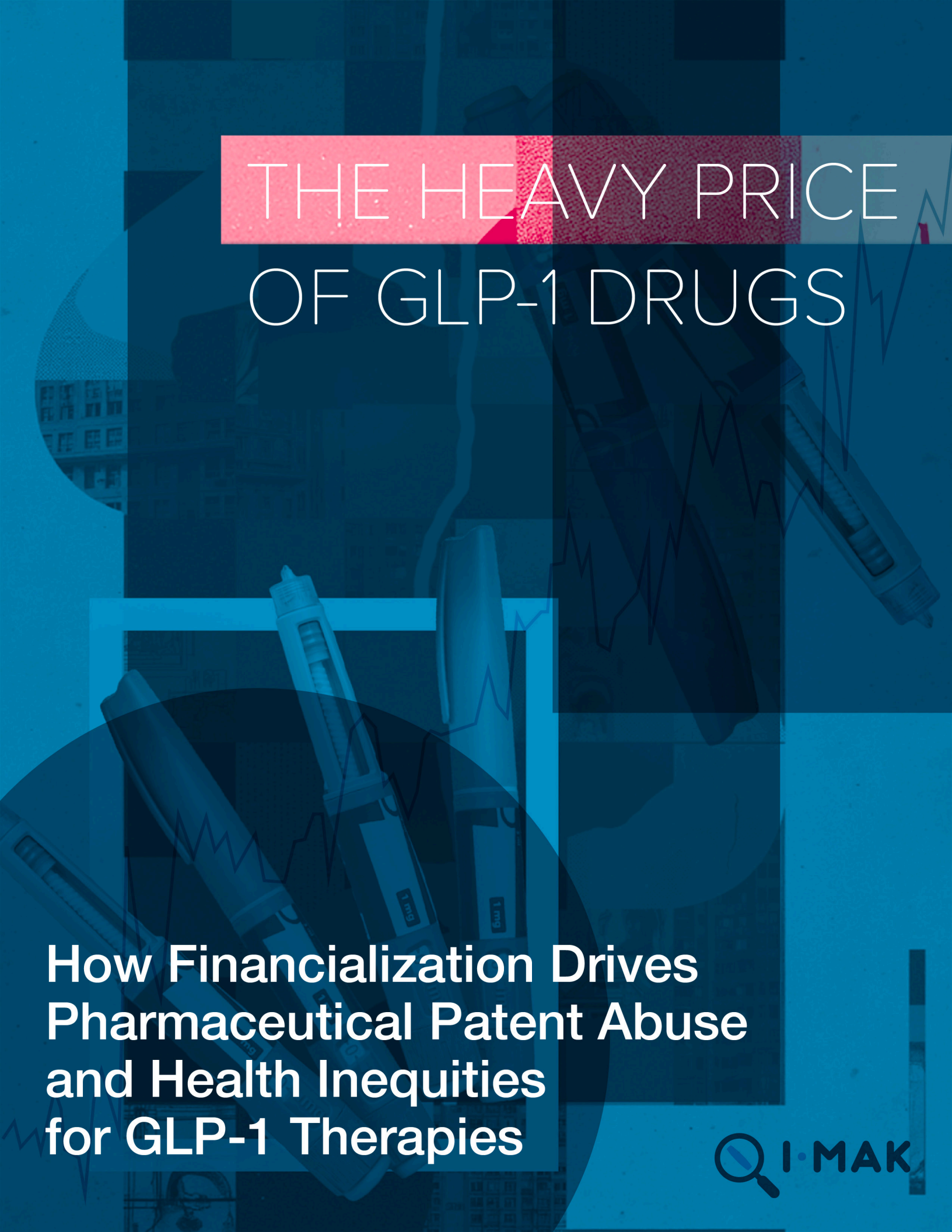

THE HEAVY PRICE OF GLP-1 DRUGS

How Financialization Drives Pharmaceutical Patent Abuse and Health Inequities for GLP-1 Therapies

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THE HEAVY PRICE OF GLP-1 DRUGS

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1 | EXECUTIVE SUMMARY

PURPOSE OF THE RESEARCH BRIEF:

This brief examines the financialized business model of Novo Nordisk and Eli Lilly for the leading GLP-1 products Ozempic, Rybelsus and Wegovy (semaglutide) and Mounjaro and Zepbound (tirzepatide). It shows how these companies are using the patent system as a key tool in their financialized business model to maximize revenues, profitability and shareholder returns. Through the creation of patent thickets, which includes filing and being granted follow-on patents for minor modifications, these companies have already extended their patent protection far beyond the term of the original patent(s) for these products. By extending their patent protection through these follow-on patents, subject to the outcome of litigation and the terms of any settlements, they potentially stand to extend their market monopoly and increase revenues. This brief highlights how the financialized business model perpetuates health inequities that will disproportionately impact Black Americans and other marginalized populations who face higher rates of obesity and diabetes yet remain underrepresented in access to GLP-1 therapies. It also makes several recommendations for systemic reforms to the patent system to counter the influence of financialization that incentivizes patent abuse, as well as healthcare policies to address these inequities and promote affordable access to these life-changing treatments.

KEY TAKEAWAYS:

1. **Two Active Ingredients, Five Products:** Semaglutide is marketed by Novo Nordisk as three separate drug products under the brand names: Ozempic (injection for diabetes, approved in 2017), Rybelsus (oral tablet for diabetes, approved in 2019), and Wegovy (injection for weight loss, approved in 2021). While industry proponents will frame Ozempic, Rybelsus and Wegovy as three new products and inventions (or innovations), all three rely on the exact same active ingredient.[1] Similarly, the active ingredient tirzepatide is marketed by Eli Lilly as two separate drugs under the brand names Mounjaro (injection for diabetes, approved in 2022) and Zepbound (injection for weight loss, approved in 2023). These products use the same delivery method and dosages.[2]

2. **GLP-1 Market Reflects a Financialized Business Model:** The financialized business models of Novo Nordisk and Eli Lilly illustrate their focus on sustaining long-term profitability over public health needs. Evidence shows unprecedented revenue growth and a heavy reliance on blockbuster drugs like these GLP-1 products that dominate their portfolios. Spending on shareholder enrichment appears to take priority over research and development (R&D), with Novo Nordisk spending 41% more on dividends and buybacks than on R&D over the past five years. While Eli Lilly has traditionally invested more in R&D, its recent surge in buybacks and dividends signals a growing focus on investor returns. Data also shows how rapidly these flagship products have come to fuel the majority of revenue for both companies, highlighting the revenue concentration characteristic of financialized business models. Lastly, the $700 billion in market capitalization gains by Novo Nordisk and Eli Lilly since the launch of GLP-1 therapies is a stark indicator of financialization, as these valuations far exceed the cumulative revenue generated by the drugs themselves.

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1 They differ only in dosage form and recommended use. Ozempic (injectable, weekly, 0.25mg, 0.5mg, 1.0mg, 2.0mg) and Rybelsus (oral, daily, 7mg, 14mg) are FDA-approved for type 2 diabetes, while Wegovy (injectable, weekly, 0.25mg, 0.5mg, 1.0mg, 1.7mg, 2.4mg) is approved for obesity.

2 Both of these products are administered in weekly subcutaneous injections, and in the same six doses (2.5 mg, 5 mg, 7.5 mg, 10 mg, 12.5 mg, 15 mg). The two products differ only in the intended use. Mounjaro is FDA-approved for Type 2 Diabetes and Zepbound is for chronic weight management. Simply put, this is the exact same drug used to treat two different conditions, diabetes and obesity.

3. **Patent Thickets Prolong Patent Protection, Potentially Lengthening Market Exclusivity:** Analysis of the patent landscapes for semaglutide (Ozempic, Rybelsus and Wegovy) and tirzepatide (Mounjaro and Zepbound) reveal a thicket of patents. The majority of the patents filed and granted relate to follow-on patents for minor modifications. These patents extend the patent protection far beyond the term of the original patented invention for these drugs. This extended patent protection increases the potential to lengthen the market monopoly, depending on litigation and settlement terms.

   Semaglutide is the same active ingredient used in three products marketed by Novo Nordisk: Ozempic, Rybelsus, and Wegovy. We have identified that Novo Nordisk has filed 320 U.S. patent applications and been granted 154 patents related to these three products.

   > The main compound patent protecting the active ingredient semaglutide as used in these three drugs is set to expire in December 2031. This compound patent should technically expire in March 2026, which is twenty years from when the patent was filed. However, the patent term on the main compound has been extended by over five years as a result of a Patent Term Adjustment (PTA) and a Patent Term Extension (PTE). We conservatively estimate that in just these five additional years, Novo Nordisk stands to earn $166 billion in revenue on Ozempic, Rybelsus and Wegovy.[3]

   In addition to the main compound patent, Novo Nordisk currently has 49 granted patents that expire after the main compound patent. These follow-on patents extend the patent protection on the products Ozempic, Rybelsus and Wegovy by ten years, until 2042. The majority of these follow-on patent applications and granted patents cover minor modifications in the form of delivery devices, formulations and methods of treatment.

   Tirzepatide is the active ingredient used in two products marketed by Eli Lilly: Mounjaro and Zepbound. While much earlier in its lifecycle, we have identified that Eli Lilly has filed 53 U.S. patent applications and been granted 16 patents related to these two products. The main compound patent covering the active ingredient tirzepatide is set to expire in 2036. In addition, Eli Lilly has several follow-on patents granted for delivery devices, formulations, and methods-of-treatment. These follow-on patents extend the patent protection for Mounjaro and Zepbound until 2041 – and it is likely that more follow-on patents will be added in the coming years.

4. **High Costs and Systemic Barriers Exacerbate Health Inequities:** The products Ozempic, Rybelsus, and Wegovy (semaglutide) and Mounjaro and Zepbound (tirzepatide) are priced at roughly $1,000 per month. At this price they disproportionately exclude low-income and marginalized populations, particularly Black Americans, who have some of the highest rates of obesity and diabetes. These high prices are enabled by the exclusivity granted through patents, which prevent generic competition and allow companies to maintain monopoly pricing. Extending the market monopoly on these drugs beyond the original patent term through abusive patent practices drives up prices and prolongs health inequities. These inequities are compounded by limited insurance and public payer coverage along with provider bias and geographic inequities that restrict access in underserved communities.

5. **Policy Reforms Are Critical to Address Structural Inequities:** Policymakers must act to curb patent abuses, expand insurance coverage for obesity treatments, and address structural barriers that limit access for marginalized communities. Without these reforms, GLP-1 products risk becoming another example of a treatment inaccessible to those who need it most.

3 Based on Wall Street consensus projections from 2026 through 2030. For 2031, one year beyond available consensus projections, we conservatively assumed a 15% decrease in total product sales from the prior year.

2 | INTRODUCTION

The recent and rapid rise of the GLP-1 receptor agonists semaglutide (Ozempic, Rybelsus and Wegovy) and tirzepatide (Mounjaro and Zepbound) offers a critical lens through which we can examine the intersection of financialization, patent abuse, and health inequities in the pharmaceutical industry.

Financialization means the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the economy[4]. It has transformed the pharmaceutical sector. This shift prioritizes short-term financial gains over long-term investments in new research and development (R&D), often at the expense of public health. A tool that has become key to the financialized business model of pharmaceutical companies is patents. Through manipulating the patent system, pharmaceutical companies are able to extend patent protection and potentially the market monopoly on their most profitable drugs. This manipulation of the patent system allows companies to maximize revenues and shareholder value, all while shifting the focus and investment away from the R&D of genuinely new medicines.

This research brief focuses on the GLP-1 receptor agonists semaglutide and tirzepatide that are branded under multiple product names, and which were originally developed for managing type 2 diabetes. Semaglutide and tirzepatide are also widely used in products for treating obesity, both conditions disproportionately affecting Black and Hispanic Americans. They exemplify how a financialized business model that uses patents as a key tool to maximize profits and shareholder enrichment deepens structural health inequities. Additionally, the limited supply of many of these products has increasingly shifted toward use in obesity treatment, driven by profit motives, leaving many type 2 diabetes patients unable to access medications they rely upon. Despite their ability to improve health outcomes, the products containing semaglutide and tirzepatide are widely inaccessible to vulnerable populations due to the industry's profit-maximizing behavior. Ultimately, all Americans bear these costs through higher insurance premiums, increased healthcare spending, and the economic burden of untreated obesity-related conditions.

With an annual market expected to reach $130 billion by 2030,[5] the companies behind these leading GLP-1 products — Novo Nordisk and Eli Lilly — have become central players in a financialized pharmaceutical industry. By leveraging patent thickets aimed at extending the market monopolies on their blockbuster drugs, these companies seek to maximize revenue streams while delaying the entry of low-cost generic alternatives. And where does all that revenue go? More was spent by Novo Nordisk on shareholder enrichment in the form of stock buybacks and dividends than on R&D, a hallmark of the financialized pharmaceutical business model.

This brief aims to highlight how patent abuse is a key tool enabling the pharmaceutical industry to carry out its financialized business model that perpetuates structural health inequities, particularly among communities of color. It calls for urgent reforms to counter the influence of financialization on the patent system by raising the bar for what should be considered an invention deserving of being granted a patent in order to promote affordability, competition and equitable access to life-saving therapies.

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4 The financialization of Big Pharma. April 2020. Accessed January 29, 2025. https://www.somo.nl/nl/wp-content/uploads/sites/2/2020/04/Rapport-The-financialisation-of-Big-Pharma-def.pdf

5 Becker Z. Move over, oncology: Obesity, diabetes meds will take over 2030's top drug rankings, evaluate forecasts. Fierce Pharma. July 11, 2024. Accessed January 29, 2025. https://www.fiercepharma.com/pharma/move-over-oncology-obesity-diabetes-meds-will-take-over-2030s-top-drug-rankings-evaluate.

3 | FIVE KEY INDICATORS OF FINANCIALIZATION IN THE GLP-1 MARKET

The rise of GLP-1 products containing semaglutide and tirzepatide serves as a powerful case study in the financialization of the pharmaceutical industry. The figures in Section 3 illustrate five key indicators of a financialized business model for these products:

- **Unprecedented Revenue Growth** (Fig. 1): Products containing semaglutide and tirzepatide have achieved record-breaking revenue growth, outpacing even the industry's previous best-selling drugs. This highlights the unparalleled pace and scale of financial returns these products generate.

- **Projected Revenue Dominance** (Fig. 2): The revenue projections for products containing semaglutide and tirzepatide showcase the magnitude of expected revenue in the first five years from launch as compared to other blockbuster drugs. This further emphasizes their outsized role in driving revenue and profits for the GLP-1 market.[6]

- **Corporate Spending Priorities** (Fig. 3): Novo Nordisk, the patent holder and manufacturer of the GLP-1 products Ozempic, Rybelsus and Wegovy (semaglutide) has spent 41% more on shareholder enrichment (buybacks and dividends) as it has on R&D in the past five years. This far exceeds peer averages and underscores the financialized focus on investor returns over the invention of new drugs.

- **Revenue Concentration** (Fig. 4): GLP-1 products have become the dominant drivers of total revenue for both Novo Nordisk and Eli Lilly. This reflects a broader industry trend of concentrating resources on high-margin, high-growth products, rather than diversifying or investing in more equitable solutions.[7]

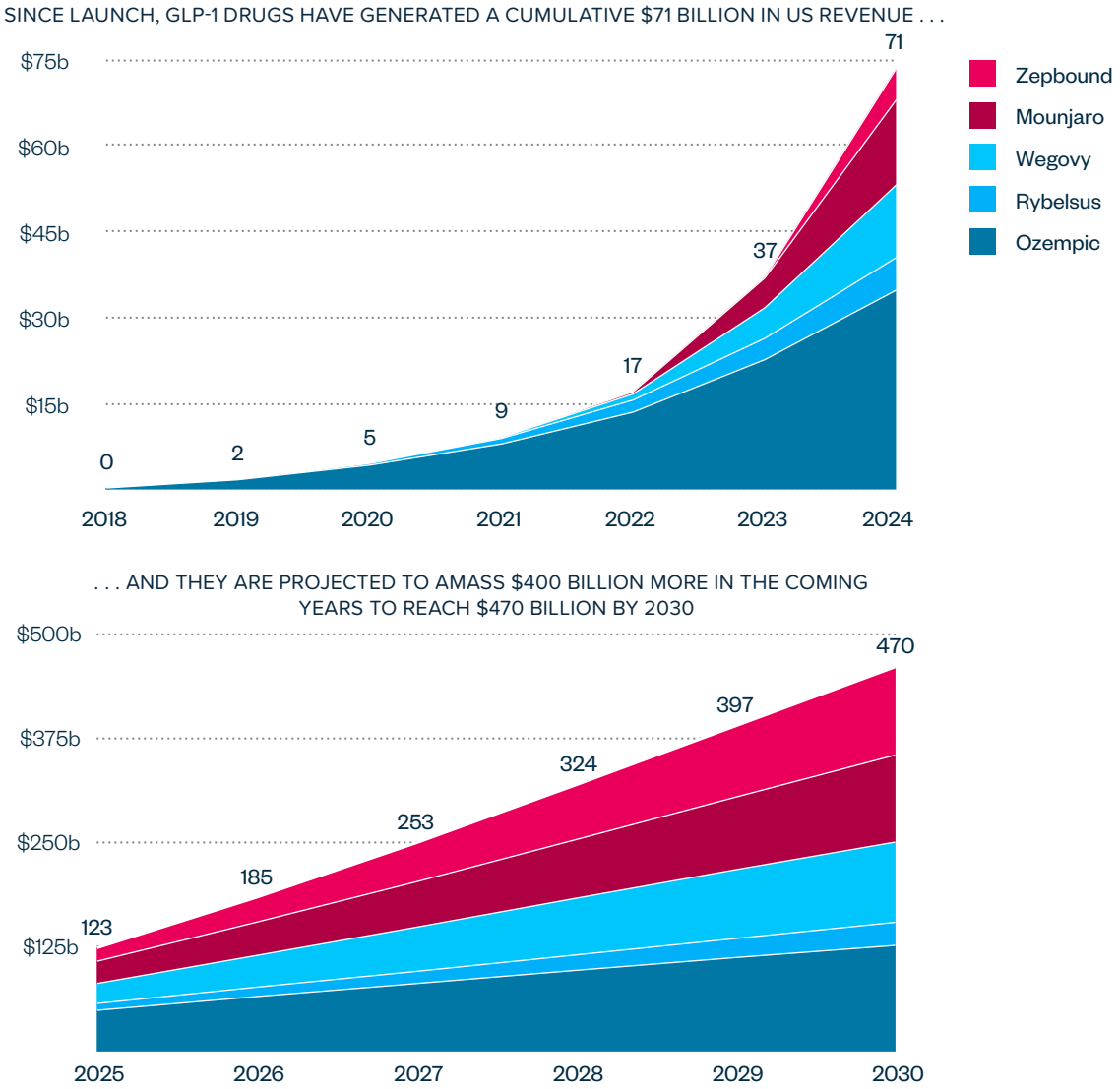
- **Extraordinary Market Capitalization Gains** (Fig. 5): The market value of Novo Nordisk and Eli Lilly has surged by $700 billion, representing a nearly 10-fold increase over the cumulative revenue generated by GLP-1 products themselves. This demonstrates how speculative valuation amplifies financial returns, prioritizing investor interests over public health outcomes.

6 This report focuses on the key GLP-1 therapies that constitute the vast majority of the GLP-1 market. While these products dominate in terms of past and projected revenue and market share, they do not represent the entirety of the GLP-1 market.

7 Other examples include Keytruda, the second highest selling drug of 2021 that accounted for 48% of Merck's total U.S. revenue and Humira the top-selling drug of 2022 which generated 42% of AbbVie's total annual U.S. revenue. Percentages were calculated using year-end reported financial results from Merck for 2021 and AbbVie for 2022.

INDICATOR #1

UNPRECEDENTED GROWTH: GLP-1 PRODUCTS REDEFINE REVENUE TRAJECTORIES (FIGURE 1)



This figure depicts the cumulative amount of U.S. revenue for Novo Nordisk and Eli Lilly's GLP-1 products using the active ingredients semaglutide and tirzepatide, beginning with the first full year of sales post-launch and through 2024. Projected revenue for each product from 2025 through 2030, based on consensus estimates from Wall Street analysts, are used to calculate the forecasted cumulative revenue to the end of the decade.

- **GLP-1 Products have achieved massive growth:** By the end of 2024, these GLP-1 products had a cumulative $71 billion in U.S. revenue, with Ozempic alone accounting for half of the total.

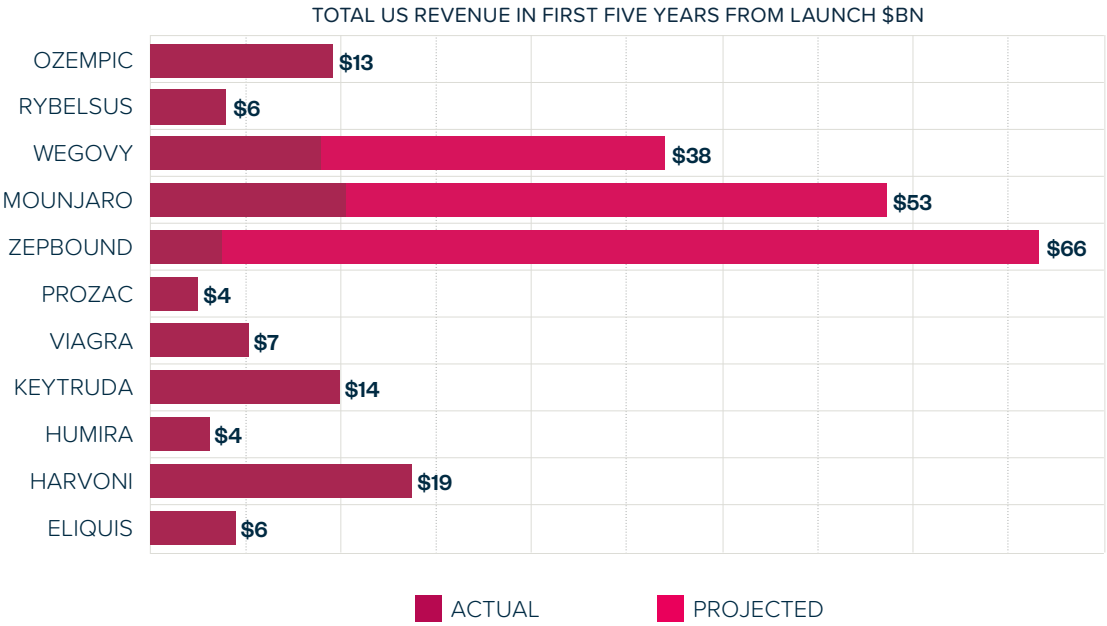
- **Projections show continued explosive growth:** From 2025 to 2030, Ozempic, Rybelsus, Wegovy (semaglutide) and Mounjaro and Zepbound (tirzepatide) are forecasted to generate $400 billion in additional U.S. revenue, to reach a staggering $470 billion in cumulative revenue by the end of 2030.

- **Comparable revenues surpass other historically lucrative products:** In just a decade, semaglutide and tirzepatide based products are set to generate nearly double the U.S. revenue of the iPhone's first 10 years—$470 billion vs. $260 billion.[8]

8 Based on total reported iPhone revenues by Apple from 2007-2016, and assuming the U.S. accounts for 40% of the global total, as noted by historical and analyst estimates. 1. Shvartsman D. Apple Inc.: Facts and Statistics (2024). Investing.com. November 4, 2024. Accessed January 29, 2025. https://www.investing.com/academy/statistics/apple-facts/.

INDICATOR #2

GLP-1 PRODUCTS DWARF OTHER HIGH-PROFILE AND TOP-SELLING DRUGS IN REVENUE (FIGURE 2)



The figure illustrates the total U.S. revenue generated by each of these top-selling products in their first five full years on the market. For products that have not yet been on the market for five full years (Wegovy, Mounjaro, and Zepbound), revenue projections are based on Wall Street consensus estimates as of 12/15/2024.

- **Unprecedented revenue growth:** Ozempic and Wegovy (semaglutide) and Mounjaro and Zepbound (tirzepatide) have generated or are projected to generate far higher U.S. revenue in their first five years compared to other high-profile and top-selling drugs.

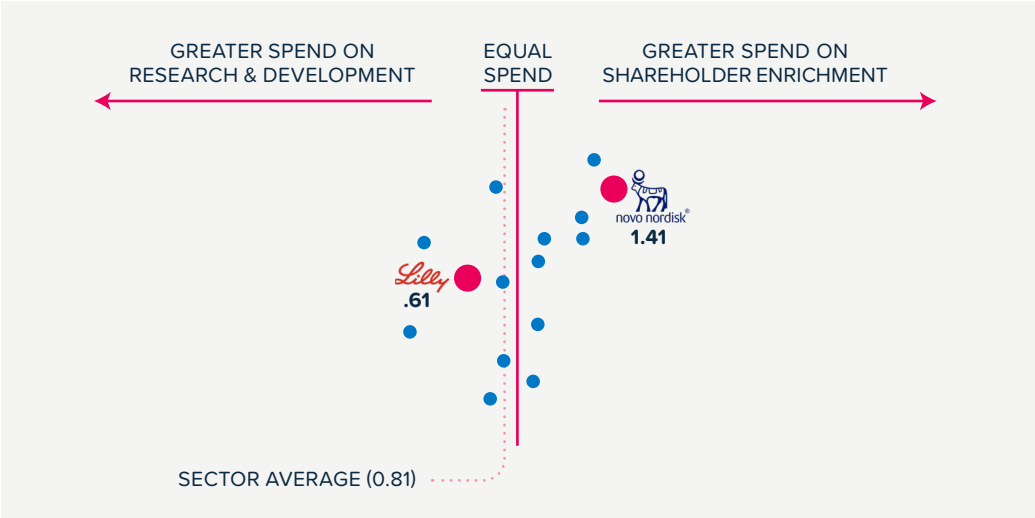
- **Scale of projections:** Estimates for Wegovy, Mounjaro, and Zepbound are based on Wall Street consensus projections, underscoring investor expectations for explosive growth and demand in the GLP-1 market.

- **Historical comparison:** Lifestyle-based blockbusters like Viagra and Prozac, once considered industry-shaping, fall far short of the scale and speed of revenue achieved by these GLP-1 products. Comparatively, the top-selling drugs of recent years - Humira and Keytruda - each generated far less revenue in their first five years compared to these GLP-1 products.

INDICATOR #3

FIGURE 3: THE COST OF FINANCIALIZATION: MORE SPENT ON SHAREHOLDERS THAN R&D

RATIO OF SPENDING ON R&D VS SHAREHOLDER ENRICHMENT FOR LEADING PHARMACEUTICAL COMPANIES 2020-2024



The figure shows the ratio of total spending on R&D versus shareholder enrichment (stock buybacks plus shareholder dividends) for 15 peer companies during the five year period from 2020-2024. A value of 1.0 indicates equal spending, while a value >1.0 reflects greater spending on shareholder enrichment, and <1.0 reflects greater spending on R&D. Figures used were reported by each company in their annual 10K SEC filing.

- **Novo Nordisk leads the sector in spending on shareholder enrichment:** With a ratio of 1.41, Novo Nordisk spent 41% more on shareholder returns (buybacks and dividends) compared to R&D, making it the highest spender on shareholder enrichment among 15 peer companies[9] in the pharmaceutical sector.

- **Eli Lilly has historically prioritized R&D, but shows signs of shifting toward greater shareholder enrichment:** With a ratio of 0.61, Eli Lilly spent more on R&D than on shareholder returns from 2020 to 2024. However, in 2024 Eli Lilly spent $2.5 billion on share repurchases and increased its quarterly dividend by 15%. The company also announced a new $15 billion share repurchase program which signals the company's shift in priorities toward shareholder enrichment.[10]

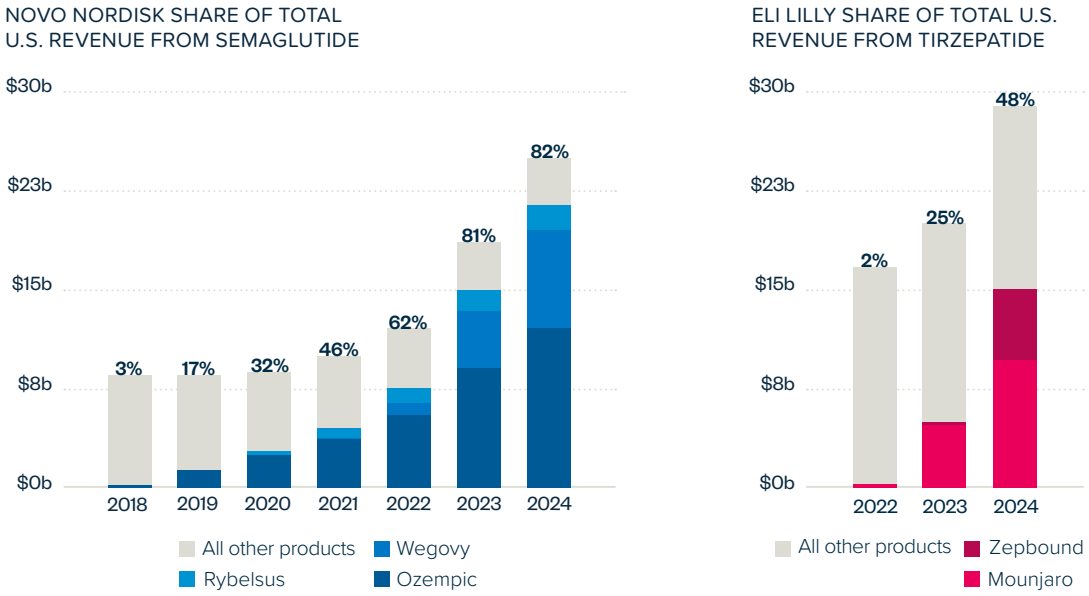
- **Industry-Wide Trend Highlights Significant Shareholder Returns:** The industry-wide average ratio of 0.81 indicates that, across leading pharmaceutical companies, R&D spending modestly exceeds shareholder returns on average. This challenges the industry's common narrative that reinvestment in R&D is always the primary financial priority.

9 The peer companies and their ratios noted in the figure include Abbvie(1.25), Amgen(1.32), AstraZeneca(0.36), Biogen(0.71), Bristol-Myers(0.86), Eli Lilly(0.43), Gilead(0.70), GSK(0.54), JNJ(0.76), Merck(0.38), Novartis(1.25), Novo Nordisk(1.41), Pfizer(0.71), Roche(0.86), and Sanofi(0.57)

10 Lilly announces new $15 billion share repurchase program and seventh consecutive 15% dividend increase. Eli Lilly and Company. December 9, 2024. Accessed January 29, 2025. https://investor.lilly.com/news-releases/news-release-details/lilly-announces-new-15-billion-share-repurchase-program-and.

INDICATOR #4

GLP-1 PRODUCTS RAPIDLY TAKE OVER AS THE REVENUE DRIVERS FOR NOVO NORDISK AND ELI LILLY (FIGURE 4)

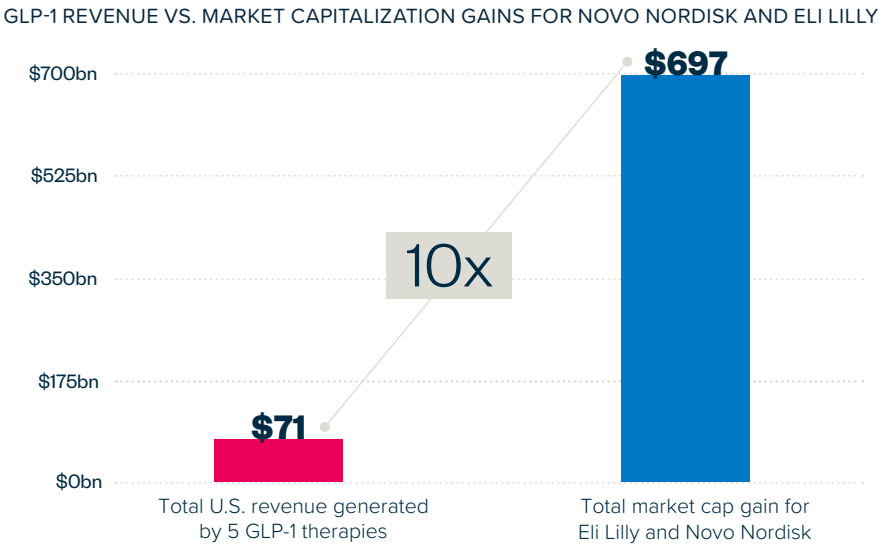


The figure illustrates the share of total U.S. revenues for Novo Nordisk and Eli Lilly that are attributable to the key GLP-1 products since their launch.

- **GLP-1 products now account for the majority of Novo Nordisk and Eli Lilly's U.S. revenue:** By the end of 2024, Ozempic, Rybelsus and Wegovy (semaglutide) accounted for 82% of Novo Nordisk's U.S. revenue and Mounjaro and Zepbound (tirzepatide) 48% of Eli Lilly's, highlighting the unprecedented speed of adoption and market dominance of these four drugs.
- **Accelerating dependence on mega-blockbuster products:** Both companies have seen GLP-1 products become the primary growth engines for their U.S. operations, underscoring a strategic focus on maximizing high-growth, high-revenue products. This overreliance on these products incentivizes patent abuse through patenting minor modifications and developing patent thickets. These patents are then used to potentially delay competition as a result of the rebranding of the same drug with minor modifications.

INDICATOR #5

THE 10X FINANCIAL MULTIPLIER EFFECT OF GLP-1 PRODUCTS (FIGURE 5)



The figure depicts the total U.S. revenue generated by GLP-1 products from launch through 2024 in comparison to the total combined gain in market capitalization for Eli Lilly and Novo Nordisk since the first product launch for each company (Ozempic 12/5/17 and Mounjaro 5/13/22) and through the end of 2024.

- **GLP-1 products have driven outsized market value growth:** Since the launch of their first GLP-1 products, Novo Nordisk and Eli Lilly have experienced a combined $697 billion increase in market capitalization or total company value, which is 10 times greater than the $71 billion in U.S. revenue generated by the products over the same period.
- **Market cap gains far exceed historical trends:** In an equivalent time period prior to the launch of their GLP-1 products, the combined market cap gains for Novo Nordisk and Eli Lilly was significantly lower at $197 billion—3.5x less than the gains realized after the introduction of these products.[11]
- **Investor expectations amplify market value:** The $697 billion surge in market capitalization reflects not only the revenue potential of GLP-1 products but also heightened investor confidence in their long-term profitability.

4 | ANALYSIS OF THE PATENT LANDSCAPE FOR SEMAGLUTIDE AND TIRZEPATIDE

This section examines the patent thicket that Novo Nordisk and Eli Lilly have built around the drugs Ozempic, Rybelsus and Wegovy (semaglutide) and Mounjaro and Zepbound (tirzepatide). We set out the types of patents that have been filed and granted, the period of patent protection, and the potential market monopoly for these two leading GLP-1 receptor agonists – underscoring their role in a financialized pharmaceutical system.

4. A) SEMAGLUTIDE

We have identified that Novo Nordisk has filed 320 U.S. patent applications related to its three products that all use the same active ingredient, semaglutide. The patent thicket protecting products containing semaglutide exemplifies how pharmaceutical companies leverage minor modifications with the intention of delaying competition and extending product profitability far beyond the lifecycle of the main compound. This behavior highlights how the patent system can be exploited for financial gain. It also illustrates how patents have become an instrumental tool in the financialized business model now practised by the pharmaceutical industry.

MAIN COMPOUND PATENTS

The active ingredient, semaglutide, as used in Novo Nordisk's products Ozempic, Rybelsus and Wegovy is protected by two key compound patents, U.S. Patent Nos. 8,129,343 ('343) and 8,536,122 ('122). Aside from providing protection for the active ingredient, these patents also disclose that semaglutide can be used to treat various indications, including diabetes, obesity and cognitive disorders, as well as in combination with other drugs. They also disclose the various potential routes of administration for using semaglutide in a product, including lingual, sublingual, oral and parenteral.

These patents were originally filed as an international application on March 20, 2006. As patents are provided with 20 years of protection from the date of filing once granted, these patents should technically expire on March 20, 2026 (see Figure 8). While the '122 patent expires on March 20, 2026, its related patent, '343, will expire over five years later on December 5, 2031. The reason for this extension is due to Patent Term Adjustments (PTA) and Patent Term Extensions (PTE) that the law provides for any delay in patent examination at the United States Patent and Trademark Office (USPTO) and regulatory approval by the U.S. Food and Drug Administration (FDA).[12]

The impact of these additional five years due to PTA and PTE is profound: Novo Nordisk is projected to earn an **estimated $166 billion from Ozempic and Wegovy** as a result of this extended period of patent protection, which spans from March 2026 to December 2031. Consequently, the U.S will not have generic equivalents of Ozempic, Rybelsus or Wegovy until 2032 at the earliest. By contrast, countries like India, which do not award patent term extensions, could see generic competition entering much sooner once the patents on the main compound expire there in 2026.[13]

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11 The equivalent prior time period for Novo Nordisk was 11/13/10 at which point their market cap was $72.2 bn, equaling a $56.7 bn gain to the reference time point of 12/5/17 (Ozempic's launch). For Eli Lilly, the equivalent prior time period was 9/27/19 at which point their market cap was $122.4 bn, equaling a $140.1 bn gain to the reference time point of 5/13/22 (Mounjaro's launch). This combined $197 bn market cap gain is 3.5x smaller than the gain of $697 bn realized from the launch of the GLP-1 products through 2024.

12 The pharmaceutical industry lobbied for Patent Term Extensions under the Hatch-Waxman Act 1984 to ensure they would be guaranteed up to 14 years of market protection from the date of a product's approval. Patent Term Extensions are a policy designed to compensate the patent holder for any loss of patent term as a result of any regulatory delays.

Patent Term Adjustment is governed by the AIA Technical Corrections Act and is a separate process to Patent Term Extensions under the Hatch Waxman Act.

13 Sadam R. India plans incentives for diabetes, obesity drug makers in 2026, government official says. Reuters. June 28, 2024. Accessed January 29, 2025. https://www.reuters.com/business/healthcare-pharmaceuticals/india-plans-incentives-diabetes-obesity-drug-makers-2026-government-official-2024-06-28/.

In addition to filing and being granted patents for the compound semaglutide, Novo Nordisk has filed and been granted patents covering derivative compounds of semaglutide. These patents, covering a broad family of derivative compounds of semaglutide, are conceived to prevent competitors from developing related drugs that could compete with Novo Nordisk's products on the market.

SEMAGLUTIDE'S THICKET OF FOLLOW-ON PATENTS

In addition to the patents protecting the compound semaglutide and its derivative forms, Novo Nordisk has built a considerable patent thicket of follow-on patents. These follow-on patents, also known as secondary patents, mainly consist of formulations, combinations with other drugs, methods of treating different indications that were already disclosed in the main compound patents, and drug delivery devices.[14]

According to our patent searches, Novo Nordisk has filed 91 patents for formulations, 41 patents covering devices to deliver the drug, and 45 patents for methods of treatment (Figure 6). In total, Novo Nordisk has currently been granted 49 follow-on patents. These follow-on patents provide patent protections until 2042.[15] This is an additional ten years beyond the main compound patent for semaglutide, which has already benefited from an additional five year extension (Figure 8). As shown in Figure 7, since the filing of the main compound patents in 2006, Novo Nordisk has been applying for patents consistently over a period of 17 years, with heavier patenting activity in 2019, two years before Wegovy was approved.

These follow-on patents form a systematic attempt to add barriers of entry for generic competitors, with the intention of extending Novo Nordisk's market monopoly for as long as possible when the main compound patent on the underlying active ingredient, semaglutide, expires.[16]

RECYCLING SEMAGLUTIDE AS A "NEW" DRUG

Semaglutide is marketed as three products under distinct brand names: Ozempic (injection for diabetes, approved in 2017), Rybelsus (oral tablet for diabetes, approved in 2019) and Wegovy (injection for weight loss, approved in 2021). While industry proponents frame these as separate and new inventions (or innovations), all three rely on the exact same active ingredient, semaglutide. The differences—delivery method, dosage and use to treat obesity —are all minor modifications of earlier disclosures that were made by Novo Nordisk in the main compound patents for semaglutide as discussed above. This patent lifecycle management of semaglutide through the continuous filing of additional patents for these variations highlights how pharmaceutical companies abuse the patent system in order to maximize their financial returns.

The semaglutide case exemplifies how the patent system has been turned into a key instrument of the pharmaceutical industry's financialized business model. By making minor modifications to what is already disclosed in the original patents, Novo Nordisk has been able to build a thicket of patents that it will use to extract greater profits while attempting to delay competition, which will then in turn be used for share buybacks and the enrichment of shareholders.

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14 On April, 30, 2024, the FTC issued a notice to Novo Nordisk identifying the improper listing of 17 of these device patents that do not contain any active ingredient on the FDA Orange Book. These improper listings can delay generic drug competition as a result of triggering automatic litigation stays, increase litigation costs that could disincentivize the development of generic drugs, and increase costs across the healthcare system. The FTC highlighted these actions as potential violations of antitrust laws and indicative of unfair methods of competition, further underscoring concerns about anti-competitive practices in the pharmaceutical industry.

Re: Improper Orange Book Patent Listings for Ozempic, Saxenda, and Victoza. U.S. Federal Trade Commission. April 30, 2024. Accessed January 29, 2025. https://www.ftc.gov/system/files/ftc_gov/pdf/novo-nordisk-ozempic-saxenda-victoza-_4302024.pdf.

15 The first patent applications relating to semaglutide were filed on March 18, 1993. With the last expiring follow-on patent being in 2042, this amounts to a period of 49 years of patent protection in total.

16 In October 2024, Novo Nordisk entered a settlement with Natco Pharma and Mylan (a subsidiary of Viatris) in relation to its product Ozempic. The terms of the settlement are confidential and it remains unclear whether generic entry will happen once the main compound patent expires or later due the follow-on patents. It is also unclear whether generic entry will be subject to any restrictions imposed by Novo Nordisk, such as volume limited distribution over a period of time.

Kansteiner F. Amid GLP-1 craze, Novo and Mylan Ink Patent Settlement in ozempic case. Fierce Pharma. October 7, 2024. Accessed January 29, 2025. https://www.fiercepharma.com/pharma/novos-patent-litigation-settlement-mylan-could-pave-way-cheaper-ozempic-generics.

Litigation between Novo, Mylan and Viatris and Sun Pharmaceutical Industries with respect to the patents protecting Wegovy is still ongoing. Novo Nordisk Inc and Novo Nordisk A/S v Viatris Inc and Mylan Pharmaceuticals, 1:23-cv-00101 and Novo Nordisk Inc and Novo Nordisk A/S v Sun Pharmaceutical Industries Ltd and Sun Pharmaceutical Industries, Inc, 1:23-cv-01459

FIGURE 6: PATENT TYPES FOR SEMAGLUTIDE

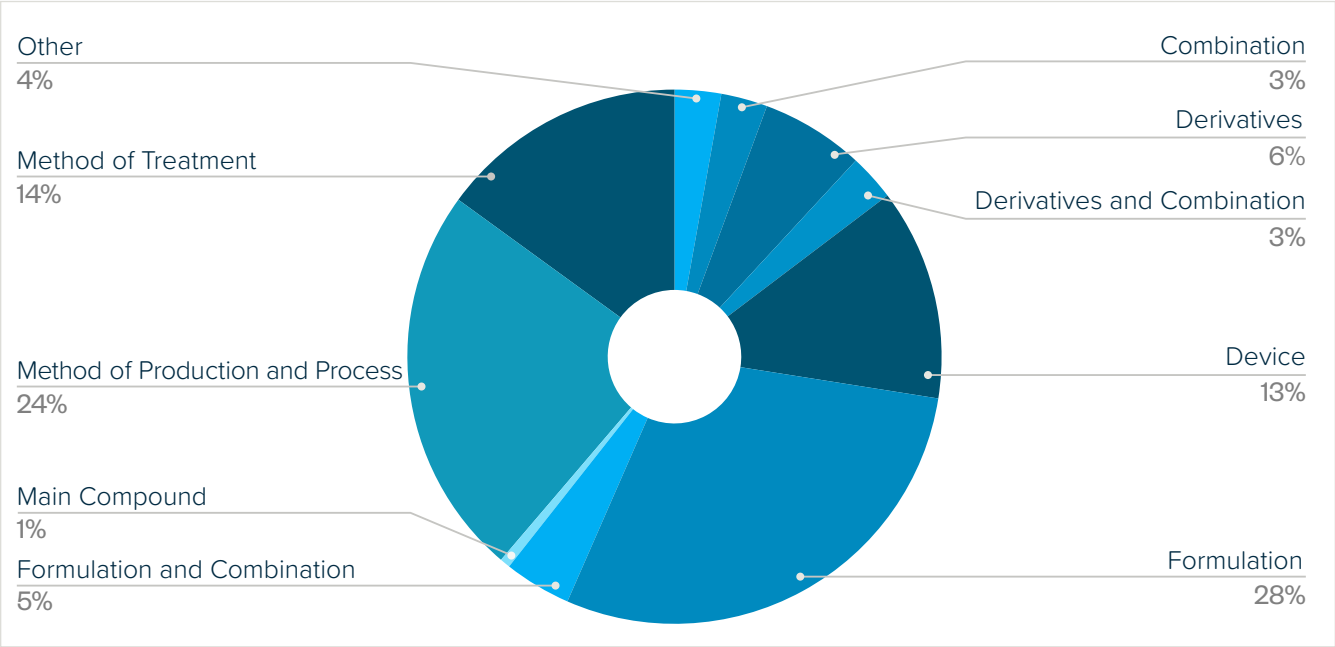


FIGURE 7: ANNUAL PATENT FILINGS FOR SEMAGLUTIDE

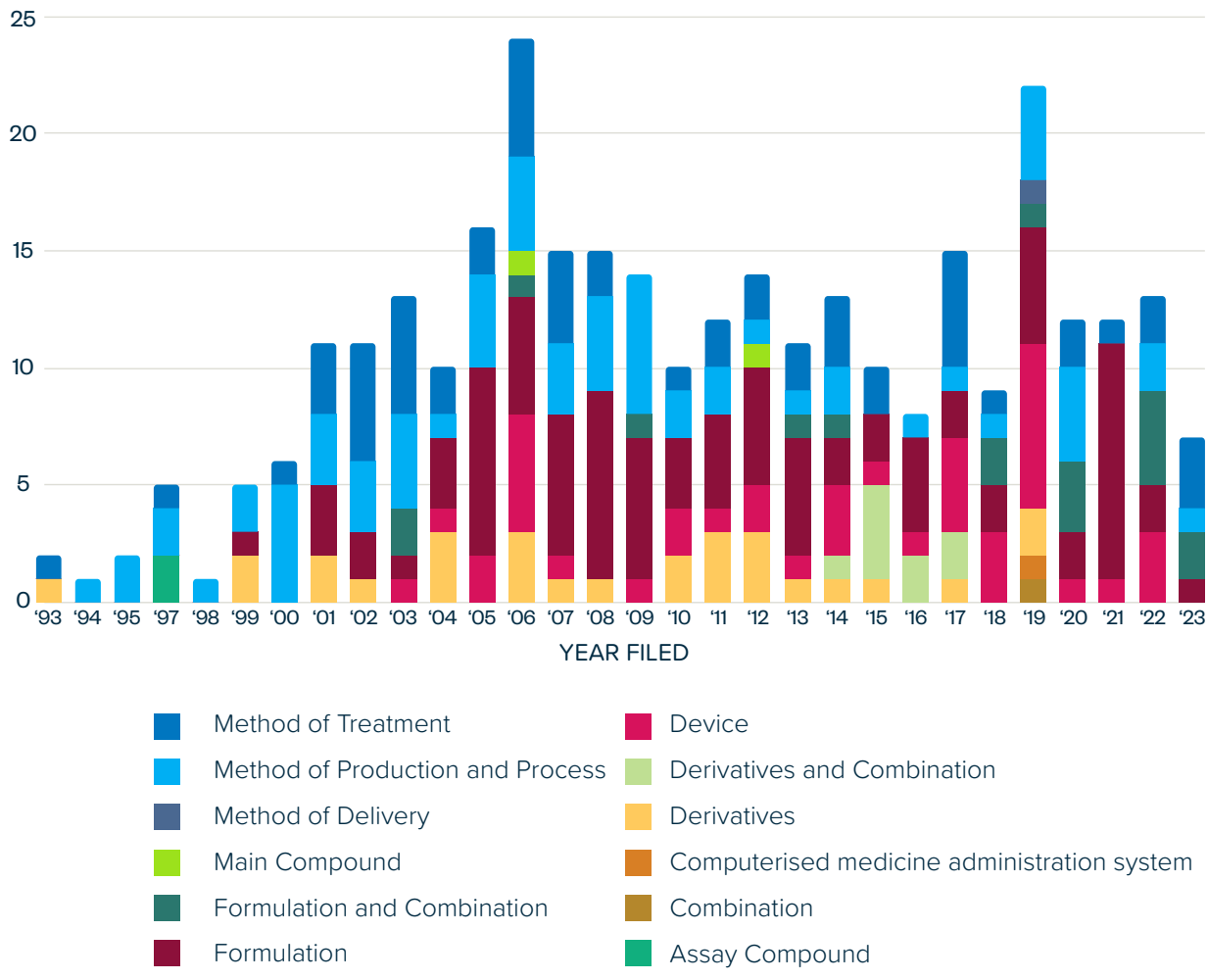
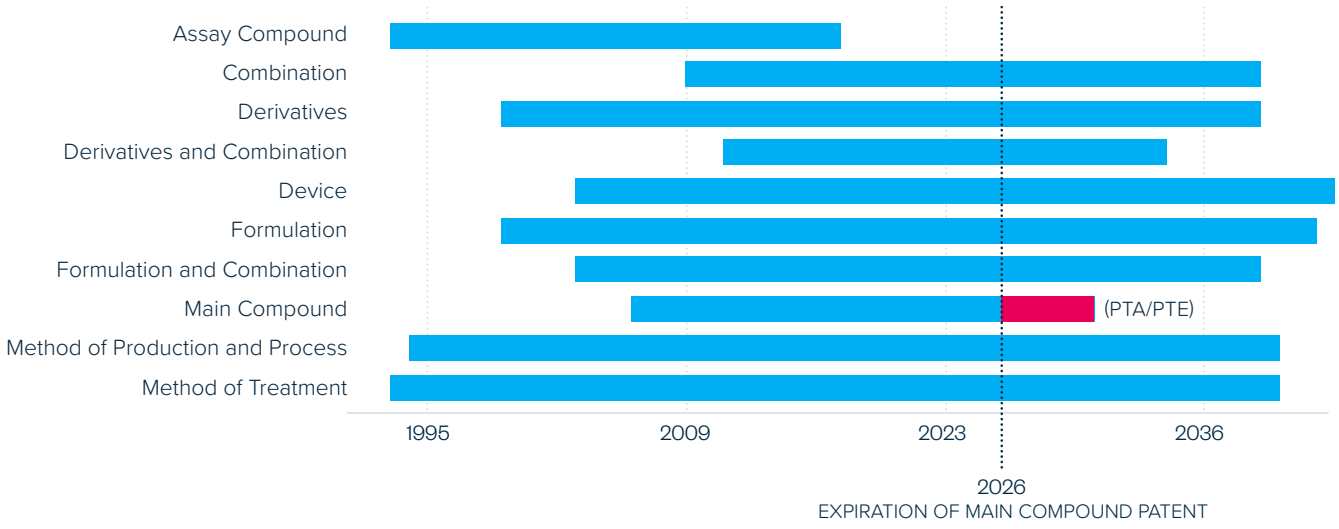


FIGURE 8: DURATION OF PATENT PROTECTION FOR SEMAGLUTIDE



4. B) TIRZEPATIDE

Tirzepatide, marketed as Mounjaro for diabetes and Zepbound for weight loss, is a newer entrant to the GLP-1 receptor agonist market. Eli Lilly has to date filed 53 U.S. patent applications related to tirzepatide, of which 16 have been granted. While the patenting behavior around tirzepatide is still early in its life cycle as compared to semaglutide, it already demonstrates how Eli Lilly has built a thicket of patents that extends its patent protection. By extending its patent protection through minor modifications, Eli Lilly seeks to maximize the lifecycle of its products while erecting as many barriers of entry for competitors as possible in order to increase the prospects of prolonging its market monopoly and profits.

MAIN COMPOUND PATENT

Tirzepatide's key compound patent, US Patent No. 9,474,780 ('780) was filed in 2015 and is expected to expire in the U.S. in January 2036 (Figure 11). In addition to covering the compound tirzepatide, patent '780 also covers a number of other compounds that target GLP-1 and GIP receptors. As a result, the patenting of these broader sets of compounds disincentivize and block competitors from developing them as potential products. This serves to further consolidate Eli Lilly's protection around the active ingredient tirzepatide and, therefore, its products Mounjaro and Zepbound.

Although patent '780 specifically claims the method of treating diabetes mellitus, it also discloses how the compounds, including tirzepatide, can be used to treat other indications, including obesity and increasing bone strength. The patent also discloses that the preferred formulation of tirzepatide is by parenteral routes, such as subcutaneous, intravenous, or transdermal.

TIRZEPATIDE'S THICKET OF FOLLOW-ON PATENTS

Eli Lilly has built a thicket of follow-on patents in addition to the patent protecting the main compound tirzepatide (Figure 9). The majority of these follow-on patents were filed between 2021 and 2022, coinciding with the launches of Mounjaro and Zepbound (Figure 10).[17]

The follow-on patent applications and granted patents cover minor modifications. The majority of the follow-on patenting covers methods of treating different indications, including obstructive sleep apnea, preventing or delaying the development of a cognitive disorder in a patient, as well as different dosing regimens for the treatment of diabetes and obesity. They also include different formulations, delivery devices, and combinations with other drugs. Currently, these follow-on patents provide patent protections until the end of 2041 (Figure 11). This adds another five years of patent protection beyond the main compound patent.[18]

17 The drop in patent filings observed in 2023 may reflect several factors. We identified several PCT international patent applications filed in 2023 that have not yet entered into the U.S. patent system and which could account for the decline. It is also possible that some applications from 2023 have not yet been published and were therefore not included in our search as of October 1, 2024. However, there remains a possibility that these filings will not materialize in the U.S. patent landscape.

18 The first patent applications relating to tirzepatide were filed on August 21, 1997. With the last expiring follow-on patent being in 2041, this amounts to a period of 44 years of patent protection in total.

Tirzepatide's rapid escalation and market dominance is reflected in its patenting activity to date. Eli Lilly's patenting around tirzepatide demonstrates its financialized priorities. Building a thicket of patents consisting of every type of minor modification in order to add patent protection demonstrates Eli Lilly's financialized business model designed to increase the prospects of extending the market monopoly in order to maximize profits and shareholder returns. Even when the main compound patent expires, generic competitors must navigate a growing web of patents, making litigation and the delay of any market entry almost inevitable.

FIGURE 9: PATENT TYPES FOR TIRZEPATIDE

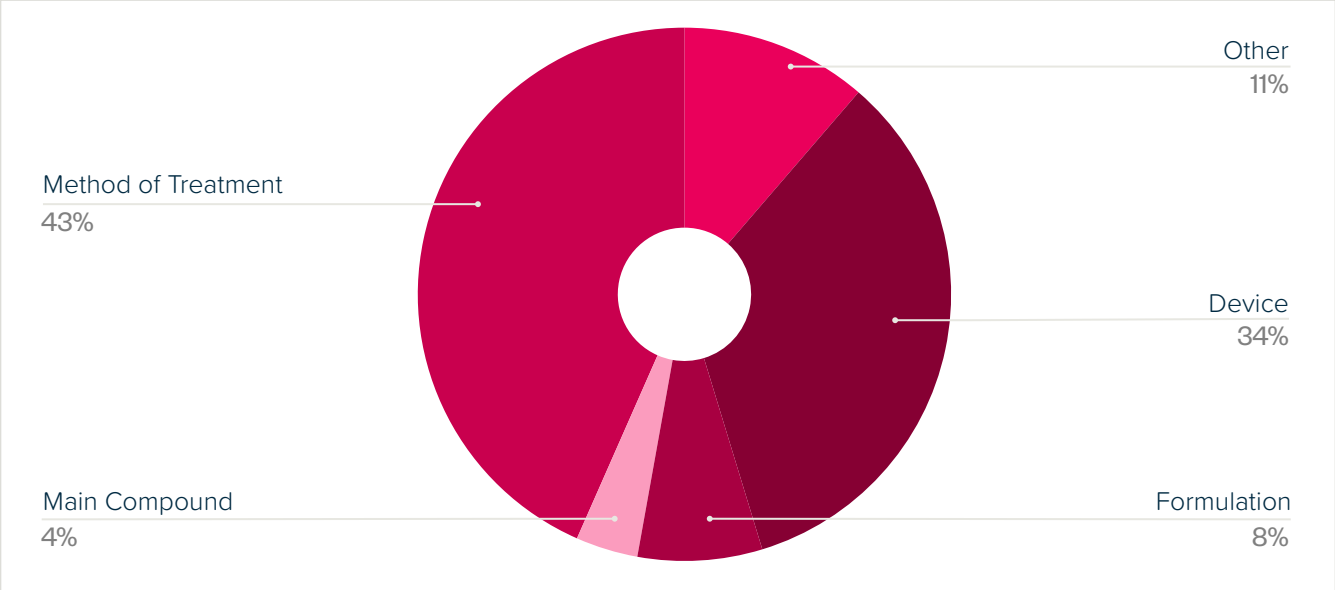


FIGURE 10: ANNUAL PATENT FILINGS FOR TIRZEPATIDE

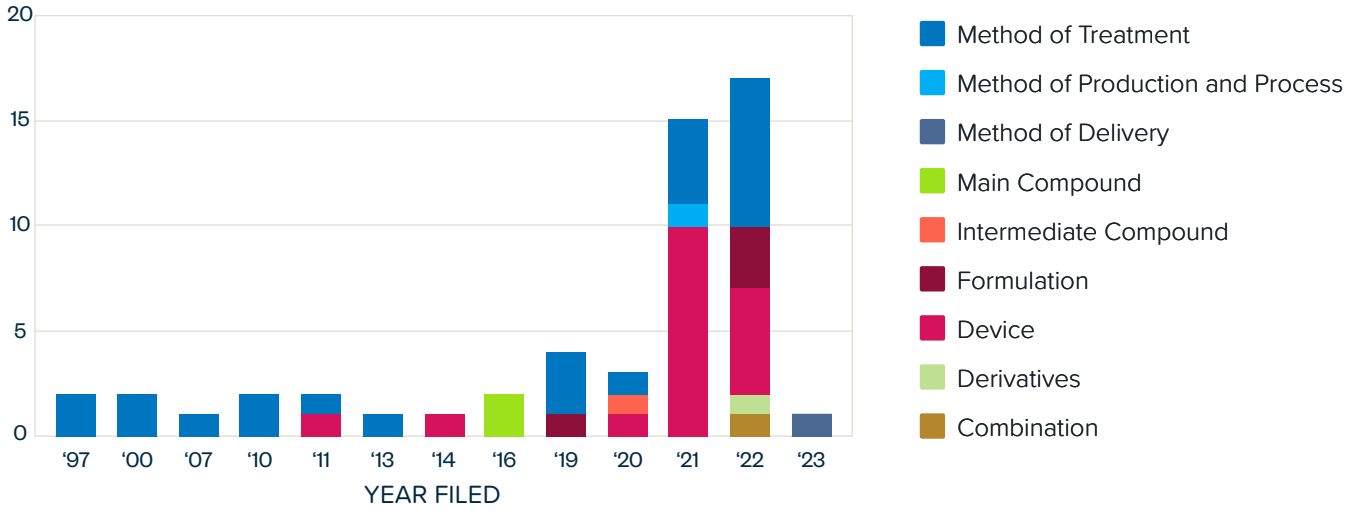
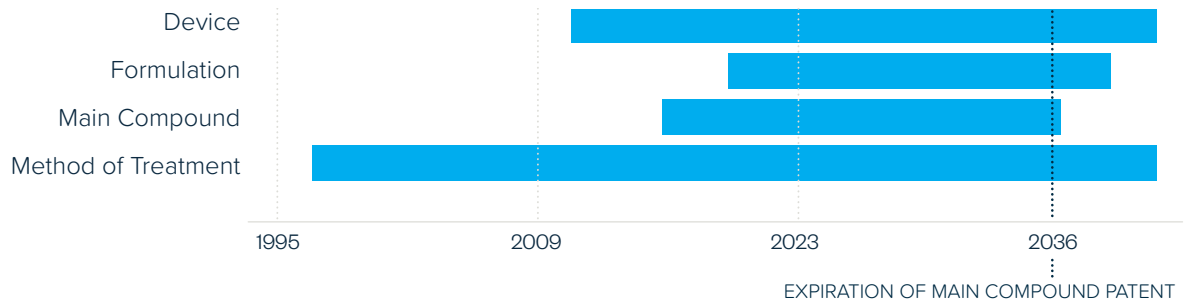


FIGURE 11: DURATION OF PATENT PROTECTION FOR TIRZEPATIDE



5 | PERPETUATING HEALTH INEQUITIES

The rise of GLP-1 products containing semaglutide and tirzepatide have had an immediate impact on the treatment of diabetes and obesity. However, these products have laid bare and exacerbated longstanding inequities in healthcare access, particularly for Black Americans and other marginalized communities. Despite bearing a disproportionate burden of diabetes, obesity and related chronic conditions, these populations face systemic barriers that limit their access to these treatments.

- **Disproportionate Impact of Obesity and Diabetes.** Obesity continues to disproportionately affect Black Americans, particularly Black women. Nearly half of Black Americans — including almost 60 percent of Black women — are living with obesity.[19] Furthermore, Black adults are nearly twice as likely as their White counterparts to have diagnosed diabetes—12.1% compared to 6.9% —highlighting the urgent need for effective interventions in these communities.[20] Yet despite this heightened need, Black patients are far less likely to be prescribed GLP-1 products. In 2023, Black adults received only about 12 percent of prescriptions for popular anti-obesity drugs, while 85 percent went to White patients.[21] This stark disparity underscores systemic inequities in the healthcare system, from provider bias to financial barriers, that disproportionately affect communities of color.
- **The Role of Financial Barriers.** The high cost of GLP-1 products is one of the most significant barriers to equitable access. Drugs like Wegovy and Mounjaro cost upwards of $1,000 per month, and few insurance plans cover them for weight loss. Medicare explicitly excludes coverage for weight-loss medications (unless there are associated cardiovascular risks). Medicaid coverage varies widely by state, with only 13 states including an anti-obesity drug in their formularies as of August 2024.[22] This financial exclusion disproportionately impacts Black Americans, who are more likely to be uninsured or underinsured and face greater economic barriers to care. The financialized nature of the pharmaceutical industry exacerbates these challenges. Companies prioritize high-margin sales to affluent, well-insured markets, aligning with shareholder interests rather than public health goals. By setting prices at levels that are inaccessible to many, manufacturers of GLP-1 products effectively exclude large segments of the population who could benefit from these treatments. This approach reflects a broader trend in healthcare, where financialization drives profit maximization at the expense of equity and accessibility.
- **Systemic and Structural Inequities.** Access to GLP-1 products is also hindered by systemic inequities in the healthcare system. Black patients are less likely to receive recommendations for these drugs, even when they meet clinical criteria. Moreover, a recent study of Medicare beneficiaries found that Black seniors were roughly one-third less likely than their white counterparts to start a GLP-1 medication, even when eligible.[23] Provider bias, lack of culturally competent care, and limited access to specialists contribute to these disparities. Additionally, low-income neighborhoods, which are disproportionately home to Black and Hispanic populations, often lack the healthcare infrastructure and pharmacy access necessary to obtain these medications.
- **Geographic and Social Determinants of Health.** The disparities in access to GLP-1 products are compounded by geographic and social determinants of health. Black Americans are more likely to live in areas with limited access to healthcare services and nutritious food. For instance, food deserts, where grocery stores are scarce and fast food is more accessible, disproportionately affect low-income and Black communities, contributing to higher rates of obesity and diabetes.[24] Moreover, the financial struggles experienced in these neighborhoods mean residents are less likely to afford the time and money needed to access GLP-1 products, even if they are aware of them.

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19 Lofton H, Ard JD, Hunt RR, Knight MG. Obesity among African American people in the United States: A Review - Lofton - 2023 - obesity - wiley online library. January 25, 2023. Accessed February 5, 2025. https://onlinelibrary.wiley.com/doi/full/10.1002/oby.23640.

20 See Table 3: Appendix A: Detailed tables. Centers for Disease Control and Prevention. Accessed January 15, 2025. https://www.cdc.gov/diabetes/php/data-research/appendix.html.

21 Lovelace B, Kopf M, Kane J. Popular weight loss drugs remain out of reach for many who need them. NBCNews.com. March 17, 2024. Accessed February 4, 2025. https://www.nbcnews.com/health/health-news/-weight-loss-drugs-wegovy-zepbound-out-of-reach-rcna142763

22 Williams E, Rudowitz R, Bell C. Medicaid coverage of and spending on glp-1s. KFF. November 4, 2024. Accessed January 29, 2025. https://www.kff.org/medicaid/issue-brief/medicaid-coverage-of-and-spending-on-glp-1s/.

23 WH Chen, Y Li, et. al. Geographic variation and racial disparities in adoption of newer glucose-lowering drugs with cardiovascular benefits among US Medicare beneficiaries with type 2 diabetes. 29 Jan 2024. https://doi.org/10.1371/journal.pone.0297208

24 Gaskin DJ, Thorpe RJ, McGinty EE, et al. Disparities in diabetes: The nexus of race, poverty, and place. American Journal of Public Health. 2014;104(11):2147-2155. doi:10.2105/ajph.2013.301420

- **Missed Opportunities for Health Equity.** GLP-1 products have the potential to narrow health disparities by addressing a key driver of chronic disease. Yet, without intentional policy interventions, they risk widening the gap between those who can afford them and those who cannot. Federal programs like Medicare, which currently exclude weight-loss drugs, have the potential to play a transformative role in expanding access. Researchers estimate that covering obesity treatments under Medicare could save the program $175 billion over 10 years by reducing the costs of obesity-related diseases.[25] However, current policies continue to prioritize cost savings over equitable access, leaving millions of Black Americans without the tools they need to improve their health outcomes.

In sum, the inequities in access to GLP-1 products illustrate the intersection of systemic racism and financialized healthcare practices. Despite the promise of these medications, their benefits remain out of reach for many Black Americans, exacerbating health disparities in obesity and diabetes. Addressing these inequities requires systemic reform, including expanded insurance coverage, culturally competent care, and intentional efforts to prioritize equity in healthcare delivery. It also requires reform of systems that enable pharmaceutical companies to wield patent monopolies for longer than intended in order to maximize profits at the expense of public health. Without these changes, the potential of GLP-1 products will remain an unfulfilled promise for the communities that need them most.

6 | RECOMMENDATIONS

1. **Reform the Patent System:** The patent system has been infected by the financialized business model of the pharmaceutical industry. Rather than incentivizing new medicines, patents now primarily drive the adoption of a profit-focused approach. As shown in this study, despite receiving PTA and PTE under the Hatch Waxman Act to compensate for the loss of any patent term of the main compound once a drug is approved, in this hyper financialized economy it is not enough. Pharmaceutical companies like Novo Nordisk and Eli Lilly want it both ways and continue to develop patent thickets made up of every minor modification of its products in order to extend patent protection that will increase the possibility of delaying competition and lengthening their market monopoly. As a result of this patent abuse, companies can maintain higher prices for longer, which then yields maximum revenue and profit to further enrich shareholders, all while perpetuating health inequities.

   This obvious abuse of the patent system in the service of financialization requires systemic reform. In order to prevent the patent thicket problem and follow-on patenting of minor modifications of existing inventions that extend patent protection and potential market monopoly, policymakers need to strengthen the novelty and obviousness standards. We provide some suggestions on how this might be done in our Blueprint for Reform on Addressing Thickets, which addresses the kind of follow-on patenting we see in this study for semaglutide and tirzepatde - namely the re-patenting of the same drug for new indications as well as modified formulations and dosing.[26]

2. **Expand Access for GLP-1 Therapies:** Many insurance plans, including Medicare, exclude coverage for GLP-1 products for obesity, leaving millions of Americans who could benefit from these treatments without affordable access. Policymakers should mandate coverage for GLP-1 products for both diabetes and obesity across public and private payers. Recognizing obesity as a medical condition rather than a cosmetic issue is essential to ensuring equitable access. Expanding coverage would make these products more accessible to underserved populations, particularly those disproportionately affected by obesity and diabetes.

   In November 2024, the Biden administration proposed expanding Medicare and Medicaid coverage for anti-obesity drugs, potentially extending coverage to an estimated 3.4 million Americans insured by Medicare and an additional four million by Medicaid.[27] This proposal would classify obesity as a disease, providing a pathway around

25 Ward A, Tysinger B, Goldman D, Lakdawalla D. Benefits of Medicare coverage for Weight Loss Drugs. The Leonard D. Schaeffer Center for Health Policy & Economics. Accessed January 29, 2025. https://healthpolicy.usc.edu/wp-content/uploads/2023/04/2023.04_Schaeffer_Center_White_Paper_Benefits_of_Medicare_Coverage_for_Weight_Loss_Drugs.pdf.

26 Initiative for Medicines, Access & Knowledge. Addressing Patent Thickets to Improve Competition and Lower Prescription Drug Prices, A Blueprint for Reform. 2023

27 Cubanski J, Williams E. Proposed Coverage of Anti-Obesity Drugs in Medicare and Medicaid Would Expand Access to Millions of People with Obesity. KFF. November 26, 2024. Accessed February 18, 2025. https://www.kff.org/policy-watch/proposed-coverage-of-anti-obesity-drugs-in-medicare-and-medicaid-would-expand-access-to-millions-of-people-with-obesity/

the federal law that blocks Medicare coverage of drugs used for weight loss. However, in April 2025, the Trump administration officially rejected this proposal. In addition, in January 2025, Medicare announced it will include semaglutide products (Ozempic, Rybelsus, and Wegovy) in its second round of drug price negotiations, treating all three brands as a single drug due to their shared active ingredient.[28] With negotiated prices set to take effect in 2027, this could significantly reduce costs for Medicare beneficiaries.[29]

3. **Encourage Generic Competition:** The lack of generic options for GLP-1 products keeps prices artificially high and limits access for underserved populations. Policymakers should prioritize measures that allow compounded versions of GLP-1 medicines in the market while accelerating the development of generics. This could include accelerating FDA approval pathways for generic equivalents and providing financial support to manufacturers entering the market. Increasing competition would drive down prices and expand access to GLP-1 products for everyone, particularly those most in need.

4. **Address Structural Barriers to Access:** Black Americans and other marginalized communities face systemic barriers to accessing GLP-1 products, including provider bias, geographic disparities, and socioeconomic challenges. To address these inequities, policymakers should invest in programs to eliminate systemic inequities in healthcare. This includes funding culturally competent care initiatives, increasing access to healthcare providers in underserved areas, and implementing provider education programs to reduce bias in prescribing practices. Policies should also prioritize expanding pharmacy networks in low-income neighborhoods to ensure patients can obtain GLP-1 products locally.

7 | CONCLUSION

The analysis of GLP-1 products, such as semaglutide and tirzepatide, reveals how a financialized pharmaceutical business model—exorbitant pricing, patent abuse, and restricted insurance coverage—perpetuate health inequities and limit access to critical treatments. While these drugs offer important treatments for obesity and diabetes, conditions that disproportionately impact Black Americans and underserved populations, their potential is undermined by systemic barriers that prioritize profits over public health. The current patent system allows companies to develop patent thickets by making minor modifications to an existing drug, which then allows them to extend their patent protection and increase the possibility of lengthening their market monopoly. As a result, competition is stifled and delayed, prices are kept higher for longer, while insurance gaps further restrict access. Addressing these challenges requires systemic reform of the patent system, expanded insurance coverage, and a commitment to equitable access. The benefits of GLP-1 drugs can only be realized when financial barriers are dismantled, shifting the focus from shareholder returns to public health priorities.

8 | ABOUT I-MAK

The Initiative for Medicines, Access and Knowledge (I-MAK) is a 501(c)(3) organization with a mission to build a more just and equitable medicines system. Our framework integrates comprehensive analytical research to inform policy, education to activate change, and partnerships to drive solutions. We bring decades of private-sector expertise and experience in the field of intellectual property as well as the pharmaceutical sector. Our work spans internationally and we collaborate with patients, drug manufacturers, patent offices, community leaders, public health professionals, policymakers, scientists, economists, and more across the globe. I-MAK's work on structural change in the patent system is featured regularly in the national and global press, as our data is cited in Congressional hearings and Committee reports. I-MAK is committed to evidence-based research and education that will benefit American families and help lower drug prices. Therefore, we have never taken funding from the pharmaceutical industry, whether branded or generic.

28 HHS Announces 15 Additional Drugs Selected for Medicare Drug Price Negotiations in Continued Effort to Lower Prescription Drug Costs for Seniors. Centers for Medicare and Medicaid Services. Jan 17, 2025. Accessed Feb 10, 2025. https://www.cms.gov/newsroom/press-releases/hhs-announces-15-additional-drugs-selected-medicare-drug-price-negotiations-continued-effort-lower

29 While tirzepatide products (Mounjaro and Zepbound) remain within their exclusivity period and aren't yet eligible for Medicare negotiations, expanding coverage and affordability should remain a priority across both public and private insurers.

PATENT SEARCH METHODOLOGY

Comprehensive patent landscaping was conducted until July 13, 2024 to identify granted patents (currently active and expired) and patent applications (currently pending and abandoned) at the United States Patent and Trademark Office (USPTO) for the drug products Ozempic, Rybelsus and Wegovy (semaglutide) and Mounjaro and Zepbound (tirzepatide). We identified patents and their patent family members that could either be used to deter other branded competitors from upstream research and development of competing similar products (e.g., "me-too" versions), or which could be used downstream to block/delay generic entrants. Irrespective of whether a patent in a patent family was a continuation, continuation-in-part, divisional application, or linked by a terminal disclaimer in terms of its expiry date, it was counted as a distinct patent. This is because each patent is a distinct right and can be asserted as such in any litigation.

Importantly, we checked for patents on these products through their entire development and licensing history, including any corporate acquisitions, co-development, sub-licensing deals, and litigation. Each individual patent and the main patent claims were then analyzed and coded in terms of their patent type (e.g. method of treatment, formulation, etc.), scope of protection of the subject matter covered, and to identify the primary patents on each drug based on the subject matter covered. We cross-checked the primary patent data and/or expiry dates identified with patents listed in the U.S. Food and Drug Administration (U.S. FDA) Orange Book and those asserted in litigation (where applicable), statements made by companies in their SEC filings or in press releases, as well as journal articles that provided analysis of the drugs and related patent information to determine the expiry date for the primary patents on each drug.

The methodology and resources used to build the patent landscape for each drug included the following steps: (1) identifying patents listed on the Orange Book[1]; (2) where applicable and publicly available, identifying patents asserted in litigation (in the U.S and Europe) in relation to a product; and (3) conducting patent searches in Orbit Intelligence/Questel, CAS SciFinder, Lens.Org, and the Espacenet (the European Patent Office) databases using (i) keyword based search strings; (ii) inventor names; (iii) assignee/company names; (iv) compound structures (for small molecule drugs); (v) laboratory code names for a drug; and (vi) Chemical Abstracts Service (CAS) number.

Every patent identified in our landscapes in relation to Ozempic, Rybelsus, Wegovy (Semaglutide) and Mounjaro and Zepbound (tirzepatide) is available at i-mak.org/glp-1

DEFINITIONS

Assignee: The current proprietor of the granted patent or patent application.

Condition(s) Treated: The main disease category for which each drug is used, based on all U.S.FDA approved clinical indications through 2024.

Drug Name: The brand name under which the drug product is marketed.

Family: A collection of granted patents and patent applications that originate from an earlier application, cover the same/similar technical content, and are related to each other because they share a priority claim and priority date. For the purpose of the database, patent families are grouped by number (e.g., Family 1, 5, 30, etc.).

1 Only patents that were listed on USFDA Orange Book (https://www.accessdata.fda.gov/scripts/cder/ob/index.cfm) as of July 2024 were included in the patent landscape.

FDA Approval: Whether the patent was filed before or after a drug was approved by the U.S.FDA and available on the U.S market.

Granted/Publication/Reissued Date:

- *Granted Date*: The date a patent is granted and ceases being a patent application.
- *Publication Date*: The date a patent application is first published for public viewing.
- *Reissued Date*: The date of reissue of a corrected patent, where errors in the patents were made without any deceptive intention.

Orange Book: Whether a patent is listed in the Orange Book (applies to granted patents only).

Patent Number: The number given to a granted patent, which is made up of 6 to 8 characters (e.g., US7390791B2).

Priority Date: The date of the first patent application filed for an invention, and which is used to establish the novelty or inventiveness of the invention in relation to prior art.

Publication Number: The number assigned to a patent application when it is published (18 months from the filing date). The number is made up of a four-digit year, followed by a seven-digit sequence, followed by a two-character Kind Code (e.g., US20170232019A1). Published patent applications are not granted patents.

Status:

- *Abandoned*: The patent application has been removed from the patent office docket of pending applications. A patent application becomes abandoned for failure to file a complete and proper reply as the condition of the application may require within the time period provided, or failure to pay required maintenance fees. Abandoned patent applications may be revived more than two years after abandonment if the delay was unintentional.
- *Active*: The patent is granted and is currently in force.
- *Expired*: The patent was granted but has expired either because the term of protection has ended or the assignee failed to pay the required maintenance fee to keep the patent active.
- *Pending*: The patent application is still on the patent office docket and under examination.

Patent Type:

- *Assay Compound*: Active substance tested and measured in an assay to determine its activity or effect on a specific target.
- *Combination*: Combination of two active ingredients.
- *Computerized medicine administration system*: a system and method for enhancing data quality of an injected drug dose dispense data set.
- *Derivatives*: Structural variations of the main compound are filed as part of the main patents for the broadest protection.

- *Derivatives and Combination*: Compound that is structural variation of the main compound.
- *Device*: Used for delivering a drug (e.g., syringe, injector pen, wearable devices).
- *Formulation*: Pharmaceutical preparations, including ingredients, to help deliver the drug into the human body.
- *Formulation and Combination*: Pharmaceutical preparations to deliver into the human body two active ingredients in combination.
- *Intermediate Compound*: Compound or substance useful for synthesizing and helping form the main compound.
- *Main Compound*: Covers the active ingredient in a drug. These types of patents typically have the broadest scope.
- *Method of Delivery*: Use of an article configured for administration to a patient.
- *Method of Diagnosis*: Method to identify patients that are most likely to respond to treatment.
- *Method of Production / Process*: Method or process for manufacturing, including derivatives, crystalline forms, and intermediate compounds used to make the final product or main compound and formulations.
- *Method of Treatment*: Specific indications (diseases) that can be treated with the active ingredient alone
- *Method of Treatment and Combination*: Specific indications (diseases) that can be treated by combining two active ingredients.

Ozempic, Rybelsus and Wegovy (semaglutide)

Search Type	Query
Keyword search	((+SEMAGLUTID+ OR OZEMPIC OR RYBELSUS OR WEGOVY OR (910463__68__2) OR (910463 2W "68" 2W "2") OR NN9535 OR NN__9535 OR ("NN" 2W 9535) OR "NNC 0113-0217" OR (NNC__0113__0217) OR (NNC 2W "0113" 2W "0217") OR GTPL9724 OR GTPL__9724 OR (GTPL 2W 9724) OR A10BJ06 OR +EGTFTSD-VSSYLEGQAA+ OR (AIB__8__ARG__34__GLP__1) OR (AIB 2W "8" 3W ARG 2W "34" 3W GLP 2W "1") OR ((AIB 2W "8" 3W ARG 2W "34") 5D (GLP 2W "1")))/TI/AB/CLMS/DESC/ODES/OBJ/ADB/ICLM/KEYW/TX/DESX AND ((NOVO 5D NORDISK)/PA/OPA/NPAN/PAH/PAHN/REAS/REAN OR (NORDISK+)/PA/OPA/NPAN/PAH/PAHN/REAS/REAN)
Broad drug category Keyword search	((GLUCAGON__LIKE__PEPTIDE__1) OR (GLUCAGON 3W LIKE 3W PEPTIDE 3W "1") OR (GLUCAGON 3W LIKE 3W PEPTIDE) OR (GLP__1) OR (GLP 3W "1") OR GLP__1RA OR (GLP 2W 1RA) OR GLP__1R+ OR GLP1 OR (INCRETIN? 5D (ANALOG+ OR DERIVAT+ OR MIMETIC? OR AGONIST+)) OR (INSULINOTROPIC 3D PEPTIDE+))/TI/AB/CLMS/ICLM AND ((NOVO 5D NORDISK)/PA/OPA/NPAN/PAH/PAHN/REAS/REAN OR (NORDISK+)/PA/OPA/NPAN/PAH/PAHN/REAS/REAN)
CAS No. Search (SciFinder database)	910463-68-2
Sequence search (Lens database)	HXEGTFTSDVSSYLEGQAAKEFIAWLVRGRG
Sequence search (NCBI Blast database)	HXEGTFTSDVSSYLEGQAAKEFIAWLVRGRG
Sequence search (SureChEMBL)	HXEGTFTSDVSSYLEGQAAKEFIAWLVRGRG

Mounjaro and Zepbound (tirzepatide)

Search Type	Query
Keyword search	((+TIRZEPATID+ OR MOUNJARO+ OR ZEPBOUND+ OR LY3298176+ OR L__Y3298176 OR (“LY” 2W 3298176) OR (2023788__19__2) OR (2023788 2W “19” 2W “2”) OR TWINCRETIN OR “GIP/GLP-1 RA” OR GIP__GLP___1___RA OR (GIP 2W GLP 2W “1” 2W RA) OR (DUAL__GIP__GLP__1__AGONIST?) OR (DUAL 2W GIP 2W GLP 2W “1” 2W AGONIST?) OR +YXEGTFTSDYSIXLDKIAQKAFVQWLIAGGPSSGAPPPS+)
Broad drug category Keyword search	(((GLUCAGON__LIKE__PEPTIDE__1) OR (GLUCAGON 3W LIKE 3W PEPTIDE 3W “1”) OR (GLP__1) OR (GLP 3W “1”) OR GLP__1RA OR (GLP 2W 1RA) OR GLP__1R+ OR GLP1 OR (GLUCOSE__DEPENDENT__INSULINOTROPIC__POLYPEPTIDE+) OR (GLUCOSE 2W DEPENDENT 2W INSULINOTROPIC 2W POLYPEPTIDE+) OR (GASTRIC__INHIBITORY__POLYPEPTIDE+) OR (GASTRIC 2W INHIBITORY 2W POLYPEPTIDE+) OR GIP OR GIPR OR GIP_R OR GIP_R? OR GCGR OR GLUCAGON OR (INCRETIN? 5D (ANALOG+ OR DERIVAT+ OR MIMETIC? OR AGONIST+)))/TI/AB/CLMS/ICLM AND ((ELI__LILLY)/PA/OPA/NPAN/PAH/PAHN/REAS/REAN OR (ELI 2W LILLY)/PA/OPA/NPAN/PAH/PAHN/REAS/REAN OR (LILLY+)/PA/OPA/NPAN/PAH/PAHN/REAS/REAN)
CAS No. Search (SciFinder database)	2023788-19-2
Sequence search (Lens database)	YXEGTFTSDYSIXLDKIAQKAFVQWLIAGGPSSGAPPPS
Sequence search (NCBI Blast database)	YXEGTFTSDYSIXLDKIAQKAFVQWLIAGGPSSGAPPPS
Sequence search (SureChEMBL)	YXEGTFTSDYSIXLDKIAQKAFVQWLIAGGPSSGAPPPS