulations, investment in vehicle safety features and special targeted actions for high-risk drivers. This is also an area where there is substantial information available on the impact of legislative interventions. Furthermore, there is scope to work with industry to enhance safety standards of vehicles, and technological changes can be phased in over time.

Mental health

In an effort to protect mental health and prevent depression, there are cost-effective actions that are relatively simple, feasible and potentially scalable, across the life course and in different settings. For younger children at risk of developing conduct disorders, interventions targeting parents, parents and children – as well as those including parents – child-based training and teacher training, can be cost-effective, particularly when taking account of the well-document lifetime adverse impacts of poor mental health developing in childhood. Interventions to prevent depression in at-risk adolescents through after-school screening, and subsequent psychological intervention, would be cost-effective. New mothers at risk of post-natal depression (as identified by health visitors), coupled with subsequent therapy, appears cost-effective. Workplace interventions that can prevent depression and anxiety can be cost saving from a business perspective for white-collar employment; this area provides another example of the importance of working outside the governmental sector to promote health. There are potentially cost-effective actions for older people, from regular participation in group-based activities to tackle risks, to mental health and well-being that arise from isolation and loneliness, and stepped care approaches for older people at risk of depression (as identified in the primary care setting). Depression prevention in adults, which can be made accessible through self-help formats, that in some cases can be delivered through new technologies, reaching hard-to-reach populations such as young men, is potentially cost-effective, and may be cost saving when accounting for productivity losses averted.

Social determinants

When working to improve the social determinants of health, the economic returns from investing in early childhood development intervention programmes are larger when the programmes follow a more targeted approach (e.g. high-risk or disadvantaged populations), involve children as participants, focus on enhancing parenting efficacy, and have better trained staff. But both targeted and universally delivered early childhood development interventions can demonstrate good value for money, despite the likelihood of underestimation of benefits due to the omission of health benefits in many cost-benefit calculations. The economic evidence for the financial returns from investments in education is well-established, and the added value of the health benefits of education further strengthens the overall case. The economic case for investing in early years interventions has been strengthened by evidence from numerous birth cohort studies that there are long-term consequences of adverse health in childhood – not just poor health, but poor educational outcomes, employment and career prospects, difficulties in personal relationships, and more risk of contact with criminal justice systems. This is an example of how long-term monitoring systems can help inform the evidence base for health promotion and disease prevention.

Measurement considerations

There are some key considerations for policymakers and others when considering and interpreting the evidence provided by economic evaluations in health promotion and disease prevention. First, to account for the way that intervention outcomes are measured – in natural units, utilities or monetary values, depending on the type of economic evaluation technique used. Utility measures like quality-adjusted life-years (QALYs) and disability-adjusted life-years (DALYs) are the most commonly used generic outcome measures.

There are also challenges in the way in which evidence of effectiveness can be determined. For many complex interventions it may be difficult to conduct randomized controlled trials, and other forms of study design have to be used. They may have greater risks of bias in their internal validity, but may be more helpful in terms of external validity, especially where issues such as cultural sensitivity and appropriateness are considered – the cost-effectiveness of interventions for health promotion and disease prevention will often be heavily influenced by rates of uptake and continued participation. Modelling studies, which synthesize costs and benefits from a number of studies, are also widely used. They can be helpful in assessing the potential long-term economic benefits of investment, and can also be adjusted to take account of uncertainty – for instance, in respect of levels of effectiveness and uptake rates. These types of studies can also be used to model the long time horizons by using intermediate outcomes, e.g. stopping smoking or changing a risky behaviour. Taking a long-term perspective is necessary in many cases because, with interventions, the largest health gain is to be expected when a healthy lifestyle is adapted early on (possibly in childhood) and maintained throughout adulthood.

Moreover, it is useful to consider differences in the cost-effectiveness and equity implications of interventions between several population subgroups, because public health interventions have a high potential to reduce socioeconomic health inequalities, but can in some circumstances widen health inequalities depending on which population groups actually make use of an intervention.

Specific gaps in the evidence

The evidence presented in this book has relied on published articles and larger studies; where systematic reviews have been undertaken on a policy or intervention, these have been presented. Gaps in the evidence remain, and the evidence on many interventions is equivocal.

This book has focused on interventions for the prevention of chronic noncommunicable diseases (NCDs), and certain types of injuries. Less attention has been devoted to prevention efforts within the health care system, such as screening programmes or pharmacological prevention, and this book has not covered the prevention of infectious diseases. There are systematic reviews of evidence and studies on the cost-effectiveness of screening procedures, vaccinations and other interventions available from the National Institute of Health and Care Excellence and the Centers for Disease Control and Prevention.

There is also potential for using behavioural science to design interventions that could be more acceptable to users and/or may steer them to make a choice to engage in health promoting behaviour. There is emerging evidence on the potential of 'nudging' interventions, although this area is still in its infancy. Hollands et al. (2013) argue that the limitations of the evidence base for altering environments to induce behavioural change – so-called choice architecture – goes beyond a lack of evidence to an absence of definitions and concepts of what this actually means to public health interventions. The Behavioural Insights Team in England, which has worked on applying behavioural science principles to government policy, has promoted a Parliamentary Select Committee review to find that 'non-regulatory measures used in isolation, including "nudges", are less likely to be effective. Effective policies often use a range of interventions.' (UK Select Committee 2011). They also cautioned that the preference of government for non-regulatory interventions has prompted officials to 'exclude consideration of regulatory measures when thinking about behaviour change' (UK Select Committee 2011).

With regards to gaps in the evidence, in the literature on alcohol there remains insufficient evidence on the effectiveness of school-based interventions and mass media campaigns. There is a gap in the physical activity literature around community-based interventions with regards to walking. Future research could study the potential cost-effectiveness around walking groups and remote mediated interventions. Also, for children, mixed evidence remains on the cost-effectiveness of walking buses. Another area where the cost-effectiveness evidence is inconsistent is related to road traffic accidents, specifically national compulsory bicycle helmet laws. More studies could be undertaken in this area, as from a public sector perspective (where the private cost of

purchasing helmets is omitted) the measure is likely to be highly cost-effective. Nevertheless, when considering cycling from a physical activity perspective, there is good evidence that a comprehensive set of infrastructures can lead to increases in cycling in a population.

Crucial gaps are also still present in the cost-effectiveness of potential policy options for combating unhealthy diets. Future research in this area could aim to examine the architecture of food choices and restricting junk food in schools. Effectiveness evidence needs to be gathered on supply-side changes triggered by government regulation and policies, as well as on agricultural and food-chain incentives. Another important area for research could examine the broader effects of interventions on people's overall preferences and dietary habits, rather than specific foods or nutrients.

Serious gaps remain in the children's environmental-health literature. Towards reducing outdoor air pollution, schemes for low-emission zone requirements need to be assessed for potential health and economic benefits. Future research could focus on combating the large uncertainties that remain in estimating the effects of environmental health hazards and improving our understanding of the long-term health impacts of early-life exposure to chemicals. Furthermore, additional coordination of assessments of children's environmental health risks, beyond traditional chemicals risks, is necessary for advancing global policy in this area.

Future work will also need to consider the lack of evidence on social determinants and the poor evidence of equity. New technologies may offer some potential to test the evidence on effectiveness and equity. For example, work on virtual (but real) supermarkets using computer software is being used to study food choice in a randomized controlled trial in New Zealand.

There is a high concentration of evidence in a small number of countries, as seen in the evidence tables (these can be found in the Policy Summary document available online: Merkur et al. 2013: 48–72). This presents challenges when considering the appropriateness of actions in different countries or settings. For instance, there is very little evidence from most countries in the east of the European Region. This may have many causes, including capacity issues, issues of priority, publication of early work in languages that are inaccessible to researchers abroad, etc.

Study assumptions and limitations

In order to conduct rigorous economic evaluations, good evidence must be available. Some economic evaluations make up for gaps in the effectiveness evidence by making assumptions and extrapolations. The specific methodological assumptions and techniques involved in cost-effectiveness analyses can have significant implications. The main assumptions include the value of health and life, the appropriate discount rate, the selected end point, as well as taking the economic perspective rather than other ethical considerations, such as fairness and distributive justice. Even where evidence is available, it can suffer from a lack of generalizability and reliance on relatively weak investigation approaches.

One of the key challenges for effectively utilizing economic evaluation to assess public health interventions is the length of the causal chain between interventions and outcomes. Rather than wait for the long time horizon to pass between intervention and health outcome, researchers have to use intermediate outcomes or risk factors – which have a shorter time horizon – to calculate expected outcomes or long-term effects using a modelling approach. The challenges with modelling are that many assumptions have to be made, including about the long-term effects of a policy. For example, when considering a school-based intervention it is necessary to make an assumption about what percentage of children will retain in the long term the health-related information that is taught (i.e. to not smoke) or the behavioural change that is introduced (i.e. to eat more fruit and vegetables). Although some studies use intermediate outcomes, the key challenge remains to effectively map clinical disease pathways to improve the validity of modelling approaches in all relevant areas for public health intervention.

Next, it is difficult to predict what individuals will consume as substitutes, e.g. for a fat tax on soft drinks, individuals may consume another beverage that falls outside the tax, but has a comparable amount of sugar. Another example of substitution is the German alcopop tax, which simply switched consumption of spirits-based mixed beverages to beer-based mixed beverages. Since individuals make substitutions that may cause interventions to have unintended consequences, policies must be designed carefully to avoid undesirable substitution effects. Moreover, the food industry, for instance, is continuously innovating, creating new complex foods that may serve as substitutes in the future; the alcohol and tobacco industries continue to make substitution products as well, thus relevant regulations may need to increase in scope to catch these new substitutes.

There are many challenges to communicating health-promotion messages effectively. For instance, vested interests have actively worked against research findings that damage their particular interests. In Chapter 13, examples are provided for the tobacco industry, asbestos industry and others about how commercial interests can use weak but well-resourced arguments to challenge good evidence regarding health promotion. Therefore, it is important to effectively communicate the evidence to counter this – for example, by providing information using language that is accessible and easily understood by the public.

For some policy actions which have been shown to have positive economic gains, and for which there is already legislation implemented in most European countries – for example, motorcycle helmet legislation – the behaviour may continue to vary due to cultural norms. Furthermore, to combat mental health problems in the target group of new mothers, a preventative intervention for women at high risk of developing post-partum depression would require an understanding and recognition of early risk factors, along with the availability of relevant health professionals to reach this group. These examples show that, even where there is a strong case for careful investment in action, any intervention needs to be sensitive to local conditions, culture, infrastructure and resources. The importance of context in any evaluation, whether analysing effectiveness or cost-effectiveness, must not be overlooked.

In particular, when examining programmes to tackle the social determinant of health, it is difficult to compare results across interventions. This has to do with

the intensity of interventions, different ages of participants in early childhood interventions, and given the large differences in costs and saving components included in the estimations. Also, when analysing early childhood development interventions from a health perspective, economic evaluations have scarcely taken account of the health benefits; thus the full return on investment may actually be higher than what is suggested by current studies.

In areas where there is a scarcity of evaluative and economic evidence generated in low- and middle-income countries (for example on road safety), this raises challenges in the potential transferability of cost-effective interventions across the European region. There are also areas where the majority of evidence comes from other regions. For example, there is a strong American bias on the evaluation of early childhood development interventions, as well as a scarcity of European evidence on the long-term effects of these programmes. Furthermore, more evidence is needed on cost-effective interventions in low- and middle-income countries.

Even when the above obstacles are understood and potentially overcome, simply identifying that there is an economic case for action, or even to identify cost-effective interventions, is just the start. The implementation of actions faces many challenges. Cross-sectoral working is vital, as many of the costs – as well as some benefits – fall outside the health sector and under the responsibility of other government ministers, i.e. education, environment, finance, transport and even agriculture. In areas where effective policies will need to combine a range of actions at different levels, e.g. in tackling tobacco smoking, alcohol consumption or improving road safety, there remains a need to further develop methods to estimate the effectiveness and cost-effectiveness of different packages of interventions that could be included in a national policy involving other government ministries beyond the health minister.

Trends in cost-effective interventions

Most countries are putting efforts into improving health education and information. However, the evidence in this book has suggested that these measures alone are not sufficient, nor are they always cost-effective. More stringent measures, such as regulation of advertising or fiscal measures, are more intrusive on individual choices and more likely to generate conflict among relevant stakeholders, but are also likely to weigh less on public finances and to produce health returns more promptly.

Fiscal measures, such as taxation, are effective for increasing the prices of tobacco and alcohol towards reducing consumption. Advertising bans are also effective at reducing consumption levels, but these must be full bans. Nevertheless, fiscal measures are complex to design and enforce; their impact may be unpredictable; and they can bear more heavily on low-income groups than on those with higher incomes. Despite this latter point though, it can be argued that the low-income groups stand to gain the most from these interventions in terms of increased health outcomes. For example, food taxes are likely to be regressive, although the less well off also benefit disproportionately from their effects.

Having different government ministries working together with the ministry of health is an important consideration, as many of the interventions discussed in the book are often delivered outside the health care system, using resources from different areas of government spending. Although there may be discussion in various levels of government on the importance of health in all policies, there may be little in the way of institutional structures and communication mechanisms to encourage action. Chapter 14 provides a long list of barriers to the cross-sectoral implementation of health-promotion measures. However, some methods have been proposed to promote intersectoral work, including presenting the economic benefits to non-health sectors of investing in health-promoting interventions; tearing down silos between budgets, with different forms of shared financing on either a voluntary or mandatory basis; and bringing budgets together can help embed health impacts in all policies. These methods require trust, and approaches need to be tailored to account for different political climates and cultures, infrastructure and resources.

The economics of health promotion in the future

The ideas and evidence explored in this book provide a valuable starting point for action, but also bring forward a research agenda for the future. Ongoing work in the areas already discussed will allow policymakers to consider a broader range of actions in the future. By undertaking research in the areas listed below, decision-makers will gain greater insights and better knowledge for the full range of outcomes those interventions may produce.

Areas for future work in the various areas include:

- Creating consistent monitoring systems of epidemiological data will help to understand differences in disease burden between countries.
- Monitoring different policy efforts in risk factor areas between countries could help researchers explain some of the differences in lifestyle factors.
- Undertaking research into national policies which include the important elements of multiple, coherent, long-lasting and large-scale strategies.
- Bettering our understanding of how to facilitate closer cooperation between all the relevant actors in different government ministries.
- Improving methods of engagement and voluntary participation by industry towards health-promoting efforts particularly related to tobacco, alcohol and food.
- For mental health, collecting evidence on different workplace settings – for example, where staff turnover is high and skill requirements low – would help strengthen the case for companies to invest. Also, improving our understanding of the links between mental and physical health to make a more holistic argument for prevention.
- Expanding research on early childhood development to other parts of the European Region. Previously, much of the evidence had come from the United States, but there are now many European studies underway to assess a variety of interventions in a European context, especially in the United Kingdom, the Netherlands and the Nordic countries.

- Understanding the long-term benefits of better psychological well-being, and understanding whether better well-being is actually going to be a protective factor for health at a future point in time.

Reducing the risk of chronic diseases and injury through interventions aimed at modifying lifestyle risk factors is possible and cost-effective, and potentially could reduce health inequalities within countries. However, turning the tide of chronic health problems that have assumed epidemic proportions during the course of the twentieth century requires fundamental changes in the social norms that regulate individual and collective behaviours. Such changes can only be triggered by wide-ranging prevention strategies addressing multiple determinants of health across social groups. The challenge now is to look at ways in which the evidence may be used to translate evidence-based knowledge into routine everyday practice across all of the WHO European Region.

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