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Obesity-Related Healthcare Costs: Economic Burden, Drivers, and Policy Implications

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ABSTRACT

Obesity imposes a substantial and growing economic burden on health systems, employers, and societies worldwide. This narrative review synthesizes current evidence on the direct and indirect costs attributable to overweight and obesity, highlighting the significant financial pressures created by rising prevalence, treatment patterns, comorbidity profiles, healthcare pricing, and access barriers. Direct medical expenditures, spanning inpatient and outpatient care, pharmaceuticals, procedures, and long-term care, constitute a major component of healthcare spending, while indirect costs such as absenteeism, presenteeism, premature mortality, and caregiver time often exceed medical expenditures. Demographic and geographic disparities further shape cost variability, underscoring the disproportionate burden borne by lower-income populations and specific age or ethnic groups. The review identifies major drivers of rising costs, evaluates the cost-effectiveness of obesity interventions, and examines policy approaches aimed at containment, including taxation, subsidies, preventive programs, and workplace wellness strategies. Persistent methodological challenges and data gaps, particularly regarding indirect costs, limit the precision of cost estimates and impede coherent policy formulation. Strengthening data systems, standardizing methodologies, and integrating equity considerations into policy design are essential for mitigating the long-term economic consequences of obesity and promoting sustainable health system financing.

Keywords: Obesity-Related Costs, Direct and Indirect Expenditures, Productivity Losses, Health Policy and Economic Burden.

INTRODUCTION

Obesity poses significant health and economic challenges worldwide. Studies have shown substantial direct and indirect costs associated with overweight and obesity, including healthcare expenses and productivity losses. The economic burden varies across countries and obesity severity levels [1-6]. Cost-analysis research highlights the importance of understanding these financial impacts to inform policy and intervention strategies aimed at reducing obesity prevalence and associated costs. For example, the economic burden of obesity is a pressing global public policy issue [7-9]. The World Health Organization (WHO) defines overweight and obesity as an abnormal or excessive accumulation of fat that presents a risk to health. Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. A BMI greater than or equal to 25 is classified as overweight, and a BMI greater than or equal to 30 as obese [10-14]. The effects of increased body weight on health include comorbidities such as cardiovascular disease, diabetes, musculoskeletal disorders, and certain forms of cancer. Obesity is associated with higher healthcare costs than an optimal BMI, with each one-unit increase in BMI related to increased expenditure [15-18]. The economic burden of obesity includes not only the direct cost of treatment and care but also the indirect loss of productivity arising from sickness, long-term disability, or premature death. Therefore, treatments and prevention strategies aimed at reducing the obesity epidemic can be justified in terms of their cost-effectiveness [19-20]. Moreover, rising levels of obesity will continue to amplify the economic burden unless complementary measures are introduced to discourage excess weight gain. Cost data on obesity can be viewed from a variety of perspectives. A societal perspective takes into

account all costs and benefits accruing to society as a whole, irrespective of who pays or receives them [21-26]. A second cost perspective focuses only on the health-care sector, tracking spending by public and private payers, which leads to the concept of health-system financing.

Defining the Scope of Obesity-Related Costs

Obesity-related costs encompass both direct medical expenses and indirect costs resulting from lost productivity [1]. Research has documented the economic burden of obesity for various countries, revealing substantial national healthcare expenditures associated with moderate and severe obesity [27-30]. Integrated cost-of-illness analyses clarify the scope and implications of obesity's financial impact, underscoring the need for comprehensive methodologies. Characterizing these costs is vital for devising effective policies and interventions to mitigate obesity's economic consequences [31-34]. Cost-of-illness studies of obesity broadly fall into two analytic frameworks that encompass a range of economic transactions [35-39]. The first delineates direct (treatment and care) and indirect (productivity loss) costs. The second separates direct medical expenses (inpatient treatments, outpatient visits, drugs, procedures, and long-term care) from indirect costs (absence from work, decreased productivity at work, provision of unpaid care, and premature death); intangible costs associated with pain, discomfort, or anxiety are also excluded [40-43]. Both approaches can yield disparate estimates, highlighting the importance of clarifying a chosen framework at the outset [43-48].

Direct Medical Expenditures Associated with Obesity

Defined as the "expenditure of funds for medical services, medications, and items" [49-50], obesity-related direct medical expenditures encompass the full array of medical interventions to treat and manage obesity and its comorbidities, including inpatient and outpatient services, pharmaceuticals, surgical procedures, long-term care, and other medical goods [51-56]. In the United States, these expenditures amounted to $50 billion in 2020, a figure that swells to more than $173 billion once expenditures associated with overweight, which roughly double the excess expenditures of obesity, are included more than fourfold higher than a previous estimate. The widely varying estimates in the United States underscore the need to specify the relevant statutory definitions, measurement frameworks, and source data [57-58]. The combination of obesity with comorbidities considerably extends the footprint of direct medical expenditures; average annual medical expenditures attributable to severe obesity exceed $2,300 per adult, while those attributable to overweight and obesity among children exceed $930[59]. Obesity raises economic costs because it enhances the risk of numerous chronic diseases forming comorbidities. As prevalence escalates, treatment protocols evolve, and physical well-being slips, the array of obesity-associated diseases commonly rises [60]. Direct medical expenditures furnish an objective measure of the overweight-and-obesity-based economic burden; other categories of economic loss, such as indirect costs (e.g., absenteeism or presenteeism), represent foregone productivity, while intangible costs, such as pain and suffering, remain even harder to quantify [61-62]. The global and societal milieu surrounding obesity also underscores the relevance of direct medical expenditures.

Indirect Costs and Productivity Losses

Obesity's indirect costs destroy productivity through March 2021, estimated absenteeism, presenteeism, caregiver time, and premature mortality, totaling approximately $1 trillion per year [4]. These costs proportionally account for similar paid employee leave and work disruption costs arising from physical limitations burdens related to comorbid conditions, notably diabetes, but also coronary heart disease, sleep apnea, multiple cancers, hyperlipidemia, hypertension, and arthritis[8]. Reducing U.S. obesity prevalence to the projected 2030 threshold would likely slash indirect costs by about $600 billion. As substantial outside work, life, and income still occur with substantial absenteeism, the considerable share of paid leave and care costs, and the heavy anticipated gains remaining in present dollar value, these productivity estimates do not fully convey the enormous economic impact of the obese population [9].

Variability by Demographics and Geography

Obesity-related costs vary considerably across demographic and geographic lines, suggesting heterogeneous implications for public health intervention and investment strategies [5]. Estimated averages tend to obscure disparities by age, sex, racial or ethnic group, and education level, residential environment, such as urban or rural location, and even country or region [4]. Relative to the entire U.S. adult population, for instance, individuals aged 55 years and older tend to incur substantially higher annual obesity-related spending per capita, and obese adults aged 18 to 34 years tend to incur substantially lower spending than average [8]. By contrast, among Australian adults, differences in average annual obesity-related costs reflect the relative incidence of obesity itself, with stratifications by income and education producing mixed results [6]. A body of evidence spanning multiple jurisdictions thus provides cross-sectional data on widespread demographic and geographic variation in the healthcare costs associated with obesity [9]. Individual circumstance does not merely influence the cost burden experienced by a given population; it also shapes the projected trajectory of that burden, as differential rates of

obesity-associated comorbidities, intervention access, and treatment intensity contribute to a distinctive cost outlook [3].

Drivers of Rising Costs

Rising prevalence, treatment patterns, comorbidities, pricing, inflation, and access barriers drive increasing obesity-related costs [5]. These factors shape expense trajectories and suggest potential intervention points 1. Analyses of direct medical expenditures estimate annual spending at $150 billion in the United States alone from 2014 to 2015[4]. Indirect costs associated with productivity losses are similarly substantial, exceeding $230 billion annually. The economic burden is especially pronounced within the European Union, where annual direct and indirect expenses attributable to obesity amount to €70 billion and €200 billion, respectively [3]. The prevalence of obesity in the United States soared more than threefold between 1976 and 2015, and by 2016, one-third of the adult population was classified as obese. Untreated obesity prevalence similarly surged on a global scale, exceeding 300% in many low and middle-income countries, including China, Mexico, Nigeria, and South Africa, from 1980 to 2015[5]. More detailed estimates indicate that treatment-related costs represent a substantial, albeit minor, fraction of total expenditure; the proportion is estimated at 9.9% in Canada and 13.9% in the United States [4].

Treatment patterns

Availability and utilization of health care services necessarily influence expenditure dynamics. Nationwide data indicate considerable variation in health care spending associated with severe obesity in the United States, ranging from $2,025 to $4,851 annually [6]. These disparate estimates reflect differences in prevalent comorbidities and access to care [3]. Canadian figures suggest that treatment-related costs amount to approximately $1 billion annually. Accordingly, rising treatment patterns at the population level can substantially compound costs [6]. Comorbidities, the presence of obesity-related comorbidities entail additional expenditures on top of the costs associated with obesity per se [3]. Global figures reveal staggering societal expenditures for diabetes and hypertension in countries where obesity is common: $230 billion and $274 billion, respectively. Unchecked comorbidity further drives associated health care spending [5]. Pricing and inflation, across Organisation for Economic Co-operation and Development countries, average treatment prices for diabetes, hypertension, cardiovascular diseases, and hyperlipidemia were estimated to be five times higher in 2008 than in 1998[7]. Pricing trends over more recent periods have frequently shown general inflation, thereby additionally magnifying costs associated with these obesity-related comorbidities [9]. Access barriers, finally, pervasive barriers to health care access constitute an important cost driver, as populations with limited access often present with greater unmet treatment needs and higher prevalence of obesity-related comorbidities [8]. For instance, untreated obesity prevalence among members of the economically disadvantaged population reached 6.5% in Canada, as compared with a national average of 4%. In the absence of robust access to preventive services, unmet need and associated prevalence tend to escalate further among lower socioeconomic segments [7].

Economic Evaluation of Interventions

An extensive body of research has evaluated the economic impact of obesity in many countries, highlighting direct medical expenditures, indirect costs, productivity losses from absenteeism, presenteeism, premature mortality, and caregiver time, intangible costs from reduced quality of life associated with obesity and related chronic diseases, and health system costs for managing overweight and obesity [1]. The rising prevalence of overweight and obesity drives up the economic burden. Cost estimates vary widely between countries, but analyses consistently show a growing economic burden [6]. Countries differ in health-care systems, data sources, and demographic populations, and many obesity-related costs are indirect, making estimates challenging; nevertheless, guns, payment systems, and age are among factors contributing to the cost burden [8]. Uncertainty about the costs of obesity is a major barrier to more effective policy implementation. Uncertainty arises from a lack of nationwide representative data, the existence of multiple, partially overlapping costs, and the need for common definitions of categories and disease indicators across studies [4].

Policy Approaches to Contain Costs

Proactive policy measures can help stabilize or slow the growing economic burden of obesity. A variety of strategic approaches offer the potential to curtail associated costs and consequently improve both population health and collective wellbeing [9]. Preliminary estimates suggest that the adoption of comprehensive pricing and coverage strategies, along with targeted prevention programs, could reduce obesity-related expenditures by around 20% [3]. Additional savings might be possible through complementary policies, such as taxation of unhealthy commodities or incentives for workplace wellness initiatives [6]. When viewed as a percentage of total healthcare outlays, anticipated cost containment falls within the same range as the decade-on-decade increase that exemplifies ongoing obesity escalation [3]. Accordingly, the policies under consideration could usefully inform forward-looking budgeting for national and regional healthcare systems [1]. Several methodological guidelines could enhance systematic analysis of obesity's economic burden and its underpinning drivers. Considerable

variability exists among the estimates produced by different studies, arising from the sensitivity of various data inputs and analytical assumptions [8]. These diverging insights can nonetheless benefit from a coordinated approach focused on the most salient determinants of policy formulation. Clarifying the elementary cost categories, time horizons, and geographical settings relevant to specific questions would foster the development of a more robust and transparent evidence base [5]. Greater uniformity regarding the terminology applied to relevant contextual factors and policy options could also facilitate the communication of compelling findings [8]. At a more granular level, addressing the distribution of costs incurred within rather than across specific cost components and within given strata, among the most heavily impacting drivers might aid analysts engaged in complex modelling exercises to prioritise forward-looking projections and associated policy recommendations [8].

Equity Considerations in Policy Design

Obesity places a considerable economic burden on society, prompting calls for policy intervention to address the growing epidemic [8]. Consideration of equity is critical for the design and implementation of such policies, since the obesity burden is disproportionately borne by certain population groups within different geographical contexts [9]. The revenue generated through taxes on certain food products, or the distribution of subsidies for healthier alternatives, may also present equity concerns depending on how food products are taxed and subsidized. Factors such as the cost of healthy food options, accessibility of leisure resources, and affordability of physical activity can influence the effectiveness of healthy-eating messages [8]. Policies targeted at specific socioeconomic or ethnic groups may encourage perverse rationing in favour of unhealthy products. Addressing these considerations can warrant careful attention to commensurate access to healthy options, securing fairness throughout the process, and monitoring distributional effects in order to avoid aggravating existing inequalities [8]. Evidence indicates that the obesity burden falls disproportionately on lower-income groups, certain ethnic minorities, and individuals in less affluent areas, although the exact demographic varies across different regions and national contexts. In the United Kingdom, for example, the relationship between socioeconomic status and obesity has remained stable since 2012, with the highest prevalence among individuals aged between 55 and 64 [8]. Policies spanning across wider geographic, demographic, and socioeconomic lines can serve both redistributional goals and population objectives [7]. By extending national initiatives around diet and exercise, building on a so-called "universal" model, more physical activity and healthier diets can be promoted universally to target some of the root causes behind overweight and obesity [9].

Methodological Challenges and Data Gaps

Measurement of the economic burden of obesity is complicated by methodological challenges and data gaps, particularly concerning indirect costs [3]. A systematic literature review identified substantial variations in healthcare costs across different classes of obesity, underlining the importance of appropriate costing methodologies [5]. Limitations in cost-of-illness studies, specifically regarding scope, quality, and the estimation of indirect costs, significantly affect the reliability of economic analyses, emphasizing the need for further research to inform effective policy and intervention strategies [1]. Estimating the total economic burden of obesity poses substantial methodological challenges driven primarily by gaps in data on indirect costs, coupled with conceptual issues regarding the classification of those costs. Variability of estimates highlights the need for the consideration of underlying assumptions. The literature indicates that direct medical expenditures associated with obesity are significantly large, with rising costs expected to persist into the foreseeable future [8].

Implications for Healthcare Systems and Insurers

The rising prevalence of obesity continues to pose significant economic challenges to public healthcare systems and the private healthcare sector [8]. The economic burden of obesity is expected to increase considerably given observed trends in obesity rates, treatment patterns, associated comorbidities, and healthcare pricing. Within this context, insurers must proactively manage the risk that rising costs present to their business models. Failure to address this risk may lead to unsustainable annual premium increases, disrupting customer relationships and profitability [9-15]. Additionally, rising treatment costs can complicate public and private decisions about coverage and access. Both public systems and private insurers may financially benefit by investing in obesity prevention and treatment initiatives that have been linked to positive health outcomes and reduced healthcare costs [1].

CONCLUSION

Obesity continues to exert immense pressure on global health systems, employers, and national economies, driven by escalating prevalence, costly treatment patterns, and the mounting burden of obesity-related comorbidities. The evidence synthesized in this review demonstrates that the economic costs of obesity extend far beyond direct medical expenditures. Productivity losses, caregiver burdens, and premature mortality generate indirect costs that are frequently greater and more challenging to quantify. Demographic and geographic disparities highlight the uneven distribution of this burden, disproportionately affecting lower-income groups and populations with limited access to preventive services. The analysis further reveals that rising healthcare prices, inflation, access barriers,

and the growth of obesity-associated chronic diseases will continue to amplify total costs unless policy interventions are strengthened. Effective cost containment requires a multipronged approach, including comprehensive prevention programs, pricing and taxation policies, targeted subsidies, improved access to care, and workplace-based health initiatives. However, persistent methodological inconsistencies, insufficient data, particularly on indirect costs, and varying analytical frameworks hinder efforts to generate precise and comparable cost estimates across settings. Addressing these challenges demands coordinated investments in better data systems, standardized costing methodologies, and evaluation frameworks that capture both direct and indirect burdens. Importantly, equity considerations must guide policy design to ensure interventions do not exacerbate existing socioeconomic disparities. By integrating economic evidence with robust, equitable policy strategies, governments and health systems can reduce the growing financial toll of obesity, enhance population health, and achieve long-term sustainability in healthcare financing.

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