

THE DETERMINANTS OF HEALTH AND THE EFFECTIVENESS OF HEALTH POLICIES

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In the mid-1970s, the Lalonde Report (Lalonde, 1974) identified four groups he called “Determinants of Health” (lifestyles, human biology, environment, and healthcare system). Two years later, Dever (1976) quantified the potential contribution to the reduction of mortality in each of these four groups, at 43%, 27%, 19%, and 11% respectively, and pointed out the disproportion between the low marginal productivity of healthcare aimed at improving health and the expenditure actually allocated to that care. Health standards are determined by the conditions in which people are born, grow and age; and in turn, these conditions are directly related to behavioural, socio-economic, environmental, and other factors, including the organisation of healthcare services and policy decisions. Much of health policy is still focused on healthcare, while non-clinical prevention, health promotion and interventions on the social environment - the “causes of the causes” are overlooked. Although health is individual, we speak of population health to refer to the prevalence or incidence of a particular disease in a community. In addition to individual interventions to maintain or restore health — surgical treatments, for example— community interventions and policies targeting certain groups of the population should also be considered. The likelihood of a person becoming chronically ill can be reduced with changes in policies and dynamic initiatives not only in the field of health, but also in other sectors.

Non-communicable diseases (NCDs) are the leading cause of death worldwide (WHO, 2013)¹. The four major types of NCD — cardiovascular disease, cancer, chronic respiratory disease, and diabetes— cause three out of five deaths worldwide. Many of these diseases could be prevented by changing the way we live, as they are associated with modifiable and preventable risk factors such as smoking, alcohol consumption, consumption of other drugs, an inadequate diet (e.g., overeating, red meat and processed meat, sugary drinks, etc.) and sedentary lifestyle or low physical activity.

It is interesting to establish and quantify the cause-effect relationships between risk factors and health/disease to help subsequently define health policies that would act efficiently on these causes. The cost of the disease, or *disease burden*, is a starting point from which to determine the scope of the problem, or the size of the effect. However, as we shall see, this alone is insufficient.

The following sections define the conceptual framework of attributable risk factors and the need to estimate the avoidable cost of the disease (section 2), proposing a typology of poli-

1 WHO Global NCD Action Plan 2013-2020. Geneva, 2013.
http://www.who.int/nmh/events/ncd_action_plan/en/.

es according to their intersectorality and objectives (section 3), while presenting the methods for evaluating policies (section 4) and the empirical evidence resulting from their application (section 5). Finally, section 6 concludes the article.

Conceptual framework: the causes of the causes and the attributable risk factors

The classical conceptual model of determinants of health by Dahlgren and Whitehead (1991) describes the strata of influence on health using a social and ecological model (Figure 1). People are at the core of the figure, and have unchangeable characteristics (age, sex or genetic makeup). Surrounding this core are the potentially modifiable factors that influence health, starting with the (so-called) “lifestyles”. This is an unfortunate name because it seems to assign individual responsibility to the person about their health, when this is actually a consequence of social determinants and conditions. Social and community networks (more external) can support community members. Other structural factors such as housing, working conditions or access to essential services (housing, education, health, etc.) envelop the above. Finally, there is a broader group of characteristics related to the cultural, socio-economic and environmental conditions of the surroundings.

The conceptual framework proposed by the Marmot Report (2013), commissioned by the WHO, goes deeper into these “causes of causes” or social determinants of health. The inter-

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relationships of these determinants with each other and with health are extremely intricate, so it is very difficult to isolate the effects of each of the factors. The model of social determinants implies that, since many of the factors influencing health are beyond people's control, it is not right to blame them. It also implies that improving health (and reducing inequalities) requires the design of global strategies, which are not specifically focused on the healthcare system. The key is to implement Health in All Policies (HiAP).

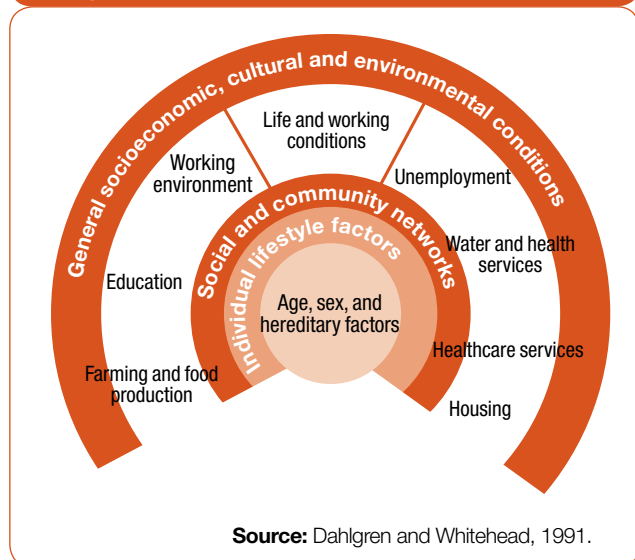
The Institute for Health Metrics and Evaluation (IHME) maintains the Global Burden of Disease² project, which uses a homogeneous methodology to estimate the burden of the disease and its temporal evolution, in terms of mortality and disability-adjusted life years (DALY), for every country in the world. This macro project regularly publishes its data and results in the *Lancet* Journal.

Spain has good health indicators compared to other European countries (European Commission, 2019). We outperform the EU-28 in life expectancy at birth and at age 65, and we have better standardised and preventable mortality rates. The health system as a whole is very efficient, because these favourable health outcomes are achieved with reasonable healthcare spending. Most of the chronic diseases that Spaniards suffer from have attributable causes, many of which correspond to behavioural (smoking, alcohol and diet) and metabolic risks. Behavioural risk factors cause more than a third of deaths in Spain (in 2017, according to the IHME, 16% of deaths were attributed to smoking; 12% to diet; 8% to alcohol; and 2% to sedentary lifestyle). The key to public policies is, therefore, how to reduce attributable risks using health policies, which will not only or always be healthcare policies.

Figure 2 represents mortality per cause in Spain in 2017. The size

² <http://www.healthdata.org/gbd>.

Figure 1. Determinants of health model by Dahlgren and Whitehead



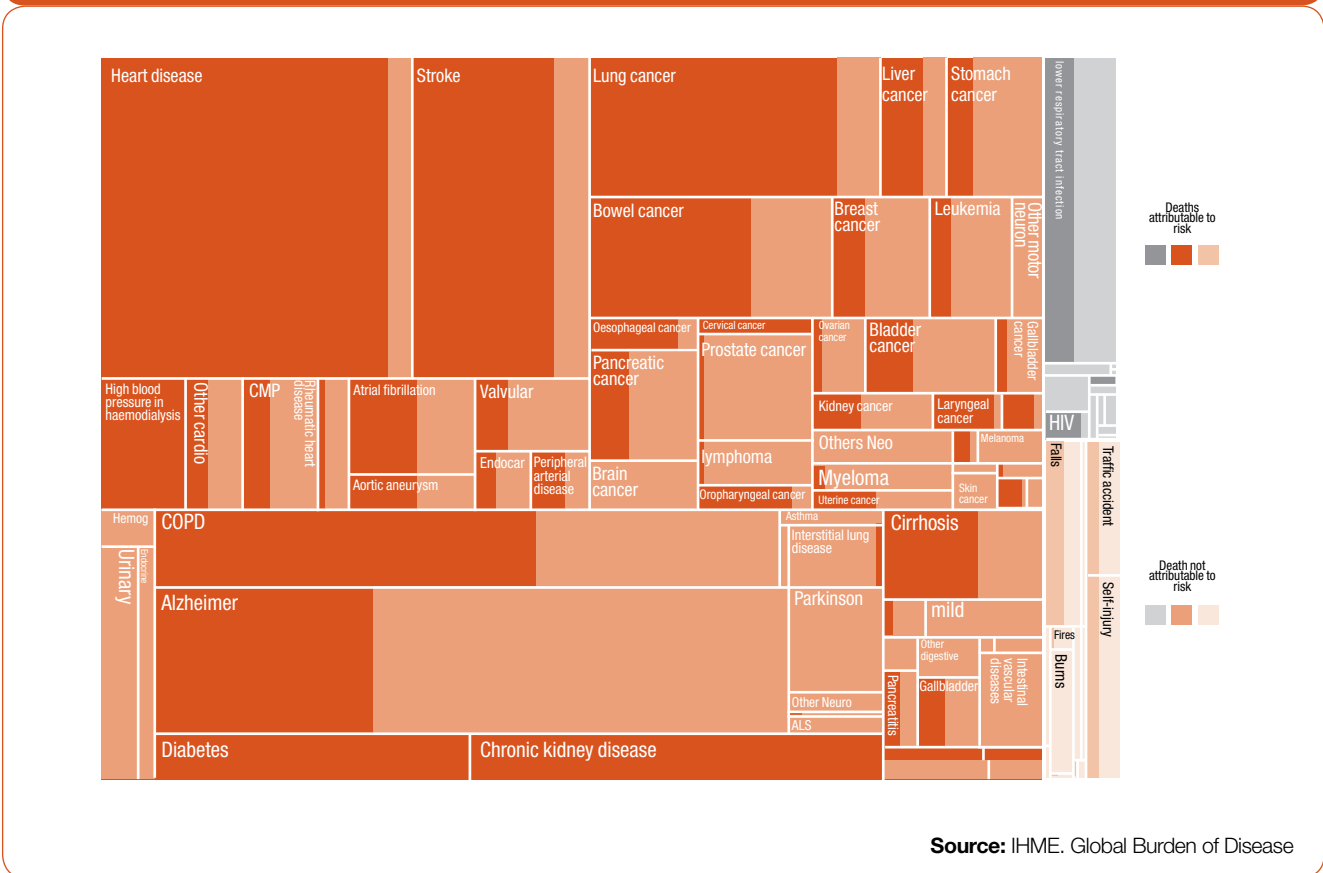
of the rectangles is proportional to the mortality rate. NCDs are illustrated in dark orange; infectious diseases in grey, while those attributable to external causes are light orange. The darkest part represents mortality that can be attributed to known causes or risks. Some of these can be treated (they are modifiable), others cannot (for example, genetics). It is useful to establish the total cost of the disease in order to calculate the importance of the problem and advocate for health. But the most relevant factor is establishing the avoidable cost of the disease, and especially how it can be avoided through effective public policies.

Let us imagine for a moment the perfect world in which there is no poverty, no environmental or employment problems, the whole population does the recommended amount of physical exercise and keeps to a Mediterranean diet, no one smokes, no one drinks excessive alcohol... Even so, there would still be diseases, because, after all, they are a sign of success in the fight against infections, and because the body still wears out and

something has to die. The question is, in this ideal and orthorexic world, what would the cost of disease be? Because the interesting part is knowing, not so much the cost of the disease, but the cost attributable to risk factors that are, in principle, within the control of individuals and governments, and are modifiable.

Individual risk factors —smoking, low physical activity, and diet— are largely responsible for most of the non-communicable burden of disease. One study (González López-Valcárcel et al., 2017), estimates the social cost of potentially preventable (chronic) diseases in Spain, specifically type 2 diabetes, ischemic heart disease and bone fractures due to osteoporosis. Prevention in this case would be to eliminate smoking, alcohol and a sedentary lifestyle from the equation, and optimise diet. The conclusion is that these three diseases cost us about €26 billion a year (3.15% of GDP), 62% of which are preventable with changes in behavioural risk factors, including sedentary lifestyle (€5,153 million) and, above all, diet (€10,483 million).

Figure 2. Death per causes, Spain 2017 Attribution to risk factors



Typology of public health policies and the HiAP

The HiAP movement inspired European public health during the Finnish presidency in the mid-2000s, and became a new paradigm in Europe. This movement, the Health in All Policies strategy, promotes incorporating health objectives into the design and evaluation of all policies. It placed health on the political agenda and represents a major step forward in health advocacy. But it requires a consistent and robust *health impact assessment methodology*, beyond traditional economic assessments, which are not designed to assess multi-sector and community strategies.

Health would therefore become a meeting point in urban, healthcare, environmental, labour, housing, policies etc. implemented by health departments or other government offices, and may or may not have budgets allocated to them. However, these policies are aimed at multiple objectives and can have unintended side effects on health. In Table 1 we have illustrated the typology of policies according to the department that leads or executes them, and according to their objectives (only health, or health and other social welfare objectives). In order to make decisions in this complex framework of policy possibilities, they need to be evaluated (see section 4 below), without losing sight of the fact that policies aimed at problems affecting large populations require multifactorial solutions and will be better achieved with community interventions than individual approaches.

The table shows examples of health improvements as effective means to improve education. According to one of the most renowned experiments in development economics, conducted in 75 primary schools in Kenya with more than 30,000 students³, deworming school children increased their participation by at least 7%, and reduced school absenteeism by 25%, at very low cost: the additional cost per year of active schooling is just \$3.27. Implementing health education or hiring more teachers would not have been able to achieve a similar impact.

Other very representative examples of the effectiveness of intersectoral or other sectoral policies on health are those carried out by the General Traffic Directorate (the driving licence points based system, among others), which significantly reduced mortality in traffic accidents. Many health promotion policies

3 <http://www.povertyactionlab.org/evaluation/primary-school-deworming-kenya>.

“Healthy and natural foods that improve the diet are one of the success factors of sustainable agriculture and fishing, which preserve the environment and enable the regeneration of resources.”

are developed from outside the healthcare system, or even if they are led by the health system, require the participation of other departments. A paradigmatic case is taxes on tobacco, alcohol, or unhealthy foods. From the point of view of the Treasury, they are sources of income. From a Department of Health perspective, they are instruments of health policies, and the lower the amount, the more effective. That is why the Departments of Health should take the lead, seeking alliances with other government departments and even with private organisations. The economic interests of those sectors with great economic power and media resources can frustrate regulatory initiatives, and in Spain, there are examples of success (smoking) and failures (alcohol) from which we can learn (Hernández-Aguado and Chilet-Rosell, 2018; Villalbí et al., 2008). We can also learn from experiences of initiatives implemented by other departments that achieve health impacts, even if it is not their main goal. An example of this is the *From Farm to Fork* movements, led by the Department of Agriculture⁴. Healthy eating is promoted as being green, because the concept of organic is integrated into collective culture and reaches people better. Healthy and natural foods that improve the diet are one of the success factors of sustainable agriculture and fishing, which preserve the environment and enable the regeneration of natural resources⁵.

A guide for public policy: beyond the principle of cost-effectiveness and budgetary impact

It is much easier, and more common, to evaluate, from an economic standpoint, pharmacological treatments than prevention programmes. It is much easier to evaluate individual than community interventions.

4 <https://cafarmtofork.cdffa.ca.gov>.

5 <https://ec.europa.eu/eurostat/documents/3217494/5723961/KS-BU-10-001-EN.PDF/c028cee1-62bd-43db-8e87-a33f032e5cb4>.

Table 1. Policies with an impact on health per department responsible and main aim. Some examples

Aims →	Health	Other social aims
Department responsible ↓		
Health	<ul style="list-style-type: none"> • Healthcare • Clinical prevention 	<ul style="list-style-type: none"> • Family planning • Deworming school children (Kenia)
Other departments	<ul style="list-style-type: none"> • Health promotion • Points based driving licence • Hygiene and safety at work • Water chlorination 	<ul style="list-style-type: none"> • <i>Sin taxes</i> (taxes on tobacco, alcohol, and sugary drinks) • Urban planning • Employment policies • Environmental policies and action against global warming • School lunches • Sustainable agriculture and fishing <i>From farm to fork</i> • Consumer protection • Historical milestones: the right to vote, equality, democracy that ended famines... • Basic sanitation, with drains • Active employment policies • Promotion of equal opportunities, particularly in education

Cost-effectiveness has become the socially agreed principle for prioritising, and making decisions regarding, resource allocation in society, and the same is true of Spain. This is not only a principle of efficiency, it is also a principle of equity, and a moral criterion because there is an opportunity cost for resources earmarked for a purpose, which, however legitimate, is lost for other purposes.

Cost-effectiveness, always based on groups (never individual patients), is behind the new paradigm of value-based health-care systems. The EU has appointed a panel of experts on the subject⁶. Furthermore, the cost-effectiveness of health promotion and disease prevention interventions to reduce chronicity is important, but the opportunity -the budgetary impact- is equally important.

6 https://ec.europa.eu/health/expert_panel/sites/expertpanel/files/024_valuebasedhealthcare_en.pdf.

Assessing the cost-effectiveness of prevention is difficult in terms of specific methodological aspects as well as incentives. Regarding the former, the possibilities for experimentation are limited: clinical trials cannot usually be performed; the consequences or effects will only be perceived in the long term; they generally respond to multiple causes and have multiple effects, and many studies fail in their external validity, because the effectiveness of the interventions being evaluated depends on cultural elements, the socioeconomic context and the local conditions. In terms of incentive issues, these tend to arise because there is usually no funding available due to the lack of interest in the results (which cannot be sold under patent). Additionally, these studies have high associated costs, especially if they involve social experiments.

However, while it is important to determine the cost of the chronicity that could be avoided with behavioural and policy changes, it is equally important to determine who finances it or who bears these costs, because for some diseases more than others, a large part of the costs are invisible, as they are off the market radar. These are costs covered by families. The costs of informal care. Thus, while only 17% of the €6,997 million that cardiovascular diseases cost to society in Spain correspond to informal care off the market radar⁷, these treatments represent 68% of the €14,557 million that dementia costs⁸.

Cost-effectiveness analyses of public interventions to reduce attributable risks (primary or secondary prevention) and to combat health problems are a necessary, but not sufficient, condition for the evaluation of public interventions. Other methods, in the process of consolidation and standardisation, are health impact assessment and studies in the social return on investment.

Health Impact Assessment (HIA) is defined by the WHO (1999) as: "A combination of procedures, methods and tools used to evaluate the potential health effects of a policy, programme or project and their distribution in the population." In Spain, this has been applied to design and evaluate some urban transformation projects, such as the Urreramendi-Betolaza Integral

7 Leal, J.; Luengo-Fernández, R.; Gray, A.; Petersen, S.; Rayner, M. (2006). "Economic burden of cardiovascular diseases in the enlarged European Union". *European Heart Journal*, 27 (13), 1610-1619.

8 Luengo-Fernández, R.; Leal, J.; Gray, A. M. (2011). "Cost of dementia in the pre-enlargement countries of the European Union". *Journal of Alzheimer's Disease*, 27 (1), 187-196.

Reform Project (PRI) and the Circumvallation (UBC)⁹, and the urban development plan for Vitoria. With a more qualitative than quantitative content, one of the strengths of this type of exercise is the exercise itself, since it makes the various players involved, the departments and organisations, sit down at the same table to talk, including those from the Department of Health. Another notable example of multisectoral health strategies that use the Health Impact Assessment is the PINSAP (Interdepartmental and Intersectoral Public Health Plan), currently reporting the period 2017-2020¹⁰. This is a version of traditional health plans, adapted to the HiAP strategy. The two fundamental cornerstones of the PINSAP are to increase the number of years in good health of the population of Catalonia (to promote a healthier Catalonia), and to incorporate health in the design and the evaluation of public policies (health impact evaluation).

The analysis of the Social Return on Investment (SROI) is becoming a standardised method for evaluating interventions in which various groups of stakeholders define different types of objectives, among which health is included. Its widespread use over the last decade stems from the UK government's efforts to improve accountability for social, economic and environmental benefits in a broad sense, within third sector organisations. The Public Services (Social Value) Act 2012, which came into force in 2013, requires public authorities to consider these types of impacts on welfare in Government contracts. The World Health Organisation's (WHO) European Office accepts the SROI as a criterion for decision-making in public health with the best available evidence, which it collects through the Health Evidence Network for investment in health and welfare. Although most empirical studies on SROI that consider health impacts are external (i.e. they are conducted outside the healthcare sector, which is considered just another aspect, but does not lead it), there are some specific studies for the Department of Health (González López-Valcárcel, 2019).

9 http://www.osakidetza.euskadi.net/r85-publ01/es/contenidos/informacion/publicaciones_informes_estudio/es_pub/adjuntos/EIS_PRI.pdf.

10 http://salutpublica.gencat.cat/web/.content/minisite/aspcat/sobre_lagencia/pinsap/continguts_antics/pinsap-cast.pdf i http://salutpublica.gencat.cat/ca/sobre_lagencia/Plans-estrategics/pinsap/.

Evidence on the effectiveness and cost-effectiveness of public health policies

Several international studies on the cost-effectiveness of preventive activities¹¹ agree that:

- Cost-saving interventions (i.e. with a positive benefit-risk ratio) are usually outside the healthcare sector. These include “sin taxes” (on smoking, alcohol and unhealthy foods) and bans (advertising at certain hours, smoking in public places, etc.) and other coercive regulations, such as limiting the amount of salt in certain foods (bread, cereals, margarine, etc.).
- Pharmacological treatments are among the clinical prevention measures with a good cost-effectiveness ratio to reduce the absolute risk of certain conditions in different subgroups of the population (statins, for example).
- Most vaccines included in the vaccination schedule are cost-effective in the long term.
- Municipal actions to cut off traffic on Sundays through the city's main thoroughfares for leisure, walking and exercise are very cost-effective, with benefit-cost ratios of up to 4: 1. More generally, the design of healthy cities is cost-effective in terms of health.
- Environmental interventions are usually much more cost-effective than individual clinical interventions (Chokshi and Farley, 2012).

An extensively studied case is that of smoking. There is clear evidence that policies and programmes aimed at reducing the demand for smoking products are highly cost-effective. Increasing taxes on the price of tobacco, banning the tobacco industry's marketing and advertising activities, the use of graphic labels with health warnings, and implementing smoke-free policies are very inexpensive interventions, while they obtain very good results. In the medium and long term, these interventions are successful in reducing cardiovascular and respiratory and lung cancer morbidity and mortality.

11 This section is a synthesis by Oliva et al. (2018). Health Economics. Editorial Piràmide, section 14.4.2 Health Economics. Editorial Piràmide, section 14.4.2.

Conclusion

The scientific community goes to great lengths to calculate the burden of disease or the cost of disease. Aside from science, it seeks, in terms of health advocacy, to justify spending (“investment”) in measures that can reduce the burden of disease. In this sense, it is important that advocacy and science are scrupulously differentiated. There is no standard methodology for studying the cost of the disease, however there are still crucial aspects to standardise (the top-down or bottom-up approach? Should we include the extra cost due to inefficiencies? Should we use an approach based on incidence or prevalence?). Health economics need to take on the challenge of contributing to the standardisation of these studies.

Public health systems are structured around health, and the role of non-clinical prevention and health promotion is still limited. The individual approach continues to prevail over the community approach. The Health in All Policies strategy requires the commitment of all relevant sectors and players in the generation of health. This HiAP strategy is based on the idea that health is in everyone's interests, and implies the need for a new governance model in which health sector policies are coordinated with those of other sectors, with commitments at different levels of government and agreements with the private sector. It also requires new specific methodological developments to assess the impact on health and other social goals. One of these developments is the methodology of the social return on investment (SROI), in which health ceases to be the central axis to be considered one of the other great social goals.

Some experiences, such as the road safety policy of the General Directorate of Traffic, the urban regeneration project in Bilbao or the programmes developed under the umbrella of PINSAP in Catalonia mark the way forward and are a good example of how intersectoral actions can have very beneficial effects on health. ■

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