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ORIGINAL RESEARCH

Analysis of Tirzepatide Acquisition Costs and Weight Reduction Outcomes in the United Kingdom: Insights from the SURMOUNT-1 Study

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ABSTRACT

Introduction: Tirzepatide, an anti-obesity medication, demonstrated significant weight loss efficacy in the SURMOUNT-1 randomized controlled trial. This analysis evaluates the cost-efficiency of tirzepatide in the UK by linking clinical outcomes to drug acquisition costs.

Methods: Data from SURMOUNT-1 (2539 participants across global sites) were used to assess tirzepatide's (5, 10, and 15 mg) impact on weight reduction over 72 weeks (72W), with a focus on drug acquisition costs and cost/weight loss outcome. Cost needed to treat and cost-to-target analyses were performed to determine the economic value of achieving specific weight loss goals and improvements in body mass index (BMI).

Results: Tirzepatide demonstrated significant weight loss, with greater reductions at higher doses. Cost/kilogram of weight loss at 72W was £102.86, £85.41, and £89.24 for 5, 10, and 15 mg, respectively. Average per-patient costs at 72W for 5% weight loss were £1852, £1971, and £2186 (5, 10, and 15 mg, respectively; average 28-day costs: £102.90, £109.52, and £121.47). Average per-patient costs for 10% weight loss were £2258, £2209, and £2338 (28-day costs: £125.43, £122.69, and £129.88). The 15 mg dose was the most cost-efficient for achieving higher weight loss targets (15% and 20%).

Conclusions: In the SURMOUNT-1 study, tirzepatide was cost-efficient in the UK for weight management, demonstrating favourable economic outcomes relative to its efficacy in reducing body weight and improving BMI. It provided additional health benefits, including reduced risks for type 2 diabetes and cardiovascular events and improved mental health. Tirzepatide contributed to cost savings and improved efficiency within the healthcare system by decreasing the burden of obesity-related conditions, thus enhancing overall healthcare resource allocation. These findings support its inclusion in clinical practice guidelines and healthcare formularies. Further research is needed to explore real-world adherence, patient-centred outcomes, and the long-term sustainability of weight loss with tirzepatide.

Keywords: Drug acquisition; Cost analysis; Tirzepatide; Obesity; Weight loss

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Key Summary Points

Why carry out this study?

Obesity imposes a significant economic burden because of its associated complications, highlighting the need for effective weight management solutions

The study aimed to evaluate the acquisition costs and weight reduction outcomes of tirzepatide in the UK

What was learned from the study?

Tirzepatide demonstrated significant weight loss and cost-efficiency, with the 15 mg dose providing the most value for achieving higher weight loss targets

Tirzepatide's use could lead to substantial cost savings and improved healthcare efficiency by reducing obesity-related complications, thereby alleviating the burden on healthcare resources

The findings validate tirzepatide's effectiveness and cost-efficiency, supporting its integration into clinical practice

INTRODUCTION

Obesity is a highly prevalent chronic disease in the UK, with nearly two-thirds of adults (63%) affected by either overweight or obesity [1]. Obesity challenges economic growth, costing approximately £27 billion yearly, which includes direct healthcare costs and indirect expenses like decreased productivity and higher absenteeism [1]. Effective management strategies, including significant weight loss, play a crucial role in improving outcomes for individuals with obesity [2]. Weight reduction has been shown to lead to improved health outcomes, such as improved cardiovascular risk factors, decreased obesity-related complications, improvement in quality of life, prevention of diabetes development, and improved glycaemic control in those living with type 2 diabetes [3–5].

Current guidelines might not precisely advise on the weight loss magnitude needed to improve health outcomes as obesity management should be individualized, but most agree on a reduction of between 5% and 10% for individuals with a body mass index (BMI) ≥ 25 kg/m^2 and at least 10% for those with complication-specific goals [4–7]. However, greater weight loss is associated with greater metabolic and biomechanical benefits [4].

Effective weight loss interventions not only help reduce body mass but also lead to substantial improvements in related health outcomes. For instance, a 5–15% reduction in body weight can significantly lower the risk of type 2 diabetes, hypertension, and cardiovascular disease, reducing both morbidity and healthcare costs [4, 8–11]. Greater weight loss of > 15% body weight can decrease obesity-related complications and potentially result in remission of type 2 diabetes [4]. Moreover, sustained weight loss with novel therapies has been associated with improved mental health, reduced reliance on medications, and enhanced overall quality of life [11–13].

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have been shown to provide benefits regarding weight loss and improvements in cardiometabolic risk factors in individuals with obesity [14]. GLP-1 RAs have emerged as pivotal agents due to their dual benefits of promoting weight loss and improving glycaemic control in patients. Moreover, drugs combining the actions of GLP-1 RA with the effects of the incretin glucose-dependent insulinotropic polypeptide (GIP) have been developed and their potential to provide clinically meaningful improvements in both type 2 diabetes and weight management investigated [15, 16].

The once-weekly subcutaneous injectable peptide tirzepatide has activity at both the GIP and GLP-1 receptor level [15] and has been approved for the treatment of type 2 diabetes [17] and weight management in adults. Tirzepatide has been shown to lower body weight and fat mass by decreasing food intake through appetite regulation and modulation of fat utilisation, with an associated improvement in health-related quality of life [17–19]. Tirzepatide was approved by the European

Medicines Agency on 15 September 2022 and both the Food and Drug Administration and the Medicines and Healthcare products Regulatory Agency on 8 November 2023 [20] for weight management in adults with BMI ≥ 30 kg/m^2 or overweight (BMI ≥ 27 kg/m^2 to < 30 kg/m^2) with at least one weight-related comorbidity, alongside a reduced calorie diet and increased physical activity.

This analysis aimed to link key clinical outcomes provided by tirzepatide from the SURMOUNT-1 study and UK drug acquisition cost to assess the specific cost per weight reduction (both as an absolute measure in kg as well as a percentage of baseline body weight) as well as per patient cost associated with achieving a given clinical target (% of body weight lost or reduction in BMI class). Patient-level data are also included to assess response variability and how this compares to averages calculated. This is intended to establish a measure of value for money for tirzepatide when used in the UK for weight management.

METHODS

Study Design and Participants

This article uses the data from the SURMOUNT-1 randomized, double-blind, placebo-controlled trial (I8F-MC-GPHK, NCT04184622). The co-primary endpoints for this study were to demonstrate that administration of tirzepatide 10 and/or 15 mg once weekly was superior to placebo for percentage change in body weight and percentage of participants achieving ≥ 5% body weight reduction at 72 weeks. Key secondary endpoints included demonstrating the superiority of tirzepatide over placebo for various efficacy measures, such as body weight reduction and changes in cardiometabolic risk factors.

SURMOUNT-1 participants ($N = 2539$) were adults (from nine countries across four continents: Argentina, Brazil, China, India, Japan, Mexico, Russian Federation, Taiwan, and the US) without type 2 diabetes who had obesity (BMI ≥ 30 kg/m^2) or were overweight (BMI ≥ 27 kg/m^2) with at least one weight-related issue and at least one unsuccessful dietary effort to lose weight. Participants were randomized for at least 72 weeks (14 visits) to receive tirzepatide at doses of 5 mg ($n = 630$), 10 mg ($n = 636$), and 15 mg ($n = 630$) once weekly (with an initial dose of 2.5 mg to the target dose by Week 20 of the study, in line with the Summary of Product Characteristics) [21] along with a reduced-calorie diet and increased physical activity for weight management. Those participants identified as having prediabetes continued for another 2 years to assess the percentage change in body weight and the onset of type 2 diabetes at 176 and 193 weeks. At 72 weeks, the mean change in body weight observed for patients receiving placebo was − 2.4% (95% CI, − 3.2 to − 1.6), a reduction of 2.4 kg (5.3 lb) [22]. Given that this article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors, ethics committee approval was not required. The SURMOUNT-1 study received the necessary ethical approvals from all study sites, obtained informed patient consent to participate, and was conducted in accordance with the Declaration of Helsinki.

Cost Analysis

Cost Needed to Treat Analysis

To assess the specific cost per reduction in weight, as both an absolute measure in kg and a percentage of baseline body weight, the cumulative drug acquisition cost for a specific dose (considering dose escalation as detailed in the SURMOUNT-1 protocol) at a given time point was divided by the mean percentage weight reduction or kg weight lost for tirzepatide at that time point. Unit costs used in this analysis reflected the UK list price at the time of commercial availability of tirzepatide in the UK (February 2024) with cost per dose being as follows: 2.5 + 5 mg: £92; 7.5 + 10 mg: £107; 12.5 + 15 mg: £122 [23]. Accounting for drug escalation, the total cost for each dose level at Week 72 was 5 mg, £1656; 10 mg, £1896; 15 mg, £2106 [23]. This was presented graphically as the

cost increased, and values calculated for Week 72 were also presented as this aligns with the primary endpoint of SURMOUNT-1.

Cost to Target Analysis

The per-patient cost associated with achieving a given clinical target (5%, 10%, 15%, and 20% weight loss and improvement in BMI class from varying starting classes) was estimated based on the medication costs and the proportion of patients achieving the clinical target. It was calculated by dividing the cumulative drug acquisition cost for a specific dose at Week 72 (considering dose escalation as detailed in the SURMOUNT-1 protocol) by the proportion of patients who achieved that outcome at 72 weeks. Unit costs used in this analysis reflected the UK list price at the time of commercial availability of tirzepatide in the UK (February 2024).

Data relating to tirzepatide in the SURMOUNT-1 study are comparative, providing an overview of the benefits of tirzepatide vs. placebo [22]. However, given that the approved indication for tirzepatide is weight loss and weight maintenance, as an adjunct to a reduced-calorie diet and increased physical activity [21], this analysis sought to consider the potential additional benefits of diet and exercise when assessing costs for weight reduction. Therefore, all assessments of costs within this analysis are absolute and do not compare tirzepatide to placebo.

RESULTS

Study Population

SURMOUNT-1 recruited 2539 participants in 119 centres in the US, China, the Russian Federation, Brazil, Argentina, Mexico, India, Japan, and Taiwan. Participants had a mean age of 44.9 years. Overall, patient characteristics were similar between treatment groups; 67.5% of patients were female with a mean body weight of 104.8 kg, mean BMI of 38.0, and 14.4-year duration of obesity at baseline. Full patient demographic details have been previously published [22].

Cost Needed to Treat Analysis: Drug Acquisition Cost Per Incremental Weight Loss % Achieved, Per Dose of Tirzepatide

All doses of tirzepatide (5, 10, and 15 mg) were evaluated over 72 weeks and noted to have respective drug acquisition costs of £1656, £1896, and £2106 (Table 1). The proportion of weight lost increased with increasing tirzepatide

Table 1 Drug acquisition cost per incremental weight loss % and absolute weight loss (kg) after 72 weeks per dose of tirzepatide

		Tirzepatide 5 mg	Tirzepatide 10 mg	Tirzepatide 15 mg
Cost of drug therapy[a]		£1656	£1896	£2106
% Weight lost	% Weight lost	16.0	21.4	22.5
	Cost per % weight lost	£103.50	£88.60	£93.60
	28-Day cost per %	£5.75	£4.92	£5.20
Kg weight lost	Kg weight lost	16.1	22.2	23.6
	Cost per kg lost	£102.86	£85.41	£89.24
	28-day cost per kg	£5.71	£4.74	£4.96

[a]Cost of drug therapy accounts for dose escalation and is total cost at Week 72

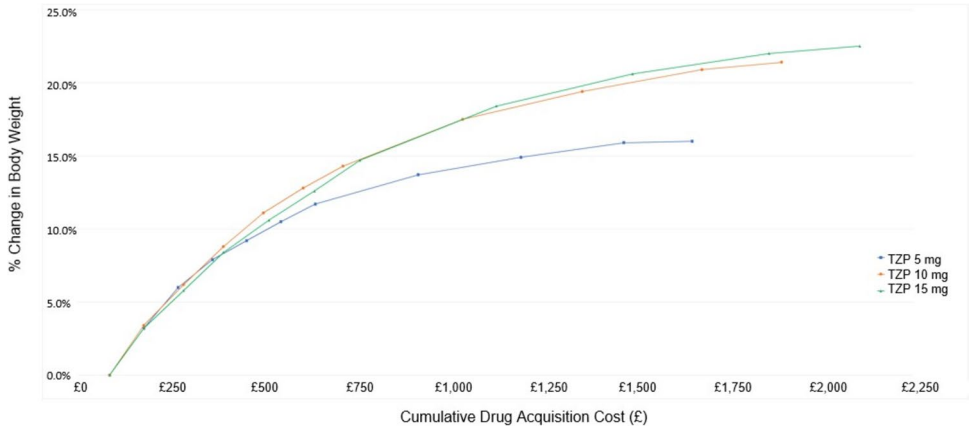

Fig. 1 Plot of tirzepatide cost for each dose (cumulative cost at a given time point) vs. percentage change in body weight achieved at that time point. *TZP* tirzepatide

dose (Table 1 and Fig. 1), and cost over 72 weeks per incremental % weight loss ranged from £88.60 to £103.50, equating to between £4.92 and £5.75 per month. Overall, 28-day costs per % or kg of weight loss were lowest for those who received tirzepatide 10 mg and highest for the tirzepatide 5 mg group.

An increase in cumulative cost (as time on treatment increases) reflected in weight benefits which continued to the end of the trial at Week 72 (Fig. 1). Notably, once patients had titrated up to a certain dose of tirzepatide, this dose level was maintained throughout the study period with no individualised down titration.

Looking at individual patient data, a high proportion of patients in each arm is presented in a tight distribution with minimal scatter, which indicates a relatively low variability in patient

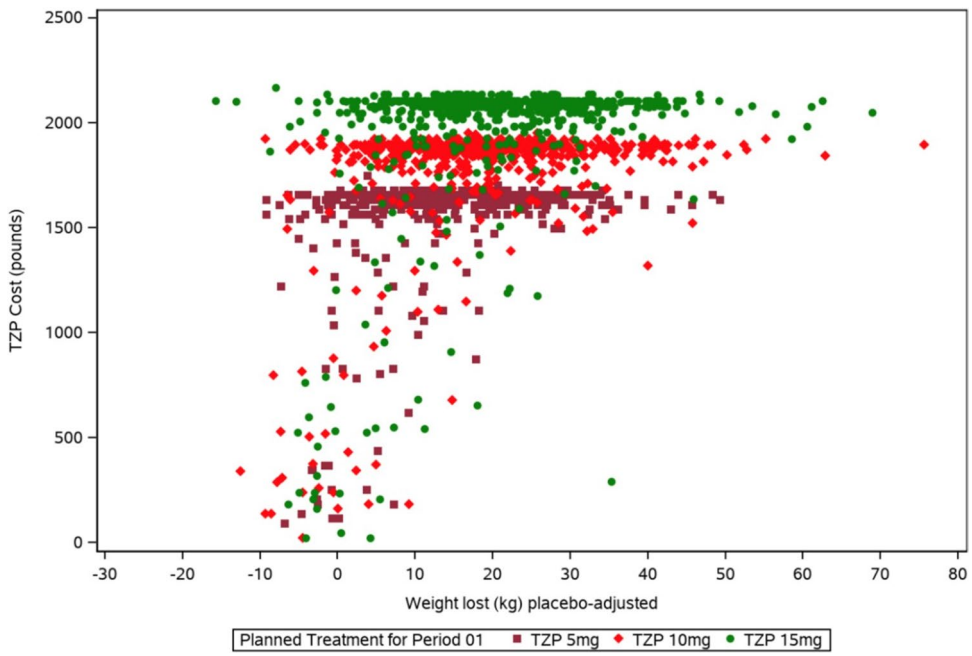

Fig. 2 Plot of tirzepatide cost vs. kg weight lost by Week 72. *TZP* tirzepatide

response, showing that the average cost figures were representative of the population as a whole and can be considered reliable predictors of clinical response (Fig. 2). Notably, the SURMOUNT-1 protocol permitted temporary discontinuation of tirzepatide, for example, in response to adverse events, and may not have adhered to protocol-defined dose escalation steps. There is some level of variation in patient response, with patients in the 15 mg arm generally achieving greater weight reduction, and this should be considered when interpreting cost analysis values, as these are based on average values from the entire patient population.

This is reinforced by the high completion rates of the SURMOUNT-1 study, 89% for the 5 mg, 88% for the 10 mg, and 90% for the 15 mg dose groups, compared to 77% for the placebo. Discontinuation rates due to adverse events ranged from 4.3–7.1% between arms vs. 2.6% for placebo, while overall treatment discontinuation rates were 14.3%, 16.4%, and 15.1% for 5, 10, and 15 mg dose groups, respectively, compared to 26.4% for the placebo [24]. Moreover, a dose-dependent weight loss was observed, with a higher proportion of individuals who received 15 mg achieving greater weight loss targets than those on lower doses, e.g., 62.9% on 15 mg achieving > 20% weight loss vs. 55.5% on 10 mg and 31.6% on 5 mg dose.

Cost to Target Analysis: Per Patient Drug Acquisition Cost Associated with a Given Clinical Outcome at 72 weeks

All doses of tirzepatide used in the study contributed to weight loss and improvement in BMI. Although the administration of higher doses (10 and 15 mg) appeared to offer greater efficacy in achieving weight loss targets, improving BMI, and potentially providing better economic value in terms of cost per outcome achieved (Table 1), the administration of 5 mg tirzepatide was also effective in inducing weight loss and was associated with lower overall drug acquisition costs for achieving a target weight loss of 5% (Table 2). Furthermore, the number needed to treat (NNT) to achieve at least a 5% weight loss over 72 weeks was 1.63, 1.46, and 1.46 for the 5, 10, and 15 mg groups, respectively. The cumulative costs associated with a shift in one BMI category at Week 72 were £2241.47, £2257.95, and £2404.93 for tirzepatide 5, 10, and 15 mg doses, respectively, equating to a mean 28-day cost of £122.47, £126.19, and £133.68 (Table 2).

Overall Cost-Efficiency and Efficacy

To achieve 15% and 20% weight loss targets, administration of tirzepatide 10 mg and tirzepatide 15 mg appeared to be the most cost-efficient, respectively. Tirzepatide 15 mg demonstrated the lowest incremental cost per 1% weight loss, suggesting that it was the most cost-efficient dose level for achieving 20% weight loss compared to either tirzepatide 5 mg or tirzepatide 10 mg. Tirzepatide administered at a dose of 15 mg consistently outperformed tirzepatide 10 mg and tirzepatide 5 mg across all weight loss categories (5%, 10%, 15%, and 20%), indicating a dose-response relationship between tirzepatide and degree of weight loss. Tirzepatide 10 mg showed good cost-efficiency for achieving 10% and 15% weight loss based on the cost analysis and generally demonstrated competitive outcomes compared to tirzepatide 5 mg and tirzepatide 15 mg across different BMI improvement categories, reinforcing its overall efficacy and cost-effectiveness. It should be noted, however, that if the priority were to ensure the highest proportion of patients achieving weight loss targets, tirzepatide 15 mg would be considered the most effective dose.

DISCUSSION

The economic consequences of obesity are significant globally, regardless of economic or geographical factors, and are projected to escalate if current trends persist [25]. In our analysis, the cost per kilogram of weight loss and per percentage of weight loss achieved with tirzepatide indicated favourable economic outcomes compared to placebo, especially at higher doses (10 and 15 mg).

Table 2 Per patient drug acquisition cost associated with a given clinical outcome at 72 weeks for each dose strength of tirzepatide

		Tirzepatide 5 mg (*N* = 630)	Tirzepatide 10 mg (*N* = 636)	Tirzepatide 15 mg (*N* = 630)
	Overall cost of drug therapy	£1656	£1896	£2106
Weight loss target at 72 weeks				
5% WL	% Achieving outcome	89.41%	96.18%	96.32%
	Cost per outcome[a]	£1852.14	£1971.30	£2186.46
	28-day cost	£102.90	£109.52	£121.47
10% WL	% Achieving outcome	73.35%	85.85%	90.08%
	Cost per outcome	£2257.67	£2208.50	£2337.92
	28-day cost	£125.43	£122.69	£129.88
15% WL	% Achieving outcome	50.24%	73.61%	78.24%
	Cost per outcome	£3296.18	£2575.74	£2691.72
	28-day cost	£183.12	£143.10	£149.54
20% WL	% Achieving outcome	31.62%	55.48%	62.88%
	Cost per outcome	£5237.19	£3417.45	£3349.24
	28-day Cost	£290.96	£189.86	£186.07
BMI target at 72 weeks				
BMI class improved overall	BMI improved overall	75.12%	83.47%	87.52%
	Cost per outcome	£2204.47	£2271.47	£2406.31
	28-day cost	£122.47	£126.19	£133.68
BMI class improved w/ baseline 25–30	BMI improved w/baseline 25–30	66.67%	72.22%	84.62%
	Cost per outcome	£2483.88	£2625.31	£2488.77
	28-day cost	£137.99	£145.85	£138.27
BMI class improved w/ baseline 30–35	BMI improved w/baseline 30–35	80.93%	91.09%	88.08%
	Cost per outcome	£2046.21	£2081.46	£2391.01
	28-day Cost	£113.68	£115.64	£132.83
BMI class improved w/ baseline 35–40	BMI improved w/baseline 35–40	80.68%	95.72%	95.08%
	Cost per outcome	£2052.55	£1980.78	£2214.98
	28-day cost	£114.03	£110.04	£123.05

Table 2 continued

		Tirzepatide 5 mg (*N* = 630)	Tirzepatide 10 mg (*N* = 636)	Tirzepatide 15 mg (*N* = 630)
BMI class improved w/ baseline > 40	BMI improved w/ baseline > 40	63.43%	66.67%	80.95%
	Cost per outcome	£2610.75	£2843.86	£2601.61
	28-day cost	£145.04	£157.99	£144.53

BMI body mass index; w/ with; *WL* weight loss

[a]Cost per outcome reflects the efficiency of the treatment in achieving its intended effect. BMI measured in kg/m^2

While participants receiving tirzepatide as part of the SURMOUNT-1 trial achieved up to 22.5% weight loss, compared with 2.4% for the placebo group [26], it is prudent to review the comparative effectiveness of similar products currently on the market. No direct comparisons of tirzepatide and semaglutide for weight management have currently been published; however, an analysis using the matching-adjusted indirect treatment comparison method to compare the efficacy of tirzepatide and semaglutide for chronic weight management showed greater weight loss with tirzepatide 10 and 15 mg vs. semaglutide 2.4 mg [27]. Additionally, a Phase 3b study in adult participants without type 2 diabetes who had obesity or overweight with weight-related comorbidities demonstrated an average 20.2% weight loss with tirzepatide vs. 13.7% with semaglutide over the 72 weeks of the study [28]. It is also noteworthy that adjunctive tirzepatide treatment over a 6-month period following bariatric surgery has been shown to significantly enhance weight loss and metabolic health [29].

In individuals with obesity (i.e., a BMI 30 kg/m^2), a median weight loss of 13% has been shown to result in reductions in risks for type 2 diabetes (41%), hypertension (22%), dyslipidaemia (19%), sleep apnoea (40%), and asthma (18%) [30]. Tirzepatide also has additional benefits which may potentially occur independently of weight loss. Ambulatory blood pressure has been reduced with tirzepatide, which was partially, but not completely, related to weight changes [31], as have serum lipids, with reductions in LDL and non-HDL cholesterol after 72 weeks of tirzepatide [11]. The SURMOUNT-1 trial demonstrated significant improvements in patient-reported mental health and psychosocial function [12, 19] as did the SURMOUNT-3 trial in multiple domains of mental health and psychosocial function in those taking tirzepatide [13].

From a cost-effectiveness standpoint, the SURMOUNT-1 findings suggest that tirzepatide is a promising investment in weight loss treatment, yielding substantial returns relative to its costs, which we calculated at £102.90 a month for the recommended 5% weight loss. The overall cost for achieving the recommended 5% weight loss with tirzepatide in SURMOUNT-1 was calculated to range from £1852.14 for the 5 mg dose to £2,186.46 for the 15 mg dose. This contrasts with the calculated cost per outcome of £2375 per 5% weight loss achieved as part of the UK Adult Weight Management Services Grant [32]. While the expenditure on weight loss medications in SURMOUNT-1 is noted, the health benefits associated with effective treatments like tirzepatide are substantial and multifaceted. Effective weight loss results in substantial reductions in obesity-related comorbidities such as type 2 diabetes, hypertension, cardiovascular disease, dyslipidaemia, and mental health issues as previously mentioned. This improvement has shown a decreased use of antihypertensive medications from baseline in the SURMOUNT-1 post hoc analysis [11] and an anticipated reduction in prescribed medication due to a 94% reduced risk of developing type 2 diabetes in adults with pre-diabetes and obesity or overweight [33]. These outcomes not only translate to reduced medication costs but also

improve overall health, reducing the need for future treatments.

The value of effective weight loss is further reflected in healthcare system efficiencies. By decreasing the incidence of obesity-related conditions, such as obstructive sleep apnoea or heart failure with preserved ejection fraction, tirzepatide helps alleviate the burden on healthcare resources, improving outpatient appointment availability and freeing up emergency room space [9, 34, 35]. For instance, the healthcare resource utilization cost for individuals with class III obesity is approximately 1.4 times higher (£3695) compared to those with normal weight [8]. Additionally, higher BMI categories significantly increase hospital admission costs, with an average rise from 15,831 euros (approximately £13,000) for BMI < 25 kg/m^2 to 30,982 euros (approximately £25,500) for BMI ≥ 40 kg/m^2 [9]. The evidence also suggests that a 5–10% weight loss via non-surgical methods results in an average healthcare cost savings of $135.35–$157.41 (approximately £107–£125) per patient per month, while a 10–20% weight loss leads to savings of $193.54 and $185.41 (approximately £150 and £145) per patient per month over the first and second years, respectively [10]. Thus, the investment in tirzepatide may not only address the direct costs of obesity-related treatments but also enhance overall healthcare efficiency, underscoring its potential value to both patients and healthcare organizations.

Although evidence supports the cost-effectiveness of bariatric surgery, there is currently no definitive consensus regarding the cost-effectiveness of non-surgical weight management programmes [36]. Tirzepatide offers a viable therapeutic option for individuals struggling with obesity, providing clinicians with a potent tool to achieve significant weight loss. The demonstrated cost-effectiveness of tirzepatide in achieving weight loss targets supports its integration into clinical practice guidelines and healthcare formularies, particularly when considered in the context of the cost associated with managing further clinical complications and comorbidities associated with obesity. Clinical decision-making should include personalized tangible goals for weight management interventions, including lifestyle modifications, dietary changes, physical activity, and, when appropriate, pharmacotherapy such as medications like tirzepatide [7].

This study had some limitations. It is based on clinical trial data (SURMOUNT-1), which may not fully reflect real-world patient diversity, healthcare settings, patient populations, real-world clinical practice, or adherence. The focus of the analysis is drug acquisition costs only, with those used in this analysis reflecting the UK list price at the time of completion of the SURMOUNT-1 study in 2023; costs do not encompass additional wraparound support or clinical time provided during the study. Moreover, dose escalation in SURMOUNT-1 dictated that individuals on tirzepatide 5 mg remained at that dose for the entire 72 weeks of the study; however, in real-world settings, doses may be adjusted upwards or downwards based on clinical need and tolerance. This adaptive approach is crucial for patient-centred care but was not explicitly addressed in the study's design. It could additionally be claimed that the relatively short-term duration of this study limits potential insights into the long-term sustainability of the weight loss observed and any treatment-associated adverse effects that may occur beyond the trial period. In addition, cost metrics such as cost per kilogram of weight loss may overlook indirect costs and long-term healthcare savings associated with sustained weight loss. Furthermore, our analysis was based on absolute costs relating to administration of tirzepatide rather than costs compared with placebo.

CONCLUSION

The analysis of tirzepatide acquisition costs and weight reduction outcomes from the SURMOUNT-1 study provides valuable insights into the cost-effectiveness of this treatment in the UK. The trial demonstrated that tirzepatide significantly reduced body weight, with higher doses (10 and 15 mg) leading to more substantial

weight loss and improved BMI categories. The cost-effectiveness of tirzepatide was evident, with the cost per kilogram of weight loss at 72 weeks being £102.86 for the 5 mg dose, £85.41 for the 10 mg dose, and £89.24 for the 15 mg dose. The most cost-effective dose for achieving greater weight loss targets, including 15% and 20% reductions, was tirzepatide 15 mg, reflecting its lower incremental cost per percentage of weight loss compared to other doses.

These findings underscore the potential economic value of tirzepatide not only in terms of its effectiveness in achieving weight loss goals but also in its potential to reduce long-term healthcare costs associated with obesity-related comorbidities. Tirzepatide's favourable cost-effectiveness profile supports its integration into clinical practice guidelines and healthcare formularies in the UK, offering a significant tool for effective weight management. Future research should aim to validate these findings in diverse patient populations and assess the long-term sustainability of weight loss and associated benefits.

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Data Availability. The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of Interest. Marc Evans and Alun Lloyd Davies report no conflicts of interest for the work under consideration for publication. Erik Spaepen reports receiving consulting fees from Eli Lilly and Company. William Evans, and Fiona Godbeer are employees and minor shareholders of Eli Lilly and Company. Laurienne Edgar is a former employee of Eli Lilly and Company.

Ethical Approval. This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors. The SURMOUNT-1 study received the necessary ethical approvals from all study sites, obtained informed patient consent to participate and was conducted in accordance with the Declaration of Helsinki.

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