The economic burden of overweight and obesity in Europe

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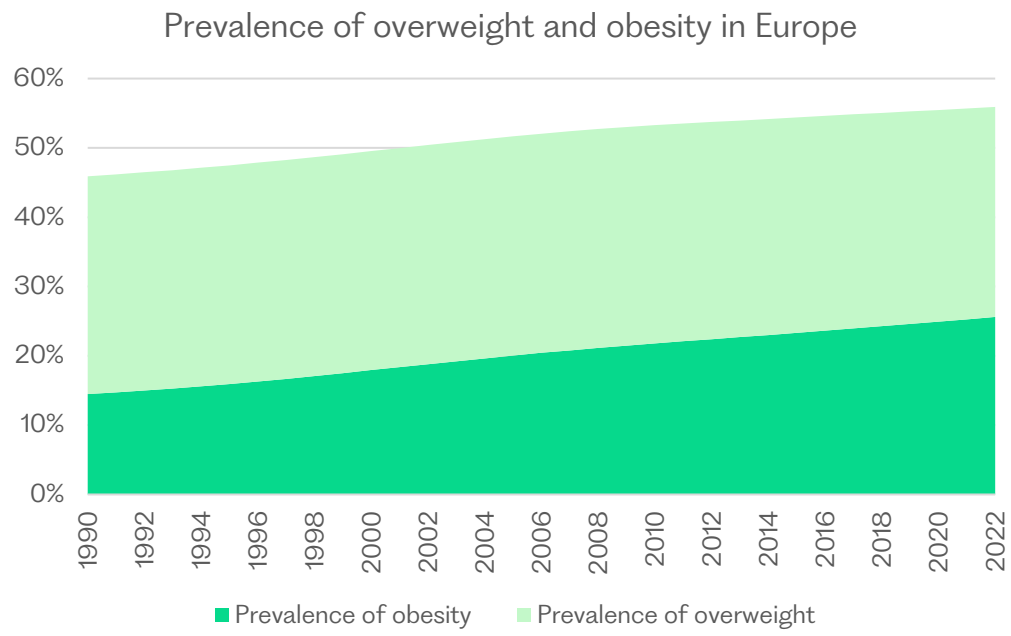
Key points

- Recognise obesity as a disease, not just a risk factor
- Address obesity-related stigma to enable effective management
- Improve access to the entire continuum of prevention and treatment
- Generate intervention evidence relevant to decision-makers
- Integrate obesity policy into the EU Safe Hearts Plan

Executive Summary

The Issue: Obesity is a chronic disease and a risk factor for serious comorbidities

Obesity is a chronic, complex, multifactorial, relapsing disease characterised by excess body fat that has detrimental health consequences (WHO, 2025a). It is estimated that half of the world's adult population (or over 2.7 billion people) will be living with overweight (defined as a body mass index, or BMI, of 25 or more) or obesity (defined as a BMI of 30 or more) by 2035 (World Obesity Federation, 2023). In Europe, the prevalence of overweight and obesity in adults has increased by 22% relative to 1990 levels, and obesity by more than 75% relative to 1990 levels:



Source: (World Health Organisation Global Health Observatory, 2024)

Obesity is an important risk factor for serious and costly diseases including diabetes mellitus type 2, cardiovascular diseases, fatty liver disease (MASH), cancers, neurological disorders, chronic respiratory diseases, osteoarthritis, and digestive disorders, with many additional specific diseases discussed in wider literature.

To understand the consequences of this increasing prevalence, we quantified the direct and indirect costs associated with persons living with elevated BMI in eight European countries (UK, Germany, France, Italy, Spain, Ireland, Greece and Romania), which represent different demographics, health systems, and economic capacities. For our estimates of direct costs, we took a disease-based approach, calculating the portion of obesity-associated disease costs attributable to obesity. For indirect costs, we calculated time and productivity losses associated with obesity using studies estimating obesity's effects on premature mortality, economic inactivity, absenteeism, presenteeism and informal care.

We find that the health and economic impacts of elevated BMI are substantial.

278,000

deaths per year attributable to elevated BMI

8 million

Almost 8 million DALYs lost each year to disability and early death

0.6 - 1.4%

of GDP annually across the 8 study country

Across our eight study countries, elevated BMI is associated with **278,000 deaths** and **almost 8 million disability-adjusted life years** (DALYs) annually.

Total annual costs (direct and indirect) of elevated BMI account for **0.6% to 1.4% of national GDP across our study countries**, demonstrating its broad impact. The total annual economic impact of elevated BMI was greatest in Germany, at €55.2 billion (€662 per capita). The UK had the greatest share of indirect costs at 58%. Economic impact as a share of GDP was greatest in the UK and Greece, at 1.4% each.

Elevated BMI is a key risk factor in other non-communicable diseases (NCDs). Our estimates of the direct costs of elevated BMI were driven primarily by its impact on NCDs like diabetes mellitus type 2, chronic kidney disease, digestive diseases and cardiovascular diseases. Cases of these diseases attributable to elevated BMI accounted for the bulk of the health and economic burdens.

Indirect (productivity) costs accounted for between 18% and 58% of the overall economic burden of elevated BMI. This includes productivity losses due to premature mortality and economic inactivity, absenteeism, presenteeism, and lost time due to caregiving. This demonstrates that the impacts of elevated BMI go well beyond the healthcare system.

Although obesity has typically been seen as a *health* issue, these results demonstrate its substantial impact on the wider economy. This highlights the need for policy makers to think beyond the health sector and prioritise obesity as an *economic priority*, not just a health priority. These findings also conclusively demonstrate that — given the strong link between elevated BMI and the risk of many NCDs — any strategy to reduce the burden of NCDs must include a strategy to address obesity.

An effective strategy to prevent and manage elevated BMI could save billions in direct and indirect costs and avoid hundreds of thousands of premature deaths each year.

Obesity is driven by a complex interaction of interdependent genetic, societal, and environmental factors. This means that, in order to be effective, a holistic and multifactorial approach will be needed, spanning policies that allow and promote healthy living, early detection and effective treatment of overweight and obesity, and intentional management of the relapsing nature of obesity, even following weight-loss.

Prevention and early detection are critical to avoiding new cases of obesity, while effective treatment and long-term management can mitigate the health and economic impacts for those currently living with obesity. However, only a small proportion of people living with obesity currently have access to effective treatments. Recent developments have expanded the range of treatment options, which include behavioural and lifestyle modification, pharmacological therapy, and metabolic and bariatric surgery (MBS).

Realising this potential also depends on how obesity is understood. Where it is treated as a lifestyle choice rather than a chronic disease, people living with obesity encounter stigma in healthcare, the workplace in everyday social settings. That stigma is harmful, but its wider cost is that it keeps the policy focus on individual responsibility — an approach that has consistently failed to reverse rising prevalence. The same framing deters people from seeking care and gives health systems little reason to invest in effective treatment and long-term management. Formal recognition of obesity as a disease, together with policies that actively confront weight-based stigma, is therefore a precondition for the strategies set out in this report to work. Our results highlight obesity's impact on the burden of NCDs, such as diabetes mellitus type 2 and cardiovascular diseases. Much of this burden can be averted by combining effective prevention, treatment, and management. This has been recognised in a number of EU strategies on other chronic diseases, such as the EU Healthier together NCD initiative**,** European Code Against Cancer, the EU Beating Cancer Plan and the EU Safe Hearts Plan (IARC, 2025; European Commission, 2021, 2026a, 2025). The EU Safe Hearts Plan identifies obesity as a major risk factor for NCDs, including diabetes mellitus type 2 and cardiovascular diseases, and can be leveraged as an opportunity to place obesity prevention and treatment at the forefront of NCD policy (European Commission, 2025).

Investments in effective obesity strategies may be held back by gaps in the evidence around the long-term effectiveness of interventions, and by the difficulty of demonstrating clear cause-and-effect between interventions and outcomes, given the complex nature of obesity and the multifaceted nature of effective obesity interventions. Decision-makers will need to account for this complexity as they evaluate different strategies.

Obesity interventions are typically evaluated from a conventional health system perspective, yet, as this report demonstrates, the impacts of obesity extend well beyond the health system and require a multi-sectoral perspective. A narrow, 'payer perspective' fails to account for the broader burden of overweight and obesity or the broader benefits of effective interventions, and risks fragmented decision-making and suboptimal investment. Reconciling these perspectives and understanding obesity as both a health and economic priority will thus be essential for integrated, effective policymaking.

What needs to be changed for obesity to be prioritised? Our report highlights a need for a fundamental shift in how obesity is understood and managed: formal recognition, prevention and treatment as a chronic disease; concerted action to reduce systemic stigma and biases; and consistent incorporation of economic impacts in intervention and policy appraisal. Enhanced evidence and cross-sector coordination will enable more coherent, scalable responses. These changes can strengthen the case for action by expanding access to care, supporting investment in effective interventions, and enabling more coordinated action across Member States.

Our recommendations

Building healthier, more resilient and more prosperous societies through improved obesity management

Recognise obesity as a disease, not just a risk factor: Obesity is a chronic, relapsing disease in its own right. Failing to recognise this hinders surveillance, funding, and health system pathways for people living with obesity. Legal and policy recognition could align obesity care with other chronic disease entitlements.

Address obesity-related stigma to enable effective management: Lack of disease recognition fuels stigma across healthcare, social, and workplace settings, thereby shifting focus onto individual behaviour rather than systemic approaches. Official recognition of obesity could help tackle weight-based stigma and promote inclusive policies.

Improve access to the entire continuum of prevention and treatment: Prevention alone has not halted rising prevalence of overweight and obesity. Integrated, lifelong care pathways that combine early detection with behavioural, pharmacological and MBS interventions are needed. As obesity is chronic and relapsing, short-term treatments without sustained holistic management will not suffice.

Generate intervention evidence relevant to decision-makers: Obesity is still largely treated as a health-sector issue, leading to underinvestment. Evidence demonstrating that interventions improve productivity, increase workforce participation, and reduce welfare costs would strengthen the case for cross-sectoral funding.

Integrate obesity policy into the EU Safe Hearts Plan: While the Plan identifies obesity as a major risk factor for cardiovascular disease and type 2 diabetes, it does not set specific targets for obesity detection and management. Embedding a strong EU commitment to obesity interventions within it would leverage the plan's aim to reduce premature mortality due to CVD by 2035, for example, through supporting implementation of a health check.

1 Background

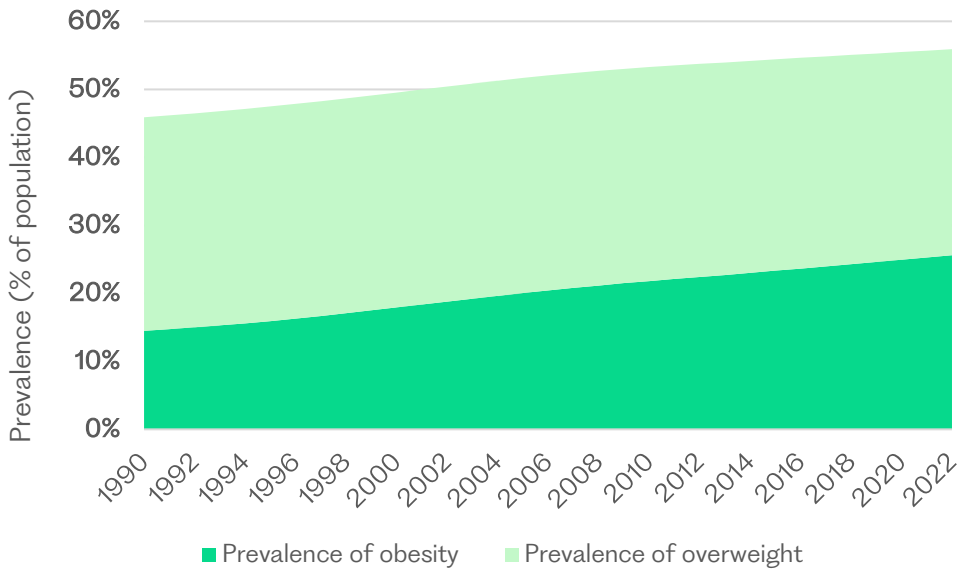
1.1 Motivation

As of 2024, 26% of adults in Europe are living with obesity, defined as a body mass index (BMI) of 30 or more, and an additional 30% are living with overweight (BMI 25-29.9) (World Health Organisation Global Health Observatory, 2024). Almost one-third of children in Europe are living with overweight or obesity, and young people with obesity are around five times more likely to continue living with obesity in adulthood compared with their peers (WHO, 2023a; Simmonds et al., 2016).

The prevalence of obesity has profound implications for population health and for national economies — now and in the future. Overweight and obesity are linked to numerous metabolic, mechanical and behavioural consequences, leading to reduced physical and mental quality of life and premature mortality (Lingvay et al., 2023; Blüher, 2025). Obesity is also associated with more than 200 comorbidities, including diabetes mellitus type 2, cardiovascular diseases, several cancers, neurological disorders, fatty liver disease (MASH), chronic respiratory diseases, osteoarthritis, and digestive disorders, with many additional diseases discussed in wider literature (Institute for Health Metrics and Evaluation, 2024; WHO, 2023e; Chandiwana et al., 2025).

Figure 1 illustrates how the prevalence of overweight and obesity in adults has increased across Europe, as measured by body-mass index (BMI). The prevalence of overweight and obesity in adults has increased by 22% relative to 1990 levels, and obesity by more than 75% relative to 1990 levels:

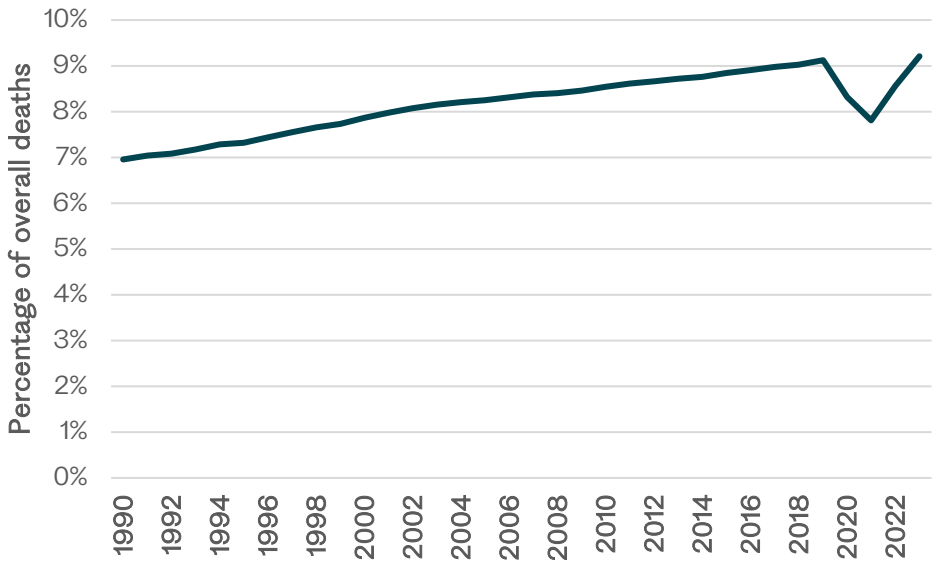
Figure 1 Prevalence of overweight and obesity in adults in Europe



Source: (World Health Organisation Global Health Observatory, 2025)

Along with prevalence, the burden attributable to elevated BMI in Europe is growing. Figure 2 shows the proportion of deaths attributable to a BMI of 25 or more — a common measure of overweight and obesity. A high BMI is responsible for an increasing share of mortality across Europe, increasing by more than 25% between 1990 and 2023.

Figure 2 Proportion of deaths attributable to elevated BMI



This growing health burden also translates into significant economic burdens: the World Obesity Federation predicts that global economic losses attributable to obesity will total US$4.32 trillion by 2035 (World Obesity Federation, 2023). This figure captures the direct healthcare costs of treating obesity and its complications, as well as productivity impacts including presenteeism (reduced productivity while at work), absenteeism (missed work or non-participation in the labour force), and premature mortality (Bustillos, Vargas and Gomero-Cuadra, 2015; Nesta and Frontier Economics, 2025). Obesity in adolescence is linked to lower educational attainment and future income in adulthood, while obesity in adulthood is linked to unemployment and early retirement, undermining both individual and national economic potential across a person's life course (OECD, 2019; French et al., 2018). Taken together, these effects are projected to reduce potential global GDP by 3.3% between 2020 and 2050 (OECD, 2019).

These figures highlight the growing need for governments and health systems to prioritise obesity in their non-communicable disease (NCD) strategies. The nature of obesity, as a relapsing-remitting disease with genetic and environmental influences, means that this will be challenging, but the potential returns are substantial. Nesta and Frontier Economics estimate that each 1% reduction in the national obesity rate in the UK could deliver £245 million in productivity benefits to the UK economy (Nesta and Frontier Economics, 2025).

We seek here to quantify the burden of elevated BMI in eight European countries, highlighting the ongoing burden of obesity across the continent and the potential health and economic benefits that addressing obesity could have.

We note that this is not the first attempt to quantify the burdens of obesity and the potential benefits of better prevention and management, and we mention previous studies throughout our report. However, the policy landscape is changing, with obesity being reframed from an "intractable" challenge to a modifiable medical condition, given the

emergence of new treatment options that can be used in combination with existing strategies (Lingvay et al., 2024; Turabi et al., 2025).

In this report, we describe the features that distinguish obesity from most other health conditions, quantify the burden of obesity in eight European countries, and discuss potential strategies for addressing the challenges of obesity.

1.2 Obesity: a chronic, relapsing disease

Obesity is defined by the WHO as a long-term, complex, relapsing, multifactorial, chronic disease characterised by excess body fat and detrimental health consequences (Levy, Nessen and Braunstein, 2025; Bray et al., 2017; WHO, 2025a). It is a result of the interaction of genetic, biological and environmental factors (Loos and Yeo, 2022; Turabi et al., 2025), including an 'obesogenic environment'. This refers to a combination of physical, economic, policy, and sociocultural conditions that can promote weight gain in the human body. These conditions can shape exposure, opportunities and constraints across nutrition, activity, stress and other biological and social pathways (Shah et al., 2025; Jones, 2007).

While human biology adapted to store fat as a defence against starvation, rapid changes towards an obesogenic environment in recent decades have outpaced the body's ability to further adapt and appropriately regulate fat mass, resulting in consequent increases in the prevalence of obesity over the last century (Shah et al., 2025). The obesogenic environment also means obesity tends to follow a relapsing-remitting pattern, where weight loss is followed by partial or complete weight regain. Multiple hormonal and metabolic mechanisms have evolved to increase hunger and reduce energy expenditure as a response to weight loss. This means that efforts to control obesity are often at odds with the body's own biological mechanisms. This multiplies the challenges of addressing obesity and often limits the long-term efficacy of weight loss through lifestyle modification alone (Blomain et al., 2013).

Understanding obesity as a medical condition and as a policy challenge requires disentangling the terms 'obesity' and 'elevated BMI'. Elevated BMI is a *symptom* of obesity, and a BMI of 30 or greater is referred to as a state of 'obesity'. However, as a relapsing disease, an individual can also be said to be *living with obesity* even if their current BMI is in a healthy range (typically BMI less than 25). In this context, obesity refers to an elevated risk of excess body fat (or adiposity) and its associated detrimental health consequences. These two common usages mean that obesity can refer to both the *cause* of elevated BMI, as well as the *outcome*. To be consistent with these two usages, we may use obesity in both contexts at different points throughout this report. In general, however, we will use the term 'elevated BMI' when referring to a state of excess body fat, and 'obesity' when referring to the long-term, relapsing disease that can cause excess body fat, and in reference to policies and strategies seeking to promote and maintain a healthy weight among the population. We will avoid using the terms overweight or obesity to refer to specific ranges of BMI.

As well as a disease in its own right, obesity is an important risk factor for other diseases. In this report, we consider both aspects of obesity:

- **Elevated BMI as a risk factor** - The Global Burden of Disease study identifies over 30 diseases for which elevated BMI is a risk factor (Institute for Health Metrics and Evaluation, 2024), and other research has put the figure as high as 200 associated conditions (Barenbaum, Tchang and Aronne, 2026).

- **Obesity as a disease** - Obesity has its own physiological and biological characteristics that drive its relapsing-remitting nature (Shah et al., 2025). It is therefore a chronic medical disease in its own right, requiring ongoing management.

Addressing obesity effectively requires understanding this dual nature: highlighting its role as risk factor strengthens the rationale for management, whilst recognising it as a disease demands particular attention to *how* it should be managed. Whilst the WHO officially recognised obesity as a disease in 1997, this has not yet translated into policy outcomes (World Obesity Federation, 2017). Highlighting the ongoing burden of obesity and advocating for approaches that acknowledge its chronic, relapsing nature therefore remains essential.

1.3 Prioritisation of obesity

While some countries have recently developed dedicated policy plans for obesity, obesity has historically been, and continues to be, a low priority in policymaking due to persistent misconceptions. It is still widely viewed as a matter of personal responsibility and primarily as a risk factor rather than as a chronic, relapsing disease (Ehlers et al., 2025; Turabi et al., 2025). This contributes to stigma, underinvestment, and a narrow focus on individual lifestyle change, despite clear evidence that these approaches have not reversed rising prevalence (Nutter et al., 2024; Brown, Flint and Batterham, 2022; Sharma, 2023).

Whilst recent WHO guidance on innovative therapies signals growing recognition of the need for more targeted care (WHO, 2025b), progress is constrained by siloed budgets, fragmented leadership, and the lack of coordinated, cross-government action (Ehlers et al., 2025).

1.4 Outline

This report consists of two sections:

- The first section describes a quantitative analysis of the health and economic burdens of elevated BMI. The analysis illustrates how obesity costs European countries significant sums in both direct and indirect costs, while also highlighting some of the key diseases associated with obesity.

- The second section provides an overview of interventions that can be used to prevent and treat obesity and its related complications. It includes a discussion of policy and implementation barriers, as well as evidence gaps, that must be addressed to support inclusive access to effective interventions.

2 Methods

We estimated the annual health and economic burdens attributable to excess adiposity, or excess body fat (Rubino et al., 2025), across eight European countries: the UK, Germany, France, Italy, Spain, Ireland, Romania and Greece. These countries were selected to reflect countries with differing demographics, health systems, and economic capacities.

Using BMI as a proxy for adiposity, we estimated three associated burdens: health burden in terms of disability-adjusted life years (DALYs) attributable to elevated BMI, direct healthcare costs for conditions attributable to elevated BMI, and indirect costs, including patient and carer productivity losses and the value of carer time, attributable to elevated BMI.

BMI is a widely used proxy for adiposity (WHO, 2025b), including in establishing eligibility criteria for different interventions for people living with excess adiposity (WHO, 2022; Rubino et al., 2025). There is also widely available comparative data across countries and diseases on the burdens associated with excess BMI from the Global Burden of Disease (GBD) study (Institute for Health Metrics and Evaluation, 2024). Moreover, studies exploring the impact of obesity on productivity have used BMI to assess the impact of overweight and obesity (Machado-Fragua et al., 2025; Campbell et al., 2021; Gupta, Richard and Forsythe, 2015).

Notwithstanding its widespread use, BMI has a number of well-documented limitations (Sweatt, Garvey and Martins, 2024). For example, BMI lacks discernment between adiposity and other tissue, potentially reducing its accuracy. Furthermore, BMI thresholds require different cut-offs for different demographic groups, an important consideration when identifying suitable interventions (NHS, 2017). The Lancet Diabetes & Endocrinology Commission on the Definition and Diagnosis of Clinical Obesity states that BMI can both underestimate and overestimate adiposity at the individual-level, with implications for patient care and health policy (Rubino et al., 2025).

There are other ways to identify adiposity. These include waist-to-hip ratio (WHR), waist-to-height ratio and hip circumference (HC), which are reliable indicators of overall and central fat (Hewage, Wijesekara and Perera, 2023; ESC, 2026). New frameworks for the diagnosis and management of excess adiposity that move beyond BMI have been developed, including from the European Association for the Study of Obesity (EASO) (Busetto et al., 2024). However, these measures are not as widely adopted or as widely available as BMI, limiting their utility in a comparative context.

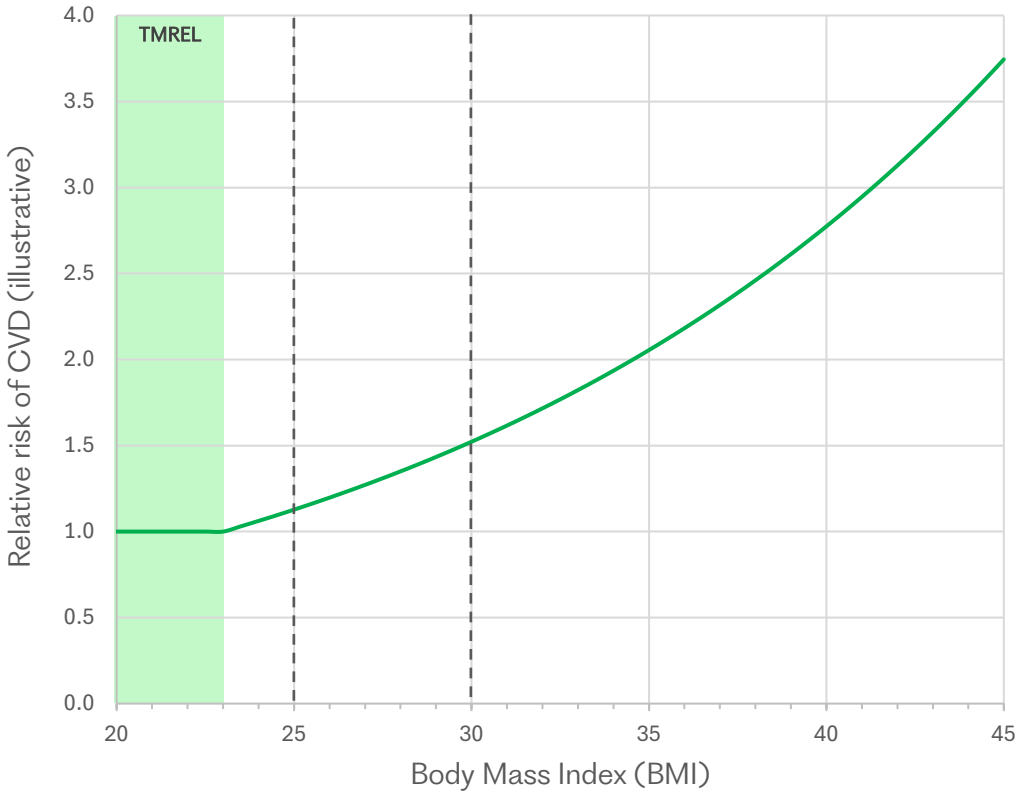
Our approach was based on population-attributable fractions (PAFs) as developed by Levin (1953) and estimated by the Global Burden of Disease (GBD) study (Hay et al., 2025). Briefly, PAFs are the proportion of a particular measure of disease burden, such as prevalent cases, DALYs, Years of Life Lost (YLL), or deaths, that can be attributed to a specific exposure or risk factor. They can also be interpreted as the disease burden that would not exist in a counterfactual world where no one was exposed to that risk factor (e.g. where no one has elevated BMI), or, in other words, the burden that would be avoided by eliminating a particular risk factor. A more detailed explanation of our PAF approach is in the Appendix.

The PAF methodology is a standard approach to calculating the burden of modifiable risk factors (Hay et al., 2025; Xiong et al., 2024; Brown et al., 2018; Brooks-Pollock and Danon, 2017). This approach is also consistent with the approach of a number of other studies of the burdens of excess weight (Papantoniou and Maniadakis, 2026; Nesta and Frontier Economics, 2025; Borges et al., 2024; d'Errico, Pavlova and Spandonaro, 2022; Dee et al., 2015; Flegal, Panagiotou and Graubard, 2015).

The GBD defines an elevated risk as any level of exposure that increases risk of disease outcomes beyond the 'theoretical minimum risk exposure level' (TMREL). For BMI, GBD defines the TMREL as 20 to 23 kg/m^2 (Brauer et al., 2024). A BMI greater than this TMREL is associated with increased risks of different diseases, discussed in more detail below. We note that this TMREL is slightly lower than common categorical definitions of BMI 20 to 24.9 as a 'healthy weight', 25 to 29.9 as 'overweight' and 30 or more as 'obese' (Rubino et al., 2025). This difference reflects GBD's treatment of BMI as a continuous rather than categorical risk factor, as illustrated in Figure 3 below. As a result, our estimates attribute some health and economic burden to individuals with a BMI between 23 and 24.9. Consideration of risks within this 'healthy' range of BMI is consistent, though, with recommendations for using lower BMI cut-points in defining overweight and obesity in some populations (WHO expert consultation, 2004).

We treat BMI as a continuous proxy for adiposity, and estimate the burden associated with all BMI greater than the TMREL. Therefore, we use the term 'elevated BMI' rather than categorical terms like 'overweight' and 'obesity' in presenting our results.

Figure 3 Theoretical minimum risk exposure level (TMREL) and illustrative relative risk of CVD by BMI



2.1 Estimating the health and economic burdens of high BMI

On the basis of the PAF approach described above, we estimated health and economic burdens attributable to elevated BMI across a set of diseases with more than 1 million global DALYs in the Global Burden of Disease (GBD) database (Institute for Health

Metrics and Evaluation, 2024). This objective approach ensured inclusion of diseases associated with the greatest morbidity and mortality burden directly attributable to elevated BMI, but we note that it is also likely to lead to a conservative estimate of overall burden. We also do not imply that diseases with less than 1 million DALYs attributable to elevated BMI do not have a meaningful impact on people living with elevated BMI or on health systems around the world. The list of the 16 diseases included in our analysis is shown in Table 1.

We note that the GBD develops its risk-outcome pairs through an assessment of whether there is evidence of biologically plausible associations between exposure and disease, which is established from multiple epidemiological studies, use of the burden of proof risk function, and voting by the GBD scientific council. Other diseases have been linked to elevated BMI, such as depression and other types of cancer (Luppino et al., 2010; An et al., 2024); however, these are not included in our analysis due to their absence from the GBD risk-outcome list. We limited our analysis to diseases included in the GBD to maintain consistency and comparability across diseases.

Table 1 Diseases with more than 1 million DALYs globally attributable to elevated BMI

DISEASE	PREVALENCE (%)	POPULATION-ATTRIBUTABLE FRACTION (%)
Diabetes mellitus type 2	7.41	63.8
Hypertensive heart disease	0.21	58.4
Gallbladder and biliary diseases	6.34	45.3
Chronic kidney disease	11.44	36.5
Asthma	6.18	24.2
Osteoarthritis	12.81	23.8
Ischaemic heart disease	6.39	18.9
Liver cancer	0.01	18.2
Low back pain	14.09	16.6
Colon and rectum cancer	0.30	13.5
Tuberculosis	11.77	12.0
Ischaemic stroke	1.31	11.1
Alzheimer's disease and other dementias	1.35	9.0
Breast cancer	0.66	8.4
Intracerebral haemorrhage	0.17	7.3
Liver disease	17.90	3.1

**Prevalence and PAFs are for the European Region. These prevalence estimates may be higher than the diagnosed prevalence inputs used to estimate direct costs.*

Accounting for multimorbidity

Given the systemic nature of excess adiposity, it is almost inevitable that many patients will have more than one BMI-related disease. Aggregate healthcare costs in the presence of multimorbidity can be less than, equal to, or greater than the sum of the individual disease costs, i.e. multimorbid costs may be 'sub-additive' or 'super-additive' relative to the simple sum per patient costs associated with either disease. In the case the costs are sub-additive, not accounting for multimorbidity leads to an overestimation of costs; in the case of super-additivity, failing to account for multimorbidity underestimates costs. Therefore, we make an adjustment for the incidence of multimorbidity for both direct and indirect costs. The specific multimorbidities considered are based on an analysis by PHE England, which found that healthcare costs for co-occurring diseases are significantly different to

the sum of their single disease costs — namely ischaemic heart disease and diabetes mellitus type 2, and ischaemic heart disease and asthma (PHE England, 2020).

Briefly, we treated different combinations of comorbid diseases as unique diseases for the purposes of assigning annual costs. We subtracted multimorbid patients from the count of prevalent cases of the individual diseases to avoid double-counting. Full details of our approach to accounting for multimorbidity are in the Appendix.

2.2 Estimating health losses

The health burdens associated with elevated BMI were extracted from the 2023 Global Burden of Disease database (Institute for Health Metrics and Evaluation, 2024) in terms of the annual number of deaths and DALYs attributable to elevated BMI across the selected conditions in our study countries. **GBD estimates these BMI-attributable figures by applying PAFs — the share of each condition attributable to elevated BMI — to the total deaths and DALYs associated with each disease.** DALYs are a combination of years of life lost (YLLs) and years lived with disability (YLDs) and therefore offer a full picture of the mortality and morbidity associated with elevated BMI.

The GBD assigns death and individual DALYs to a single condition, ensuring no double aggregating when totalling BMI-related outcomes across diseases (GBD, 2020).

2.3 Direct healthcare costs

For direct healthcare costs, we took a disease-by-disease approach to calculating the annual healthcare costs of elevated BMI, allowing for an assessment of the contribution of individual diseases associated with elevated BMI to the overall burden.

First, the annual, per-patient healthcare cost of each disease in Table 1 was sourced from the literature for each of the eight study countries. Second, we multiplied these per-patient costs by estimates of the prevalence for each disease in each country to estimate the total direct cost burden by disease and country. Third, we applied disease- and country-specific PAFs to these overall estimates to estimate the share of direct costs attributable to elevated BMI. As there is no direct 'cost' PAF, we used the PAF for YLD, on the assumption that it would be the key driver of healthcare costs. Sources for our disease costs by country are provided in Appendix 8.1.

2.4 Indirect productivity costs

In contrast to the disease-by-disease approach for direct costs, we took a top-down, 'overweight and obesity' approach to estimating annualised indirect costs; that is, we considered costs and foregone productivity associated with increased economic inactivity, absenteeism, presenteeism, and informal care due to conditions related to excess BMI.

Under this approach, we used studies assessing the indirect cost impacts of excess BMI relative to a 'healthy' weight. We note that different studies are likely to have used different BMI ranges to define a 'healthy' weight, from the GBD TMREL of BMI 20-23 to the conventional BMI 25 and 30 thresholds for overweight and obesity, respectively. This approach avoids challenges with double-counting productivity losses under the disease-by-disease approach, where there is typically insufficient data to adjust for the multimorbidity impacts on indirect cost components. Moreover, this method captures the

productivity impacts of elevated BMI beyond its impact via diagnosed conditions. For example, people living with elevated BMI may suffer from reduced physical function, fatigue, pain, and psychosocial factors that impact their productivity independent of any subsequent conditions associated with elevated BMI (Buğday et al., 2025; Gupta, Richard and Forsythe, 2015). We use the overarching term 'overweight and obesity' to refer to this approach.

The one exception to this 'overweight and obesity'-based approach was premature mortality costs, where we utilised a disease-based approach with PAFs specific to deaths when estimating the productivity impacts of premature mortality.

The calculation of each indirect cost component is explained below:

- To calculate the **indirect costs associated with premature mortality**, we took a human capital approach (HCA), assuming a proportion of those who die due to causes associated with elevated BMI prior to retirement age would have otherwise worked until retirement age, and, therefore, their deaths represent a loss due to foregone productivity. These productivity losses were valued according to country-specific wage rates. To calculate the costs attributable to elevated BMI, we multiplied each disease cost by the relevant PAFs. We note, however, that these estimates do not account for foregone receipt of benefits, such as state pension, due to premature mortality. Inclusion of such savings would have the effect of reducing the net societal costs of premature mortality.

- To calculate the **indirect costs associated with higher rates of economic inactivity** due to elevated BMI, we utilised a Mendelian Randomisation study from Campbell et al. (2021). They found a significant causal impact of BMI on being in the sick/disabled employment category, with the odds ratio for each kg/m^2 increase in BMI being 1.076. This estimate was used to estimate the impact of living with overweight or obesity (class I/II/III) on the level of economic inactivity in the population (i.e. the employment reduction due to obesity). The HCA is used to value this foregone productivity, applied to a proportion of the general population in each country who are economically inactive due to illness but want to work (Eurostat, 2026).

- To calculate the **indirect costs associated with absenteeism and presenteeism**, we estimate the impact of different BMI categories on productivity and impairment using evidence from Gupta, Richard and Forsythe (2015), who incorporate Work Productivity and Activity Impairment questionnaire — General Health (WPAI-GH) survey data from 5 of our 8 European countries. They find significantly higher absenteeism and presenteeism for obesity class II and III relative to those living with normal weight. For absenteeism, we apply the proportional increase to the average days of absenteeism in each of our countries (WHO European Health Information Gateway, 2024). For presenteeism, we multiply the percentage-point increase in presenteeism by days worked per year. No increase is applied to overweight or obesity class I, given that no significant effects were found. Like permanent reductions in employment due to economic inactivity, these days represent lost productivity. This was valued according to country-specific wage rates and represents a reduction in potential societal productivity.

- To calculate the **indirect costs associated with informal caregiving** required for an individual living with a condition attributable to elevated BMI, we used an opportunity cost method. This method assigns value to the time spent by a carer providing unpaid care to a person living with a condition attributable to elevated BMI, which could otherwise have been spent earning an income. We utilised a study from Machado-Fragua et al. (2025), which found elevated BMI was associated with higher odds of limitations in activities of daily living (ADL)

compared to those living with normal weight for European countries for those over 50. The hours of informal care for those with ADL limitations were sourced from Nektarios, Valvis and Georgiadis (2025). Annual hours of informal care were multiplied by the median hourly wage in each country.

Full details on our calculation of each of these cost components are presented in the Appendix. All costs are adjusted to 2024 values.

2.5 Limitations of quantitative analysis

This analysis has several potential limitations that should be considered when interpreting the results. First, we use a disease-by-disease methodology for direct costs but an overarching 'overweight and obesity' approach for indirect costs. We considered this appropriate given the differing mechanisms through which elevated BMI generates costs. Healthcare expenditure attributable to elevated BMI is likely to be mediated predominantly through specific disease pathways, making a disease-by-disease estimation approach the most transparent and defensible method for direct costs. By contrast, elevated BMI may affect productivity through channels that extend beyond its impact on diagnosed diseases, including reduced physical functioning, fatigue, pain, and psychosocial factors (Buğday et al., 2025). We considered that an overarching approach for indirect costs was therefore better suited to capturing these broader effects.

In terms of direct healthcare costs, disease prevalence rates and costs per case were drawn from a range of country-specific sources in order to produce country-specific estimates. However, these sources employ different methodologies, definitions, and data collection approaches. As a result, the component inputs may not be fully comparable across countries: aggregation of these estimates and cross-country comparisons should be done with caution.

The multimorbidity adjustment applied to direct costs was based on a Public Health England analysis identifying which BMI-related diseases do not have fully additive healthcare costs when they co-occur (Public Health England, 2020a). While this adjustment is important to avoid double-counting, the patterns of cost non-additivity observed in England may not generalise to other healthcare systems. Differences in clinical practice and healthcare pricing could lead to different patterns of non-additivity between disease costs.

The estimated increase in economic inactivity attributable to elevated BMI was derived from a UK-specific study using UK Biobank data (Campbell et al., 2021). This effect size was then applied to baseline country-specific economic inactivity rates to generate national estimates. The relationship between elevated BMI and economic inactivity may differ across countries due to differences in welfare states and cultural factors. However, a notable strength of this input is that it was estimated using Mendelian Randomisation, a causal inference method that exploits genetic variation in BMI. Importantly, this approach did not control for health conditions caused by elevated BMI, meaning the resulting estimate captures the full impact of elevated BMI on economic inactivity, including effects mediated through disease pathways.

The estimates of increased absenteeism and presenteeism come from Gupta, Richard and Forsythe (2015) and the estimates of ADL limitations come from Machado-Fragua et al. (2025), both of which are European-wide studies. While the multi-country scope of these studies is a strength, these are cross-sectional studies meaning causality cannot be confirmed due to potential endogeneity. Furthermore, both studies adjusted for certain health conditions that may themselves be caused by elevated BMI, such as diabetes mellitus type 2 and cardiovascular disease. If elevated BMI leads to productivity losses via these disease pathways, controlling for them may result in an underestimate of the true

impact of elevated BMI on absenteeism, presenteeism, and functional limitations. Moreover, these studies used self-reported survey data, potentially biasing estimates.

Finally, as noted previously, we estimate the economic burden of all elevated BMI beyond a TMREL of BMI 20-23 and do not categorise these costs by 'overweight' or 'obese' BMI categories. This limits the ability to interpret the differential impacts by category, and our evidence may not align with policy responses based on BMI category. However, as the risks and burdens associated with excess BMI are continuous, rather than categorical, we suggest that categorical interpretations and responses are not helpful.

2.6 Opportunities and challenges in the management of elevated BMI

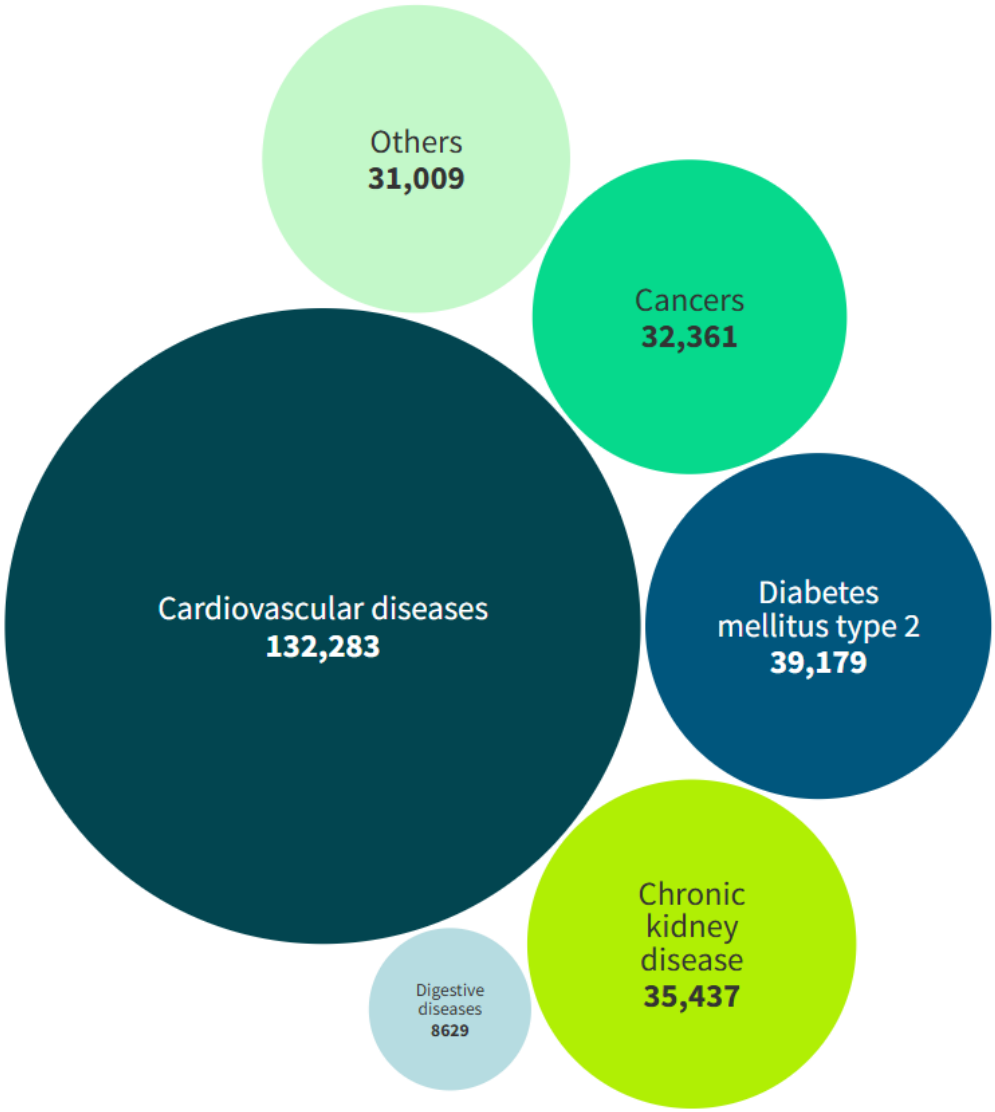
We conducted a targeted literature review to explore key challenges and promising solutions in the context of the prevention and management of elevated BMI. To validate and refine our findings, we used an iterative process involving two expert roundtables with European stakeholders, including policymakers, academics, and healthcare professionals. Roundtable discussions were informed by preliminary results of our quantitative analysis and a background literature review on obesity interventions. The roundtables aimed to rank elevated BMI within population health and broader economic priorities, identify imperative opportunities and challenges for intervention, and determine the most important forms of evidence for investment decisions. Insights from these discussions then informed a targeted literature review which identified promising investment opportunities and suggested necessary changes needed for prioritising elevated BMI as a health priority.

3 Health and economic burden of elevated BMI

3.1 Health burdens of elevated BMI

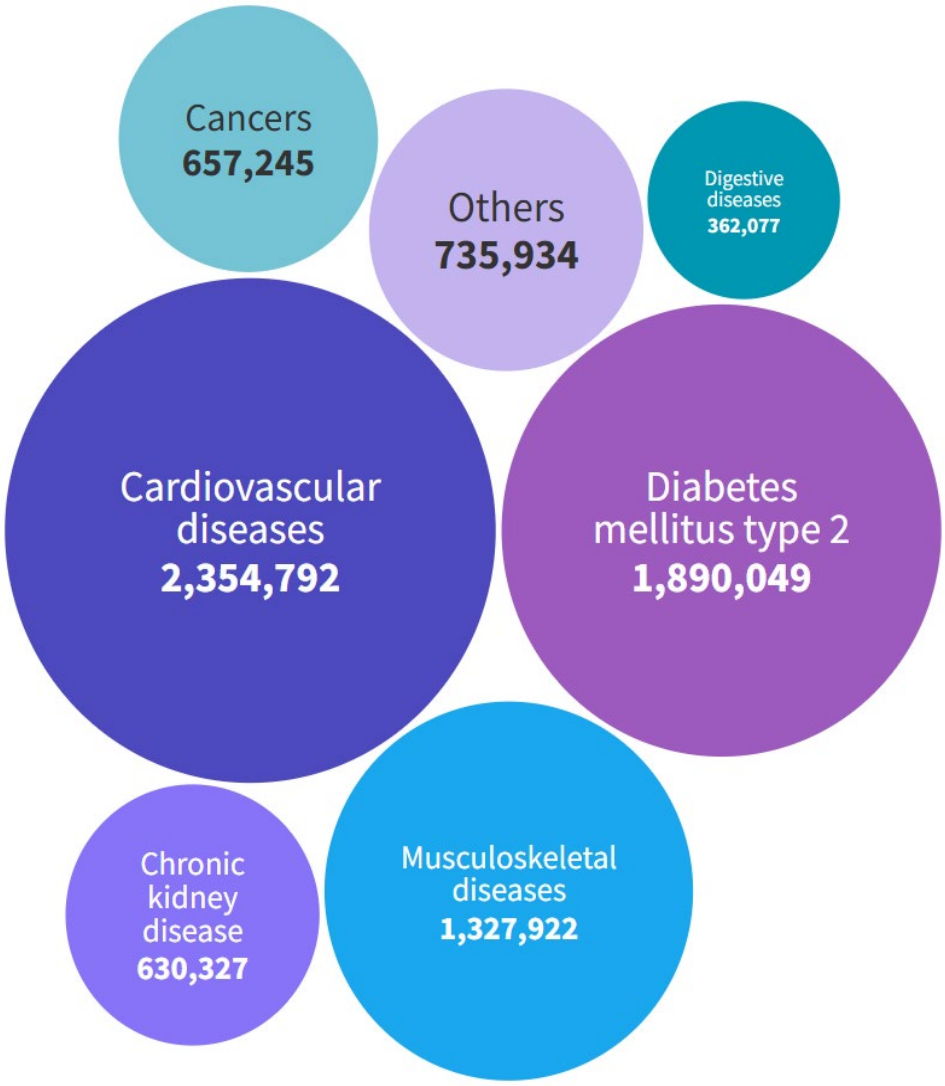
Elevated BMI is associated with a substantial health burden. The Global Burden of Disease study estimates that, in 2023, elevated BMI contributes to 278,000 deaths annually across our study countries, with cardiovascular diseases being the largest contributor (see Figure 4). In terms of the proportional contribution of elevated BMI to overall death numbers, BMI is implicated in more than half of all diabetes mellitus type 2 deaths across our study countries, 44% of digestive disease deaths, and 31% of chronic kidney disease deaths. Country-specific numbers can be found in the Appendix.

Figure 4 Annual deaths attributable to elevated BMI across study countries



Beyond the mortality burden, elevated BMI is associated with significant morbidity, based on 2023 estimates from the GBD. Figure 5 displays the contribution of elevated BMI towards annual DALYs, which are a measure of mortality and morbidity. Similar to deaths, cardiovascular disease has the most BMI-related DALYs, closely followed by diabetes mellitus type 2. Elevated BMI is implicated in almost 60% of diabetes mellitus type 2 DALYs, 45% of digestive disease DALYs and 32% of chronic kidney disease DALYs. Country-specific numbers can be found in Table 5 and Table 6.

Figure 5 Annual DALYs attributable to elevated BMI across study countries



Musculoskeletal diseases include osteoarthritis and low back pain; Cardiovascular diseases include hypertensive heart disease, ischaemic heart disease, ischaemic stroke, intracerebral haemorrhage, ischaemic heart disease with diabetes mellitus type 2 and ischaemic heart disease and asthma; Cancers include breast cancer, colon and rectum cancer and liver cancer; Others includes Alzheimer's disease and other dementias, asthma, liver disease and tuberculosis.

Highlighting the link between the slightly nebulous concept of elevated BMI and concrete disease outcomes helps ground its impact in tangible terms for governments and health systems — with enhanced prevention and management, much of this burden could be avoided. These health outcomes, as well as the broader quality of life impacts for people living with elevated BMI, translate into a significant economic burden within and beyond the health system. Our economic burden results are in the next section.

3.2 Direct healthcare costs associated with elevated BMI

Our PAF approach allows us to explore the economic healthcare costs of elevated BMI by associated disease (see Table 2 and Figure 6). The disease accounting for the greatest share of healthcare spending attributable to elevated BMI varies by country, but diabetes mellitus type 2, cardiovascular diseases, musculoskeletal diseases and chronic kidney disease all imposed significant costs on health systems.

The diseases contributing the greatest share of the burden associated with elevated BMI vary across countries (Table 2), underscoring the need to tailor obesity policies to the local context and local priorities, rather than adopting a one-size-fits-all approach.

Table 2 Annual direct costs, by condition, attributable to elevated BMI (€Billions)

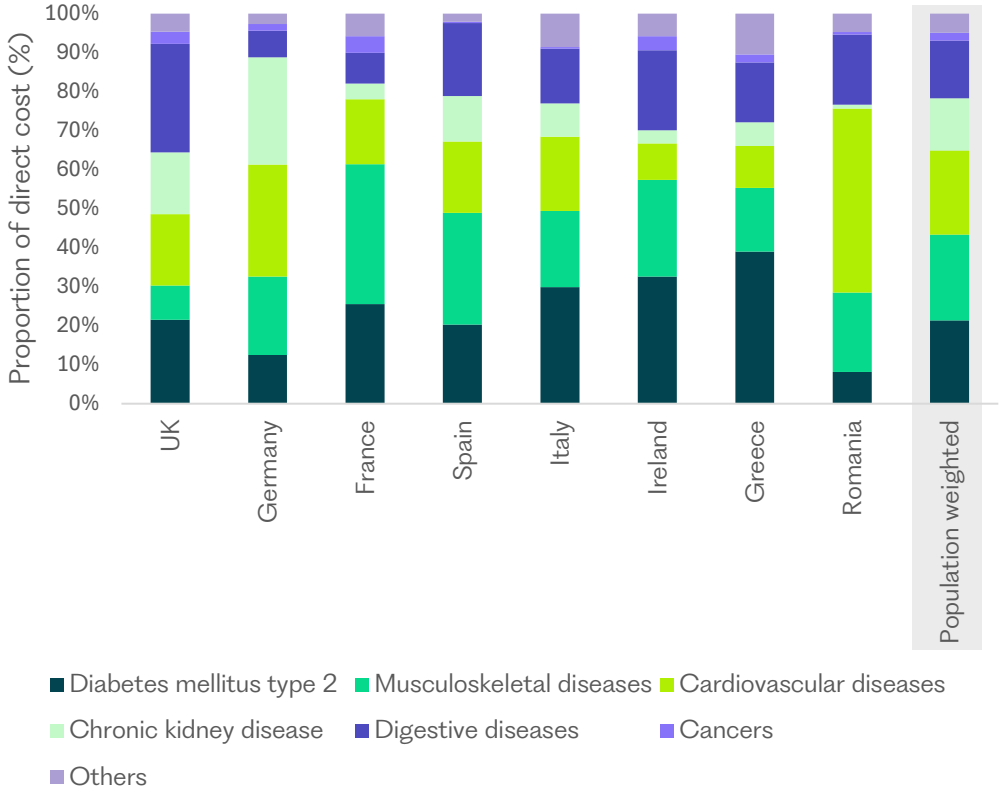
	UK	GERMANY	FRANCE	SPAIN	ITALY	IRELAND	GREECE	ROMANIA
Diabetes mellitus type 2	3.9	3.8	4.9	3.0	3.8	0.5	0.9	0.1
Musculoskeletal diseases[a]	1.6	6.1	6.9	4.3	2.5	0.4	0.4	0.2
Cardiovascular diseases[b]	3.3	8.7	3.2	2.7	2.5	0.1	0.2	0.5
Chronic kidney disease	2.9	8.3	0.8	1.7	1.1	0.1	0.1	<0.1
Digestive diseases	4.0	1.7	1.0	1.5	1.5	0.2	0.2	<0.1
Cancers[c]	0.6	0.5	0.8	0.0	0.1	0.1	0.0	<0.1
Others[d]	1.9	1.2	1.6	1.6	1.4	0.2	0.4	0.2
Total	**18.2**	**30.3**	**19.2**	**14.9**	**12.9**	**1.5**	**2.3**	**1.1**

Costs in bold represent the greatest proportional cost in each country.

[a]Includes osteoarthritis and low back pain; [b]Includes hypertensive heart disease, ischaemic heart disease, ischaemic stroke, intracerebral haemorrhage, ischaemic heart disease with diabetes mellitus type 2, and ischaemic heart disease and asthma; [c]Includes breast cancer, colon and rectum cancer and liver cancer; [d]Includes Alzheimer's disease and other dementias, asthma, liver disease and tuberculosis.

Figure 6 below illustrates the share of direct healthcare costs by disease by country and population-weighted averages.

Figure 6 Proportion of direct costs by attributable condition



3.3 Total economic burdens of elevated BMI

Our analysis shows that elevated BMI is associated with substantial economic burden on the health system and wider society across all eight European countries examined. Total annual economic costs (direct and indirect) reach €43.2 billion in the UK and €55.2 billion in Germany, with Spain, Italy, and France each incurring costs of around €20.0 billion. Even in smaller economies such as Romania, the annual burden remains considerable at €2.5 billion (see Table 3). As a percentage of GDP, costs attributable to elevated BMI range from 0.7% to 1.4%, which is within previously published ranges (Nagi et al., 2024b).1 The highest percentage is seen in Greece and the UK at 1.4%, with the lowest in Romania at 0.7%.

Direct costs per capita (per resident) are largest in Germany at €363, with the lowest in Romania at €59. Indirect costs per capita are largest in the UK at €362, driven in particular by lost productivity associated with economic inactivity due to conditions

[1] For Ireland, costs are expressed as a share of modified Gross National Income (GNI*) rather than GDP. A large share of Irish GDP reflects multinational enterprise activity, so mGNI is regarded as a more representative measure of domestic economic output, while a GDP-based figure would understate Ireland's relative burden.

associated with elevated BMI. France has the lowest indirect per-capita costs, at €63, due to low estimations of economic inactivity, absenteeism and presenteeism costs compared to countries with comparable GDP.

Study countries with the largest indirect cost share, such as the UK, Germany and Ireland, are generally those where employment rates remain relatively high across the working age. Whilst the make-up of indirect costs differs across these countries, there exists more scope for elevated BMI to have greater negative productivity impacts since more people are working, especially at older ages where prevalence of overweight and obesity is highest. Figure 7 shows the distribution of total economic burden by direct (green) and indirect (shades of purple) costs for each study country.

Table 3 The annual economic burdens of elevated BMI by component, direct and indirect

	UK	GERMANY	FRANCE	SPAIN	ITALY	IRELAND	GREECE	ROMANIA
Direct Costs (€ Billions)	18.2	30.3	19.2	14.9	12.9	1.5	2.3	1.1
Indirect costs (€ Billions)	25.1	24.9	4.1	4.7	7.5	1.7	1.1	1.4
Economic inactivity	10.0	6.8	1.1	1.3	1.2	0.7	0.1	0.2
Absenteeism	3.0	8.7	0.6	1.3	2.4	0.2	0.3	0.4
Presenteeism	7.0	4.3	0.9	0.9	1.7	0.4	0.3	0.5
Informal care	3.3	3.4	1.0	0.9	1.4	0.3	0.2	0.1
Mortality	1.8	1.7	0.6	0.3	0.7	0.1	0.1	0.2
Total costs (€ Billions)	43.2	55.2	23.3	19.6	20.3	3.2	3.4	2.5
Direct costs per capita (€)	263	363	280	305	218	286	222	59
Indirect costs per capita (€)	362	298	63	97	126	312	105	71
Total costs per capita (€)	625	662	343	401	345	598	328	131
Total costs as % of GDP	1.4%	1.3%	0.8%	1.2%	0.9%	1.1%*	1.4%	0.7%

GDP = Gross Domestic Product

** Ireland cost burden reported in terms of share of modified Gross National Income (mGNI) to reflect the composition of the local economy. See corresponding Ireland section below.*

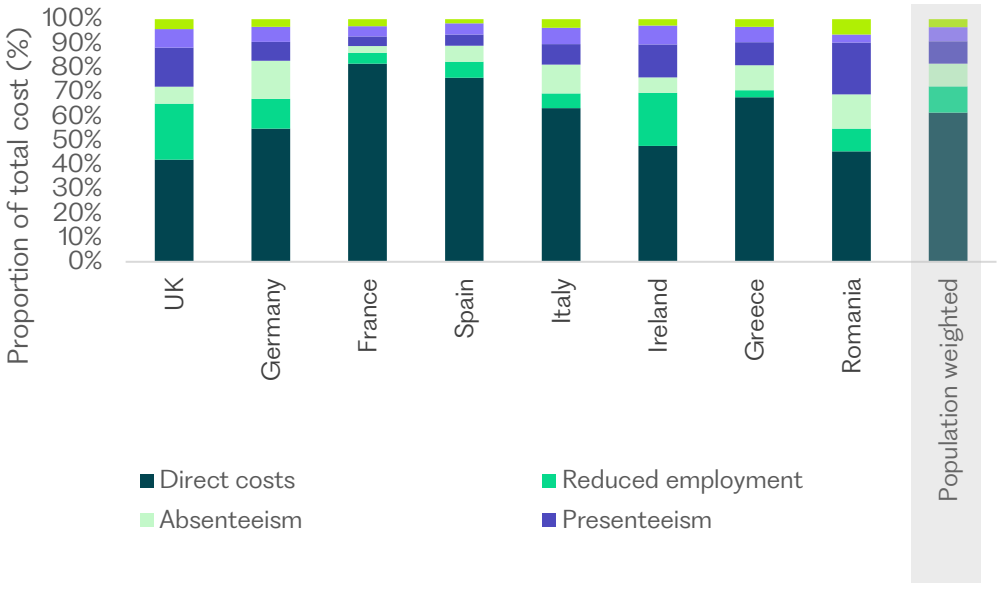
For countries such as Greece, France and Spain, where employment rates are generally lower, and dip substantially at older working ages, indirect costs generally make up a smaller share of total costs. Other factors including the percentage of GDP countries spend on healthcare may also influence the division between direct and indirect costs.

No indirect cost component is consistently the largest across countries — increased economic inactivity, absenteeism and presenteeism all generate substantial costs to society, reflecting the impact of obesity-linked diseases on labour force participation and earning potential. The costs of presenteeism and absenteeism reflect that, even for those in work, elevated BMI is associated with lower productivity. There is, therefore, significant scope to improve productivity by managing BMI, with potential improved labour force participation and fewer days of absenteeism and presenteeism.

Informal care also represents a significant component of the economic burden, constituting 13-14% of total indirect costs across countries. The unpaid time provided by families and communities to support individuals with conditions related to elevated BMI is an often-overlooked component of disease burden, but it represents time that could otherwise be spent in employment or in other valuable ways. Premature mortality represents the smallest cost component in terms of productivity losses, predominantly due to many of the deaths associated with diseases linked to elevated BMI coming near to or after retirement age.

These figures underscore the potential indirect productivity and employment-related costs attributable to elevated BMI. This provides economic evidence that elevated BMI has impacts beyond the health sector and is salient to additional national stakeholders, providing an impetus to prioritise broader, multisectoral investment in the prevention and management of elevated BMI.

Figure 7 Proportion of total costs by cost component



When compared to other major areas of public spending, the economic burden of elevated BMI as a share of GDP is comparable to what some of the evaluated countries spend as a percentage of their GDP in the provision of public services, such as on housing and defence (see Table 4). The next sections discuss total economic burdens by country in more detail.

Table 4 Comparison of public expenditures as % of GDP, 2024

	UK	GERMANY	FRANCE	SPAIN	ITALY	IRELAND*	GREECE	ROMANIA
Elevated BMI	1.4%	1.3%	0.8%	1.2%	0.9%	1.1%	1.4%	0.7%
Housing	0.9%	0.5%	1.3%	0.5%	4.3%	1.1%	0.4%	1.5%
Education	4.8%	4.5%	5.0%	4.2%	3.9%	4.9%	4.0%	3.3%
Defence	2.2%	1.1%	1.8%	0.9%	1.2%	0.4%	2.2%	1.7%

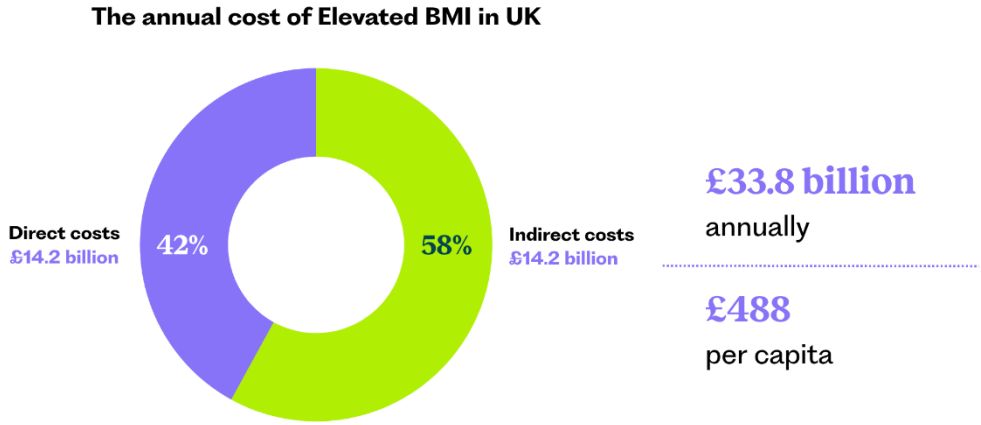
Table adapted from OECD's analysis of Government by Expenditure (OECD, 2025a). For Ireland, figures are expressed as a share of modified Gross National Income (GNI) rather than GDP. A large share of Irish GDP reflects multinational enterprise activity, so GNI* is regarded as a more representative measure of domestic resources. Percentage GDP spend values from (OECD, 2025a) are multiplied by a factor of 1.75, representing the ratio of 2023 GDP (€510.0bn) to 2023 modified GNI (€290.9bn), obtained from (Central Statistics Office, 2025). All other countries' figures remain GDP-based.*

3.4 Economic burdens of elevated BMI by country

3.4.1 United Kingdom

Elevated BMI costs the UK £33.8 billion per year

Figure 8 Direct and indirect cost breakdown, UK

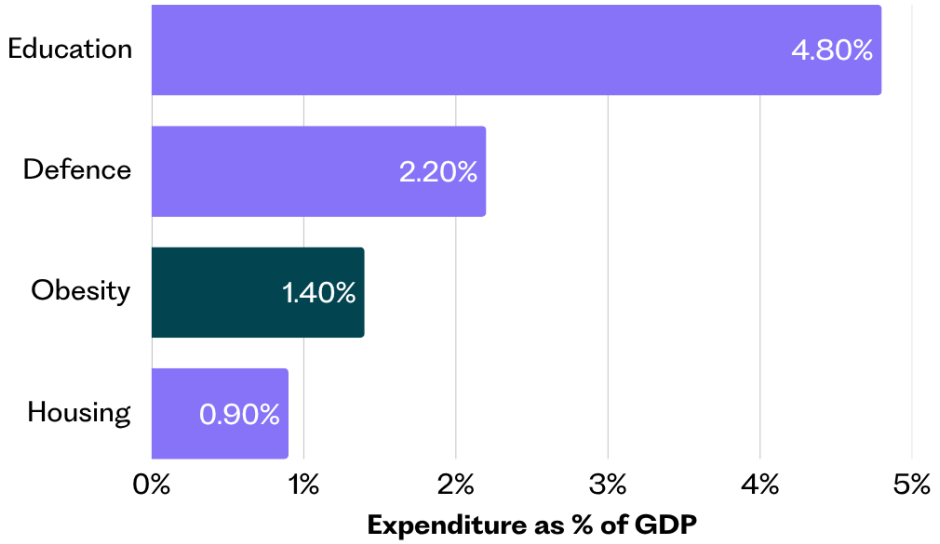


Elevated BMI costs the UK an estimated £33.8 billion annually (£488 per capita), split between £14.2 billion in direct costs (42%) and £19.6 billion in indirect costs (58%). Direct costs are driven by digestive diseases (£3.2bn), diabetes mellitus type 2 (£3.1bn), cardiovascular disease (£2.6bn), and chronic kidney disease (£2.3bn), among others.

On the indirect side, economic inactivity is the largest component at £7.8 billion, followed by presenteeism (£5.4bn), informal care (£2.6bn), absenteeism (£2.4bn), and premature mortality (£1.4bn). That the UK's indirect burden is most reflected in the cost of economic inactivity reflects the high base rate of economic inactivity due to illness in the UK, which has risen in the UK but fallen in other European countries since the COVID-19 pandemic (Office for Budget Responsibility, 2023). Moreover, the UK's absenteeism rates are amongst the lowest in European countries, meaning obesity-related absenteeism is also lower in our analysis (Institute for Public Policy Research, 2024).

Overall, expenditure related to elevated BMI amounts to roughly 1.4% of GDP, exceeding housing spending and representing more than half the defence budget.

Figure 9 Expenditure as % of GDP by government sector, 2024; UK



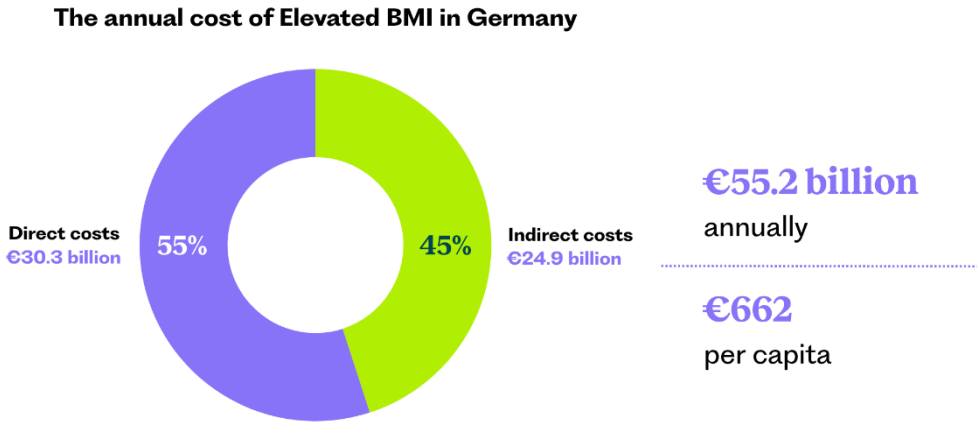
Policy context

Alongside ongoing structural reforms within the NHS and Department of Health, NICE has approved three pharmacological therapies for weight management through the NHS, signalling a shift towards recognising pharmacotherapy as a legitimate component of obesity care (NICE, 2025). However, NHS access to pharmacological therapies remains severely restricted due to supply constraints, strict eligibility criteria, and a phased rollout that limits access. In particular, GP practices are not mandated to prescribe, meaning access may vary significantly between practices (NHS England, 2026). There is also significant geographical variation in bariatric surgery commissioning, with 31% of Integrated Care Systems applying more restrictive criteria than recommended by NICE guidance, and some parts of England lacking bariatric surgery units entirely (Elhariry et al., 2025). This multi-tiered pathway to surgery means some patients can face total waits of up to five years (Elhariry et al., 2025).

3.4.2 Germany

Elevated BMI costs Germany €55.2 billion per year

Figure 10 Direct and indirect cost breakdown, Germany

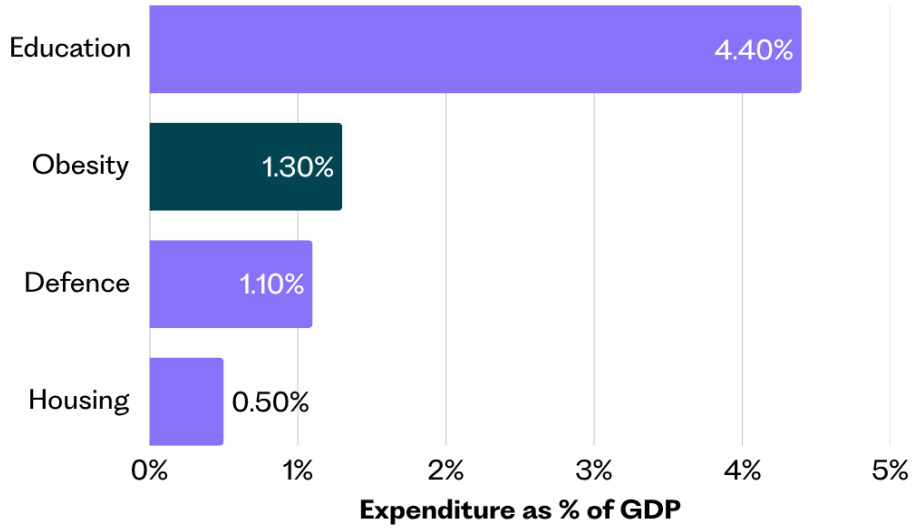


Elevated BMI costs Germany an estimated €55.2 billion annually (€662 per capita), split between €30.3 billion in direct costs (55%) and €24.9 billion in indirect costs (45%). Direct costs are driven by cardiovascular disease (€8.7bn), chronic kidney disease (€8.3bn), musculoskeletal diseases (€6.1bn), and diabetes mellitus type 2 (€3.8bn), among others.

On the indirect side, absenteeism is the largest component at €8.7 billion, followed by economic inactivity (€6.8bn), presenteeism (€4.3bn), informal care (€3.4bn), and premature mortality (€1.7bn). Germany's indirect burden is most affected by the cost of absenteeism, reflecting that workers in Germany take a large number of days of off sick relative to other European countries, possibly owing to the more generous sick pay policies in Germany (The Economist, 2025). Germany also has relatively high inactivity rates, which are another component driving large indirect costs.

Overall, expenditure related to elevated BMI amounts to roughly 1.3% of GDP, exceeding housing and the defence budget in 2024.

Figure 11 Expenditure as % of GDP by government sector, 2024; Germany



Policy context

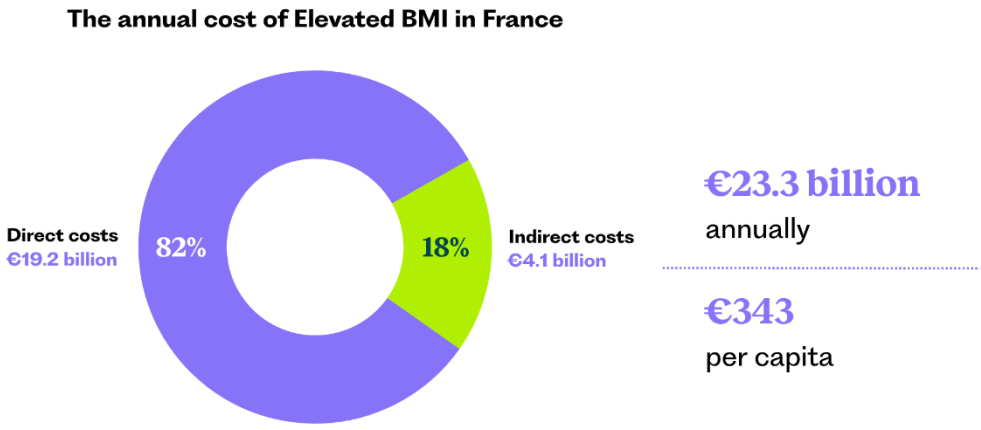
Germany launched a Disease Management Programme (DMP) for adults with obesity in mid-2024, marking the first time obesity has been formally integrated into the country's structured chronic disease management framework (World Obesity Federation, 2024). The DMP framework for obesity is possible since Germany has recognised obesity as a disease, and is therefore legally anchored in Germany's fifth book of the Social Code (SGB V) under § 137f as a structured treatment programme for chronic diseases (G-BA, 2022). Germany also has preventive health check-ups, fully covered for adults with statutory health insurance that can be claimed between 18-34 and every three years from age 35 onwards (Venzaziel, 2025). The programme is designed to assess individual risk factors and support early detection of cardiovascular disease, kidney disease and diabetes mellitus type 2. There is an opportunity to link identification of obesity as a risk factor to optimal obesity management initiatives via this programme.

However, barriers remain for DMP implementation. These include the need for regional negotiations between statutory health insurers and physician associations, as well as the lack of legal confirmation on how contracts will be implemented. Moreover, §34(1) of the German Social Code Book V (Sozialgesetzbuch V — SGB V) still classifies obesity management medicines (OMMs) as "lifestyle", prohibiting their reimbursement by statutory health insurance (Bundesminiterium der Justiz und für Verbraucherschutz, 1988; Lautenbach et al., 2026). Although bariatric surgery is reimbursable, only a small proportion of patients with morbid obesity in Germany have access to it, largely due to the restrictive attitude of health insurance companies regarding cost coverage and inconsistent eligibility decisions across insurers (Auf der Maur et al., 2022). For the above initiatives to translate into effective obesity care across the whole spectrum from prevention to treatment, wider reimbursement of such interventions is necessary.

3.4.3 France

Elevated BMI costs France €23.3 billion per year

Figure 12 Direct and indirect cost breakdown, France

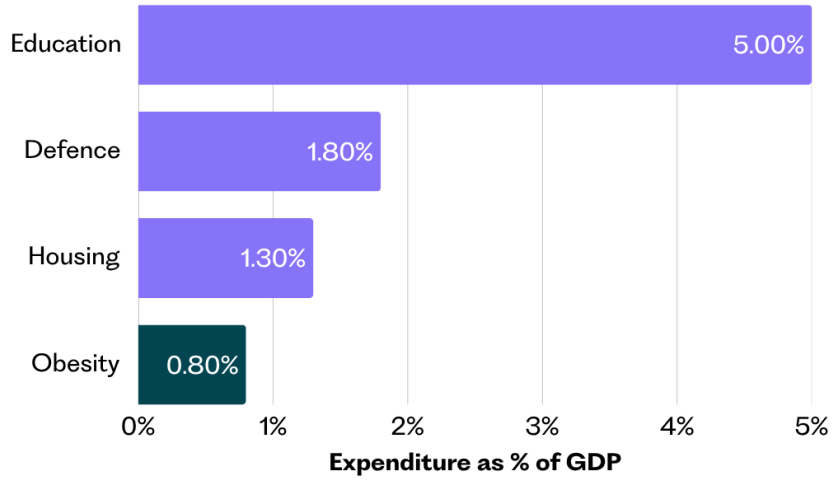


Elevated BMI costs France an estimated €23.3 billion annually (€343 per capita), split between €19.2 billion in direct costs (82%) and €4.1 billion in indirect costs (18%). Direct costs are driven by musculoskeletal diseases (€6.9bn), diabetes mellitus type 2 (€4.9bn), cardiovascular disease (€3.2bn), and digestive diseases (€1.0bn), among others.

On the indirect side, economic inactivity is the largest component at €1.1 billion, followed by informal care (€1.0bn), presenteeism (€0.9bn), absenteeism (€0.6bn), and premature mortality (€0.6bn). France's indirect burden is particularly low relative to its direct burden, owing to a combination of factors. The prevalence of elevated BMI in France is the lowest among our study countries, according to the NCD Risk Factor Collaboration (Phelps et al., 2024), although national sources, including the Feuille de route obésité 2026—2030, report higher adult obesity prevalence in France (up to 18%, based on self-reported survey data) than the measured-data estimates used in this analysis (approximately 10%). The NCD-RisC trend for French women has also been debated (Ezzati et al., 2024; Czernichow et al., 2024). To maintain cross-country comparability, we retain the NCD-RisC estimates. However, if national data more accurately reflect current prevalence, the burden estimates presented for France may be conservative. This is particularly relevant for older working-age adults, among whom the prevalence of elevated BMI is highest. However, employment rates decline substantially among those aged 55-69 years, limiting the scope for productivity-related costs attributable to elevated BMI (INSEE, 2026, sect.Labour Force Survey 2025).

Overall, expenditure related to elevated BMI amounts to roughly 0.8% of GDP, approximately half the defence budget.

Figure 13 Expenditure as % of GDP by government sector, 2024; France



Policy context

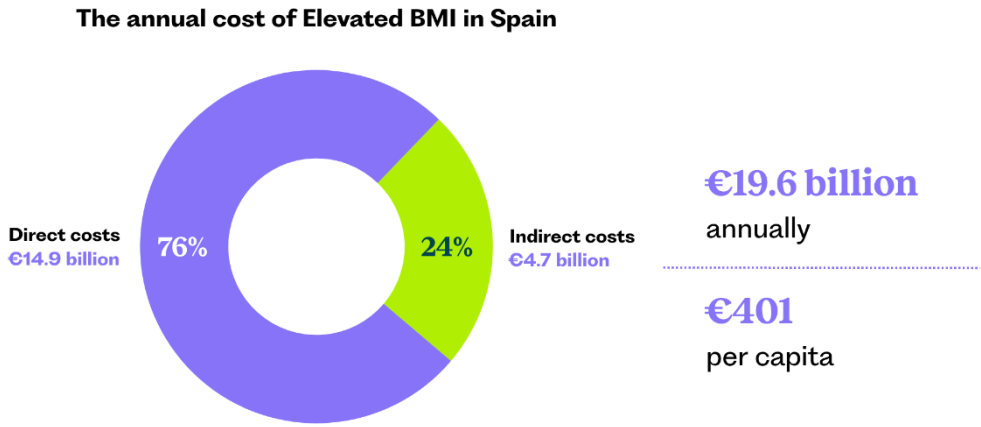
France has launched the Roadmap for the Care of People Living with Obesity 2026—2030, confirming obesity as a top public health priority, positioning it as a chronic condition requiring structured, multidisciplinary management (Ministère de la Santé, de la Famille, de l'Autonomie et des Personnes handicapées, 2026). The strategy aims to address the fragmentation and unequal access to care identified in previous plans. It focuses on secondary and tertiary prevention, while primary prevention remains with the Programme National Nutrition Santé (PNNS). France also provides preventive health check-ups (Mon Bilan Prévention), which are fully covered for insured persons in selected age groups (l'Assurance Maladie, 2026), and France recently introduced a "reinforced coordinated care pathway" for complex obesity (parcours coordonné renforcé obésité, PCR) that enables eligible patients to access consultations from dietitians, physical activity professionals, and psychologists (Légifrance, 2026). The pathway requires medical prescription and lasts for two years. France was also the first EU member to reimburse medications for those with BMI ≥35 + comorbidity, or BMI ≥40 (Jacobsen et al., 2026).

However, barriers remain. The coordinated care pathway is currently designed only for individuals with complex obesity (Légifrance, 2026), and reimbursement of medications is limited to prescriptions initiated by level 2/3 specialist care centres (Service Public, 2026). Reimbursement is second-line, conditional on documented failure of nutrition management (Légifrance, 2026). This focuses demand on already-stretched specialist services and limits timely uptake for people living in underserved areas — a concern compounded by France's documented 'medical deserts' context (Légifrance, 2026; Ministère de la Santé, de la Famille, de l'Autonomie et des Personnes handicapées, 2026; Queneau and Ourabah, 2023). In addition, broader training of healthcare professionals in obesity management remains limited, although this is a core objective of the 2026-2030 Roadmap and is expected to be operationalised in the coming period (Ministère de la Santé, de la Famille, de l'Autonomie et des Personnes handicapées, 2026). Uptake of Mon Bilan Prévention assessments remains limited, with only a small proportion of the eligible population receiving an assessment between 2024 and 2026 (Le Houerou, 2026). At the same time, France has one of Europe's most established bariatric surgery programmes, with more than 600,000 individuals having undergone surgery, equivalent to approximately 1% of the adult population (Paccou et al., 2022). Nevertheless, access to bariatric surgery remains uneven, with disparities by socioeconomic status and geography (Benamran et al., 2024).

3.4.4 Spain

Elevated BMI costs Spain €19.6 billion per year

Figure 14 Direct and indirect cost breakdown, Spain



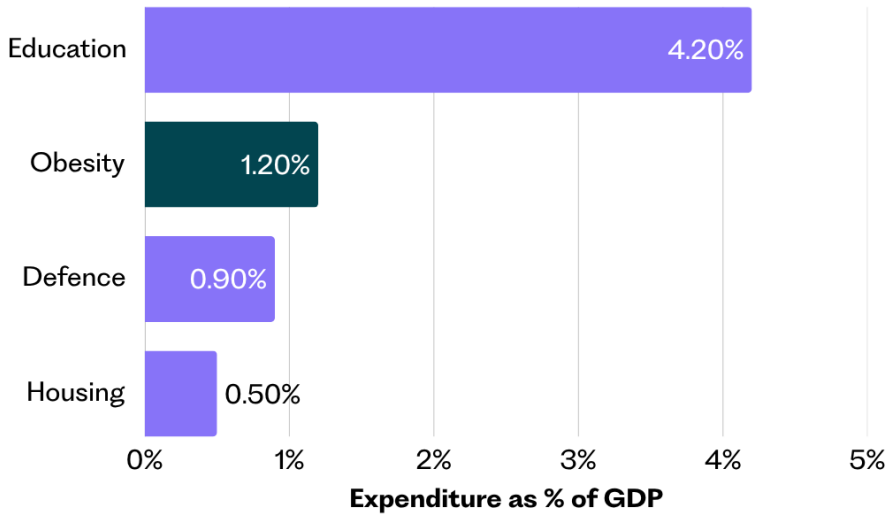
Elevated BMI costs Spain an estimated €19.6 billion annually (€401 per capita), split between €14.9 billion in direct costs (76%) and €4.7 billion in indirect costs (24%). Direct costs are driven by musculoskeletal diseases (€4.3bn), diabetes mellitus type 2 (€3.0bn), cardiovascular disease (€2.7bn), and chronic kidney disease (€1.7bn), among others.

On the indirect side, absenteeism and economic inactivity are each €1.3 billion, followed by presenteeism (€0.9bn), informal care (€0.9bn), and premature mortality (€0.3bn), showing somewhat balanced contributions across productivity categories. Moderate prevalence and high absenteeism rates translate into a substantial productivity burden related to elevated BMI. However, Spain's indirect costs are about a third of direct costs, which is lower than some countries in our analysis. This is due to a combination of lower wages and low employment rates, which reduce the value and scope of the productivity impact of elevated BMI (EURES, 2025).

Overall, expenditure related to elevated BMI amounts to roughly 1.2% of GDP, exceeding defence and housing spending.

Another Spanish study (Pereira-Bouzas et al., 2025), seeking to estimate the potential economic and social value that could be generated by achieving different degrees of weight loss, has suggested the economic benefits of weight-loss (in contrast to our estimate of the economic costs of elevated BMI) could be up to €292 billion. We review other reports estimating the economic burden of elevated BMI in the discussion section.

Figure 15 Expenditure as % of GDP by government sector, 2024; Spain



Policy context

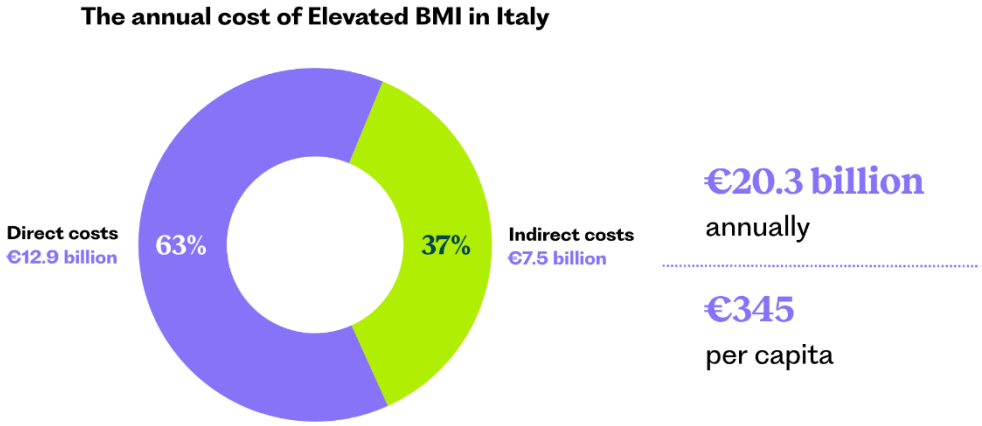
Spain has recently approved the Development Document of the Spanish Chronicity Strategy 2025-2028, in which obesity is highlighted as a priority health problem (Ministerio de Sanidad, 2025). Strategic Line 4 of this strategy states that the health system will adopt a comprehensive approach to obesity, strengthening prevention and control through healthier environments and lifestyles. The strategy emphasises the need for comprehensive assessments beyond BMI and optimised, individualised treatment delivered by interdisciplinary teams and supported by community resources. Importantly, the approach also addresses comorbidities, social determinants, destigmatisation, and psycho-emotional factors, such as anxiety, depression, and low self-esteem, particularly in vulnerable populations.

However, barriers remain for effective care around elevated BMI across the management continuum, from prevention to more targeted treatment. Spain currently excludes obesity management medications (OMMs) from public funding through the national health system (Sistema Nacional de Salud, or 'SNS'), preventing access to pharmacological treatment for the broader population living with obesity (Carmo, Justamante and Callejo-Velasco, 2026). Access to bariatric surgery within the public system is primarily characterised by long waiting lists, regional disparities, and limited resources (Arteaga-González et al., 2018). Improved access to such interventions will be necessary for these initiatives to translate into effective obesity management.

3.4.5 Italy

Elevated BMI costs Italy €20.3 billion per year

Figure 16 Direct and indirect cost breakdown, Italy

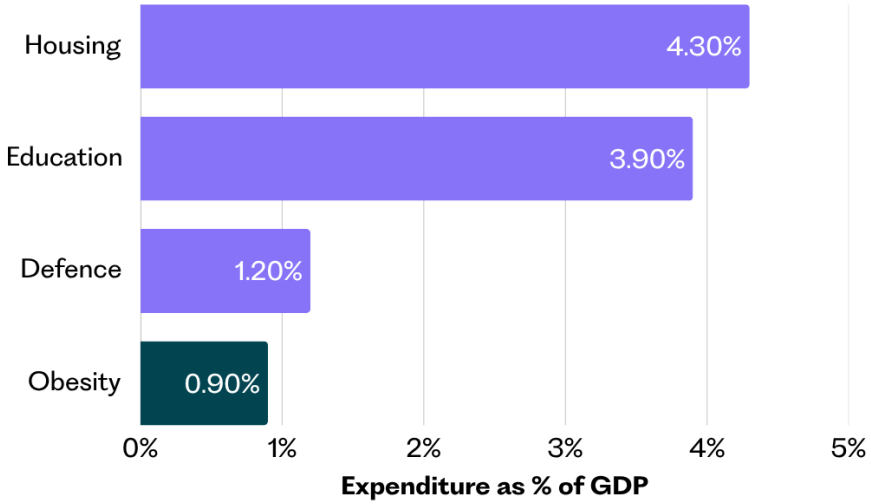


Elevated BMI costs Italy an estimated €20.3 billion annually (€345 per capita), split between €12.9 billion in direct costs (63%) and €7.5 billion in indirect costs (37%). Direct costs are driven by diabetes mellitus type 2 (€3.8bn), musculoskeletal diseases (€2.5bn), cardiovascular disease (€2.5bn), and digestive diseases (€1.5bn), among others.

On the side of indirect costs, absenteeism is the largest component at €2.4 billion, followed by presenteeism (€1.7bn), informal care (€1.4bn), economic inactivity (€1.2bn), and premature mortality (€0.7bn). Italy's indirect burden is most reflected in the cost of absenteeism, reflecting that workers in Italy take a relatively large number of days of absenteeism. Moreover, employment rates in Italy are increasing at later ages, when obesity prevalence is highest, meaning obesity is impacting productive workers (OECD, 2025b).

Overall, expenditure related to elevated BMI amounts to roughly 0.9% of GDP, approaching the amount of government spending on defence.

Figure 17 Expenditure as % of GDP by government sector, 2024; Italy



Policy context

Italy recently approved a law to recognise obesity as a chronic, progressive, relapsing disease rather than a lifestyle issue (Bifulco, Pagano and Zazzo, 2025), making it the first country to do so within a codified legislative framework. It mandates that individuals with obesity have a right to access services included within Italy's Essential Levels of Assistance (LEA). It also establishes the Observatory for the Study of Obesity (Osservatorio per lo studio dell'obesità, OSO) under the Ministry of Health (Parlamento italiano, 2026). The OSO is tasked with monitoring and studying healthy lifestyle, contributing to the national prevention and treatment programme, verifying implementation by regions and autonomous provinces, and presenting an annual report to Parliament on epidemiological and diagnostic-therapeutic data alongside new scientific evidence on obesity. The Observatory has recently moved into its implementation phase (Ministero della Salute, 2026), although the Observatory operates with minimal dedicated resources and uses existing Ministry staff and infrastructure. It receives no additional public funding, and its members are unpaid. These resource constraints contrast with the broad remit assigned to the Observatory under the law.

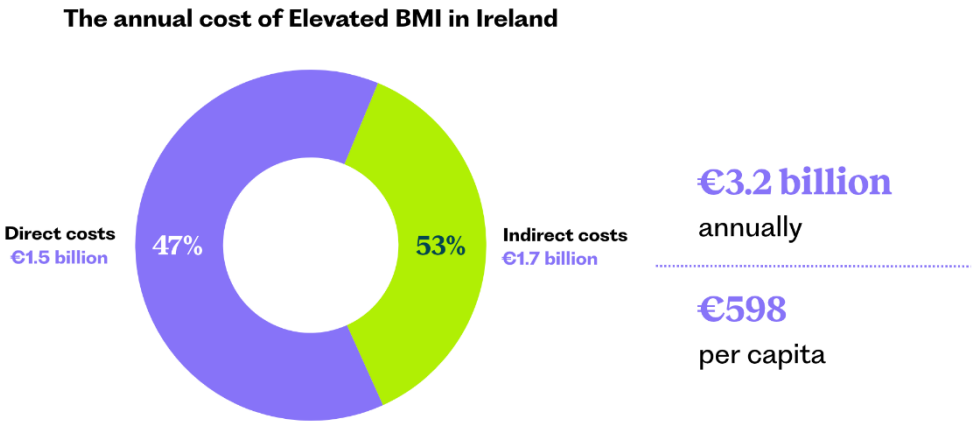
Italy has also established a dedicated structural Obesity Fund that provides ring-fenced funding for addressing obesity (European Observatory on Health Systems and Policies, 2025). The updated National Chronic Disease Plan adds obesity, alongside epilepsy and endometriosis, to the ten conditions covered since 2016, bringing the total to thirteen. Separately, the PNP 2026-2031, adopted by State-Regions Agreement in 2026, includes obesity among its areas of focus.

However, there are barriers to translating this new law into effective obesity care. Although the law recognises the right of people with obesity to access "Essential Levels of Assistance" (LEA) services, obesity has not been formally included within the LEA, potentially leading to a lack of access for people living with obesity (Gobbi, 2025). It will also fall on Italian regions to ensure LEA services are available, which may take considerable time and resources (SISMED, 2025). The dedicated funding is so far symbolic in magnitude, but may mark the start of a structured path forward. To translate these initiatives into effective obesity management, formal inclusion of obesity in the LEA will be necessary, along with adequate resourcing across the management continuum.

3.4.6 Ireland

Elevated BMI costs Ireland €3.2 billion per year

Figure 18 Direct and indirect cost breakdown, Ireland



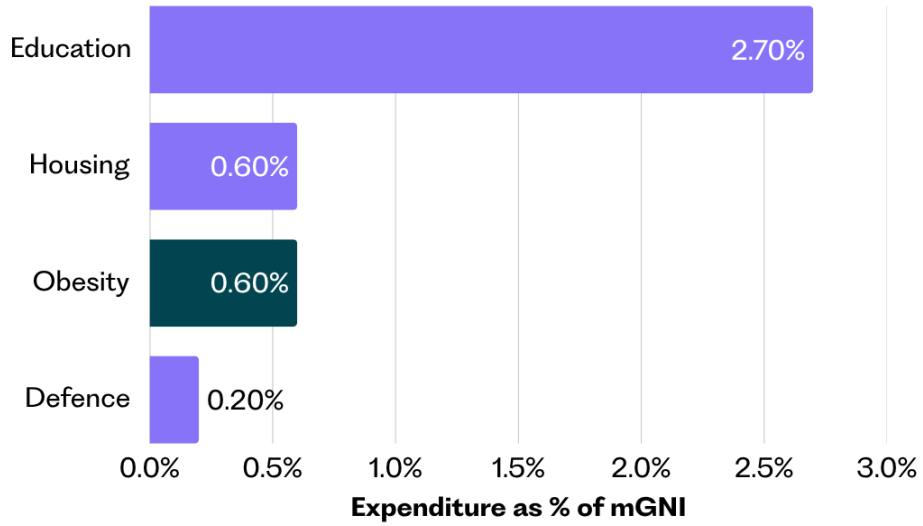
Elevated BMI costs Ireland an estimated €3.2 billion annually (€598 per capita), split between €1.5 billion in direct costs (47%) and €1.7 billion in indirect costs (53%). Direct costs are driven by diabetes mellitus type 2 (€0.5bn), musculoskeletal diseases (€0.4bn), and digestive diseases (€0.2bn), among others.

On the indirect side, economic inactivity is the largest component at €0.7 billion, followed by presenteeism (€0.4bn), informal care (€0.3bn), absenteeism (€0.2bn), and premature mortality (€0.1bn). The burden of elevated BMI in Ireland is most reflected in the cost of economic inactivity due to high base rates of economic inactivity due to illness. This may reflect the high prevalence of people with disabilities and the employment gap between those with and without disabilities in Ireland (Eurostat, 2025).

Overall, expenditure related to elevated BMI amounts to roughly 1.1% of modified Gross National Income (mGNI)[2], matching housing spending and equalling more than double defence spending.

[2] *For Ireland, expenditure shares are expressed in terms of modified Gross National Income (mGNI) rather than Gross Domestic Product (GDP), as for the other countries. A large share of Irish GDP is based on multinational activity, and mGNI better reflects the resources available to the domestic economy.*

Figure 19 Expenditure as % of modified GNI by government sector, 2024; Ireland



Policy context

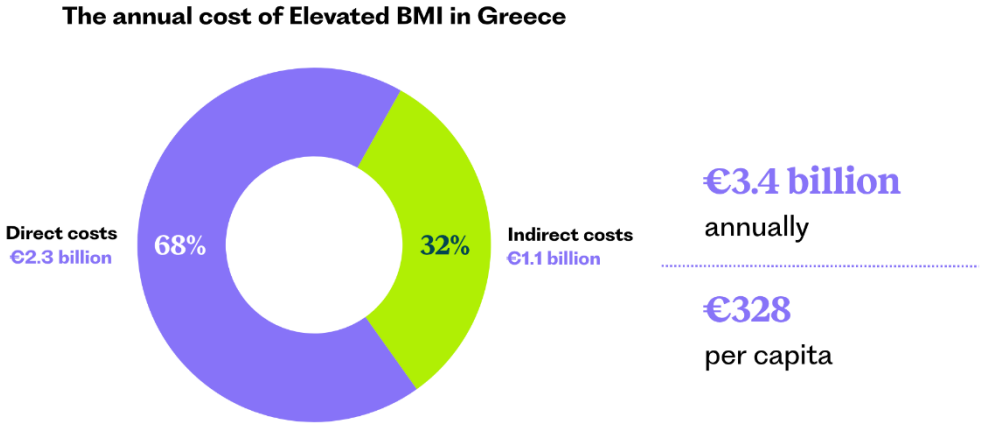
Ireland is currently developing a new strategy to address obesity, with a focus on prevention, treatment and community support (Department of Health, 2026). The plan is an update of the existing national Obesity Policy and Action Plan 2016-2025, 'A Healthy Weight for Ireland', which was developed to address policy and intervention options for promoting healthy eating and preventing and managing overweight and obesity (Department of Health, 2026a). The HSE Chronic Disease Management (CDM) Treatment Programme in General Practice has helped over 400,000 eligible patients living with diabetes mellitus type 2, COPD, asthma and cardiovascular illness since 2020 (Health Service Executive, 2025). During that time, 51% of new chronic disease diagnoses have been made through the programme, and enrolled patients experienced 30% fewer ED attendances, 26% fewer hospital admissions, and 33% fewer GP out-of-hours attendances compared to their pre-enrolment rates (Health Service Executive, 2025). By shifting the focus toward prevention and early intervention, the programme is redefining healthcare delivery and promoting sustainable healthcare practices.

However, barriers remain for effective obesity care in Ireland. Despite the success of the HSE Chronic Disease Management (CDM) Programme, obesity is not currently included as a condition within it — the programme covers only diabetes mellitus type 2, COPD, asthma and cardiovascular disease (Lynch, 2025). Whether obesity should be incorporated into the CDM programme remains a matter of ongoing debate, although 85% of surveyed GPs have expressed support for its expansion to include obesity (Tandan et al., 2022). Furthermore, reimbursement by state schemes of pharmacological therapies remains limited and only for patients meeting strict clinical criteria (Lynch, 2025). Experts also say the level of bariatric surgery delivery is too low (Lynch, 2025).

3.4.7 Greece

Elevated BMI costs Greece €3.4 billion per year

Figure 20 Direct and indirect cost breakdown, Greece

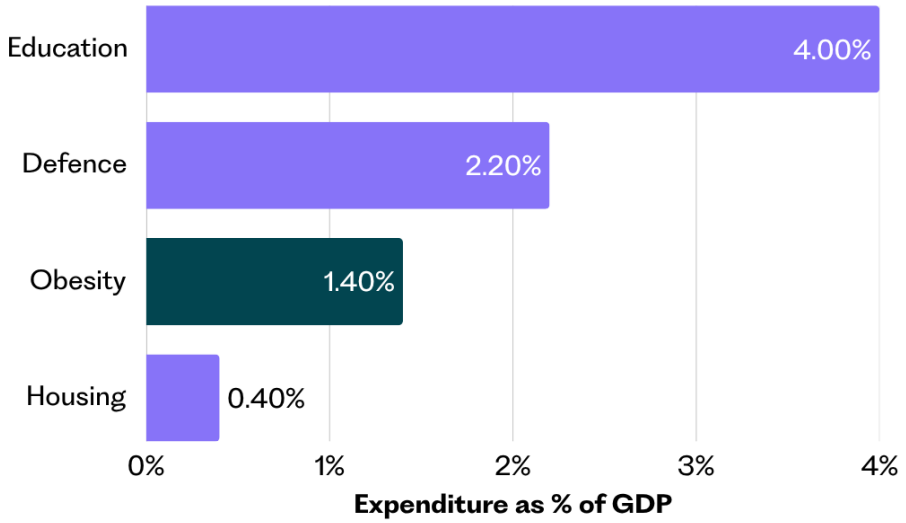


Elevated BMI costs Greece an estimated €3.4 billion annually (€328 per capita), split between €2.3 billion in direct costs (68%) and €1.1 billion in indirect costs (32%). Direct costs are driven by diabetes mellitus type 2 (€0.9bn), musculoskeletal diseases (€0.4bn), and cardiovascular disease (€0.2bn), among others.

On the indirect side, absenteeism and presenteeism are each €0.3 billion, followed by informal care (€0.2bn), economic inactivity (€0.1bn), and premature mortality (€0.1bn). Absenteeism rates are relatively high in Greece, which drives its indirect cost burden. Greece's low employment rate for later working ages, where the prevalence of elevated BMI is highest, means there is less scope for productivity-related costs due to obesity. This combined with Greece's low rates of economic inactivity due to illness leads to relatively lower indirect costs.

Overall, expenditure related to elevated BMI amounts to roughly 1.4% of GDP, exceeding housing spending and representing more than half of the defence budget.

Figure 21 Expenditure as % of GDP by government sector, 2024; Greece



Policy context

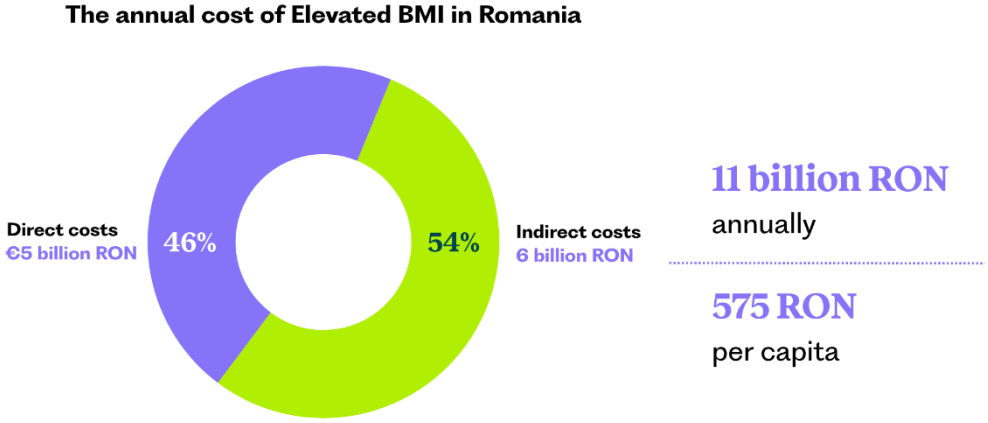
Greece's new national cardiovascular and metabolic risk screening programme, the "*Prolambano*", launched in February 2025, offers free and comprehensive cardiometabolic health checks for all adults aged 30 to 70 (European Commission, 2026b). Since December 2025, the programme has been expanded to include free access to pharmacological therapies for eligible individuals (National Electronic Health Record Project, 2025). Eligibility requires a BMI over 40 or between 37 and 40 with a related comorbidity, a medical assessment, and participation in a supervised nutritional counselling programme. Alongside this, a free digital application has been introduced to encourage healthy habits and family-based physical activity, with a particular focus on tackling childhood obesity.

However, barriers remain for effective management and treatment of elevated BMI in Greece. While the *Prolambano* programme now offers free access to pharmacological therapies, eligibility is confined to individuals with very high BMI thresholds, excluding the broader population living with obesity (Koutroumpis, 2025).

3.4.8 Romania

Elevated BMI costs Romania 11 billion RON per year (€ 2.5 billon)

Figure 22 Direct and indirect cost breakdown, Romania

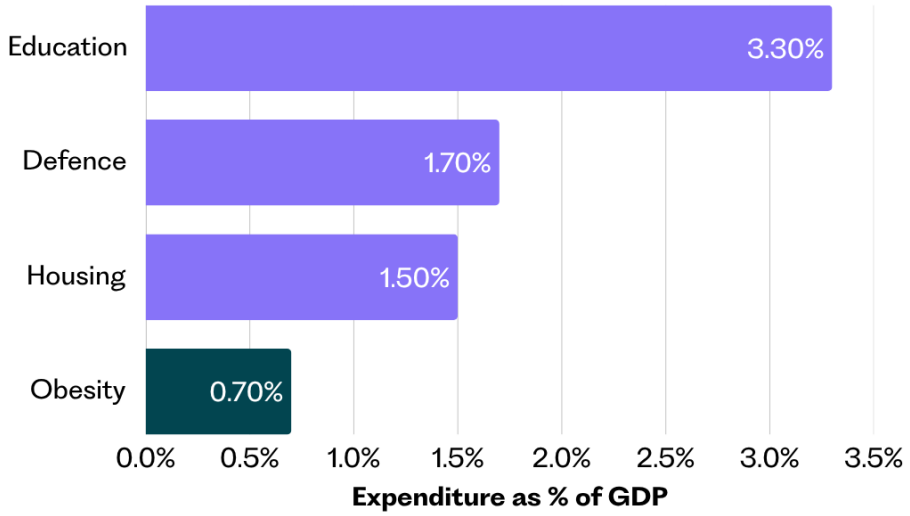


Elevated BMI costs Romania an estimated 11 billion RON (€2.5 billion) annually (575 RON, or €131, per capita), split between 5.0 billion RON (€1.1 billion) in direct costs (46%) and 6.0 billion RON (€1.4 billion) in indirect costs (54%). Direct costs are driven by cardiovascular disease (2.4bn RON/€0.5bn), musculoskeletal diseases (1.0bn RON/€0.2bn), and diabetes mellitus type 2 (0.4bn RON/€0.1bn), among others.

On the indirect side, presenteeism is the largest component at 2.3 billion RON (€0.5bn), followed by absenteeism (1.5bn RON/€0.4bn) and economic inactivity (1.0bn RON/€0.2bn), premature mortality (0.7bn RON/€0.2bn), and informal care (0.4bn RON/€0.1bn). Romania has a low per-capita cost for obesity, which is likely reflective of the low percentage of GDP spent on healthcare (OECD, 2025c), as well as lower employment rates at older ages. They also have modest rates of economic activity and absenteeism.

Overall, expenditure related to elevated BMI amounts to roughly 0.7% of GDP, representing almost half of the housing and defence spending budgets.

Figure 23 Expenditure as % of GDP by government sector, 2024; Romania



Policy context

In 2022, the Romanian Government published the National Health Strategy 2022-2030, which aims to address the burden of chronic diseases in an integrated manner (Ministerul Sănătății, 2022). The strategy includes a workstream on screening programmes currently implemented at the regional level, including those for cardiovascular diseases, funded via EU funds. The strategy also aims to restructure the primary care level, which currently focuses on acute treatment and monitoring of chronic patients, with less emphasis on prevention and the integrated management of chronic diseases.

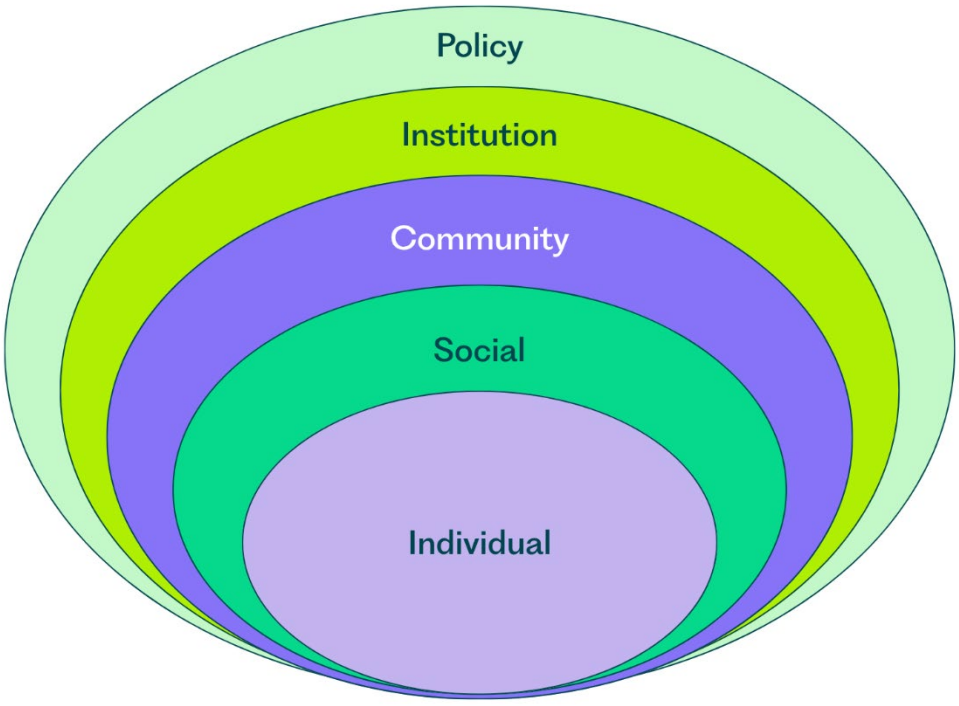
However, the Romanian healthcare system is heavily underfunded with the lowest per-capita health expenditure in the EU, limiting the fiscal space to invest in new management programmes and treatment pathways, including for elevated BMI (OECD, 2025c).

4 Opportunities for investment in obesity management

Our estimates of the health and economic burdens attributable to elevated BMI illustrate the potential benefits of better prevention, earlier detection, and effective disease management to individuals, health systems and society. The persistent upward trend in BMI over the last 50 years also demonstrates that historical approaches to prevention and management have not had the desired impact (WHO, 2023d; EPRS, 2025), although we acknowledge that counterfactual rates of elevated BMI in the absence of any such interventions are not known.

As we have discussed, overweight and obesity are driven by complex interactions between genetic, lifestyle, cultural, institutional and policy factors (Shah et al., 2025). To date, however, most strategies have narrowly framed the consequences of elevated BMI as an issue of individual choice rather than a chronic, relapsing-remitting disease (Ehlers et al., 2025; Souza et al., 2023; McLaughlin et al., 2024; Dorfman and Wallack, 2007). Addressing overweight and obesity therefore requires a comprehensive, multifactorial approach ("obesity strategy") that consciously situates individuals within the wider external social, community, institutional, and political contexts, as visually represented in Figure 24.

Figure 24. Conceptual framework for understanding the multifactorial influences of overweight and obesity, adapted from Kelly et al. (2021) and WHO (2023c)



Thus, the most effective and sustainable obesity strategies act across multiple levels of influence, recognising the individual underpinnings of the disease while supporting people in their interactions across different social, community, institutional and policy contexts (Kelly, 2021). At the social level, this can include influencing peer and family networks and dynamics. At the community-level, this may involve changes in the local context, including access to healthy food and opportunities for movement. However, these actions must operate within policy and institutional environments that strengthen and sustain prevention and treatment efforts.

As emphasised by the WHO, appropriate policy and institutional contexts are essential foundations to equitable and effective obesity strategies (WHO, 2023e). These include promoting healthy behaviours through guidelines, nutrition labelling, marketing restrictions, and fiscal measures such as taxes on sugar-sweetened beverages and subsidies on healthy food (WHO, 2023b; European Commission, 2013; IARC, 2025; EACH, 2025; WHO, 2022). However, many such initiatives still implicitly put the responsibility on the individual to make better choices within an unchanged policy, institutional and community environment (Ralston, Godziewski and Carters-White, 2023; Chung et al., 2026). An optimal obesity strategy needs to shift at least some responsibility and accountability to the community, institutional and policy contexts (Chung et al., 2026).

Critically, such a shift also requires recognising the role of active treatment in managing elevated BMI. The increasing burden of obesity demonstrates a need to go beyond current preventative approaches, but availability and access to treatment remains limited in many European countries (Craig et al., 2018; Evans et al., 2023).

Incorporating treatment into obesity policy ensures key gaps in current intervention provision are addressed:

- **Move beyond a narrow focus on prevention and lifestyle interventions** — Obesity interventions should support patients across a continuum — from prevention to early detection of elevated BMI, to active treatment and long-term management. While prevention policies alone may help some individuals maintain a healthy BMI, those already living with elevated BMI require more deliberate and targeted interventions (Kheniser, Saxon and Kashyap, 2021). Effective options include intensive behavioural and lifestyle therapies, pharmacological treatment, and metabolic and bariatric surgery (MBS). The most effective intervention at each phase will depend on disease severity, individual needs and safety considerations.

- **Address the relapsing nature of obesity** — Weight regain after initial loss is common for people living with obesity. Sustainable treatment may therefore be required to help patients move beyond one-time weight reduction towards longer-term health improvements, with pharmacotherapy providing an option (American Diabetes Association Professional Practice Committee for Obesity, 2026). To facilitate long-term treatment approaches, health systems must adopt chronic-care models and policies that recognise the complex and multifactorial nature of obesity (Golden, 2020), in line with broader EU strategies for other chronic diseases, such as the European Code Against Cancer and the EU Beating Cancer Plan (IARC, 2025; European Commission, 2021), and the EU Safe Hearts Plan (European Commission, 2025).

- **Facilitate early intervention to improve long-term trajectories** — Childhood and adolescence represent critical windows for intervention: more than half (55%) of children with elevated BMI go on to live with obesity in adolescence, and 80% of them will continue to live with obesity in adulthood (Simmonds et al., 2016). Furthermore, less than 15% of youth with elevated BMI lose this weight as adults, underscoring the chronic, progressive nature of the condition (Torbahn et

al., 2025). Age-appropriate interventions, delivered early and with sufficient intensity can modify long-term trajectories and mitigate later metabolic consequences (Salama, Hassan and Kumar, 2025).

Given the expansion and diversification of the treatment landscape in recent years, the following section highlights some of the available strategies and interventions, spanning behavioural and lifestyle modification, pharmacotherapy and MBS. This section illustrates options within the developing intervention landscape, including lifestyle, medical and surgical interventions, but it is not intended as a full review of the evidence or of the relative advantages and disadvantages of different options. This section should not be interpreted as clinical advice.

4.1 Lifestyle modification interventions

Box 1 Overview of behavioural and lifestyle interventions: evidence and current recommendations

Even with the emergence of more treatment options, behavioural and lifestyle modification interventions will still be the foundation of any obesity management strategy for youth or adults (Moiz et al., 2025). These may consist of promoting changes in physical activity and/or nutritional practices, and behavioural therapies. Examples include intensive structured interventions, and app-based treatment programmes drawing on nutrition, exercise, and behavioural therapy (Roth et al., 2023; Ranucci et al., 2017; WHO, 2022).

Clinical trial data on intensive lifestyle interventions indicate short-term weight loss at a low cost with a low risk of complications and minimal invasiveness (Machado et al., 2022; Heeren et al., 2023).

However, evidence also shows that achieving and significant and sustained weight loss via lifestyle interventions without further intervention is difficult, given the chronic relapsing nature of obesity and the complex interaction of environmental, genetic, and psychosocial risk factors (WHO, 2022; Ells et al., 2018). Evidence suggests lifestyle interventions alone are associated with limited weight loss and a high likelihood of long-term relapse, with many individuals regaining lost weight - and sometimes exceeding their starting weight - after initial weight loss (Sharma, 2023; Machado et al., 2022; Nordmo, Danielsen and Nordmo, 2020; Ells et al., 2018). Weight regain following diet-induced weight loss is particularly common, and overshooting baseline weight is frequently observed following short-term intensive dietary interventions (Dulloo, Jacquet and Montani, 2012; Ochner et al., 2013).

Considerations around behavioural and lifestyle interventions:

- Behavioural and lifestyle interventions are not a specific treatment for obesity: all individuals, regardless of body size or composition, would benefit from embracing healthy diets and regular physical activity (Wharton et al., 2020; WHO, 2020, 2025b). Behavioural and lifestyle interventions can provide an important platform for other more structured obesity care interventions (WHO, 2025b). While some people may succeed in losing weight with intensive behaviour and lifestyle modification alone, most people living with overweight or obesity require more targeted intervention (Kheniser, Saxon and Kashyap, 2021).

- Structured, intensive lifestyle interventions show some success in clinical trial settings and are recommended in treatment guidelines, but these are often challenging to implement at scale in routine care due to high resource requirements, inappropriate funding models or reimbursement, and the substantial time commitment and engagement required for success (Lingvay et al., 2024; Frood et al., 2013).

- Behavioural and lifestyle interventions are primarily focused on individual responsibility and choice, and often fail to tackle obesity's complex aetiology (multifactorial influences including genetic variants, psycho-social factors, and the obesogenic environment) and chronicity (high relapse rates) (Machado et al., 2022; WHO, 2025b; Shah et al., 2025).

- While there is evidence of weight loss associated with behavioural and lifestyle interventions in clinical trial setting, a cause-effect link in real-world settings can be difficult to establish. High heterogeneity and variable effects of behavioural and lifestyle interventions generate complexity in causal attribution (Salam et al., 2020). The heavy reliance on adherence, action through multiple, diffuse, and indirect mechanisms, and measurement concerns related to key 'dosing' variables (such as caloric intake and physical activity) in behavioural and lifestyle interventions complicate causal attribution (Oliveira et al., 2025; Lingvay et al., 2024).

4.2 Pharmacological interventions

Box 2 Overview of pharmacological interventions: evidence and current recommendations

Medications ('pharmacotherapies') for weight loss and long-term obesity management are increasingly available. Such pharmacotherapy can augment weight loss beyond what lifestyle and behaviour changes alone can attain and can support the long-term management of obesity as a chronic, relapsing condition (WHO, 2022). The pharmacotherapy landscape continues to evolve: there are several established pharmacological interventions, and "a new generation of powerful therapies is revolutionising management options" (Lingvay et al., 2024). While older pharmacological interventions generally produce modest weight loss (around 3-9% of body weight), evidence indicates that novel pharmacotherapy options may achieve greater reductions (around 6-22% of body weight). Greater weight loss offers greater health benefits, including reduced risk of diabetes, as well as cardiometabolic benefits, thereby demonstrating cost-effectiveness and potential cost savings in some settings (WHO, 2025b; Lingvay et al., 2024; Moiz et al., 2025; Papantoniou and Maniadakis, 2025; Silva Miguel et al., 2024; Sandhu et al., 2023; Aon, 2026).

Pharmacological interventions (pharmacotherapy) are generally recommended for individuals with BMI ≥ 30 or with BMI ≥ 27 kg/m2 with obesity-related complications in Europe (WHO, 2022). The WHO has issued conditional recommendation for the use of novel pharmacotherapy options as a long-term treatment for obesity in adults (>19 years) with BMI ≥30 kg/m2, as part of comprehensive obesity chronic care programmes (WHO, 2025b). Adjunct intervention with intensive behavioural counselling (including structured exercise and diet goals, restricted energy intake, weekly counselling, and routine progress assessments) would further amplify the efficacy of novel pharmacotherapy and sustainability of health improvements, although the feasibility of implementation will differ across settings and contexts (WHO, 2025b).

For youth living with obesity, the regulatory landscape is also evolving and eligibility thresholds (e.g. BMI percentiles or minimum body weight) vary by geography, although several pharmacological therapies are approved for use by adolescents (≥12 years) (Jung, 2024; Torbahn et al., 2024). There are limited options approved for children younger than 12 (WHO, 2022; Torbahn et al., 2025). A meta-analysis of randomised control trials on the use of novel pharmacotherapy options in children and adolescent populations has found them effective in producing clinically meaningful reductions in obesity markers (BMI, waist circumference, body weight), as well as improvements in glycaemic and cardiometabolic outcomes (Romariz et al., 2025; Torbahn et al., 2024; Kotecha et al., 2025).

Considerations around pharmacological interventions

- As with any active intervention, pharmacotherapy can have adverse effects and contraindications. Adverse effects are most commonly mild to moderate gastrointestinal symptoms (Lingvay et al., 2024; Kotecha et al., 2025), but they can include more serious events (Ghusn and Hurtado, 2024; Long et al., 2024). The WHO's adult guidelines note that, despite these effects, the overall benefits of novel pharmacotherapies generally outweigh potential harms (WHO, 2025b).

- Evidence gaps remain regarding safety in specific adult populations, such as pregnant women (WHO, 2025b). In children, the evidence base is still developing, with studies clarifying key areas for further research — including nutritional adequacy, appropriate use, and long-term developmental outcomes (Zaitoon et al., 2025). Strengthening the evidence base will also help refine treatment protocols, while clearer guidance on managing common side effects can improve outcomes, support quality of life, and reduce the risk of treatment discontinuation. Given obesity's chronicity and frequent recurrence, this should also include studies on optimal long-term use of pharmacotherapies (Turabi et al., 2025).

- Negative attitudes and prevailing judgements around obesity within healthcare settings — often defined by an over-emphasis on personal responsibility — can lead to pharmacotherapy being dismissed as a 'quick fix' (Heitmann, 2025). This contributes to delayed or inadequate treatment and a default reliance on lifestyle advice rather than prescribing effective pharmacological options (Busetto, Sbraccia and Vettor, 2022).

- According to the WHO, equitable access to these treatments, even for medically qualified patients, remains inadequate to meet population-level needs due to a restrictive reimbursement landscape (WHO, 2025b; Lasota et al., 2024). Establishing clear, evidence-based guidelines on patient selection criteria may help better align pharmacological access with medical eligibility at the population-level. In some cases, legislation should change to facilitate this — in Germany, the social health insurance system cannot reimburse medications considered lifestyle medications, which includes all anti-obesity medicines prescribed for weight loss, despite the German parliament recognising obesity as a disease (Madelung and Bayley, 2025). Similarly in Spain, disease recognition by the Ministry of Health has not translated into reimbursement policy (Lecube et al., 2025).

- Optimal adherence to medication is challenging in chronic diseases, yet it underpins the effectiveness of chronic-disease treatment (Sharma et al., 2025; Kan et al., 2023). Obesity pharmacotherapy is no exception (Vallis et al., 2022; Sharma et al., 2025). Adherence to pharmacotherapy (including following dosing recommendations and treatment continuity) may be challenging, particularly in the treatment initiation phase (Sharma et al., 2025). Treatment protocols should thus consider contextually-appropriate, patient-centred recommendations to improve adherence at different treatment phases, as learned from other chronic diseases such as hypertension and diabetes mellitus type 2 (Sharma et al., 2025).

4.3 Metabolic and bariatric surgery (MBS)

Box 3 Overview of MBS interventions: evidence and current recommendations

MBS has long been considered an effective intervention for achieving substantial and lasting weight loss and improving obesity-related conditions (Eisenberg et al., 2022). It is associated with potential weight loss of 24%-37% of body weight (Heeren et al., 2023). MBS can produce enduring reductions in BMI, long-term clinical benefits, and cost savings, particularly through the improvement or remission of obesity-related complications (Lingvay et al., 2024; Gasoyan et al., 2019; Borisenko, Lukyanov and Ahmed, 2018).

Indications for MBS vary by guideline and context. Common thresholds for adults (age > 18 years) start from BMI ≥ 35kg/m2 (irrespective of comorbidities) and BMI ≥ 30 kg/m2 with associated comorbidities (WHO, 2022; Eisenberg et al., 2022). Different BMI cutoffs may be considered for different ethnic groups (WHO, 2022).

MBS can also be used in adolescents aged 10-19 with a BMI ≥ 40 kg/m2 or BMI ≥ 35 kg/m2 with associated comorbidities, after evaluation by specialty multidisciplinary teams (Pratt et al., 2018; WHO, 2022; Eisenberg et al., 2022). In some situations where benefits outweigh the risks, pre-adolescent children (<10 years) may also be considered for MBS (Pratt et al., 2018). Observational studies comparing cohorts aged 10 to 19 years undergoing MBS with cohorts receiving lifestyle-only interventions or non-surgical controls have demonstrated the safety and efficacy of MBS (in terms of durable weight loss outcomes and resolution of comorbidities) in young patients when conducted in comprehensive youth and family-friendly settings (Pratt et al., 2018).

Considerations around MBS

- Negative attitudes (stigma) towards obesity, combined with misconceptions about MBS, often limit referral and uptake (Garcia et al., 2022). There is also a bias towards initial conservative management of obesity among healthcare practitioners, resulting in delayed access to MBS (Sinclair et al., 2021).
- Delayed surgery results in lower clinical benefits and higher costs compared to prompt surgery, although it is still considered highly cost effective compared to no surgery (Borisenko, Lukyanov and Ahmed, 2018).
- Eligibility for MBS is determined not only by weight-related criteria, but also by overall medical fitness for surgery. It requires cardiac and other presurgical evaluations, and it may not be suitable for those with multiple severe chronic conditions (Eisenberg et al., 2022). The negative impact of delayed surgery and importance of being 'medically fit for surgery' suggest the need to consider MBS earlier in the patient's disease course.
- MBS has a rare risk of perioperative mortality and non-fatal complications but is generally viewed as a safe surgical procedure, comparing favourably to other frequently performed operations with established safety profiles (Lingvay et al., 2024; Sharma, 2023; Clapp et al., 2024; IFSO, 2024).
- Disparities in access to and quality of metabolic and bariatric surgery exist across Europe, fuelled by inadequate investment, infrastructure, and patient and provider awareness (Sinclair et al., 2021). The restrictive — and varying — eligibility and reimbursement landscape further amplifies access inequalities (Sinclair et al., 2021).

4.4 Evaluating the clinical and economic evidence around obesity interventions

Whilst we advocate for obesity strategies, any such strategies must be effective and cost-effective. The complex nature of obesity and the relative novelty of some pharmacological interventions may present challenges to comprehensive evaluation, uptake and use of the clinical and economic evidence. These challenges are a barrier to the adoption of urgently needed strategies and may require re-thinking how evidence is appraised.

Drawing **direct cause-effect links** between interventions, especially behaviour and lifestyle interventions, and obesity-related outcomes is challenging since multiple factors can confound attribution in diseases with multifactorial pathways (Salam et al., 2020). Various individual-level factors (e.g. diet, physical activity, sleep, stress, genetics, medications, and socioeconomic context) and environmental factors (e.g. food availability, built environment, cultural norms, and policy) can concurrently influence obesity, making it difficult to completely isolate the 'diffuse' effects of a single intervention in the real world compared to a controlled setting (Blaxall et al., 2024). As such, more real-world evidence on multifaceted, long-term obesity interventions is needed, and research methodologies may require revision.

Individuals may respond differently to the same interventions based on genetics, metabolic adaptation, baseline health, age, and sex. Average effects can obscure the true cause-effect relationship at the individual level, and the 'right' intervention may be distinct for different individuals. A nuanced understanding of obesity phenotypes and the establishment of care 'archetypes' would enable appropriate, individualised treatment (Innovative Health Initiative, 2026).

There are also evidence gaps relating to the full spectrum of potential **effects of obesity interventions on related comorbidities**. At the individual level, obesity typically co-occurs with a variety of NCDs — including hypertension, dyslipidaemia, diabetes mellitus type 2, osteoarthritis, and cardiovascular disease — each of which contributes to additional complications and an elevated mortality risk (Pearson-Stuttard et al., 2023). The bidirectional interactions between obesity and these comorbidities mean the downstream effects of interventions rarely follow a simple, linear cause-effect pathway at the population level and, thus, may be underestimated. This lack of clear attribution fuels a persistent under-recognition of the impact that obesity interventions could have on other NCDs.

Evidence on obesity interventions is primarily developed from a health system perspective; the heterogeneity in economic outcome measures used is a challenge for economic evaluation (Zanganeh et al., 2019). However, an understanding of the economic effects of obesity interventions is needed for policymakers concerned with labour markets, economic productivity and fiscal health, and can provide budget holders with the information needed to allocate funds. Interventions should, therefore, be evaluated from a sufficiently broad perspective that captures all outcomes relevant to such decision-makers.

Finally, evidence on the costs and benefits of obesity interventions is often developed on **shorter-term time horizons** (Sharif, Yousefi and Sharif, 2024; Blaxall et al., 2024). While costs of interventions are usually immediate, there is a temporal concern related to the realisation of the benefits of interventions at the population-health level. Accordingly, it is important to ensure longer-term time horizons are consistently used across intervention studies, especially those which are intended for larger-scale implementation (Sharif, Yousefi and Sharif, 2024; Lee et al., 2024; McCrabb et al., 2019).

5 Discussion and recommendations

Our analysis highlights the substantial health and economic burdens that elevated BMI imposes. The estimated annual economic burden ranges from €2.5 billion in Romania to €55.2 billion in Germany, representing 0.7% to 1.4% of national GDP across the study countries. These translate into per capita costs of €131 per Romanian resident to €662 per German resident.

Notably, we find that indirect costs make up between 18% and 58% of total costs in our study countries, with France at the lower bound and the UK at the upper bound. France's lower bound relies on transposing a UK Biobank-derived Mendelian randomisation effect size to the French context, and the direction of this potential bias is plausibly downward, meaning France's true indirect cost share may be understated. These figures demonstrate that obesity is not only a healthcare issue, but also a broader economic issue with wide-ranging societal impacts.

This study adds to a growing body of research on the economic burden of obesity, all of which point to substantial direct and indirect costs. Our findings re-confirm these burdens, but we note considerable heterogeneity between estimates, reflecting different analytical approaches, different data sources, and different timing of studies:

- In the UK, Nesta/Frontier Economics (2025) estimate of the economic burden of obesity and overweight reported a total direct and indirect cost of £126 billion, compared to our UK estimate of £33.8 billion. Much of this difference is driven by Frontier's monetisation of lost QALYs. To avoid any double-counting, we did not value lost QALYs over and above productivity losses. Omitting this component reduces their estimate to £54.6 billion. The remaining difference appears to be driven by different data sources and assumptions.

- In Germany, Effertz et al. (2016) reported a direct and indirect burden of €63 billion based on a patient-level analysis of German insurer data, relative to our current German estimate of €55.2 billion. The Effertz *et al.* patient-level analysis will have captured a broader range of impacts and diseases than our disease-based approach, so some divergence is expected, even after allowing for inflation and increased prevalence since 2016. As the Effertz et al., (2016) estimate is now a decade old, and obesity prevalence and healthcare costs have risen materially since 2016, the true current economic burden in Germany is likely considerably higher than both the original €63 billion figure and our own estimate, which should be interpreted as a conservative lower bound.

- In France, Asterès (2024) estimated that obesity imposed a socioeconomic burden of €12.7 billion, and that this could increase to €15.4 billion by 2030. This is substantially lower than our estimate of €23.3 billion. However, Asterès noted that their estimate was conservative relative to the literature at the time. A key driver of the gap relative to other studies, including our own, was their 'friction cost' approach to estimating productivity losses, which only counts productivity losses for the time it takes to *replace* a worker, rather than counting the full potential productivity lost due to morbidity or premature mortality.

- In Spain, a study from Fundación Weber (Pereira-Bouzas et al., 2025) reported a burden of €292 billion, relative to our Spanish estimate of €19.6 billion. The difference reflects differences in the scope of costs included and how those costs were estimated, rather than differences in the underlying data. In particular, the Weber study quantified the potential economic and social value generated by weight loss, or the "cost of inaction", and therefore captured a wider set of costs than our estimate of the current burden attributable to elevated BMI. It was

modelled independently for each of 18 weight-related complications and, where the evidence allowed, by severity of complication. The study employed a broader cost scope, covering direct healthcare costs, direct non-healthcare costs, productivity losses, monetised QALYs and other intangible costs, alongside bottom-up costing based on 2024 official Spanish unit costs. Prevalence was derived from BMI-band-specific odds ratios, whereas our approach applies population attributable fractions to national expenditure and productivity data. The higher monetary estimate reported by Weber reflects its broader cost scope and different costing approach. The difference between the two estimates therefore largely reflects differences in what costs are captured and how they are valued.

- In Ireland, Dee et al. (2015), using 2009 data, reported an estimate of direct and indirect cost of €1.1 billion. After allowing for inflation and increasing prevalence, this is likely to be less than our estimate of €3.2 billion, reflecting differences in methodology and data sources.

Overall, relative to these comparator studies, our estimates appear to be conservative and reflect deliberately cautious assumptions.

Given this existing body of evidence, why another study of the health and economic burdens of obesity? Simply, because the evidence to date has not reversed the growing prevalence of elevated BMI. Critically, though, the range of options for addressing obesity is evolving rapidly, so this moment represents a new opportunity to address many of obesity's most pressing challenges, and these latest estimates can help inform decision-making in this new landscape.

Our recommendations for addressing obesity and elevated BMI focus on achieving effective obesity policy across the care continuum, with the aim of reducing both current and future health and economic burdens. Recognising obesity as a chronic disease and addressing stigma can help elevate obesity as a policy priority and support greater access to prevention and treatment. Continued evidence generation can inform investment decisions and strengthen the case for action, while EU-wide obesity policies can help translate these efforts into coordinated action across Member States.

1. Recognise obesity as a disease, not just a risk factor.

Obesity is a key risk factor in a wide range of NCDs, and recognition of this role is critical in developing effective NCD action plans, such as the EU Safe Hearts Plan. However, obesity is, at the same time, a chronic, relapsing disease in its own right, with its own impacts on health, quality of life, and costs, including productivity losses (Machado et al., 2022; Savona et al., 2021; WHO, 2025b; Kelly, 2021).

Failing to recognise obesity as a disease with distinct health and economic impacts hinders effective disease surveillance; appropriate funding; investment in prevention, treatment and long-term care; and the development of sufficient health system capacity (Chandiwana et al., 2025). Obesity, like other chronic diseases such as hypertension, diabetes mellitus type 2, and cancer, requires an appropriate chronic care model encompassing early detection and targeted treatment within comprehensive long-term care pathways. Health systems, though, have not consistently prioritised prevention and treatment of obesity commensurate with other chronic diseases (Heeren et al., 2023).

Recognition of obesity as a chronic, progressive, and relapsing disease would facilitate the implementation of national prevention, treatment and management programmes and ensure access to medical support (Bifulco, Pagano and Zazzo, 2025). For example, in Germany, the social health insurance system still classifies obesity as a lifestyle problem, and therefore does not reimburse anti-obesity medicines for weight loss (Madelung and Bayley, 2025). European countries, including France, Germany, Ireland and Italy, are

beginning to recognise obesity as a disease, although regulatory changes to align obesity policy with other chronic disease entitlements still lag (Mooney, 2020; Ministry of Health, 2026; Bifulco, Pagano and Zazzo, 2025; Department of Health, 2026b). For obesity policy to be an effective component of broader chronic disease action plans, the full spectrum of obesity interventions should be accessible, which can only happen with appropriate recognition.

2. Address obesity-related stigma to enable effective management.

For obesity policy to be effectively enacted, there must be a change in attitudes as to how it is perceived in wider society, healthcare settings and governments. Not recognising obesity as a disease but as a lifestyle issue contributes to stigma and discrimination across the life course and across healthcare, social and workplace settings (Bannuru, 2025; Bifulco, Pagano and Zazzo, 2025). Stigma has been found to perpetuate obesity through a vicious cycle of physiological, psychological, and social mechanisms (Westbury et al., 2023). Such stigma is consistently linked to worsened physical and mental health outcomes in people living with obesity, with evidence of lower quality, accessibility and uptake of health and social services and interventions (Bannuru, 2025). Given that there is often a disproportionate obesity burden in vulnerable populations, this fuels further social and health inequalities (Bifulco, Pagano and Zazzo, 2025).

Obesity-related stigma can manifest as a focus on individual behaviour (often as subtle 'patient blaming'), which neglects systemic approaches that are necessary to enable effective obesity management (Westbury et al., 2023). A narrow focus on individual responsibility encourages lifestyle interventions, which have largely been unsuccessful, partly due to stigma-induced barriers to wider adoption of healthy behaviours (Westbury et al., 2023). The failure of such approaches can unintentionally compound stigma by fuelling pre-existing negative beliefs and attitudes among the general population, as well as healthcare professionals (Blaxall et al., 2024). The official recognition of obesity as a disease could be a starting point in tackling weight-based stigma, safeguarding the rights and psychological well-being of people living with obesity and promoting inclusive guidelines, policies and systems, as well as appropriate interventions (Bifulco, Pagano and Zazzo, 2025; Chandiwana et al., 2025).

3. Improve access to a continuum of prevention and treatment.

Most national obesity strategies are focused on primary prevention of elevated BMI but neglect strategies for the substantial number of people already living with obesity and elevated BMI. Strategies focused on primary prevention leave people already living with obesity or elevated BMI without structured, long-term treatment and management that could prevent the development of the associated health conditions that we find drive the health and economic burdens of elevated BMI. Once obesity is established, primary prevention alone is unlikely to reverse clinical manifestations and economic impacts of the disease.

Effective obesity strategies should move beyond primary prevention and establish integrated, lifelong care pathways that combine early detection of obesity, as well as its related complications, with targeted behavioural, pharmacological, and MBS interventions, according to applicable guidelines. Pharmacological interventions and MBS have been shown to help people lose more weight than behavioural interventions alone, whilst also reducing the risk of many of the complications that arise from obesity, such as diabetes mellitus type 2 and cardiometabolic conditions (WHO, 2025b; Lingvay et al., 2024; Moiz et al., 2025; Papantoniou and Maniadakis, 2025; Silva Miguel et al., 2024; Sandhu et al., 2023; Eisenberg et al., 2022; Heeren et al., 2023). Active treatment of obesity provides effective secondary prevention against associated diseases in a way that prevention and lifestyle interventions alone cannot. This includes early, structured intervention in children and adolescents when appropriate, as obesity established early typically persists into

adulthood, with long-lasting health and economic effects (OECD, 2019; French et al., 2018; Simmonds et al., 2016).

Critically, as obesity is a chronic, relapsing condition, there must be a long-term management component, beyond any initial weight-loss phase. As noted earlier, many patients can relapse and may regain more weight than was originally lost. This means strategies must extend beyond short-term interventions and provide sustained, adaptive long-term management. Long-term management strategies can maintain ≥10% weight reduction (American Diabetes Association Professional Practice Committee for Obesity, 2026).

4. Generate intervention evidence relevant to decision-makers, such as long-term effects and economic outcomes.

For obesity treatments to be funded and prioritised, evidence that is relevant to decision-makers both within and beyond the health system must be generated. For decision-makers within the health system, evidence on the long-term costs and effectiveness of obesity interventions is crucial if they are to be funded for long-term disease management (Sharif, Yousefi and Sharif, 2024; Lee et al., 2024; McCrabb et al., 2019). Furthermore, understanding how obesity interventions further impact obesity-linked conditions is essential to assessing the full value of these interventions.

Our study adds to the growing evidence of the substantial — and *avoidable* — economic consequences of obesity and its related comorbidities, including lower workforce productivity and participation. Yet, obesity is still largely treated as a healthcare issue, leading to underinvestment relative to its impact and limiting progress in cross-sectoral policy solutions (Okunogbe et al., 2021). Siloed thinking persists: economic policymakers view obesity solely as a health problem, while health policymakers do not account for its impacts on workforce productivity and economic growth (Ehlers et al., 2025).

Compounding the challenges of siloed thinking is the reality that any effective obesity strategy requires a multifaceted approach encompassing lifestyle interventions, taxation policy, screening, intervention and long-term management. Such a multifaceted approach means that it is difficult to demonstrate clear cause-and-effect between any one intervention and economic or equity outcomes in complex, real-world settings.

To overcome these challenges, methodologies must be developed to disentangle the confounding and overlapping impacts of interventions, in order to assess the value of any one intervention. Demonstrating that investments in obesity interventions can help achieve cross-sectoral goals, for example in terms of productivity, workforce participation, and reduced welfare costs, would strengthen the case for cross-sectoral funding. Without such evidence, cross-sectoral collaboration and investment risks falling short of what is needed to realise the full potential of available obesity treatments to improve economic and social outcomes.

5. Integrate obesity into the EU Safe Hearts Plan.

The EU Safe Hearts Plan is the first comprehensive, EU-level strategy for cardiovascular health policy (European Commission, 2025) and represents an important step in the prevention of NCDs in Europe. However, while the plan acknowledges obesity as an important CVD risk factor and makes obesity-related recommendations under its prevention pillar (Pillar 1) and early-detection pillar (Pillar 2), it does not mention obesity or elevated BMI under its treatment and care pillar (Pillar 3). This is a missed opportunity to acknowledge the role of active treatment in managing obesity and elevated BMI in preventing cardiovascular disease (in addition to treating obesity for its own sake).

Likewise, although the plan sets targets for CVD mortality, blood pressure, cholesterol and blood sugar measurement, it does not set a target for the prevalence of elevated BMI. No

NCD strategy can be effective without explicitly addressing one of the most important risk factors in a range of NCDs. The plan already recommends screening for elevated BMI, and this provides a mechanism to identify those who require intervention. allowing for better integration of obesity policy from detection through to treatment.

The EU Safe Hearts Plan is a valuable framework for integrated policy action in tackling NCDs, and obesity's role as a primary driver of the plan's focal conditions means there is a clear opportunity to place obesity prevention *and* treatment at the core of its policy (European Commission, 2025). The Safe Hearts Plan should ensure an effective obesity strategy is at its core, embedding such a strategy at the forefront of EU health policy, rather than treating it as a side concern or lifestyle issue.

6 Conclusion

These recommendations emphasise the need to radically shift how we understand and respond to elevated BMI and obesity. We must understand obesity as a disease in its own right, as well as an important risk factor for other NCDs. This can address the stigma associated with obesity and support an effective, multifaceted strategy on par with other chronic diseases, encompassing prevention, early-detection, effective treatment and long-term management. To appropriately prioritise an obesity strategy alongside competing priorities, it will also be important to fully understand its burdens, across all sectors of the economy, as well as the potential value of effective interventions in reducing these burdens.

The EU Safe Hearts Plan offers an opportunity to approach obesity policy in a more structured manner, but this means embedding obesity through the plan, including within its treatment and care pillar, and including an explicit obesity target among its objectives. The rapidly evolving policy and treatment landscape offers a valuable opportunity to change how health systems and societies perceive and address obesity. The payoff would be measured in longer, healthier lives, and savings to health systems and wider economies that could be re-invested in reducing the burdens of other NCDs.

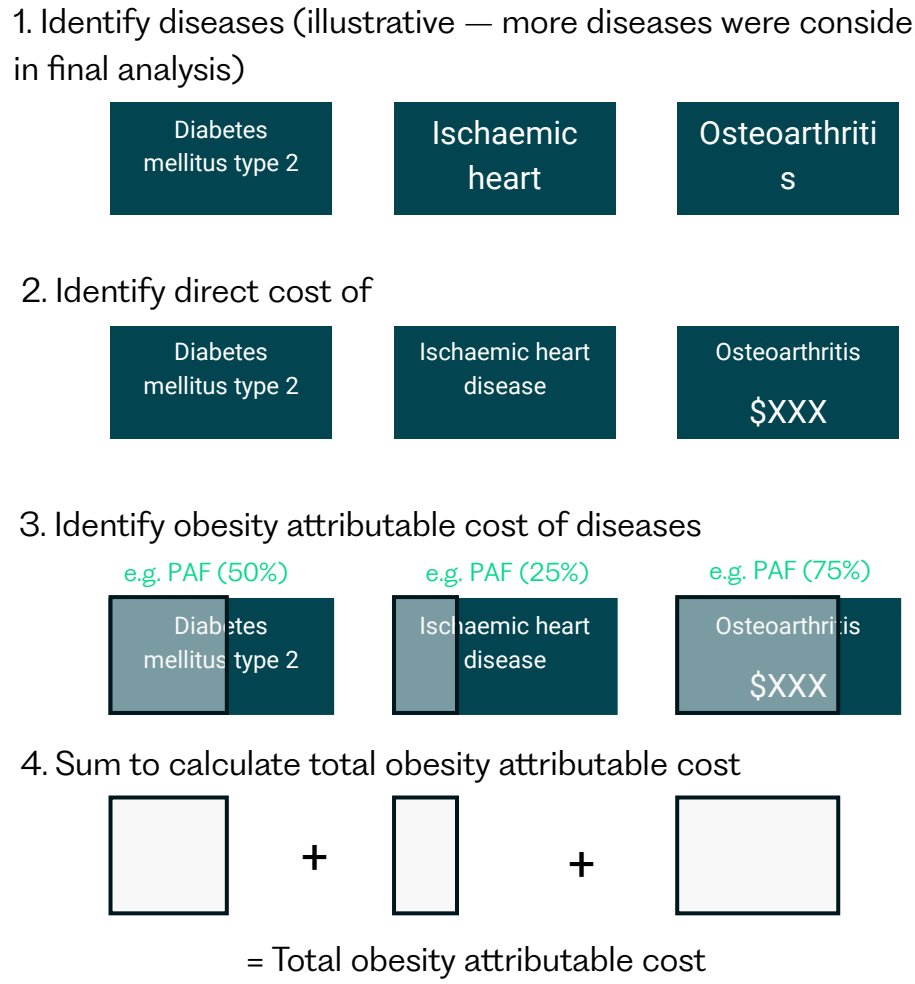
Appendix

A Calculating direct costs

We took a disease-based approach to calculating the direct costs of elevated BMI. This allows isolation of the diseases that contribute the most towards direct costs, providing important information about which points along the disease pathway intervention should be targeted.

To calculate these costs, we applied population attributable fractions (PAFs) on a disease-by-disease basis to first calculate the direct cost of diseases that have a link to obesity, and then the proportion of this cost that is attributable to obesity. This is a similar approach to the Nesta and Frontier Economics study, and a standard methodology in calculating the cost of modifiable risk factors (Xiong et al., 2024; Nesta and Frontier Economics, 2025).

Figure 25 Approach to calculating to cost of elevated BMI



The annual disease costs were calculated using:

- **Diagnosed prevalence** — country-specific published estimates of prevalence from national databases were used where possible. Diagnosed prevalence was used where available to reflect the fact not all those with the condition will incur health care costs related to that condition. In the absence of either of these estimates, country-specific prevalence estimates were taken from GBD 2023.

- **Average annual cost per case** — country-specific published estimates from national costing sources were used where possible. These reflected the annual health care cost of any treated case of the condition.

The product of these measures provides the total cost associated with that disease. We assume this direct cost burden represents the morbidity and mortality burden associated with this disease, and that YLDs, a measure of morbidity, contribute equally to this cost burden. We therefore use YLD PAFs to calculate the proportion of this burden that is attributable to excess weight before summing the attributable costs to generate a direct cost associated with elevated BMI.

PAFs are defined as the proportion of a certain measure of disease burden, such as prevalent cases, DALYs, YLDs or deaths, that can be attributed to a specific exposure or risk factor. This approach allows for disease burden to be systematically allocated between different risk factors or 'causes', while also ensuring that the proportions attributable to different causes cannot exceed the total disease burden. In this approach, eliminating the exposure is assumed to also eliminate the portion of disease burden attributable to that exposure.

To illustrate, if the PAF for elevated BMI for a disease's DALYs is 40%, reducing everyone's BMI to a 'healthy' level would eliminate 40% of the DALYs associated with that disease. PAFs, therefore, are a useful tool for quantifying the attributable burden of elevated BMI as well as for estimating the costs and other burdens that could be avoided through better management and secondary prevention of excess weight. We utilise PAFs for YLDs for most cost components, with the assumption that morbidity best approximates direct and indirect costs.

The conceptual steps in calculating the obesity-attributable burdens of NCDs are outlined above in Figure 25.

B Indirect costs

To calculate the costs associated with premature mortality, we assume a proportion of those who die prior to retirement age due to obesity-related conditions would otherwise have been working and, therefore, their deaths are associated with foregone productivity costs. We take the human capital approach: by assuming these people would be employed in the absence of their disease, we assume there is foregone productivity, valued at the average age-specific annual wage rate.

We also calculated costs associated with higher rates of economic inactivity due to excess weight. For each obesity-linked disease, we used the employment reduction due to the disease compared to a population without the disease. These were typically reported in percentage terms. In the absence of country-specific data on each disease's employment impact, we applied the same employment reductions across countries adjusted for the country-specific employment rates.

Finally, to calculate the costs associated with informal care, we employed the opportunity cost method, where we assumed the time spent providing unpaid care would otherwise have been spent earning an income.

The equations for each of these indirect cost components are set out below. To gain the obesity-attributable costs we multiply by the relevant PAFs. All parameters are age-specific where possible.

Premature mortality costs =

number of deaths for each obesity linked condition * years left to work * disease-specific employment rate * median annual wage * PAF

Reduced employment costs (for every obesity class) =

% of general population economically inactive due to illness who want to work * Increased odds of being sick/disabled employment category from Campbell et al. (2021) * prevalence in obesity class * median annual wage

Absenteeism costs (for obesity class II/III) =

average annual days of absenteeism * multiplier for days of absenteeism from Gupta, Richard and Forsythe (2015) * reduced class-specific employment rate * prevalence in obesity class * median daily wage

Presenteeism costs (for obesity class II/III) =

We explain each of the parameters and their source below:

- **Deaths due to the disease by age group** — country-specific number of deaths due to each disease for each five-year age group were sourced from GBD 2023.
- **Age-specific employment rates** — sourced from national databases where possible. These are necessary to reflect that not all those who died would have otherwise been employed.
- **Employment reduction due to disease** — sourced predominantly from Ward (2015). These are necessary to calculate the number of people who are no longer employed who otherwise would have been.
- **Years left to work for each age group** — by taking the midpoint of each 5-year age band, we calculated the years left to work for each age group.
- **Prevalence in obesity class —** sourced from Phelps et al. (2024), providing age-specific prevalence for overweight and obesity classes I/II/III.
- **% economically inactive due to illness who want to work —** This represents those who are not seeking work due to illness but want to work in the general population in each country and is sourced from Eurostat (2026).
- **Increased odds of being sick/disabled employment category —** sourced from Campbell et al. (2021), who foundfound an odds ratio of being in this category of 1.076 per unit increase in BMI. To calculate the impact on each obesity class relative to normal weight, we adopted a conservative approach, using the minimum BMI within each obesity class and the maximum BMI within the normal

weight range. These estimates are applied to the baseline proportion of economically inactive individuals due to illness who want to work in the general population, sourced from Eurostat (2026), which we assume reflects the normal weight population.

- **Average annual days of absenteeism in each country** — sourced predominantly from WHO European Health Information Gateway (2024). The absenteeism multiplier for obesity classes can be applied to this number.

- **Absenteeism multiplier per obesity class -** sourced from Gupta, Richard and Forsythe (2015), who explored the impact of overweight and obesity on absenteeism in Germany, France, Spain, Italy and the UK using the WPAI-GH survey. It is calculated using *% of days absent in each class/% of days absent for normal weight* before being applied to country-specific averages. No effect is applied for overweight or obesity class I.

- **Presenteeism increase per obesity class** — sourced from Gupta, Richard and Forsythe (2015), who explored the impact of overweight and obesity on presenteeism in Germany, France, Spain, Italy and the UK using the WPAI-GH survey. They calculate the percentage-point increase in presenteeism per each obesity class relative to normal weight. We apply this to the number of days available to work in each year. No effect is applied for overweight or obesity class I.

- **Increased probability of activities of daily life (ADL) limitations per obesity class** — sourced from Machado-Fragua et al. (2025), who found obesity was associated with higher odds of limitations in ADL compared to those of normal weight for European countries for those over 50. No significant effect was found for overweight.

- **Informal care hours for those with ADL limitations** — sourced from Nektarios, Valvis and Georgiadis (2025), who estimated informal care hours by ADL category. We used hours for those with Level 2 ADL limitations, which refers to those who require assistance with household chores and/or taking medication, since this was the most common ADL category in the study.

- **Median annual/daily/hourly wage** — country-specific median wages sourced from national labour statistics. These reflect the value of the foregone productivity.

Multimorbidity for direct costs

Some patients will have more than one of the included diseases, which can lead to healthcare costs or productivity costs that are either less than or greater than the sum of the individual disease costs — i.e. multimorbid costs may be 'sub-additive' or 'super-additive' relative to the simple sum of the per-patient costs associated with either disease. In the case the costs are sub-additive, not accounting for multimorbidity leads to an overestimation of costs; in the case of super-additivity, failing to account for multimorbidity underestimates costs.

To account for multimorbidity, we took the following steps:

1. **Identification of specific multimorbidities and their prevalence** — multimorbidities were selected based on two key criteria:

    i. **Prevalence numbers** — the multimorbidity had to be sufficiently prevalent to be considered in our analysis.

    ii. **Additivity** — the additivity of costs was another key consideration. If costs were additive, there was no need to consider the cost of multimorbidity separately.

    These criteria were judged based on an analysis of the literature, with two key sources being Health and social care costs of a selection of health conditions (2025) and Cortaredona and Ventelou (2017).

2. **Creation of separate multimorbid disease categories** — This involved the subtraction of multimorbid patients from single disease costs and the creation of separate multimorbid disease categories to ensure no double-counting of patients.

3. **Calculation of unit costs associated with multimorbidities**:

    - **Direct costs** — Multimorbid-specific unit costs depended on multiplier applied to the sum of two diseases. The multiplier was calculated based on sources in the literature and was <1 if subadditive, and >1 if superadditive.

4. **Calculation of weighted average PAFs** — PAFs were calculated using weights aligned with the relative cost contribution of each disease towards the multimorbid unit cost(s). When the PAF is viewed as a measure of the avoidable multimorbid disease burden attributable to elevated BMI, the overall effect of reducing BMI falls between the two PAFs, with larger reductions observed in diseases with higher PAFs and smaller reductions in those with lower PAFs.

C Health burden results

Table 5 Total and elevated BMI-attributable deaths for BMI-linked diseases

		UK	Germany	France	Italy	Spain	Ireland	Greece	Romania
Diabetes mellitus type 2	Total	8,135	23,297	13,515	17,903	10,606	654	1,939	2,656
	Att.	4,113	11,612	6,661	8,585	5,394	334	1,098	1,382
Musculoskeletal diseases[a]	Total	0	0	0	0	0	0	0	0
	Att.	0	0	0	0	0	0	0	0
Cardiovascular diseases[b]	Total	136,122	260,146	101,710	169,839	81,668	7,609	39,972	112,801
	Att.	18,495	37,972	12,845	27,861	12,921	1,025	6,168	14,996
Chronic kidney disease	Total	12,049	41,075	15,565	19,330	16,769	652	7,263	3,440
	Att.	3,482	12,185	4,751	6,162	4,971	208	2,528	1,150
Digestive diseases	Total	4,769	4,004	2,761	3,247	3,650	130	733	311
	Att.	2,094	1,751	1,194	1,377	1,676	58	350	129
Cancers[c]	Total	49,133	65,033	51,923	44,516	32,945	2,728	7,740	12,488
	Att.	6,328	7,856	6,331	5,051	4,565	349	532	1,349
Others	Total	46,287	87,654	51,312	68,825	40,000	2,587	9,148	9,686
	Att.	4,270	7,209	4,446	5,332	4,333	244	1,099	676
Total	Total	256,495	481,210	236,786	323,661	185,638	14,359	66,794	141,381
	Att.	38,783	78,586	36,226	54,368	33,860	2,218	11,775	19,682

Source: Global Burden of Disease database (Institute for Health Metrics and Evaluation, 2024)
[a]Includes osteoarthritis and low back pain; [b]Includes hypertensive heart disease, ischaemic heart disease, ischaemic stroke, intracerebral haemorrhage, ischaemic heart disease with diabetes mellitus type 2 and ischaemic heart disease and asthma; [c]Includes breast cancer, colon and rectum cancer and liver cancer.
Att. = Attributable to elevated BMI

Table 6 Total and elevated BMI-attributable DALYs for BMI-linked diseases

		UK	GERMANY	FRANCE	ITALY	SPAIN	IRELAND	GREECE	ROMANIA
Diabetes mellitus type 2	Total	124,063	346,067	190,978	246,883	137,985	9,591	31,443	51,492
	Att.	69,869	188,740	103,053	128,070	75,556	5,315	18,942	29,106
Musculoskeletal diseases	Total	0	0	0	0	0	0	0	0
	Att.	0	0	0	0	0	0	0	0
Cardiovascular diseases	Total	2,114,549	3,616,414	1,400,992	2,140,565	1,138,006	112,292	556,884	1,811,300
	Att.	357,531	582,927	200,894	369,321	197,841	18,193	96,530	277,564
Chronic kidney disease	Total	154,070	478,549	187,776	224,884	189,183	8,483	93,119	65,325
	Att.	44,831	144,750	57,139	71,117	57,015	2,646	32,384	21,880
Digestive diseases	Total	65,918	55,132	34,806	40,764	44,215	1,809	8,677	5,282
	Att.	29,965	24,814	15,385	17,668	20,708	831	4,203	2,280
Cancers	Total	918,164	1,229,606	970,114	808,039	615,480	53,928	139,210	275,842
	Att.	119,811	146,456	116,533	90,138	83,671	6,808	19,405	29,530
Others	Total	598,619	1,031,366	603,480	780,740	462,994	32,366	106,931	151,256
	Att.	57,385	88,510	55,233	63,475	52,005	3,255	13,172	12,905
Total	Total	6,724,918	10,624,634	5,941,438	6,828,194	4,384,886	387,857	1,043,205	3,197,935
	Att.	1,434,974	2,085,654	1,146,358	1,335,164	1,010,510	79,622	311,676	555,289

Source: Global Burden of Disease database (Institute for Health Metrics and Evaluation, 2024)
[a]Includes osteoarthritis and low back pain; [b]Includes hypertensive heart disease, ischaemic heart disease, ischaemic stroke, intracerebral haemorrhage, ischaemic heart disease with diabetes mellitus type 2 and ischaemic heart disease and asthma; [c]Includes breast cancer, colon and rectum cancer and liver cancer.
Att. = Attributable to elevated BMI

Table 7 Sources for prevalence

	UK	GERMANY	FRANCE	ITALY	SPAIN	GREECE	ROMANIA	IRELAND
Diabetes mellitus type 2	7.70%	8.60%	5.60%	5.00%	9.70%	11.90%	11.60%	6%
	(DHS, 2024)	(Baumert et al., 2025)	(Santé publique France, 2024)	(Istituto Superiore di Sanità, 2021)	(International Diabetes Federation, 2025)	(Makrilakis et al., 2021)	(Mota et al., 2016)	(HSE, 2025a)
Ischaemic heart disease	3.00%	7.60%	5.60%	3.60%	2.80%	2.68%	5.60%	2.42%
	(DHS, 2024)	(Porst et al., 2022)	(Grave et al., 2024)	(GBD, 2023)	(Baena-Díez et al., 2014)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)
Hypertensive heart disease	0.07%	0.31%	0.37%	0.72%	0.23%	0.12%	0.30%	0.05%
	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)
Chronic kidney disease	4.40%	5.90%	1.33%	2.89%	3.57%	5.1%	0.81%	4.40%
	(DHS, 2024)	(Brück et al., 2016)	(Blacher et al., 2025)	(De Nicola et al., 2015)		Calculated	(Bradacs et al., 2025) *Late stage	(Nowak et al., 2023)

					(Navarro González et al., 2024)			
Low back pain	13.31%	15.69%	38.30%	24.00%	19.80%	15.00%	18.57%	12.80%
	(GBD, 2023) & (Versus Arthritis, 2012)	(GBD, 2023)	(Husky et al., 2018)	(Health Search, 2018)	(El Instituto Nacional de Estadística, 2023)	(Stranjalis et al., 2004)	(GBD, 2023)	(CSO, 2024)
Ischaemic stroke	0.03%	0.04%	0.15%	0.03%	0.12%	0.05%	0.07%	0.12%
	(GBD, 2023)	(GBD, 2023)	(Gabet et al., 2024)	(GBD, 2023) * Incidence	(Díaz-Guzmán et al., 2012)	(GBD, 2023)	(GBD, 2023)	(NOCA and INAS, 2023)
Osteoarthritis	14.13%	7.19%	13.71%	16.13%	14.34%	14.75%	12.31%	11.32%
	(GBD, 2023)	(Wido, 2023) For Knee OA	(Pers et al., 2024)	(Colombo, Franca; and Ilaria., 2021)	(GBD, 2023)	(Anagnostopoulos et al., 2010)	(GBD, 2023)	(French et al., 2016)
Asthma	6.50%	5.76%	6.40%	6.10%	5.50%	9.10%	4.30%	8.50%
	(DHS, 2024)	(Akmatov et al., 2020)	(Raherison-Semjen et al., 2021)	(Cazzola et al., 2011)	(Ribas et al., 2020)	(Kourlaba et al., 2019)	(GBD, 2023)	(CSO, 2024)

Gallbladder and biliary diseases	1.19%	1.20%	1.22%	1.60%	1.63%	1.74%	1.75%	1.07%
	(GBD, 2023; Li et al., 2023)	(Li et al., 2023) *20% symptomatic applied	(Li et al., 2023) *20% symptomatic applied	(Li et al., 2023) *20% symptomatic applied	(Li et al., 2023) *20% symptomatic applied	(Li et al., 2023) *20% symptomatic applied	(Li et al., 2023) *20% symptomatic applied	(Li et al., 2023) *20% symptomatic applied
Intracerebral haemorrhage	1.00%	0.01%	0.05%	0.01%	0.02%	0.02%	0.02%	0.02%
	(GBD, 2023)	(GBD, 2023)	(Gabet et al., 2024)	(GBD, 2023)	(GBD, 2023) (Díaz-Guzmán et al., 2012)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)
Alzheimer's disease and other dementias	1.41%	2.80%	1.83%	5.00%	2.13%	5.00%	1.43%	1.19%
	(DHS, 2024; GBD, 2023)	(Robert Koch Institute, 2025)	(France Alzheimer, 2025)	(Istituto Superiore di Sanità, 2024)	(Alzheimer Europe, 2019)	(Kosmidis et al., 2018)	(Alzheimer Europe, 2019) *Overall population rate	(HSE, 2025a)
Colon and rectum cancer	0.43%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
	(GBD, 2023)	(IARC, 2022a)	(IARC, 2022a)	(IARC, 2022a)	(IARC, 2022a)	(IARC, 2022a)	(IARC, 2022a)	(IARC, 2022a)
Tuberculosis	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.07%	0.01%

	(DHS, 2024)	Using France as a proxy	(Santé publique France, 2023)	(Istituto Superiore di Sanità, 2024)	(Fontana et al., 2025)	(WHO, 2023c)	(Munteanu et al., 2022)	(HSE, 2025b)
Liver cancer	0.02%	0.01%	0.02%	0.01%	0.01%	0.02%	0.02%	0.01%
	(GBD, 2023)	(IARC, 2022a)	(IARC, 2022b)	(GBD, 2023)	(IARC, 2022e)	(IARC, 2022c)	(IARC, 2022a)	(IARC, 2022d)
Breast cancer	0.85%	0.17%	0.80%	0.17%	0.14%	0.70%	0.51%	0.66%
	(GBD, 2023)	(WIDo, 2023)	(IARC, 2022b)	(GBD, 2023)	(IARC, 2022e)	(IARC, 2022c)	(IARC, 2022a)	(IARC, 2022d)
Non-alcoholic fatty liver disease (NAFLD)	16.48%	14.39%	15.37%	25.92%	20.97%	19.20%	21.98%	16.36%
	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)	(GBD, 2023)

Table 8 Sources for direct costs

	UK	GERMANY	FRANCE	ITALY	SPAIN	GREECE	ROMANIA	IRELAND
Diabetes mellitus type 2	£1,147.96	€1,503.00	€2,503.00	€1,570.00	€1,306.60	€981.72	RON 3122.42	€2,468.80
	(Kidney Research UK, 2023)	(Ulrich et al., 2016)	(CNAM, 2025)	(Mennini et al., 2024)	(Mata-Cases et al., 2016)	(Athanasakis et al., 2010)	(Bala et al., 2022), (Morgovan et al., 2020) *Calculated	(Nolan et al., 2006)
Ischaemic heart disease	£1,639.48	€2,290.00	€2,045.00	€2,478.00	€1,812.00	€758.01	€1,002.05	€1,135.20
	(Public Health England, 2020b)	(Luengo-Fernandez et al., 2023)	(CNAM, 2025)	(Lorenzovici et al., 2022)	(Luengo-Fernandez et al., 2023)	(Stafylas et al., 2023)	(Lorenzovici et al., 2022) *Proxied heart failure for IHD	(Stamenic et al., 2024)
Hypertensive heart disease	£5,716.48	€5,576.00	€2,045.00	€272.00	€8,259.00	€4,411.00	€1,002.05	€1,754.00
	(Public Health England, 2020b)	(Peters-Klimm et al., 2012)	(CNAM, 2025)	(Dovizio, Leogrande and Esposti, 2024)	(Escobar et al., 2020) *Mean hospital cost for HF + HF	(Stafylas et al., 2017)	(Lorenzovici et al., 2022)	(Irish Heart Foundation, 2015)
Chronic kidney disease	£2,036.91	€5,458.00	€2,715.00	€2,723.00	€2,493.00	€758.01	€917.10	€1,425.00

	(Public Health England, 2020b)	(Gandjour et al., 2020) *Calculated to exclude dialysis patients	(Jha et al., 2023; Blacher et al., 2025) *Type 3 patients	(Jommi et al., 2018)	(Escobar et al., 2021)	(Jha et al., 2023)	(Bradacs et al., 2025)	(Elshahat et al., 2020) *Stage 1 to 4 UK value used
Low back pain	£321.51	€608.12	€715.60	€622.00	€279.55	€601.70	€1,096.27	€2,959.00
	(Zemedikun et al., 2024)	(Wenig et al., 2009)	(Fatoye et al., 2023)	(Colombo, Franca; and Ilaria., 2021)	(Alonso-García and Sarría-Santamera, 2020) *Direct cost multiplier applied	(Savvari et al., 2023) *Knee osteoarthritis value used as proxy	(Alonso-García and Sarría-Santamera, 2020)	(Raftery et al., 2012) Chronic non-cancer used as pain proxy
Ischaemic stroke	£2,668.79	€13,273.00	€18,865.00	€7,419.00	€8,491.00	€6,111.54	€4,227.23	€2,671.10
	(Public Health England, 2020b)	(Schmid, 2015)	(CNAM, 2025)	(d'Errico, Pavlova and Spandonaro, 2022)	(Alvarez-Sabín et al., 2017)	(Siskou et al., 2023)	(Strilciuc et al., 2021)	(Luengo-Fernandez et al., 2020)
Osteoarthritis	£268.17	€3,682.00	€2,195.00	€622.00	€1,502.00	€601.70	€1,675.30	€343.10
	(Chen et al., 2012)	(Schild et al., 2021)	(Salmon et al., 2019)	(Colombo, Franca; and Ilaria., 2021)	(Loza et al., 2009)	(Savvari et al., 2023) *Knee osteoarthritis value used as proxy	(Savvari et al., 2023) *Greece value used as a proxy	(Sorensen, Valentelyte and Birgisdóttir, 2024)

Asthma	£329.54	€753.00	€757.00	€1,183.14	€279.24	€673.00	€1,192.99	€710.00
	(Orlovic et al., 2024)	(Jacob et al., 2016)	*France value used as proxy	(Dal Negro et al., 2016)	(Doz et al., 2013)	(Vellopoulou et al., 2019)	(Agache et al., 2025)	(Asthma Society of Ireland, 2019)
Gallbladder and biliary diseases	£6,780.00	€3,667.00	€2,490.00	€3,622.00	€4,181.30	€1,676.00	€443.00	€5,973.00
	(Jones, Mawhinney and Brown, 2012)	(Weikl, Karkossa and Marquardt, 2025)	(CNAM, 2025)	(Lamberts et al., 2017)	(Ministerio de Sanidad., 2026)	(Kastanioti, n.d.)	(Uivarosan et al., 2015)	(HIQA, 2014)
Intracerebral haemorrhage	£2,573.78	€9,880.00	€4,664.00	€9,044.00	€19,879.76	€3,917.00	€ 4,227.23	€49,754.00
	(Patel et al., 2020)	(Dodel et al., 2004)	(CNAM, 2025)	(Bottacchi et al., 2012)	(Alvarez-Sabín et al., 2017)	(Christodoulou et al., 2025)	(Strilciuc et al., 2021) *Ischaemic stroke value as proxy	(Smeds et al., 2022)
Alzheimer's disease and other dementias	£2,715.27	€1,700.00	€3,441.00	€3,779.00	€1,015.00	€4,552.25	RON 14,369.00	€2,516.15
	(Public Health England, 2020b)	(Gläser et al., 2025)	(CNAM, 2025)	(Mennini et al., 2025)	(Meijer et al., 2022)	(Ruiz-Adame Reina, 2018)	(Onetiu et al., 2016)	(O'Shea and Monaghan, 2017)
Colon and rectum cancer	£5,283.12	€29,860.00	€10,850.00	€4,489.00	€3,774.33	€4,489.00	€ 7,388.00	€7,921.40

	(Public Health England, 2020b)	(Haug et al., 2014)	(CNAM, 2025)	(d'Errico, Pavlova and Spandonaro, 2022) *Italian figure from source is used	(Ibarrondo et al., 2022)	(d'Errico, Pavlova and Spandonaro, 2022) *Italian figure used as a proxy	(Henderson et al., 2021)	(Tilson et al., 2012)
Tuberculosis	£7,217.37	€7,931.00	€5,691.00	€9,224.00	€10,262.62	€10,282.00	RON 7,116.72	€6,088.00
	(Diel et al., 2012)	(Diel et al., 2012)	(Diel et al., 2012)	(Diel et al., 2012)	(Gullón et al., 2016)	(Diel et al., 2014)	(MECA et al., 2026)	(Joyce et al., 2019)
Liver cancer	£6,542.55	€11,152.00	€13,489.00	€4,489.00	€1,303.68	€4,489.00	€ 1,303.68	€1,303.68
	(Cullen et al., 2023)	(Clouth et al., 2018)	(CNAM, 2025)	(d'Errico, Pavlova and Spandonaro, 2022)	(Darbà and Ascanio, 2025)	(d'Errico, Pavlova and Spandonaro, 2022)	(Darbà and Ascanio, 2025) *Spain used as proxy	Darbà and Ascanio, 2025a) *Spain used as proxy
Breast cancer	£2,928.93	€26,107.00	€15,659.00	€4,489.00	€4,575.67	€4,706.00	€ 4,706	€14,458.00
	(Public Health England, 2020b)	(Khan et al., 2023)	(CNAM, 2025)	(d'Errico, Pavlova and Spandonaro, 2022)	(Ibarrondo et al., 2022)	(Skroumpelos et al., 2016)	(Skroumpelos et al., 2016) *Greece proxy	(Darbà and Ascanio, 2025)

Non-alcoholic fatty liver disease (NAFLD)	£2,668.79 (Public Health England, 2020b)	€1,917.00 (O'Hara et al., 2020)	€2490.00 (CNAM, 2025)	€1732 (O'Hara et al., 2020)	€8,491.00 (O'Hara et al., 2020)	€2,763.00 (O'Hara et al., 2020) *European average used	€ 2,763.00 (O'Hara et al., 2020) *European average used	€3,879.00 (O'Hara et al., 2020) * UK Proxy

(Lingvay et al., 2024; Gasoyan et al., 2019; Borisenko, Lukyanov and Ahmed, 2018). (Pratt et al., 2018).(Moiz et al., 2025)
(Romariz et al., 2025; Torbahn et al., 2024; Kotecha et al., 2025; Zaitoon et al., 2025) (Zaitoon et al., 2025; Jung, 2024). (WHO, 2022; Torbahn et al., 2025).(Sandhu et al., 2023; Papantoniou and Maniadakis, 2025; Silva Miguel et al., 2024)

References

Agache, I., Torres, M., Eguiluz-Gracia, I., Bradatan, E., El Abd, K., Bilo, M.B., Rivolta, F., Sangalli, A., Bumbacea, R., Ali, S., Antolin, D., Cuenda, Á.C.L., Albéndiz, V., Oliveira, M.M., Nogueira, P.J., Carmona, L., and HEAD Study Group, 2025. Economic Impact of Allergic Diseases and Asthma-The HEAD Pan-European Registry. *Allergy*, 80(6), pp.1677—1701. 10.1111/all.16596.

Akmatov, M.K., Holstiege, J., Steffen, A. and Bätzing, J., 2020. Trends and regional distribution of outpatient claims for asthma, 2009—2016, Germany. *Bulletin of the World Health Organization*, 98(1), pp.40—51. 10.2471/BLT.19.229773.

Alonso-García, M. and Sarría-Santamera, A., 2020. The Economic and Social Burden of Low Back Pain in Spain: A National Assessment of the Economic and Social Impact of Low Back Pain in Spain. *Spine*, 45(16), p.E1026. 10.1097/BRS.0000000000003476.

Alvarez-Sabín, J., Quintana, M., Masjuan, J., Oliva-Moreno, J., Mar, J., Gonzalez-Rojas, N., Becerra, V., Torres, C., Yebenes, M., and CONOCES Investigators Group, 2017. Economic impact of patients admitted to stroke units in Spain. *The European journal of health economics: HEPAC: health economics in prevention and care*, 18(4), pp.449—458. 10.1007/s10198-016-0799-9.

Alzheimer Europe, 2019. *Dementia in Europe Yearbook 2019*. [online] Available at: https://www.alzheimer-europe.org/sites/default/files/alzheimer_europe_dementia_in_europe_yearbook_2019.pdf [Accessed 16 Mar. 2026].

American Diabetes Association Professional Practice Committee for Obesity, 2026. Pharmacologic Treatment of Obesity in Adults: Standards of Care in Overweight and Obesity. *Diabetes, Obesity, and Cardiometabolic CARE*, 1(1), pp.5—36. 10.2337/doci25-0008.

An, W., Luo, J., Yu, Z., Li, M., Wei, H., Song, A., Mao, Y., Bian, H., He, L., Xiao, F. and Wei, H., 2024. Obesity and risk for liver disease: a two-sample Mendelian randomisation study. *The British Journal of Nutrition*, 132(10), pp.1403—1410. 10.1017/S000711452400237X.

Anagnostopoulos, I., Zinzaras, E., Alexiou, I., Papathanasiou, A.A., Davas, E., Koutroumpas, A., Barouta, G. and Sakkas, L.I., 2010. The prevalence of rheumatic diseases in central Greece: a population survey. *BMC Musculoskeletal Disorders*, 11(1), p.98. 10.1186/1471-2474-11-98.

Aon, 2026. *Workforce-Focused Analysis on GLP-1s: Phase Two Findings*. [online] Aon. Available at: https://www.aon.com/en/insights/articles/workforce-focused-analysis-on-glp-1s [Accessed 15 June 2026].

Arteaga-González, I.J., Martín-Malagón, A.I., Ruiz de Adana, J.C., de la Cruz Vigo, F., Torres-García, A.J. and Carrillo-Pallares, A.C., 2018. Bariatric Surgery Waiting Lists in Spain. *Obesity Surgery*, 28(12), pp.3992—3996. 10.1007/s11695-018-3453-z.

Association of Bariatric patients in Greece, 2024. *EOPYY surgery approval process - Association of Bariatric Patients of Greece - 'New Beginning'*. [online] Available at: https://bariatrichellas.gr/eopyy/ [Accessed 23 Sept. 2026].

Asterès, 2024. *l'obésité en France : un coût de 12,7 Mds€ en 2024 et potentiellement 15,4 Mds€ en 2030*. [online] Available at: https://asteres.fr/site/wp-content/uploads/2024/11/ASTERES-NOVO-NORDISK-Cout-de-lobesite-en-2024-15112024.pdf [Accessed 17 Sept. 2026].

Asthma Society of Ireland, 2019. Easing the Economic Burden of Asthma — Asthma Society of Ireland. Available at: https://www.asthma.ie/about-us/what-we-do/advocacy-research/pre-budget-submissions/easing-the-economic-burden-of-asthma/ .

Athanasakis, K., Ollandezos, M., Angeli, A., Gregoriou, A., Geitona, M. and Kyriopoulos, J., 2010. Estimating the direct cost of Type 2 diabetes in Greece: the effects of blood glucose regulation on patient cost. *Diabetic Medicine*, 27(6), pp.679—684. 10.1111/j.1464-5491.2010.03004.x.

Auf der Maur, I., Gero, D., Kampmann, G., Prediger, T., Schopf, S., Peters, J., Widmer, J., Deerberg-Wittram, J., Köhler-Hohmann, C., Bueter, M. and Thalheimer, A., 2022. Kostenübernahme bariatrischer Operationen ohne Antragstellung — Erfahrungen in einem deutschen Adipositaszentrum. *Chirurgie (Heidelberg, Germany)*, 93(11), pp.1082—1088. 10.1007/s00104-022-01690-z.

Baena-Díez, J.M., Grau, M., Forés, R., Fernández-Bergés, D., Elosua, R., Sorribes, M., Félix-Redondo, F.J., Segura, A., Rigo, F., Cabrera de León, A., Sanz, H., Marrugat, J. and Sala, J., 2014. Prevalencia de fibrilación auricular y factores asociados en España, análisis de seis estudios de base poblacional. Estudio DARIOS. *Revista Clínica Española*, 214(9), pp.505—512. 10.1016/j.rce.2014.06.006.

Bala, C., Rusu, A., Ciobanu, D. and Roman, G., 2022. Length of Hospital Stay, Hospitalization Costs, and Their Drivers in Adults with Diabetes in the Romanian Public Hospital System. *International Journal of Environmental Research and Public Health*, [online] 19(16). 10.3390/ijerph191610035.

Bannuru, R.R., 2025. Weight stigma and bias: standards of care in overweight and obesity—2025. *BMJ Open Diabetes Research & Care*, [online] 13(Suppl 1). 10.1136/bmjdrc-2025-004962.

Barenbaum, S.R., Tchang, B.G. and Aronne, L.J., 2026. The important role of comorbidities in the management of obesity. *Journal of the Endocrine Society*, 10(3), p.bvag012. 10.1210/jendso/bvag012.

Baumert, J., Reitzle, L., Brinks, R., Kuhnert, R. and Heidemann, C., 2025. Trends in prevalence and number of cases of diagnosed type 2 diabetes in Germany: Projections until 2050. *Journal of Health Monitoring*, 10(3), p.e13381. 10.25646/13381.

Benamran, D., Chierici, A., Bulsei, J., Fontas, E. and Iannelli, A., 2024. A Comprehensive Insight into the Economic Profile of People Receiving Metabolic and Bariatric Surgery Use in France. *Obesity Surgery*, 34(9), pp.3315—3323. 10.1007/s11695-024-07377-0.

Bifulco, M., Pagano, C. and Zazzo, E.D., 2025. Obesity legally recognised as a chronic disease in Italy. *The Lancet Diabetes & Endocrinology*, 13(12), pp.1001—1002. 10.1016/S2213-8587(25)00326-2.

Blacher, J., Kab, S., Cheddani, L., Halimi, J.-M., Stengel, B., De Pinho, N.A., Goldberg, M., Zins, M. and Olié, V., 2025. Prevalence of chronic kidney disease in France - The constances cohort. *BMC Nephrology*, 26(1), p.312. 10.1186/s12882-025-04213-0.

Blaxall, M., Richardson, R., Schoonees, A., Metzendorf, M.-I., Durão, S., Naude, C., Bero, L. and Farquhar, C., 2024. Obesity intervention evidence synthesis: Where are the gaps and which should we address first? *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 25(4), p.e13685. 10.1111/obr.13685.

Blomain, E.S., Dirhan, D.A., Valentino, M.A., Kim, G.W. and Waldman, S.A., 2013. Mechanisms of Weight Regain following Weight Loss. *ISRN Obesity*, 2013, p.210524. 10.1155/2013/210524.

Blüher, M., 2025. An overview of obesity-related complications: The epidemiological evidence linking body weight and other markers of obesity to adverse health outcomes. *Diabetes, Obesity and Metabolism*, 27(S2), pp.3—19. 10.1111/dom.16263.

Borges, M., Sampaio, F., Costa, J., Freitas, P., Matias Dias, C., Gaio, V., Conde, V., Figueira, D., Pinheiro, B. and Silva Miguel, L., 2024. Burden of Disease and Cost of Illness of Overweight and Obesity in Portugal. *Obesity Facts*, 18(2), pp.107—120. 10.1159/000541781.

Borisenko, O., Lukyanov, V. and Ahmed, A.R., 2018. Cost—utility analysis of bariatric surgery. *British Journal of Surgery*, 105(10), pp.1328—1337. 10.1002/bjs.10857.

Bottacchi, E., Corso, G., Tosi, P., Morosini, M.V., De Filippis, G., Santoni, L., Furneri, G. and Negrini, C., 2012. The cost of first-ever stroke in Valle d'Aosta, Italy: linking clinical registries and administrative data. *BMC Health Services Research*, 12(1), p.372. 10.1186/1472-6963-12-372.

Bradacs, I.A., Bába, L.-I., Lorenzovici, L., Precup, A.M., Ráduly, S.F.-, Tar, G., Nastase, V., Daina, L.G., Bozu, R., Nagy, G.J., Siriopol, D.C., Sandesc, D., Bedreag, O.H., Buicu, F., Mircescu, G. and Ismail, G., 2025. Epidemiology and hospitalization costs of chronic kidney disease in Romania. *Health Economics Review*, 15, p.38. 10.1186/s13561-025-00614-x.

Brauer, M., Roth, G.A., Aravkin, A.Y. *et al.*, 2024. Global burden and strength of evidence for 88 risk factors in 204 countries and 811 subnational locations, 1990—2021: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet*, 403(10440), pp.2162—2203. 10.1016/S0140-6736(24)00933-4.

Bray, G.A., Kim, K.K., Wilding, J.P.H., and World Obesity Federation, 2017. Obesity: a chronic relapsing progressive disease process. A position statement of the World Obesity Federation. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 18(7), pp.715—723. 10.1111/obr.12551.

Brooks-Pollock, E. and Danon, L., 2017. Defining the population attributable fraction for infectious diseases. *International Journal of Epidemiology*, 46(3), pp.976—982. 10.1093/ije/dyx055.

Brown, A., Flint, S.W. and Batterham, R.L., 2022. Pervasiveness, impact and implications of weight stigma. *eClinicalMedicine*, [online] 47. 10.1016/j.eclinm.2022.101408.

Brown, K.F., Rumgay, H., Dunlop, C., Ryan, M., Quartly, F., Cox, A., Deas, A., Elliss-Brookes, L., Gavin, A., Hounsome, L., Huws, D., Ormiston-Smith, N., Shelton, J., White, C. and Parkin, D.M., 2018. The fraction of cancer attributable to modifiable risk factors in England, Wales, Scotland, Northern Ireland, and the United Kingdom in 2015. *British Journal of Cancer*, 118(8), pp.1130—1141. 10.1038/s41416-018-0029-6.

Brück, K., Stel, V.S., Gambaro, G., Hallan, S., Völzke, H., Ärnlöv, J., Kastarinen, M., Guessous, I., Vinhas, J., Stengel, B., Brenner, H., Chudek, J., Romundstad, S., Tomson, C., Gonzalez, A.O., Bello, A.K., Ferrieres, J., Palmieri, L., Browne, G., Capuano, V., Van Biesen, W., Zoccali, C., Gansevoort, R., Navis, G., Rothenbacher, D., Ferraro, P.M., Nitsch, D., Wanner, C., Jager, K.J., and European CKD Burden Consortium, 2016. CKD Prevalence Varies across the European General Population. *Journal of the American Society of Nephrology: JASN*, 27(7), pp.2135—2147. 10.1681/ASN.2015050542.

Buğday, B., Çelik, A.L., Safran, E.E. and Şevgin, Ö., 2025. Impact of resistance exercise and diet on physical activity, sleep, and fatigue in obese individuals: a randomized controlled trial. *BMC Public Health*, 25(1), p.2282. 10.1186/s12889-025-23549-8.

Bundesminiterium der Justiz und für Verbraucherschutz, 1988. *Section 34 SGB 5 - Individual provision*. [online] Available at: https://www.gesetze-im-internet.de/sgb_5/___34.html [Accessed 1 June 2026].

Busetto, L., Dicker, D., Frühbeck, G., Halford, J.C.G., Sbraccia, P., Yumuk, V. and Goossens, G.H., 2024. A new framework for the diagnosis, staging and management of obesity in adults. *Nature Medicine*, 30(9), pp.2395—2399. 10.1038/s41591-024-03095-3.

Busetto, L., Sbraccia, P. and Vettor, R., 2022. Obesity management: at the forefront against disease stigma and therapeutic inertia. *Eating and Weight Disorders*, 27(2), pp.761—768. 10.1007/s40519-021-01217-1.

Bustillos, A.S., Vargas, K.G. and Gomero-Cuadra, R., 2015. Work productivity among adults with varied Body Mass Index: Results from a Canadian population-based survey. *Journal of Epidemiology and Global Health*, 5(2), pp.191—199. 10.1016/j.jegh.2014.08.001.

Campbell, D.D., Green, M., Davies, N., Demou, E., Ward, J., Howe, L.D., Harrison, S., Johnston, K.J.A., Strawbridge, R.J., Popham, F., Smith, D.J., Munafò, M.R. and Katikireddi, S.V., 2021. Effects of increased body mass index on employment status: a Mendelian randomisation study. *International Journal of Obesity*, 45(8), pp.1790—1801. 10.1038/s41366-021-00846-x.

Carmo, M., Justamante, I. and Callejo-Velasco, D., 2026. *PCR208 Pharmacologic Treatment of Obesity in Spain: Results From a Physicians' Prescription Panel - Value in Health*. [online] Available at: https://www.valueinhealthjournal.com/article/S1098-3015(24)06335-6/fulltext [Accessed 1 June 2026].

Cazzola, M., Puxeddu, E., Bettoncelli, G., Novelli, L., Segreti, A., Cricelli, C. and Calzetta, L., 2011. The prevalence of asthma and COPD in Italy: A practice-based study. *Respiratory Medicine*, 105(3), pp.386—391. 10.1016/j.rmed.2010.09.022.

Central Statistics Office, 2025. *Economy Measuring Ireland's Progress 2023*. [online] Available at: https://www.cso.ie/en/releasesandpublications/ep/p-mip/measuringirelandsprogress2023/economy/ [Accessed 17 June 2026].

Chandiwana, N., Barquera, S., Baur, L., Buse, K., Halford, J., Halpern, B., Jackson-Morris, A., Mbanya, J.C., Nece, P. and Ralston, J., 2025. Obesity is a disease: global health policy must catch up. *The Lancet Global Health*, 13(10), pp.e1659—e1660. 10.1016/S2214-109X(25)00275-X.

Chen, A., Gupte, C., Akhtar, K., Smith, P. and Cobb, J., 2012. The Global Economic Cost of Osteoarthritis: How the UK Compares. *Arthritis*, 2012, p.698709. 10.1155/2012/698709.

Christodoulou, K.C., Mohr, K., Uphaus, T., Jägersberg, M., Valerio, L., Farmakis, I.T., Hobohm, L., Binder, H., Konstantinides, S.V. and Keller, K., 2025. Hospital Costs of Intracranial Haemorrhage in Patients with Acute Pulmonary Embolism: Possible Implications for Emerging Therapies. *Thrombosis and Haemostasis*, 125(10), pp.1048—1051. 10.1055/a-2511-4599.

Chung, S.T., Harrington, J., Kandula, N.R., Kershaw, K.N., Mongraw-Chaffin, M., Baah, F.O., Pfammatter, A.F., Stanton, M.V., Stanford, F.C., and on behalf the American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology; and Council on Quality of Care and

Outcomes Research, 2026. Socioeconomic and Structural Barriers to Addressing Obesity in Communities: A Scientific Statement From the American Heart Association. *Circulation*, 153(8), pp.e252—e262. 10.1161/CIR.0000000000001395.

Clapp, B., Abi Mosleh, K., Glasgow, A.E., Habermann, E.B., Abu Dayyeh, B.K., Spaniolas, K., Aminian, A. and Ghanem, O.M., 2024. Bariatric surgery is as safe as other common operations: an analysis of the ACS-NSQIP. *Surgery for Obesity and Related Diseases*, 20(6), pp.515—525. 10.1016/j.soard.2023.11.017.

Clouth, J., Liepa, A.M., Moeser, G., Friedel, H., Bernzen, M., Trojan, J. and Garal-Pantaler, E., 2018. Hepatocellular carcinoma after prior sorafenib treatment: incidence, healthcare utilisation and costs from German statutory health insurance claims data. *Health Economics Review*, 8, p.18. 10.1186/s13561-018-0199-1.

CNAM, 2025. *Les bénéficiaires de la Complémentaire santé solidaire (C2S) en 2023 | L'Assurance Maladie*. [online] Available at: https://www.assurance-maladie.ameli.fr/etudes-et-donnees/2025-beneficiaires-complementaire-sante-solidaire-c2s-2023 .

Colombo, G., Franca;, H. and Ilaria., P., 2021. *Utilization of Healthcare Resources in Osteoarthritis: A Cost of Illness Analysis Based on Real-World Data in Italy - ProQuest*. [online] Available at: https://www.proquest.com/openview/aaa97f176b89c174d90d7d127bd925ef/1?pq-origsite=gscholar&cbl=3933272 [Accessed 16 Mar. 2026].

Cortaredona, S. and Ventelou, B., 2017. The extra cost of comorbidity: multiple illnesses and the economic burden of non-communicable diseases. *BMC medicine*, 15(1), p.216. 10.1186/s12916-017-0978-2.

Craig, H., le Roux, C., Keogh, F. and Finucane, F.M., 2018. How Ethical Is Our Current Delivery of Care to Patients with Severe and Complicated Obesity? *Obesity Surgery*, 28(7), pp.2078—2082. 10.1007/s11695-018-3301-1.

CSO, 2024. *Prevalence of selected long-standing medical conditions of all persons aged 18 years and over*. [online] Available at: https://data.cso.ie/ [Accessed 16 Mar. 2026].

Cullen, K., Jones, M., Pockett, R.D., Burton, A., Cross, T.J.S., Rowe, I.A., Paley, L., Tataru, D., Alexander, G., Marshall, A. and Fitzsimmons, D., 2023. Cost of hepatocellular carcinoma to the national health service in England: a registry-based analysis. *BMJ Open Gastroenterology*, [online] 10(1). 10.1136/bmjgast-2022-000998.

Czernichow, S., Ziegler, O., Clément, K., Coupaye, M. and Laville, M., 2024. Assessing worldwide trends of underweight and obesity. *The Lancet*, 404(10463), pp.1642—1643. 10.1016/S0140-6736(24)02097-X.

Dal Negro, R.W., Distante, C., Bonadiman, L., Turco, P. and Iannazzo, S., 2016. Cost of persistent asthma in Italy. *Multidisciplinary Respiratory Medicine*, 11(1), p.44. 10.1186/s40248-016-0080-1.

Darbà, J. and Ascanio, M., 2025. Hepatocellular carcinoma: what are the differential costs compared to the general population? *Journal of Medical Economics*, 28(1), pp.471—478. 10.1080/13696998.2025.2484073.

De Nicola, L., Donfrancesco, C., Minutolo, R., Lo Noce, C., Palmieri, L., De Curtis, A., Iacoviello, L., Zoccali, C., Gesualdo, L., Conte, G., Vanuzzo, D., Giampaoli, S., and ANMCO-SIN Research Group, 2015. Prevalence and cardiovascular risk profile of chronic kidney disease in Italy: results of the 2008-12 National Health Examination Survey. *Nephrology,*

Dialysis, Transplantation: Official Publication of the European Dialysis and Transplant Association - European Renal Association, 30(5), pp.806—814. 10.1093/ndt/gfu383.

Dee, A., Callinan, A., Doherty, E., O'Neill, C., McVeigh, T., Sweeney, M.R., Staines, A., Kearns, K., Fitzgerald, S., Sharp, L., Kee, F., Hughes, J., Balanda, K. and Perry, I.J., 2015. Overweight and obesity on the island of Ireland: an estimation of costs. *BMJ Open*, 5(3), p.e006189. 10.1136/bmjopen-2014-006189.

Department of Health, 2026a. *Addressing Obesity*. [online] gov.ie. Available at: https://www.gov.ie/en/healthy-ireland/policy-information/addressing-obesity/ [Accessed 1 June 2026].

Department of Health, 2026b. *Addressing Obesity*. [online] Available at: https://www.gov.ie/en/healthy-ireland/policy-information/addressing-obesity/ [Accessed 12 June 2026].

Department of Health, 2026. *Public Consultation on a new National Obesity Strategy in Ireland*. [online] gov.ie. Available at: https://www.gov.ie/en/department-of-health/consultations/public-consultation-on-a-new-national-obesity-strategy-in-ireland/ [Accessed 1 June 2026].

DHS, 2024. *Diabetes - Data | Fingertips | Department of Health and Social Care*. [online] Available at: https://fingertips.phe.org.uk/profile/diabetes-ft/data#page/1 [Accessed 16 Mar. 2026].

Díaz-Guzmán, J., Egido, J.-A., Gabriel-Sánchez, R., Barberá-Comes, G., Fuentes-Gimeno, B., Fernández-Pérez, C., and on behalf of the IBERICTUS Study Investigators of the Stroke Project of the Spanish Cerebrovascular Diseases Study Group, 2012. Stroke and Transient Ischemic Attack Incidence Rate in Spain: The IBERICTUS Study. *Cerebrovascular Diseases*, 34(4), pp.272—281. 10.1159/000342652.

Diel, R., Rutz, S., Castell, S. and Schaberg, T., 2012. Tuberculosis: cost of illness in Germany. *European Respiratory Journal*, 40(1), pp.143—151. 10.1183/09031936.00204611.

Diel, R., Vandeputte, J., Vries, G. de, Stillo, J., Wanlin, M. and Nienhaus, A., 2014. Costs of tuberculosis disease in the European Union: a systematic analysis and cost calculation. *European Respiratory Journal*, 43(2), pp.554—565. 10.1183/09031936.00079413.

Dodel, R.C., Haacke, C., Zamzow, K., Pawelzik, S., Spottke, A., Rethfeldt, M., Siebert, U., Oertel, W.H., Schöffski, O. and Back, T., 2004. Resource Utilization and Costs of Stroke Unit Care in Germany. *Value in Health*, 7(2), pp.144—152. 10.1111/j.1524-4733.2004.72314.x.

Dorfman, L. and Wallack, L., 2007. Moving Nutrition Upstream: The Case for Reframing Obesity. *Journal of Nutrition Education and Behavior*, 39(2), pp.S45—S50. 10.1016/j.jneb.2006.08.018.

Dovizio, M., Leogrande, M. and Esposti, L.D., 2024. Scompenso cardiaco e impatto economico: un'analisi nella reale pratica clinica in Italia. *Global & Regional Health Technology Assessment*, 11, pp.94—100. 10.33393/grhta.2024.3013.

Doz, M., Chouaid, C., Com-Ruelle, L., Calvo, E., Brosa, M., Robert, J., Decuypère, L., Pribil, C., Huerta, A. and Detournay, B., 2013. The association between asthma control, health care costs, and quality of life in France and Spain. *BMC Pulmonary Medicine*, 13(1), p.15. 10.1186/1471-2466-13-15.

Dulloo, A.G., Jacquet, J. and Montani, J.-P., 2012. How dieting makes some fatter: from a perspective of human body composition autoregulation. *Proceedings of the Nutrition Society*, 71(3), pp.379—389. 10.1017/S0029665112000225.

EACH, 2025. *A European Cardiovascular Health Plan: The Roadmap*. [online] European Alliance for Cardiovascular Health. Available at: https://www.cardiovascular-alliance.eu/wp-content/uploads/2025/04/EACH-A-EUROPEAN-CARDIOVASCULAR-HEALTH-PLAN-THE-ROADMAP_FINAL_WEB.pdf .

Effertz, T., Engel, S., Verheyen, F. and Linder, R., 2016. The costs and consequences of obesity in Germany: a new approach from a prevalence and life-cycle perspective. *The European Journal of Health Economics*, 17(9), pp.1141—1158. 10.1007/s10198-015-0751-4.

Ehlers, L.H., Reinstrup, N.W., Olesen, R.H., Holm, J.-C., McEwan, P. and Le Roux, C.W., 2025. Global barriers to decision makers for prioritizing interventions for obesity. *International Journal of Obesity*, 49(2), pp.246—253. 10.1038/s41366-024-01650-z.

Eisenberg, D., Shikora, S.A., Aarts, E., Aminian, A., Angrisani, L., Cohen, R.V., Luca, M.D., Faria, S.L., Goodpaster, K.P.S., Haddad, A., Himpens, J.M., Kow, L., Kurian, M., Loi, K., Mahawar, K., Nimeri, A., O'Kane, M., Papasavas, P.K., Ponce, J., Pratt, J.S.A., Rogers, A.M., Steele, K.E., Suter, M. and Kothari, S.N., 2022. 2022 American Society for Metabolic and Bariatric Surgery (ASMBS) and International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO): Indications for Metabolic and Bariatric Surgery. *Surgery for Obesity and Related Diseases*, 18(12), pp.1345—1356. 10.1016/j.soard.2022.08.013.

El Instituto Nacional de Estadística, 2023. *Encuesta de Salud de España*. [online] INE. Available at: https://www.ine.es/dyngs/Prensa/ESdE2023.htm [Accessed 16 Mar. 2026].

Elhariry, M., Iyer, P., Isack, N., Sousa, B., Singh, P., Abbott, S., Wiggins, T., Nirantharakumar, K., Bellary, S., Flint, S.W., Pournaras, D.J. and Hazlehurst, J.M., 2025. Variation in the commissioning of specialist weight management services and bariatric surgery across England: Results of a freedom of information-based mapping exercise across the 42 integrated Care Systems of England. *Clinical Obesity*, 15(3), p.e12731. 10.1111/cob.12731.

Ells, L.J., Rees, K., Brown, T., Mead, E., Al-Khudairy, L., Azevedo, L., McGeechan, G.J., Baur, L., Loveman, E., Clements, H., Rayco-Solon, P., Farpour-Lambert, N. and Demaio, A., 2018. Interventions for treating children and adolescents with overweight and obesity: an overview of Cochrane reviews. *International Journal of Obesity*, 42(11), pp.1823—1833. 10.1038/s41366-018-0230-y.

Elshahat, S., Cockwell, P., Maxwell, A.P., Griffin, M., O'Brien, T. and O'Neill, C., 2020. The impact of chronic kidney disease on developed countries from a health economics perspective: A systematic scoping review. *PLOS ONE*, 15(3), p.e0230512. 10.1371/journal.pone.0230512.

EPRS, 2025. *Obesity in the EU: an ongoing epidemic*.

d'Errico, M., Pavlova, M. and Spandonaro, F., 2022. The economic burden of obesity in Italy: a cost-of-illness study. *The European Journal of Health Economics*, 23(2), pp.177—192. 10.1007/s10198-021-01358-1.

ESC, 2026. *Recommendations for EU-wide cardiometabolic health checks*. [online] European Society of Cardiology. Available at: https://www.escardio.org/news/news-room/recommendations-for-eu-wide-cardiometabolic-health-checks/ [Accessed 12 Mar. 2026].

Escobar, C., Palacios, B., Aranda, U., Capel, M., Sicras, A., Sicras, A., Hormigo, A., Alcázar, R., Manito, N. and Botana, M., 2021. Costs and healthcare utilisation of patients with chronic kidney disease in Spain. *BMC Health Services Research*, 21(1), p.536. 10.1186/s12913-021-06566-2.

Escobar, C., Varela, L., Palacios, B., Capel, M., Sicras, A., Sicras, A., Hormigo, A., Alcázar, R., Manito, N. and Botana, M., 2020. Costs and healthcare utilisation of patients with heart failure in Spain. *BMC Health Services Research*, 20, p.964. 10.1186/s12913-020-05828-9.

EURES, 2025. *Labour Market Information: Spain - EURES (EURopean Employment Services)*. [online] Available at: https://eures.europa.eu/living-and-working/labour-market-information/labour-market-information-spain_en [Accessed 27 May 2026].

European Commission, 2013. *EU Action Plan on Childhood Obesity 2014-2020*. [online] LU: Publications Office. 10.2785/36105.

European Commission, 2021. *Europe's Beating Cancer Plan*. [online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A44%3AFIN [Accessed 12 Mar. 2026].

European Commission, 2025. *Communication on an EU cardiovascular health plan: the Safe Hearts Plan*. [online] Strasbourg. Available at: https://health.ec.europa.eu/publications/communication-eu-cardiovascular-health-plan-safe-hearts-plan_en [Accessed 10 Mar. 2026].

European Commission, 2026a. *Healthier together — EU non-communicable diseases initiative - Public Health*. [online] Available at: https://health.ec.europa.eu/non-communicable-diseases/healthier-together-eu-non-communicable-diseases-initiative_en [Accessed 12 June 2026].

European Commission, 2026b. *National Public Health Prevention Programme / Cardiovascular Risks Prevention - Reforms and Investments*. [online] Available at: https://reforms-investments.ec.europa.eu/projects/national-public-health-prevention-programme-cardiovascular-risks-prevention_en [Accessed 1 June 2026].

European Observatory on Health Systems and Policies, 2025. *Health Systems and Policy Monitor*. [online] Available at: https://eurohealthobservatory.who.int/monitors/health-systems-monitor/countries-hspm/hspm/italy-2023/principal-health-reforms/analysis-of-recent-reforms [Accessed 16 June 2026].

Eurostat, 2025. *Disability statistics - unemployment and people outside the labour force*.

Eurostat, 2026. *[lfsa_igar] Persons outside the labour force not seeking employment by main reason*. [online] Available at: https://ec.europa.eu/eurostat/databrowser/view/lfsa_igar___custom_20168814/default/table [Accessed 19 Feb. 2026].

Evans, M., de Courcy, J., de Laguiche, E., Faurby, M., Haase, C.L., Matthiessen, K.S., Moore, A. and Pearson-Stuttard, J., 2023. Obesity-related complications, healthcare resource use and weight loss strategies in six European countries: the RESOURCE survey. *International Journal of Obesity*, 47(8), pp.750—757. 10.1038/s41366-023-01325-1.

Ezzati, M., Zhou, B., Bennett, J.E. and Phelps, N.H., 2024. Assessing worldwide trends of underweight and obesity — Authors' reply. *The Lancet*, 404(10463), p.1644. 10.1016/S0140-6736(24)02099-3.

Fatoye, F., Gebrye, T., Ryan, C.G., Useh, U. and Mbada, C., 2023. Global and regional estimates of clinical and economic burden of low back pain in high-income countries: a systematic review and meta-analysis. *Frontiers in Public Health*, [online] 11. 10.3389/fpubh.2023.1098100.

Flegal, K.M., Panagiotou, O.A. and Graubard, B.I., 2015. Estimating population attributable fractions to quantify the health burden of obesity. *Annals of Epidemiology*, 25(3), pp.201—207. 10.1016/j.annepidem.2014.11.010.

Fontana, M., Cordero, Á.R., Guerras, J.M., Abascal, E., Herrera, L. and Herrador, Z., 2025. Vigilancia epidemiológica de la tuberculosis en España, 2023. *Boletín Epidemiológico Semanal*, 33(1), pp.12—22. 10.4321/s2173-92772025000100002.

France Alzheimer, G., 2025. Alzheimer : 1,4 M de personnes malades en 2025. Available at: https://www.francealzheimer.org/prevalence-de-la-maladie-dalzheimer-et-des-maladies-apparentees-14-m-de-personnes-malades-en-2025/ [Accessed 16 Mar. 2026].

French, H.P., Galvin, R., Horgan, N.F. and Kenny, R.A., 2016. Prevalence and burden of osteoarthritis amongst older people in Ireland: findings from The Irish LongituDinal Study on Ageing (TILDA). *European Journal of Public Health*, 26(1), pp.192—198. 10.1093/eurpub/ckv109.

French, S.A., Wall, M., Corbeil, T., Sherwood, N.E., Berge, J.M. and Neumark-Sztainer, D., 2018. Obesity in Adolescence Predicts Lower Educational Attainment and Income in Adulthood: The Project EAT Longitudinal Study. *Obesity*, 26(9), pp.1467—1473. 10.1002/oby.22273.

Frood, S., Johnston, L.M., Matteson, C.L. and Finegood, D.T., 2013. Obesity, Complexity, and the Role of the Health System. *Current Obesity Reports*, 2(4), pp.320—326. 10.1007/s13679-013-0072-9.

Gabet, A., Béjot, Y., Touzé, E., Woimant, F., Suissa, L., Grave, C., Lailler, G., Tuppin, P. and Olié, V., 2024. Epidemiology of stroke in France. *Archives of Cardiovascular Diseases*, 117(12), pp.682—692. 10.1016/j.acvd.2024.10.327.

Gandjour, A., Armsen, W., Wehmeyer, W., Multmeier, J. and Tschulena, U., 2020. Costs of patients with chronic kidney disease in Germany. *PLoS ONE*, 15(4), p.e0231375. 10.1371/journal.pone.0231375.

Gasoyan, H., Tajeu, G., Halpern, M.T. and Sarwer, D.B., 2019. Reasons for Underutilization of Bariatric Surgery: The Role of Insurance Benefit Design. *Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery*, 15(1), pp.146—151. 10.1016/j.soard.2018.10.005.

G-BA, 2022. *Disease-Management-Programme (DMP) | G-BA*. [online] Available at: https://www.g-ba.de/themen/disease-management-programme/ [Accessed 1 June 2026].

GBD, 2020. Global burden of 369 diseases and injuries in 204 countries and territories, 1990—2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet (London, England)*, 396(10258), pp.1204—1222. 10.1016/S0140-6736(20)30925-9.

GBD, 2023. *Global Burden of Disease Study 2023*. [online] Institute for Health Metrics and Evaluation. Available at: https://vizhub.healthdata.org/gbd-compare [Accessed 16 Mar. 2026].

Ghusn, W. and Hurtado, M.D., 2024. Glucagon-like Receptor-1 agonists for obesity: Weight loss outcomes, tolerability, side effects, and risks. *Obesity Pillars*, 12, p.100127. 10.1016/j.obpill.2024.100127.

Gläser, E., Kilimann, I., Platen, M., Hoffmann, W., Brosseron, F., Buerger, K., Coenjaerts, M., Düzel, E., Ewers, M., Fliessbach, K., Frommann, I., Gemenetzi, M., Glanz, W., Hellmann-Regen, J., Incesoy, E.I., Janowitz, D., Jessen, F., Peters, O., Priller, J., Ramirez, A., Schneider, A., Spottke, A., Spruth, E.J., Teipel, S., Wagner, M. and Michalowsky, B., 2025. The economic burden of subjective cognitive decline, mild cognitive impairment and Alzheimer's dementia: excess costs and associated clinical and risk factors. *Alzheimer's Research & Therapy*, 17(1), p.142. 10.1186/s13195-025-01785-9.

Gobbi, B., 2025. *Obesity is a disease: Italy first country to recognise it with law passed*. [online] Il Sole 24 ORE. Available at: https://en.ilsole24ore.com/art/obesity-is-a-disease-italy-first-country-to-recognise-it-the-go-ahead-law-AH8HqtvC [Accessed 10 June 2026].

Grave, C., Gabet, A., Danchin, N., Iliou, M.-C., Lailler, G., Tuppin, P., Cohen, A., Blacher, J., Puymirat, E. and Olié, V., 2024. Epidemiology of ischaemic heart disease in France. *Archives of Cardiovascular Diseases*, 117(12), pp.725—737. 10.1016/j.acvd.2024.10.322.

Gullón, J.A., García-García, J.M., Villanueva, M.Á., Álvarez-Navascues, F., Rodrigo, T., Casals, M., Anibarro, L., García-Clemente, M.M., Jiménez, M.Á., Bustamante, A., Penas, A., Caminero, J.A. and Caylà, J., 2016. Tuberculosis Costs in Spain and Related Factors. *Archivos de Bronconeumología*, 52(12), pp.583—589. 10.1016/j.arbr.2016.05.015.

Gupta, S., Richard, L. and Forsythe, A., 2015. The humanistic and economic burden associated with increasing body mass index in the EU5. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 8, pp.327—338. 10.2147/DMSO.S83696.

Haug, U., Engel, S., Verheyen, F. and Linder, R., 2014. Estimating colorectal cancer treatment costs: a pragmatic approach exemplified by health insurance data from Germany. *PloS One*, 9(2), p.e88407. 10.1371/journal.pone.0088407.

Hay, S.I., Ong, K.L., Santomauro, D.F. *et al*., 2025. Burden of 375 diseases and injuries, risk-attributable burden of 88 risk factors, and healthy life expectancy in 204 countries and territories, including 660 subnational locations, 1990—2023: a systematic analysis for the Global Burden of Disease Study 2023. *The Lancet*, 406(10513), pp.1873—1922. 10.1016/S0140-6736(25)01637-X.

Health Search, 2018. *Health Search Newsletter*. [online] Available at: https://www.healthsearch.it/documenti/documenti_ricercatori/Newsletter/2018/2_2018.pdf?utm_source=chatgpt.com [Accessed 16 Mar. 2026].

Health Service Executive, 2025. *GP chronic disease programme makes a difference for 400,000 people in Ireland*. [online] Available at: https://about.hse.ie/news/gp-chronic-disease-programme-makes-a-difference-for-400000-people-in-ireland/ [Accessed 1 June 2026].

Heeren, F.A.N., Darcey, V.L., Deemer, S.E., Menon, S., Tobias, D. and Cardel, M.I., 2023. Breaking down silos: the multifaceted nature of obesity and the future of weight management. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 378(1885), p.20220215. 10.1098/rstb.2022.0215.

Heitmann, B.L., 2025. The Impact of Novel Medications for Obesity on Weight Stigma and Societal Attitudes: A Narrative Review. *Current Obesity Reports*, 14(1), p.18. 10.1007/s13679-025-00611-5.

Henderson, R.H., French, D., Maughan, T., Adams, R., Allemani, C., Minicozzi, P., Coleman, M.P., McFerran, E., Sullivan, R. and Lawler, M., 2021. The economic burden of colorectal

cancer across Europe: a population-based cost-of-illness study. *The Lancet. Gastroenterology & Hepatology*, 6(9), pp.709—722. 10.1016/S2468-1253(21)00147-3.

Hewage, N., Wijesekara, U. and Perera, R., 2023. Determining the best method for evaluating obesity and the risk for non-communicable diseases in women of childbearing age by measuring the body mass index, waist circumference, waist-to-hip ratio, waist-to-height ratio, A Body Shape Index, and hip index. *Nutrition (Burbank, Los Angeles County, Calif.)*, 114, p.112135. 10.1016/j.nut.2023.112135.

HIQA, 2014. *Health Technology Assessment of Scheduled Procedures Referral thresholds for adult patients suspected of having gallstone disease Draft for consultation July 2014 - Google Search*. [online] Available at: https://www.hiqa.ie/sites/default/files/2017-01/HIQA-Gallstone-Disease-for-consultation.pdf .

HSE, 2025a. *Diabetes Ireland*. [online] HSE.ie. Available at: https://www.hse.ie/website-update/ [Accessed 16 Mar. 2026].

HSE, 2025b. *Tuberculosis in Ireland: provisional trends in surveillance data*. [online] Available at: https://www.hpsc.ie/a-z/vaccinepreventable/tuberculosistb/tbdataandreports/20250313_2020-2024_TB_Trends_Slideset_v1.0.pdf [Accessed 16 Mar. 2026].

Husky, M.M., Ferdous Farin, F., Compagnone, P., Fermanian, C. and Kovess-Masfety, V., 2018. Chronic back pain and its association with quality of life in a large French population survey. *Health and Quality of Life Outcomes*, 16, p.195. 10.1186/s12955-018-1018-4.

IARC, 2022a. *Cancer Today*. [online] Available at: https://gco.iarc.who.int/today/ [Accessed 16 Mar. 2026].

IARC, 2022b. *Global Cancer Observatory, France*. [online] IARC. Available at: https://gco.iarc.who.int/media/globocan/factsheets/populations/250-france-metropolitan-fact-sheet.pdf [Accessed 16 Mar. 2026].

IARC, 2022c. *Global Cancer Observatory, Greece*. [online] Available at: https://gco.iarc.who.int/media/globocan/factsheets/populations/300-greece-fact-sheet.pdf [Accessed 16 Mar. 2026].

IARC, 2022d. *Global Cancer Observatory, Ireland*. [online] Available at: https://gco.iarc.who.int/media/globocan/factsheets/populations/372-ireland-fact-sheet.pdf [Accessed 16 Mar. 2026].

IARC, 2022e. *Global Cancer Observatory, Spain*. [online] Available at: https://gco.iarc.who.int/media/globocan/factsheets/populations/724-spain-fact-sheet.pdf [Accessed 16 Mar. 2026].

IARC, 2025. *European Code Against Cancer | 14 ways to prevent cancer*. [online] International Agency for Research on Cancer; World Health Organisation. Available at: https://cancer-code-europe.iarc.who.int/ [Accessed 16 Feb. 2026].

Ibarrondo, O., Lizeaga, G., Martínez-Llorente, J.M., Larrañaga, I., Soto-Gordoa, M. and Álvarez-López, I., 2022. Health care costs of breast, prostate, colorectal and lung cancer care by clinical stage and cost component. *Gaceta Sanitaria*, 36(3), pp.246—252. 10.1016/j.gaceta.2020.12.035.

IFSO, 2024. *9th Global Registry Report*. International Federation for Surgery of Obesity & Metabolic Disorders.

Innovative Health Initiative, 2026. *The future treatment of people living with obesity*. [online] SOPHIA (Stratification of Obesity Phenotypes to Optimise Future Obesity Therapy). Available at: https://imisophia.eu [Accessed 3 Feb. 2026].

INSEE, 2026. *Labour Force Survey*. Labour Force Survey 2025. [online] Available at: https://www.insee.fr/en/statistiques/8667814#consulter [Accessed 27 May 2026].

Institute for Health Metrics and Evaluation, 2024. *GBD Results*. Available at: https://vizhub.healthdata.org/gbd-results/ [Accessed 20 Oct. 2025].

Institute for Public Policy Research, 2024. *Revealed: Hidden annual cost of employee sickness is up £30 billion since 2018*. [online] IPPR. Available at: https://www.ippr.org/media-office/revealed-hidden-annual-cost-of-employee-sickness-is-up-30-billion-since-2018 [Accessed 26 May 2026].

International Diabetes Federation, 2025. *Spain Diabetes Prevalence & Health Data | IDF Atlas*. [online] Available at: https://diabetesatlas.org/data-by-location/country/spain/ [Accessed 16 Mar. 2026].

Irish Heart Foundation, 2015. *The Cost of Heart Failure in Ireland — The social, economic and health implications of heart failure in Ireland*. Available at: https://www.rte.ie/documents/news/cost-of-heart-failure-report-web.pdf [Accessed 16 Mar. 2026].

Istituto Superiore di Sanità, 2021. *Diabete*. [online] Available at: https://www.epicentro.iss.it/diabete/aggiornamenti [Accessed 16 Mar. 2026].

Istituto Superiore di Sanità, 2024. *Malattia di alzheimer*. [online] Available at: https://www.epicentro.iss.it/alzheimer/ [Accessed 16 Mar. 2026].

Jacob, C., Bechtel, B., Engel, S., Kardos, P., Linder, R., Braun, S. and Greiner, W., 2016. Healthcare costs and resource utilization of asthma in Germany: a claims data analysis. *The European Journal of Health Economics*, 17, pp.195—201. 10.1007/s10198-015-0671-3.

Jacobsen, S., Rozario, M. de, Jacobsen, S. and Rozario, M. de, 2026. France becomes first EU country to reimburse anti-obesity drugs, minister says. *Reuters*. [online] 28 May. Available at: https://www.reuters.com/legal/litigation/france-reimburse-weight-loss-drugs-mid-june-health-minister-says-2026-05-28/ [Accessed 1 June 2026].

Jha, V., Al-Ghamdi, S.M.G., Li, G., Wu, M.-S., Stafylas, P., Retat, L., Card-Gowers, J., Barone, S., Cabrera, C. and Garcia Sanchez, J.J., 2023. Global Economic Burden Associated with Chronic Kidney Disease: A Pragmatic Review of Medical Costs for the Inside CKD Research Programme. *Advances in Therapy*, 40(10), pp.4405—4420. 10.1007/s12325-023-02608-9.

Jommi, C., Armeni, P., Battista, M., di Procolo, P., Conte, G., Ronco, C., Cozzolino, M., Costanzo, A.M., di Luzio Paparatti, U., Concas, G., Remuzzi, G., and On behalf of the IRIDE Study Group, 2018. The Cost of Patients with Chronic Kidney Failure Before Dialysis: Results from the IRIDE Observational Study. *PharmacoEconomics - Open*, 2(4), pp.459—467. 10.1007/s41669-017-0062-z.

Jones, C., Mawhinney, A. and Brown, R., 2012. The true cost of gallstone disease. *The Ulster Medical Journal*, 81(1), pp.10—13.

Jones, D.A., 2007. Tackling Obesities: Future Choices — Obesogenic Environments — Evidence Review.

Joyce, D.P., O'Neill, C., Heneghan, H.M., Curran, C., Barry, K., Sweeney, K., Malone, C., McLaughlin, R. and Kerin, M.J., 2019. The changing cost of breast cancer care: lessons from a centralised modern cancer centre. *Irish Journal of Medical Science (1971 -)*, 188(2), pp.409—414. 10.1007/s11845-018-1872-4.

Jung, H.W., 2024. Current options in obesity pharmacotherapy for children and adolescents. *Precision and Future Medicine*, 8(2), pp.38—49. 10.23838/pfm.2024.00093.

Kan, H., Bae, J.P., Dunn, J.P., Buysman, E.K., Gronroos, N.N., Swindle, J.P., Bengtson, L.G.S. and Ahmad, N., 2023. Real-world primary nonadherence to antiobesity medications. *Journal of Managed Care & Specialty Pharmacy*, 29(10), pp.1099—1108. 10.18553/jmcp.2023.23083.

Kastanioti, C., n.d. Health care costs and related socio-economic factors of cholecystectomy: an evaluation of two operative techniques in greece. *Health Science Journal*, 5(1), pp.0—0.

Kelly, R., 2021. Preventing Obesity: A Social Ecological Exploration of Centers for Disease Control Prevention Strategies and Guidance toward Healthy Eating, Physical Activity, and Communities. *Theses and Dissertations*. [online] https://doi.org/10.25772/0MZN-QA40.

Khan, S.A., Hernandez-Villafuerte, K., Hernandez, D. and Schlander, M., 2023. Estimation of the stage-wise costs of breast cancer in Germany using a modeling approach. *Frontiers in Public Health*, 10, p.946544. 10.3389/fpubh.2022.946544.

Kheniser, K., Saxon, D.R. and Kashyap, S.R., 2021. Long-Term Weight Loss Strategies for Obesity. *The Journal of Clinical Endocrinology & Metabolism*, 106(7), pp.1854—1866. 10.1210/clinem/dgab091.

Kidney Research UK, 2023. *The health economics of kidney disease to 2033*. [online] Available at: https://www.kidneyresearchuk.org/wp-content/uploads/2023/06/Economics-of-Kidney-Disease-summary-report_accessible.pdf [Accessed 16 Mar. 2026].

Kosmidis, M.H., Vlachos, G.S., Anastasiou, C.A., Yannakoulia, M., Dardiotis, E., Hadjigeorgiou, G., Sakka, P., Ntanasi, E. and Scarmeas, N., 2018. Dementia Prevalence in Greece: The Hellenic Longitudinal Investigation of Aging and Diet (HELIAD). *Alzheimer Disease & Associated Disorders*, 32(3), p.232. 10.1097/WAD.0000000000000249.

Kotecha, P., Huang, W., Yeh, Y.-Y., Narvaez, V.M., Adirika, D., Tang, H., Bernier, A.V., Westen, S.C., Smith, S.M., Bian, J. and Guo, J., 2025. Efficacy and Safety of GLP-1 RAs in Children and Adolescents With Obesity or Type 2 Diabetes: A Systematic Review and Meta-Analysis. *JAMA pediatrics*, 179(12), pp.1308—1317. 10.1001/jamapediatrics.2025.3243.

Kourlaba, G., Bakakos, P., Loukides, S., Vellopoulou, K., Solakidi, A. and Maniadakis, N., 2019. The self-reported prevalence and disease burden of asthma in Greece. *The Journal of Asthma: Official Journal of the Association for the Care of Asthma*, 56(5), pp.478—497. 10.1080/02770903.2018.1471704.

Koutroumpis, J., 2025. Greece Launches Free Obesity Treatments and New National Screening Programs. *GreekReporter.com*. Available at: https://greekreporter.com/2025/12/10/greece-launches-free-obesity-treatments/ [Accessed 1 June 2026].

Lamberts, M.P., Özdemir, C., Drenth, J.P.H., van Laarhoven, C.J.H.M., Westert, G.P. and Kievit, W., 2017. Cost-effectiveness of a new strategy to identify uncomplicated gallstone disease

patients that will benefit from a cholecystectomy. *Surgical Endoscopy*, 31(6), pp.2534—2540. 10.1007/s00464-016-5256-4.

Lasota, K., Holownia-Voloskova, M., Casciano, R. and Walczak, J., 2024. Is There an Opportunity for Reimbursement of Anti-Obesity Drugs in Central and Eastern Europe? *Value in Health*, 27(12), p.S428. 10.1016/j.jval.2024.10.2192.

l'Assurance Maladie, 2026. *Mon bilan prévention par les médecins, un temps d'échange dédié à la prévention*. [online] Available at: https://www.ameli.fr/medecin/sante-prevention/bilan-prevention-ages-cles [Accessed 1 June 2026].

Lautenbach, A., Seitz, L., Knerr-Rupp, K., Hartmann, C., McMillan, A., Cooper, C. and Meadows, R., 2026. Characteristics of Individuals Living with Obesity in Germany, Weight Loss Methods Attempted, and Response over a 12-Month Period: Results from a Cross-Sectional Survey. *Obesity Facts*. [online] 10.1159/000550050.

Le Houerou, A., 2026. *Mise en oeuvre du dispositif « Mon Bilan Prévention »*. [online] Sénat. Available at: https://extranet.gslb.senat.fr/questions/base/2025/qSEQ251006408.html [Accessed 15 Sept. 2026].

Lecube, A., Azriel, S., Barreiro, E., Blay, G., Carretero-Gómez, J., Ciudin, A., Fernández, J.M., Flores, L., de Hollanda, A., Martínez, E., Miñambres, I., Moizé, V., Morales, C., Ramírez, V., Salvador, J., Soler, M.J., Supervía, M., Valentí, V., Vicente-Rodríguez, G., Vilarrasa, N. and Malagón, M.M., 2025. The Spanish GIRO Guideline: A Paradigm Shift in the Management of Obesity in Adults. *Obesity Facts*, pp.1—13. 10.1159/000544880.

Lee, K., Bauman, A., Wolfenden, L., Phongsavan, P. and Crane, M., 2024. How long does it take to scale-up obesity prevention interventions? *Preventive Medicine*, 185, p.108012. 10.1016/j.ypmed.2024.108012.

Légifrance, 2026. *Arrêté du 26 février 2026 pris pour l'application de l'article R. 4012-1 du code de la santé publique - Légifrance*. [online] Available at: https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000053613439 [Accessed 1 June 2026].

Levin, M.L., 1953. The occurrence of lung cancer in man. *Acta - Unio Internationalis Contra Cancrum*, 9(3), pp.531—541.

Levy, S., Nessen, M. and Braunstein, G., 2025. *Obesity - Nutritional Disorders*. [online] MSD Manual Professional Edition. Available at: https://www.msdmanuals.com/professional/nutritional-disorders/obesity-and-the-metabolic-syndrome/obesity [Accessed 23 Nov. 2025].

Li, Z.-Z., Guan, L.-J., Ouyang, R., Chen, Z.-X., Ouyang, G.-Q. and Jiang, H.-X., 2023. Global, regional, and national burden of gallbladder and biliary diseases from 1990 to 2019. *World Journal of Gastrointestinal Surgery*, 15(11), pp.2564—2578. 10.4240/wjgs.v15.i11.2564.

Lingvay, I., Brown-Frandsen, K., Colhoun, H.M., Deanfield, J., Emerson, S.S., Esbjerg, S., Hardt-Lindberg, S., Hovingh, G.K., Kahn, S.E., Kushner, R.F., Lincoff, A.M., Marso, S.P., Fries, T.M., Plutzky, J., Ryan, D.H., and SELECT Study Group, 2023. Semaglutide for cardiovascular event reduction in people with overweight or obesity: SELECT study baseline characteristics. *Obesity (Silver Spring, Md.)*, 31(1), pp.111—122. 10.1002/oby.23621.

Lingvay, I., Cohen, R.V., Roux, C.W. le and Sumithran, P., 2024. Obesity in adults. *The Lancet*, 404(10456), pp.972—987. 10.1016/S0140-6736(24)01210-8.

Long, B., Pelletier, J., Koyfman, A. and Bridwell, R.E., 2024. GLP-1 agonists: A review for emergency clinicians. *The American Journal of Emergency Medicine*, 78, pp.89—94. 10.1016/j.ajem.2024.01.010.

Loos, R.J.F. and Yeo, G.S.H., 2022. The genetics of obesity: from discovery to biology. *Nature Reviews Genetics*, 23(2), pp.120—133. 10.1038/s41576-021-00414-z.

Lorenzovici, L., Bârzan-Székely, A., Farkas-Ráduly, S., Pană, B.C., Csanádi, M., Chiriac, N.D. and Kaló, Z., 2022. Burden of Chronic Heart Failure in Romania. *Healthcare*, 10(1), p.107. 10.3390/healthcare10010107.

Loza, E., Lopez-Gomez, J.M., Abasolo, L., Maese, J., Carmona, L. and Batlle-Gualda, E., 2009. Economic burden of knee and hip osteoarthritis in spain. [online] 10.1002/art.24214.

Luengo-Fernandez, R., Candio, P., Violato, M., Leal, J., Randall, G. and Jackson, S., 2020. At What Cost: The Economic Impact of Stroke in Europe.

Luengo-Fernandez, R., Walli-Attaei, M., Gray, A., Torbica, A., Maggioni, A.P., Huculeci, R., Bairami, F., Aboyans, V., Timmis, A.D., Vardas, P. and Leal, J., 2023. Economic burden of cardiovascular diseases in the European Union: a population-based cost study. *European Heart Journal*, 44(45), pp.4752—4767. 10.1093/eurheartj/ehad583.

Luppino, F.S., de Wit, L.M., Bouvy, P.F., Stijnen, T., Cuijpers, P., Penninx, B.W.J.H. and Zitman, F.G., 2010. Overweight, Obesity, and Depression: A Systematic Review and Meta-analysis of Longitudinal Studies. *Archives of General Psychiatry*, 67(3), pp.220—229. 10.1001/archgenpsychiatry.2010.2.

Lynch, D., 2025. Informing the future direction of obesity care. *Medical Independent*. Available at: https://www.medicalindependent.ie/in-the-news/news-features/informing-the-future-direction-of-obesity-care/ [Accessed 1 June 2026].

Machado, A.M., Guimarães, N.S., Bocardi, V.B., da Silva, T.P.R., Carmo, A.S. do, Menezes, M.C. de and Duarte, C.K., 2022. Understanding weight regain after a nutritional weight loss intervention: Systematic review and meta-analysis. *Clinical Nutrition ESPEN*, 49, pp.138—153. 10.1016/j.clnesp.2022.03.020.

Machado-Fragua, M.D., Sabia, S., Fayosse, A., Silva, G.C., Landré, B. and Singh-Manoux, A., 2025. Cross-Sectional Associations of Body Mass Index With Disability Across High- and Middle-Income Countries in 2002-2006 and 2015-2018. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, p.e70054. 10.1111/obr.70054.

Madelung, M. and Bayley, H., 2025. *The Potential for the Private Prescription Market in Europe*. [online] IQVIA. Available at: https://www.iqvia.com/-/media/iqvia/pdfs/emea/library/whitepaper/iqvia-2025_the-potential-for-the-private-prescription-market-in-europe.pdf .

Makrilakis, K., Kalpourtzi, N., Ioannidis, I., Iraklianou, S., Raptis, A., Sotiropoulos, A., Gavana, M., Vantarakis, A., Kantzanou, M., Hadjichristodoulou, C., Chlouverakis, G., Trypsianis, G., Voulgari, P.V., Alamanos, Y., Touloumi, G., Liatis, S., and EMENO Study Group, 2021. Prevalence of diabetes and pre-diabetes in Greece. Results of the First National Survey of Morbidity and Risk Factors (EMENO) study. *Diabetes Research and Clinical Practice*, 172, p.108646. 10.1016/j.diabres.2020.108646.

Mata-Cases, M., Casajuana, M., Franch-Nadal, J., Casellas, A., Castell, C., Vinagre, I., Mauricio, D. and Bolíbar, B., 2016. Direct medical costs attributable to type 2 diabetes

mellitus: a population-based study in Catalonia, Spain. *The European Journal of Health Economics*, 17(8), pp.1001—1010. 10.1007/s10198-015-0742-5.

McCrabb, S., Lane, C., Hall, A., Milat, A., Bauman, A., Sutherland, R., Yoong, S. and Wolfenden, L., 2019. Scaling-up evidence-based obesity interventions: A systematic review assessing intervention adaptations and effectiveness and quantifying the scale-up penalty. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 20(7), pp.964—982. 10.1111/obr.12845.

McLaughlin, J., Rejon, C.S., Bell, M., Schwander, B., Coulman, K. and McLeod, H., 2024. Holistic modelling as a catalyst for effective obesity policy. *BMJ*, 386, p.e077139. 10.1136/bmj-2023-077139.

MECA, A., Subtirelu, M., Turcu-Stiolica, A., Nitu, F. and Bogdan, M., 2026. *PREVALENCE OF TUBERCULOSIS IN SOUTH-WEST ROMANIA AND THE DIRECT COSTS BURDEN — Farmacia Journal*. [online] Available at: https://farmaciajournal.com/issue-articles/prevalence-of-tuberculosis-in-south-west-romania-and-the-direct-costs-burden/ [Accessed 16 Mar. 2026].

Meijer, E., Casanova, M., Kim, H., Llena-Nozal, A. and Lee, J., 2022. Economic costs of dementia in 11 countries in Europe: Estimates from nationally representative cohorts of a panel study. *The Lancet Regional Health - Europe*, 20, p.100445. 10.1016/j.lanepe.2022.100445.

Mennini, F.S., Sciattella, P., Marcellusi, A., Bartolini, F., Bernardi, F.F., Levrat-Guillen, F., Cozzolino, M., Di Gennaro, M., Giordana, R., Giustozzi, M. and Trama, U., 2024. An Analysis of the Distribution of Direct Cost of Diabetes Care in Selected Districts in Italy. *Diabetes Therapy*, 15(6), pp.1417—1434. 10.1007/s13300-024-01580-z.

Mennini, F.S., Sciattella, P., Scortichini, M., Migliorini, R., Trabucco Aurilio, M., Marcellusi, A. and Bianchetti, A., 2025. Burden of disease of Alzheimer disease in Italy: a real-world data analysis. *BMC Health Services Research*, 25(1), p.588. 10.1186/s12913-025-12735-4.

Ministère de la Santé, de la Famille, de l'Autonomie et des Personnes handicapées, 2026. *La feuille de route obésité 2026-2030*. [online] Available at: https://sante.gouv.fr/soins-et-maladies/prises-en-charge-specialisees/obesite/article/la-feuille-de-route-obesite-2026-2030 [Accessed 1 June 2026].

Ministerio de Sanidad, 2025. *Estrategia para el Abordaje de la Cronicidad en el Sistema Nacional de Salud*. Available at: https://www.sanidad.gob.es/areas/calidadAsistencial/estrategias/abordajeCronicidad/docs/20250704_EAC_DOCUMENTO-DESARROLLO_2025-2028_Final.pdf .

Ministerio de Sanidad., 2026. *Altas, estancia media (días) y coste medio (€) de los 25 procesos de tipo médico más frecuentes en hospitalización. Hospitales de agudos. SNS. Año 2023*. [online] Available at: https://www.sanidad.gob.es//eestadEstudiosstadisticas/docs/CMBD/2023Medicos.pdf [Accessed 16 Mar. 2026].

Ministero della Salute, 2026. *Gazzetta Ufficiale*. [online] Available at: https://www.gazzettaufficiale.it/eli/id/2026/07/28/26A03750/sg [Accessed 15 Sept. 2026].

Ministerul Sănătății, 2022. *Strategia Națională de Sănătate 2022-2030*. [online] Raportuldegardă.ro. Available at: https://raportuldegarda.ro/strategia-nationala-sanatate-2022-2030/ [Accessed 1 June 2026].

Ministry of Health, 2026. *Prise en charge des personnes en situation d'obésité - Feuille de route 2026-2030*. [online] Available at: https://sante.gouv.fr/IMG/pdf/fdr_obesite.pdf .

Moiz, A., Filion, K.B., Tsoukas, M.A., Yu, O.H.Y., Peters, T.M. and Eisenberg, M.J., 2025. The expanding role of GLP-1 receptor agonists: a narrative review of current evidence and future directions. *eClinicalMedicine*, [online] 86. 10.1016/j.eclinm.2025.103363.

Mooney, V., 2020. Obesity in Germany 'The long winding road to reimbursement for obesity care'. *ECPO*. Available at: https://eurobesity.org/obesity-in-germany-the-long-winding-road-to-reimbursement-for-obesity-care/? [Accessed 19 Feb. 2026].

Morgovan, C., Cosma, S.A., Valeanu, M., Juncan, A.M., Rus, L.L., Gligor, F.G., Butuca, A., Tit, D.M., Bungau, S. and Ghibu, S., 2020. An Exploratory Research of 18 Years on the Economic Burden of Diabetes for the Romanian National Health Insurance System. *International Journal of Environmental Research and Public Health*, 17(12), p.4456. 10.3390/ijerph17124456.

Mota, M., Popa, S.G., Mota, E., Mitrea, A., Catrinoiu, D., Cheta, D.M., Guja, C., Hancu, N., Ionescu-Tirgoviste, C., Lichiardopol, R., Mihai, B.M., Popa, A.R., Zetu, C., Bala, C.G., Roman, G., Serafinceanu, C., Serban, V., Timar, R., Veresiu, I.A. and Vlad, A.R., 2016. Prevalence of diabetes mellitus and prediabetes in the adult Romanian population: PREDATORR study. *Journal of Diabetes*, 8(3), pp.336—344. 10.1111/1753-0407.12297.

Munteanu, I., Cioran, N., van Hest, R., Abubakar, I., Story, A., Chiotan, D., de Vries, G. and Mahler, B., 2022. Tuberculosis Surveillance in Romania Among Vulnerable Risk Groups Between 2015 and 2017. *Therapeutics and Clinical Risk Management*, 18, pp.439—446. 10.2147/TCRM.S347748.

National Electronic Health Record Project, 2025. *Free medication for obesity*. [online] Available at: https://www.ehealthrecord.gov.gr/en/announcements/free-medication-for-obesity [Accessed 11 June 2026].

Navarro González, J.F., Ortiz, A., Cebrián Cuenca, A., Moreno Barón, M., Segú, L., Pimentel, B., Aranda, U., Lopez-Chicheri, B., Capel, M., Pomares Mallol, E., Caudron, C., García Sánchez, J.J. and Alcázar Arroyo, R., 2024. Projection of the clinical and economic burden of chronic kidney disease between 2022 and 2027 in Spain: Results of the Inside CKD project. *Nefrologia*, 44(6), pp.807—817. 10.1016/j.nefroe.2024.11.009.

Nektarios, M., Valvis, Z. and Georgiadis, T., 2025. A Methodology for Estimating the Demand for Long-Term Care in Hours: The Baseline Scenario for Greece. *Journal of Long-Term Care*, [online] 0. 10.31389/jltc.402.

Nesta and Frontier Economics, 2025. *The economic and productivity costs of obesity and excess weight in the UK*. [online] nesta. Available at: https://www.nesta.org.uk/report/the-economic-and-productivity-costs-of-obesity-and-overweight-in-the-uk/ [Accessed 20 Aug. 2025].

NHS, 2017. *Obesity*. [online] nhs.uk. Available at: https://www.nhs.uk/conditions/obesity/ [Accessed 16 Dec. 2025].

NHS England, 2026. NHS England » Interim commissioning guidance. Available at: https://www.england.nhs.uk/long-read/interim-commissioning-guidance-nice-ta1026-tirzepatide/ [Accessed 1 June 2026].

NICE, 2025. *A guide for prescribing medicines to manage overweight and obesity*. Available at: https://www.nice.org.uk/guidance/ta1026/resources/a-guide-for-prescribing-medicines-to-manage-overweight-and-obesity-pdf-19828318651333 .

NOCA and INAS, 2023. *IRISH NATIONAL AUDIT OF STROKE*. [online] Available at: https://d7g406zpx7bgk.cloudfront.net/x/6b5072d754/irish-national-audit-of-stroke-national-report-2023-finalv2.pdf [Accessed 16 Mar. 2026].

Nolan, J.J., O'Halloran, D., McKenna, T.J., Firth, R. and Redmond, S., 2006. The cost of treating type 2 diabetes (CODEIRE). *Irish Medical Journal*, 99(10), pp.307—310.

Nordmo, M., Danielsen, Y.S. and Nordmo, M., 2020. The challenge of keeping it off, a descriptive systematic review of high-quality, follow-up studies of obesity treatments. *Obesity Reviews*, 21(1), p.e12949. 10.1111/obr.12949.

Nowak, N., Mellotte, G., The National Renal Office, Health Service Executive of Ireland, O'Halloran, A., The Irish Longitudinal Study on Ageing, Trinity college Dublin, Kenny, R.A., The Irish Longitudinal Study on Ageing, Trinity college Dublin, Sexton, D., and Nephrology Department, St James's Hospital Dublin, Ireland, 2023. *Chronic Kidney Disease in community-dwelling adults aged 50+ years in Ireland: A Report from TILDA and the National Renal Office*. 1st edn. [online] TILDA, Trinity College Dublin. 10.38018/TildaRe.2023-03.

Nutter, S., Eggerichs, L.A., Nagpal, T.S., Ramos Salas, X., Chin Chea, C., Saiful, S., Ralston, J., Barata-Cavalcanti, O., Batz, C., Baur, L.A., Birney, S., Bryant, S., Buse, K., Cardel, M.I., Chugh, A., Cuevas, A., Farmer, M., Ibrahim, A., Kataria, I., Kotz, C., Kyle, T., le Brocq, S., Mooney, V., Mullen, C., Nadglowski, J., Neveux, M., Papapietro, K., Powis, J., Puhl, R.M., Rea Ruanova, B., Saunders, J.F., Stanford, F.C., Stephen, O., Tham, K.W., Urudinachi, A., Vejar-Renteria, L., Walwyn, D., Wilding, J. and Yusop, S., 2024. Changing the global obesity narrative to recognize and reduce weight stigma: A position statement from the World Obesity Federation. *Obesity Reviews*, 25(1), p.e13642. 10.1111/obr.13642.

Ochner, C.N., Barrios, D.M., Lee, C.D. and Pi-Sunyer, F.X., 2013. Biological Mechanisms that Promote Weight Regain Following Weight Loss in Obese Humans. *Physiology & behavior*, 0, pp.106—113. 10.1016/j.physbeh.2013.07.009.

OECD, 2019. *The Heavy Burden of Obesity: The Economics of Prevention*. [online] OECD Publishing. 10.1787/67450d67-en.

OECD, 2025a. *Government expenditure by function*. [online] Available at: https://data-explorer.oecd.org/vis?pg=0&snb=339&df[ds]=dsDisseminateFinalDMZ&df[id]=DSD_NAAG_VI%40DF_NAAG_OTEF&df[ag]=OECD.SDD.NAD&df[vs]=1.0&isAvailabilityDisabled=false&tm=expenditure&dq=A.EU%2BFRA%2BDEU%2BGRC%2BIRL%2BITA%2BESP%2BGBR.OTES13F.GF06%2BGF09%2BGF07%2BGF02..&pd=2023%2C2024&to[TIME_PERIOD]=false&vw=tb [Accessed 19 Mar. 2026].

OECD, 2025b. *OECD Employment Outlook 2025 - Italy*. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/07/oecd-employment-outlook-2025-country-notes_5f33b4c5/italy_a775131b/7e806b33-en.pdf .

OECD, 2025c. *The resilience and sustainability of Romania's healthcare system: OECD Reviews of Health Systems: Romania 2025*. [online] OECD. Available at: https://www.oecd.org/en/publications/oecd-reviews-of-health-systems-romania-2025_f52e4a98-en/full-report/the-resilience-and-sustainability-of-romania-s-healthcare-system_89b96253.html [Accessed 1 June 2026].

Office for Budget Responsibility, 2023. How does economic inactivity compare across advanced economies? Available at: https://obr.uk/box/how-does-economic-inactivity-compare-across-advanced-economies/ [Accessed 26 May 2026].

O'Hara, J., Finnegan, A., Dhillon, H., Ruiz-Casas, L., Pedra, G., Franks, B., Morgan, G., Hebditch, V., Jönsson, B., Mabhala, M., Reic, T., Van Thiel, I., Ratziu, V., Romero-Gomez, M., Bugianesi, E., Schattenberg, J.M. and Anstee, Q.M., 2020. Cost of non-alcoholic steatohepatitis in Europe and the USA: The GAIN study. *JHEP Reports*, 2(5), p.100142. 10.1016/j.jhepr.2020.100142.

Okunogbe, A., Nugent, R., Spencer, G., Ralston, J. and Wilding, J., 2021. Economic impacts of overweight and obesity: current and future estimates for eight countries. *BMJ Global Health*, [online] 6(10). 10.1136/bmjgh-2021-006351.

Oliveira, M.C.A.M., Viana, J.P.M.N., Braga, S. de Q. and Pimentel, M.M.W., 2025. Lifestyle Interventions for the Treatment of Obesity in Workers: An Integrative Review. *Obesities*, 5(4), p.79. 10.3390/obesities5040079.

Onetiu, V., Aurelian, S.M., Capisizu, A., Cristescu, F., Zus, I.C. and Kissimova-Skarbek, K., 2016. Cost of dementia in Romania: a cross-sectional Cost-of-Illness study undertaken in Bucharest. *Zdrowie Publiczne i Zarządzanie*, 2016(Tom 14, Numer 3), pp.204—226.

Orlovic, M., Tzelis, D., Guerra, I., Bar-Katz, V., Woolley, N., Bray, H., Hanslot, M., Usmani, O. and Madoni, A., 2024. Environmental, healthcare and societal impacts of asthma: a UK model-based assessment. *ERJ Open Research*, [online] 10(4). 10.1183/23120541.00577-2023.

O'Shea, E. and Monaghan, C., 2017. An economic analysis of a community-based model for dementia care in Ireland: a balance of care approach. *International Psychogeriatrics*, 29(7), pp.1175—1184. 10.1017/S1041610217000400.

Paccou, J., Genser, L., Lespessailles, É., Bertin, É., Javier, R.-M., Duclos, M., Joly, A.-S., Boirie, Y., Pattou, F., Delarue, J. and Cortet, B., 2022. French recommendations on the prevention and treatment of osteoporosis secondary to bariatric surgery. *Joint Bone Spine*, 89(6), p.105443. 10.1016/j.jbspin.2022.105443.

Pantelis, A. and Doulami, G., 2025. Obstacles Faced by Young Bariatric Surgeons in Greece: A Call for Change. *Obesity Surgery*, 35(5), pp.1989—1992. 10.1007/s11695-025-07820-w.

Papantoniou, P. and Maniadakis, N., 2025. Cost-effectiveness of semaglutide 2.4 mg versus liraglutide 3 mg for the treatment of obesity in Greece. *Frontiers in Public Health*, [online] 13. 10.3389/fpubh.2025.1690211.

Papantoniou, P. and Maniadakis, N., 2026. The Economic Cost of Obesity: A Cost-of-Illness Study in Greece. *Applied Health Economics and Health Policy*, 24(1), pp.195—215. 10.1007/s40258-025-01002-6.

Parlamento italiano, 2026. *Legge 149/25 - articolo 4: Istituzione dell'Osservatorio per lo studio dell'obesità*. [online] Available at: https://www.medicoeleggi.com/argomenti000/italia2025/417661-4.htm [Accessed 15 Sept. 2026].

Patel, A., Berdunov, V., King, D., Quayyum, Z., Wittenberg, R. and Knapp, M., 2020. Current, future and avoidable costs of stroke in the UK.

Pearson-Stuttard, J., Banerji, T., Capucci, S., de Laguiche, E., Faurby, M.D., Haase, C.L., Sommer Matthiessen, K., Near, A.M., Tse, J., Zhao, X. and Evans, M., 2023. Real-world costs of obesity-related complications over eight years: a US retrospective cohort study in 28,500 individuals. *International Journal of Obesity*, 47(12), pp.1239—1246. 10.1038/s41366-023-01376-4.

Pereira-Bouzas, P., Vicente, E., Pachón, M., Gonzalo, E., Hidalgo-Vega, Á. and García, E., 2025. *Valor Social de un mejor control en la obesidad en España*. [online] Fundación Weber. Available at: https://www.weber.org.es/wp-content/uploads/2025/11/Proyecto-OBESIDAD-WEB-1.pdf [Accessed 16 June 2026].

Pers, Y.-M., Nguyen, C., Borie, C., Daste, C., Kirren, Q., Lopez, C., Ouvrard, G., Ruscher, R., Argenson, J.-N., Bardoux, S., Baumann, L., Berenbaum, F., Binard, A., Coudeyre, E., Czernichow, S., Dupeyron, A., Fabre, M.-C., Foulquier, N., Gérard, C., Hausberg, V., Henrotin, Y., Jeandel, C., Lesage, F.-X., Liesse, B., Mainard, D., Michel, F., Ninot, G., Ornetti, P., Oude-Engberink, A., Rat, A.-C., Richette, P., Roren, A., Thoumie, P., Walrand, S., Rannou, F. and Sellam, J., 2024. Recommendations from the French Societies of Rheumatology and Physical Medicine and Rehabilitation on the non-pharmacological management of knee osteoarthritis. *Annals of Physical and Rehabilitation Medicine*, 67(7), p.101883. 10.1016/j.rehab.2024.101883.

Peters-Klimm, F., Halmer, A., Flessa, S., Szecsenyi, J. and Ose, D., 2012. What drives the costs of heart failure care in Germany? A health services cost analysis. *Journal of Public Health*, 20(6), pp.653—660. 10.1007/s10389-012-0501-3.

PHE England, 2020. *Health and social care costs of a selection of health conditions*. [online] GOV.UK. Available at: https://www.gov.uk/government/publications/health-and-social-care-costs-of-a-selection-of-health-conditions [Accessed 9 Jan. 2026].

Phelps, N.H., Singleton, R.K., Zhou, B. *et al*., 2024. Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults. *The Lancet*, 403(10431), pp.1027—1050. 10.1016/S0140-6736(23)02750-2.

Porst, M., Von Der Lippe, E., Leddin, J., Anton, A., Wengler, A., Breitkreuz, J., Schüssel, K., Brückner, G., Schröder, H., Gruhl, H., Plaß, D., Barnes, B., Busch, M.A., Haller, S., Hapke, U., Neuhauser, H., Reitzle, L., Scheidt-Nave, C., Schlotmann, A., Steppuhn, H., Thom, J., Ziese, T. and Rommel, A., 2022. The burden of disease in Germany at the national and regional level—results in terms of disability-adjusted life years (DALY) from the BURDEN 2020 study. *Deutsches Ärzteblatt international*. [online] 10.3238/arztebl.m2022.0314.

Pratt, J.S.A., Browne, A., Browne, N.T., Bruzoni, M., Cohen, M., Desai, A., Inge, T., Linden, B.C., Mattar, S.G., Michalsky, M., Podkameni, D., Reichard, K.W., Stanford, F.C., Zeller, M.H. and Zitsman, J., 2018. ASMBS pediatric metabolic and bariatric surgery guidelines, 2018. *Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery*, 14(7), pp.882—901. 10.1016/j.soard.2018.03.019.

Public Health England, 2020a. *Health and social care costs of a selection of health conditions*. [online] GOV.UK. Available at: https://www.gov.uk/government/publications/health-and-social-care-costs-of-a-selection-of-health-conditions [Accessed 20 Aug. 2025].

Public Health England, 2020b. The health and social care costs of a selection of health conditions and multi-morbidities.

Queneau, P. and Ourabah, R., 2023. Rapport 23-11. Les zones sous-denses, dites « déserts médicaux », en France. États des lieux et propositions concrètes. *Bulletin de l'Académie Nationale de Médecine*, 207(7), pp.860—871. 10.1016/j.banm.2023.06.003.

Raftery, M.N., Ryan, P., Normand, C., Murphy, A.W., Harpe, D. de la and McGuire, B.E., 2012. The Economic Cost of Chronic Noncancer Pain in Ireland: Results From the PRIME Study, Part 2. *The Journal of Pain*, 13(2), pp.139—145. 10.1016/j.jpain.2011.10.004.

Raherison-Semjen, C., Izadifar, A., Russier, M., Rolland, C., Aubert, J.-P., Touboul, C., Leynaud, D., Fabry-Vendrand, C. and Didier, A., 2021. Self-reported asthma prevalence and management in adults in France in 2018: ASTHMAPOP survey. *Respiratory Medicine and Research*, 80, p.100864. 10.1016/j.resmer.2021.100864.

Ralston, R., Godziewski, C. and Carters-White, L., 2023. The many meanings of policy instruments: exploring individual and structural determinants in obesity policy. *Policy & Politics*, 51(2), pp.295—313. 10.1332/030557321X16762984942169.

Ranucci, C., Pippi, R., Buratta, L., Aiello, C., Gianfredi, V., Piana, N., Reginato, E., Tirimagni, A., Chiodini, E., Sbroma Tomaro, E., Gili, A., De Feo, P., Fanelli, C. and Mazzeschi, C., 2017. Effects of an Intensive Lifestyle Intervention to Treat Overweight/Obese Children and Adolescents. *BioMed Research International*, 2017(1), p.8573725. 10.1155/2017/8573725.

Ribas, C.D., Sagardia, A.S., Prina, E., Mainar, A.S., Navarro, A.S. and Teijeiro, C.E., 2020. Late Breaking Abstract - Prevalence, characterization and costs of severe asthma in Spain (BRAVO 1). *European Respiratory Journal*, [online] 56(suppl 64). 10.1183/13993003.congress-2020.4639.

Robert Koch Institute, 2025. Dementia — Prevalence, trends and regional patterns in Germany. An analysis based on routine data from the statutory health insurance. [online] 10.25646/13079.

Romariz, L.M., de Melo, A.A.C., Finnegan, E., Mesquita, Y. and Janovsky, C.C.P.S., 2025. GLP-1 receptor agonists for the treatment of obesity in children and adolescents: a meta-analysis of randomized controlled trials. *Pediatric Research*, pp.1—9. 10.1038/s41390-025-04228-1.

Roth, L., Ordnung, M., Forkmann, K., Mehl, N. and Horstmann, A., 2023. A randomized-controlled trial to evaluate the app-based multimodal weight loss program zanadio for patients with obesity. *Obesity*, 31(5), pp.1300—1310. 10.1002/oby.23744.

Rubino, F., Cummings, D.E., Eckel, R.H., Cohen, R.V., Wilding, J.P.H., Brown, W.A., Stanford, F.C., Batterham, R.L., Farooqi, I.S., Farpour-Lambert, N.J., Roux, C.W. le, Sattar, N., Baur, L.A., Morrison, K.M., Misra, A., Kadowaki, T., Tham, K.W., Sumithran, P., Garvey, W.T., Kirwan, J.P., Fernández-Real, J.-M., Corkey, B.E., Toplak, H., Kokkinos, A., Kushner, R.F., Branca, F., Valabhji, J., Blüher, M., Bornstein, S.R., Grill, H.J., Ravussin, E., Gregg, E., Busaidi, N.B.A., Alfaris, N.F., Ozairi, E.A., Carlsson, L.M.S., Clément, K., Després, J.-P., Dixon, J.B., Galea, G., Kaplan, L.M., Laferrère, B., Laville, M., Lim, S., Fuentes, J.R.L., Mooney, V.M., Nadglowski, J., Urudinachi, A., Olszanecka-Glinianowicz, M., Pan, A., Pattou, F., Schauer, P.R., Tschöp, M.H., Merwe, M.T. van der, Vettor, R. and Mingrone, G., 2025. Definition and diagnostic criteria of clinical obesity. *The Lancet Diabetes & Endocrinology*, 13(3), pp.221—262. 10.1016/S2213-8587(24)00316-4.

Ruiz-Adame Reina, M., 2018. *Estudio de costes sociales, directos e indirectos, de la atención a personas con demencias tipo alzheimer en Andalucía*. [http://purl.org/dc/dcmitype/Text] Universidad de Granada. Available at: https://dialnet.unirioja.es/servlet/tesis?codigo=145606 [Accessed 16 Mar. 2026].

Salam, R.A., Padhani, Z.A., Das, J.K., Shaikh, A.Y., Hoodbhoy, Z., Jeelani, S.M., Lassi, Z.S. and Bhutta, Z.A., 2020. Effects of Lifestyle Modification Interventions to Prevent and Manage Child and Adolescent Obesity: A Systematic Review and Meta-Analysis. *Nutrients*, 12(8), p.2208. 10.3390/nu12082208.

Salama, M., Hassan, D. and Kumar, S., 2025. Updates on Anti-Obesity Medications in Children and Adolescents. *Children*, [online] 12(10). 10.3390/children12101390.

Salmon, J.H., Rat, A.C., Achit, H., Ngueyon-Sime, W., Gard, C., Guillemin, F., Jolly, D. and Fautrel, B., 2019. Health resource use and costs of symptomatic knee and/or hip osteoarthritis. *Osteoarthritis and Cartilage*, 27(7), pp.1011—1017. 10.1016/j.joca.2019.03.005.

Sandhu, H., Xu, W., Olivieri, A.-V., Lübker, C., Smith, I. and Antavalis, V., 2023. Once-Weekly Subcutaneous Semaglutide 2.4 mg Injection is Cost-Effective for Weight Management in the United Kingdom. *Advances in Therapy*, 40(3), pp.1282—1291. 10.1007/s12325-022-02423-8.

Santé publique France, 2023. *Tuberculose*. [online] Available at: https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-et-infections-respiratoires/tuberculose [Accessed 16 Mar. 2026].

Santé publique France, 2024. *Le diabète en France continue de progresser | Santé publique France*. [online] Available at: https://www.santepubliquefrance.fr/les-actualites/2024/le-diabete-en-france-continue-de-progresser [Accessed 16 Mar. 2026].

Savona, N., Macauley, T., Aguiar, A., Banik, A., Boberska, M., Brock, J., Brown, A., Hayward, J., Holbæk, H., Rito, A.I., Mendes, S., Vaaheim, F., van Houten, M., Veltkamp, G., Allender, S., Rutter, H. and Knai, C., 2021. Identifying the views of adolescents in five European countries on the drivers of obesity using group model building. *The European Journal of Public Health*, 31(2), pp.391—396. 10.1093/eurpub/ckaa251.

Savvari, P., Skiadas, I., Barmpouni, M., Papadakis, S.A., Psychogios, V., Pastroudis, A.P., Skarpas, G.A., Tsoutsanis, A., Garofalakis, A., Katsifis, G., Argyropoulou, O.D., Boumpas, D. and Menegas, D., 2023. Moderate to Severe Osteoarthritis: What is the Economic Burden for Patients and the Health Care System? Insights from the "PONOS" Study. *Cartilage*, 15(3), pp.268—277. 10.1177/19476035231196524.

Schild, M., Müller, U., von Schenck, U., Prieur, S. and Miller, R., 2021. The burden of chronic pain for patients with osteoarthritis in Germany: a retrospective cohort study of claims data. *BMC Musculoskeletal Disorders*, 22(1), p.317. 10.1186/s12891-021-04180-1.

Schmid, T., 2015. Costs of treating cardiovascular events in Germany: a systematic literature review. *Health Economics Review*, 5, p.27. 10.1186/s13561-015-0063-5.

Service Public, 2026. Two obesity drugs reimbursed from 15 June. [online] Available at: https://www.service-public.gouv.fr/particuliers/actualites/A18932?lang=en [Accessed 18 June 2026].

Shah, A., Davarci, O., Chaftari, P. and Avenatti, E., 2025. Obesity as a Disease: A Primer on Clinical and Physiological Insights. *Methodist DeBakey Cardiovascular Journal*, 21(2), pp.4—13. 10.14797/mdcvj.1515.

Sharif, F.V., Yousefi, N. and Sharif, Z., 2024. Economic Evaluations of Anti-obesity Interventions in Obese Adults: An Umbrella Review. *Obesity Surgery*, 34(5), pp.1834—1845. 10.1007/s11695-024-07104-9.

Sharma, A.M., 2023. The Transformative Impact of New Anti-Obesity Medications: A Paradigm Shift in Medical Practice? *Journal of Obesity & Metabolic Syndrome*, 32(4), pp.285—288. 10.7570/jomes23078.

Sharma, A.M., Birney, S., Crotty, M., Finer, N., Segal-Lieberman, G., Vázquez-Velázquez, V. and Vrijens, B., 2025. Determinants of adherence to obesity medication: A narrative review. *Obesity Reviews*, 26(5), p.e13885. 10.1111/obr.13885.

Silva Miguel, L., Soares, M., Olivieri, A., Sampaio, F., Lamotte, M., Shukla, S., Conde, V., Freitas, P., Costa, J. and Borges, M., 2024. Cost-effectiveness of semaglutide 2.4 mg in chronic weight management in Portugal. *Diabetology & Metabolic Syndrome*, 16(1), p.97. 10.1186/s13098-024-01338-4.

Simmonds, M., Llewellyn, A., Owen, C.G. and Woolacott, N., 2016. Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 17(2), pp.95—107. 10.1111/obr.12334.

Sinclair, P., Vijgen, G.H.E.J., Aarts, E.O., Van Nieuwenhove, Y. and Maleckas, A., 2021. First Inventory of Access and Quality of Metabolic Surgery Across Europe. *Obesity Surgery*, 31(12), pp.5196—5206. 10.1007/s11695-021-05633-1.

Siskou, O., Galanis, P., Konstantakopoulou, O., Stafylas, P., Karagkouni, I., Tsampalas, E., Garefou, D., Alexopoulou, H., Gamvroula, A., Lypiridou, M., Kalliontzakis, I., Fragkoulaki, A., Kouridaki, A., Tountopoulou, A., Kouzi, I., Vassilopoulou, S., Manios, E., Mavraganis, G., Vemmou, A., Karagkiozi, E., Savopoulos, C., Dimas, G., Myrou, A., Milionis, H., Siopis, G., Evaggelou, H., Protogerou, A., Samara, S., Karapiperi, A., Kakaletsis, N., Papastefanatos, G., Papastefanatos, S., Sourtzi, P., Ntaios, G., Vemmos, K., Korompoki, E. and Kaitelidou, D., 2023. The Cost and the Value of Stroke Care in Greece: Results from the SUN4P Study. *Healthcare*, 11(18), p.2545. 10.3390/healthcare11182545.

SISMED, 2025. Italy recognizes obesity as a chronic disease - SISMED Segreteria. *SISMED - Italian Society of Medical Sciences*. Available at: https://www.sismed-it.com/en/obesity-law-2025-chronic-disease-lea/ [Accessed 10 June 2026].

Skroumpelos, A., Naoum, V., Kyriopoulos, D., Pavi, E. and Kyriopoulos, J., 2016. Private and Catastrophic Health Expenditure of Patients with Early and Locally Advanced Breast Cancer in Greece. *Value in Health*, 19(7), p.A724. 10.1016/j.jval.2016.09.2162.

Smeds, M., Skrifvars, M.B., Reinikainen, M., Bendel, S., Hoppu, S., Laitio, R., Ala-Kokko, T., Curtze, S., Sibolt, G., Martinez-Majander, N. and Raj, R., 2022. One-year healthcare costs of patients with spontaneous intracerebral hemorrhage treated in the intensive care unit. *European Stroke Journal*, 7(3), pp.267—279. 10.1177/23969873221094705.

Sorensen, J., Valentelyte, G. and Birgisdóttir, U.R., 2024. *Counting the Cost of Arthritis: A report on the financial and personal burden of living with arthritis*. [online] Available at: https://www.arthritisireland.ie/Handlers/Download.ashx?IDMF=89cbed2c-afd4-4187-8a7f-cdc90bb377cf [Accessed 16 Mar. 2026].

Souza, L.M.S., Chaves, S.C.L., Santana, J.M. and Pereira, M., 2023. Public policy interventions for preventing and treating obesity: scoping review. *Nutrition Reviews*, 81(12), pp.1653—1664. 10.1093/nutrit/nuad028.

Stafylas, P., Farmakis, D., Kourlaba, G., Giamouzis, G., Tsarouhas, K., Maniadakis, N. and Parissis, J., 2017. The heart failure pandemic: The clinical and economic burden in Greece. *International Journal of Cardiology*, 227, pp.923—929. 10.1016/j.ijcard.2016.10.042.

Stafylas, P., Sarafidis, P., Tychala, C., Pella, E., Karaiskou, M., Valsami, R., Stergiou, G. and Boletis, I., 2023. #5632 THE CLINICAL AND ECONOMIC BURDEN OF CHRONIC KIDNEY DISEASE IN GREECE. *Nephrology Dialysis Transplantation*, 38(Supplement_1), p.gfad063c_5632. 10.1093/ndt/gfad063c_5632.

Stamenic, D., Fitzgerald, A.P., Gajewska, K.A., O'Neill, K.N., Bermingham, M., Cronin, J., Lynch, B.M., O'Brien, S.M., McHugh, S.M., Buckley, C.M., Kavanagh, P.M., Kearney, P.M. and O'Keeffe, L.M., 2024. Health care utilization and the associated costs attributable to

cardiovascular disease in Ireland: a cross-sectional study. *European Heart Journal. Quality of Care & Clinical Outcomes*, 11(1), pp.37—46. 10.1093/ehjqcco/qcae014.

Stranjalis, G., Tsamandouraki, K., Sakas, D.E. and Alamanos, Y., 2004. Low Back Pain in a Representative Sample of Greek Population: Analysis According to Personal and Socioeconomic Characteristics. *Spine*, 29(12), p.1355. 10.1097/01.BRS.0000127181.59012.1C.

Strilciuc, S., Grad, D.A., Mixich, V., Stan, A., Buzoianu, A.D., Vladescu, C. and Vintan, M.A., 2021. Societal Cost of Ischemic Stroke in Romania: Results from a Retrospective County-Level Study. *Brain Sciences*, 11(6), p.689. 10.3390/brainsci11060689.

Sweatt, K., Garvey, W.T. and Martins, C., 2024. Strengths and Limitations of BMI in the Diagnosis of Obesity: What is the Path Forward? *Current Obesity Reports*, 13(3), pp.584—595. 10.1007/s13679-024-00580-1.

Tandan, M., Twomey, B., Twomey, L., Egan, M. and Bury, G., 2022. National Chronic Disease Management Programmes in Irish General Practice-Preparedness and Challenges. *Journal of Personalized Medicine*, 12(7), p.1157. 10.3390/jpm12071157.

The Economist, 2025. Germans are world champions of calling in sick. *The Economist*. [online] Available at: https://www.economist.com/business/2025/01/23/germans-are-world-champions-of-calling-in-sick [Accessed 27 May 2026].

Tilson, L., Sharp, L., Usher, C., Walsh, C., S, W., O'Ceilleachair, A., Stuart, C., Mehigan, B., John Kennedy, M., Tappenden, P., Chilcott, J., Staines, A., Comber, H. and Barry, M., 2012. Cost of care for colorectal cancer in Ireland: a health care payer perspective. *The European journal of health economics: HEPAC: health economics in prevention and care*, 13(4), pp.511—524. 10.1007/s10198-011-0325-z.

Torbahn, G., Jones, A., Griffiths, A., Matu, J., Metzendorf, M.-I., Ells, L.J., Gartlehner, G., Kelly, A.S., Weghuber, D. and Brown, T., 2024. Pharmacological interventions for the management of children and adolescents living with obesity—An update of a Cochrane systematic review with meta-analyses. *Pediatric Obesity*, 19(5), p.e13113. 10.1111/ijpo.13113.

Torbahn, G., Lischka, J., Brown, T., Ells, L.J., Kelly, A.S., Wabitsch, M. and Weghuber, D., 2025. Anti-Obesity Medication in the Management of Children and Adolescents With Obesity: Recent Developments and Research Gaps. *Clinical Endocrinology*, 102(1), pp.51—61. 10.1111/cen.15133.

Turabi, A.E., Ungerman, D., Ahlawa, H. and Hartenstein, L., 2025. *The path toward a metabolic health revolution*. [online] McKinsey Health Institute. Available at: https://www.mckinsey.com/mhi/our-insights/the-path-toward-a-metabolic-health-revolution [Accessed 19 Feb. 2026].

Uivarosan, D., Endres, L., Tit, D. and Bungau, S., 2015. (PDF) THE ECONOMIC IMPACT OF THE DIGESTIVE DISEASES ACROSS THE EU MEMBER STATES. THE COSTS ANALYSIS IN CHOLECYSTECTOMY. *ResearchGate*. [online] Available at: https://www.researchgate.net/publication/280305482_THE_ECONOMIC_IMPACT_OF_THE_DIGESTIVE_DISEASES_ACROSS_THE_EU_MEMBER_STATES_THE_COSTS_ANALYSIS_IN_CHOLECYSTECTOMY [Accessed 16 Mar. 2026].

Ulrich, S., Holle, R., Wacker, M., Stark, R., Icks, A., Thorand, B., Peters, A. and Laxy, M., 2016. Cost burden of type 2 diabetes in Germany: results from the population-based KORA studies. *BMJ Open*, 6(11), p.e012527. 10.1136/bmjopen-2016-012527.

Vallis, M., Boyland, E., Caroli, M., Erhardt, E., Frelut, M.L., Mazur, A., Molnar, D., Torbahn, G., Ring-Dimitriou, S., Stenlid, R., Thivel, D., Vlachopapadopoulou, E., Weghuber, D., and European Childhood Obesity Group, 2022. Adherence to Treatment Recommendations in Chronic Disease: What Is (Im)Possible? Expert Conclusions from the 30th ECOG Workshop 2021. *Annals of Nutrition & Metabolism*, 78(6), pp.352—358. 10.1159/000526406.

Vellopoulou, K., Bakakos, P., Loukides, S., Maniadakis, N. and Kourlaba, G., 2019. The Economic Burden of Asthma in Greece: A Cross-Sectional Study. *Applied Health Economics and Health Policy*, 17(5), pp.629—640. 10.1007/s40258-019-00469-4.

Venzaziel, 2025. Check-ups for men in 2025: important check-ups. Available at: https://venaziel.de/en/check-up-knowledge-center/vorsorgeuntersuchungen-maenner/ [Accessed 1 June 2026].

Versus Arthritis, 2012. *Local level prevalence estimates for osteoarthritis (hip and knee, total and severe), back pain (total and severe) and rheumatoid arthritis as per the results of the Versus Arthritis MSK Calculator modelling tool.* [online] Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.versusarthritis.org%2Fmedia%2F14566%2Fmskcalculator_laccg_england.xlsx&wdOrigin=BROWSELINK [Accessed 16 Mar. 2026].

Ward, B.W., 2015. Multiple Chronic Conditions and Labor Force Outcomes: A Population Study of U.S. Adults. *American journal of industrial medicine*, 58(9), pp.943—954. 10.1002/ajim.22439.

Weikl, C., Karkossa, I. and Marquardt, S., 2025. *A German Claims Database Analysis of Epidemiology, Treatment Patterns, and Healthcare Resource Utilization of Patients with Primary Biliary Cholangitis (PBC)*. [online] ISPOR | International Society For Pharmacoeconomics and Outcomes Research. Available at: https://www.ispor.org/heor-resources/presentations-database/presentation-cti/ispor-2025/poster-session-5/a-german-claims-database-analysis-of-epidemiology-treatment-patterns-and-healthcare-resource-utilization-of-patients-with-primary-biliary-cholangitis-pbc [Accessed 16 Mar. 2026].

Wenig, C.M., Schmidt, C.O., Kohlmann, T. and Schweikert, B., 2009. Costs of back pain in Germany. *European Journal of Pain*, 13(3), pp.280—286. 10.1016/j.ejpain.2008.04.005.

Westbury, S., Oyebode, O., van Rens, T. and Barber, T.M., 2023. Obesity Stigma: Causes, Consequences, and Potential Solutions. *Current Obesity Reports*, 12(1), pp.10—23. 10.1007/s13679-023-00495-3.

Wharton, S., Lau, D.C.W., Vallis, M., Sharma, A.M., Biertho, L., Campbell-Scherer, D., Adamo, K., Alberga, A., Bell, R., Boulé, N., Boyling, E., Brown, J., Calam, B., Clarke, C., Crowshoe, L., Divalentino, D., Forhan, M., Freedhoff, Y., Gagner, M., Glazer, S., Grand, C., Green, M., Hahn, M., Hawa, R., Henderson, R., Hong, D., Hung, P., Janssen, I., Jacklin, K., Johnson-Stoklossa, C., Kemp, A., Kirk, S., Kuk, J., Langlois, M.-F., Lear, S., McInnes, A., Macklin, D., Naji, L., Manjoo, P., Morin, M.-P., Nerenberg, K., Patton, I., Pedersen, S., Pereira, L., Piccinini-Vallis, H., Poddar, M., Poirier, P., Prud'homme, D., Salas, X.R., Rueda-Clausen, C., Russell-Mayhew, S., Shiau, J., Sherifali, D., Sievenpiper, J., Sockalingam, S., Taylor, V., Toth, E., Twells, L., Tytus, R., Walji, S., Walker, L. and Wicklum, S., 2020. Obesity in adults: a clinical practice guideline. *CMAJ*, 192(31), pp.E875—E891. 10.1503/cmaj.191707.

WHO, 2020. *WHO Guidelines on Physical Activity and Sedentary Behaviour*. Geneva: World Health Organization.

WHO, 2022. *WHO European regional obesity report 2022*. [online] Copenhagen: World Health Organization. Available at: https://iris.who.int/server/api/core/bitstreams/e65ae612-3723-4df5-a0e3-639dcdaa9ef8/content .

WHO, 2023a. *Childhood obesity: five facts about the WHO European Region*. [online] Available at: https://www.who.int/europe/news/item/03-03-2023-childhood-obesity--five-facts-about-the-who-european-region [Accessed 12 Mar. 2026].

WHO, 2023b. *Global report on the use of sugar-sweetened beverage taxes*. [online] Available at: https://www.who.int/publications/i/item/9789240084995 [Accessed 16 Feb. 2026].

WHO, 2023c. *Health data overview for the Hellenic Republic*. [online] WHO. Available at: https://data.who.int/countries/300 [Accessed 16 Mar. 2026].

WHO, 2023d. *Health service delivery framework for prevention and management of obesity*. [online] Available at: https://www.who.int/publications/i/item/9789240073234 [Accessed 10 Dec. 2025].

WHO, 2023e. *WHO acceleration plan to stop obesity*. [online] Available at: https://www.who.int/publications/i/item/9789240075634 [Accessed 29 Jan. 2026].

WHO, 2025a. *Obesity and overweight*. [online] Available at: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight [Accessed 23 Nov. 2025].

WHO, 2025b. *WHO guideline on the use of glucagon-like peptide-1 (GLP-1) therapies for the treatment of obesity in adults*. World Health Organization (WHO).

WHO European Health Information Gateway, 2024. *Absenteeism from work due to illness, days per employee per year*. [online] Available at: https://gateway.euro.who.int/en/indicators/hfa_411-2700-absenteeism-from-work-due-to-illness-days-per-employee-per-year/ [Accessed 18 Feb. 2026].

WHO expert consultation, 2004. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *The Lancet*, 363(9403), pp.157—163. 10.1016/S0140-6736(03)15268-3.

WIDo, 2023. *Daten zur Erkrankung Brustkrebs in Deutschland. — AOK Gesundheitsatlas Deutschland*. [online] Daten zur Erkrankung Brustkrebs in Deutschland. — AOK Gesundheitsatlas Deutschland. Available at: https://gesundheitsatlas-deutschland.de [Accessed 16 Mar. 2026].

Wido, 2023. *Daten zur Erkrankung Kniegelenksarthrose in Deutschland. — AOK Gesundheitsatlas Deutschland*. [online] Daten zur Erkrankung Kniegelenksarthrose in Deutschland. — AOK Gesundheitsatlas Deutschland. Available at: https://gesundheitsatlas-deutschland.de [Accessed 16 Mar. 2026].

World Health Organisation Global Health Observatory, 2024. *Overweight among adults, BMI >= 25, prevalence (age-standardized estimate) (%)*. [online] Available at: https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-overweight-among-adults-bmi--25-(age-standardized-estimate)-(-) [Accessed 19 Feb. 2026].

World Obesity Federation, 2017. *Obesity as a Disease*. [online] World Obesity Federation. Available at: https://www.worldobesity.org/what-we-do/our-policy-priorities/obesity-as-a-disease [Accessed 16 Mar. 2026].

World Obesity Federation, 2023. *Economic impact of overweight and obesity to surpass $4 trillion by 2035*. [online] Available at: https://www.worldobesity.org/news/economic-impact-of-overweight-and-obesity-to-surpass-4-trillion-by-2035 [Accessed 5 Sept. 2025].

World Obesity Federation, 2024. *2024 in review: Deutsche Adipositas Gesellschaft (DAG)*. [online] World Obesity Federation. Available at: https://www.worldobesity.org/news/2024-in-review-deutsche-adipositas-gesellschaft-dag [Accessed 1 June 2026].

Xiong, X., Huo, Z., Zhou, Y., Bishai, D.M., Grépin, K.A., Clarke, P.M., Chen, C., Luo, L. and Quan, J., 2024. Economic costs attributable to modifiable risk factors: an analysis of 24 million urban residents in China. *BMC Medicine*, 22(1), p.549. 10.1186/s12916-024-03772-7.

Zacharoulis, D., Bakalis, V., Zachari, E., Sioka, E., Tsimpida, D., Magouliotis, D., Tasiopoulou, V., Chatedaki, C. and Tzovaras, G., 2018. Current knowledge and perception of bariatric surgery among Greek doctors living in Thessaly. *Asian Journal of Endoscopic Surgery*, 11(2), pp.138—145. 10.1111/ases.12436.

Zaitoon, H., Wauters, A.D., Rodriguez, L.M. and Lynch, J.L., 2025. Beyond Weight Loss: Optimizing GLP-1 Receptor Agonist Use in Children. *Children*, 12(11), p.1427. 10.3390/children12111427.

Zanganeh, M., Adab, P., Li, B. and Frew, E., 2019. A Systematic Review of Methods, Study Quality, and Results of Economic Evaluation for Childhood and Adolescent Obesity Intervention. *International Journal of Environmental Research and Public Health*, 16(3), p.485. 10.3390/ijerph16030485.

Zemedikun, D.T., Kigozi, J., Wynne-Jones, G., Guariglia, A., Nirantharakumar, K., Marshall, T. and Roberts, T., 2024. Healthcare resource utilisation and economic burden attributable to back pain in primary care: A matched case-control study in the United Kingdom. *British Journal of Pain*, 18(2), pp.137—147. 10.1177/20494637231208364.

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