LLY (& PFE, AMGN): Rolling out obesity model, after positive SELECT results. Anderson Drug Daily

August 18, 2023

The Wolfe Byte

In today's Anderson Drug Daily, we discuss our obesity model assumptions, following recent positive SELECT trial results. For LLY, it suggests upside to what is formally carried in our company model

OBESITY CATEGORY MODEL: The insured market for obesity drugs could reach ~$103B by 2030 (up from ~$8B in 2023)

*We share assumptions, for the first time, of our detailed bottom-up obesity forecast model, in an attempt to frame some of the key debates about how the obesity market will develop downstream of recent positive SELECT results (our analysis of that trial here: LLY: NOVO's SELECT trial hits, in a BIG way...great for the obesity category). They reflect our views as of today, but clearly, there are still many uncertainties that lie ahead which could cause our forecasts to change. This analysis is most relevant to **Eli Lilly** (LLY; Outperform); **Pfizer** (PFE; Peer Perform); **Amgen** (AMGN; Peer Perform); and **NovoNordisk** (NOVO; not covered), and certain other smaller/private companies.*

If interested in obtaining a working version of this model, contact us or your salesperson.

WHAT OUR MODEL IS ... AND ISN'T

- **The insured market only (not the cash pay segment).** Our approach focuses on the insured market in the US (commercial, Medicare, Medicaid) and Ex-US (single government payers, commercial). We do not model the cash pay market, although acknowledge that this could be significant. Naturally, the cash pay segment decreases in size as the insured segment increases.
- **Adult obese patients only - NOT having type 2 diabetes (T2D), NOT pediatrics.** We model adults with obesity (BMI 30+) or overweight with at least 1 weight-related co-morbidity (i.e. in line with Wegovy label and tirzepatide Ph 3 SURMOUNT program). However, this model excludes patients with concomitant T2D - the model is only for the purely obese/overweight segment. We also do not model pediatric usage, which would be additive.
- **While this model does not forecast sales of individual products (rather, it is a model that sizes the overall obesity TAM), we do make franchise market share assumptions for LLY and NOVO (details below).** Implied is that the model...

COMPANY	TICKER	RATING	PT	% UPSIDE
Amgen, Inc.	AMGN	PP	NA	
Eli Lilly	LLY	OP	$595.00	10.7%
Pfizer	PFE	PP	NA	

Source: Wolfe Research
OP=Outperform, PP=Peer Perform, UP=Underperform, NR=Not Rated
Priced as of 08/17/23

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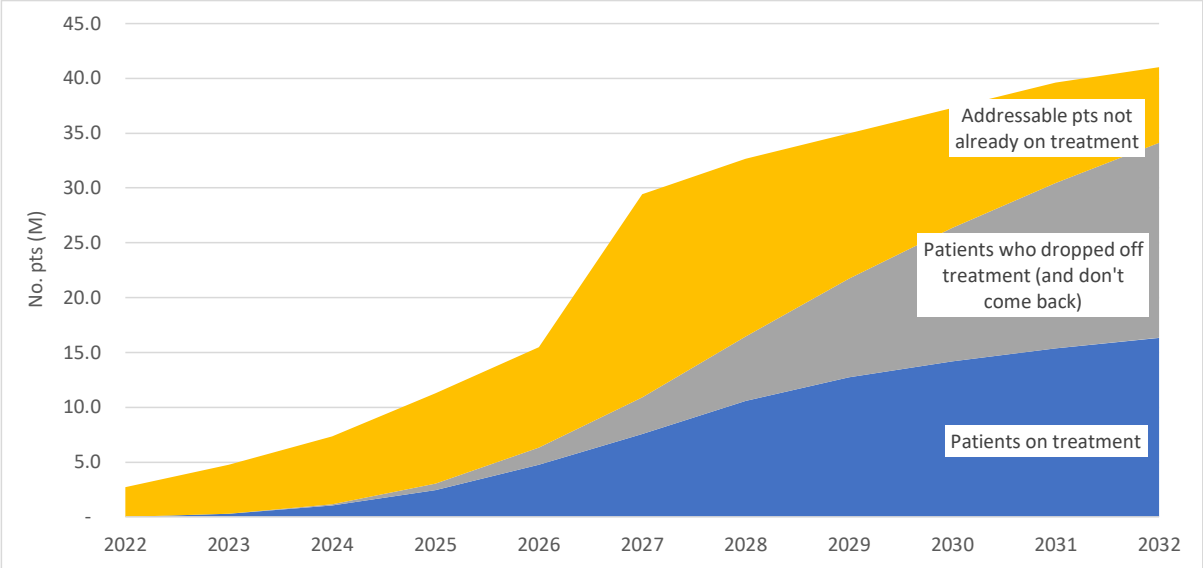
- ...encompasses branded novel AOMs, both recently launched and still in development, that include: NOVO's Saxenda/Wegovy/CagriSema, NOVO's oral semaglutide, LLY's tirzepatide/orfoglipron (oral GLP1)/retatrutide (GGG), BI/Zealand's survodutide, PFE's danuglipron, and AMGN's AMG133.

KEY ASSUMPTIONS

- **Positive SELECT results will make it difficult for payers NOT to cover AOMs - but the *rate* of coverage increase will remain uncertain.** This goes for both US and Ex-US payers. In the US, we expect there will be an increasing number of US employers and plans "opting in" to cover AOMs - with % opt-ins growing quickly from 50% in 2022 (i.e. the figure provided by NOVO) to 70% by 2025, which aligns with a recent employer/plan survey conducted by PSG (43% currently covering + 28% considering over the next 1-2y - we assume all considerers will convert). SELECT may help to increase the likelihood of Medicare coverage (e.g. through TROA), but even if successful, actual coverage will not start until ~2027 (see below). We also assume increasing Medicaid coverage over time. SELECT should also influence ex-US payer coverage (currently Wegovy is not covered by government payers in certain European markets where it is approved/launched). For our recent report on US payer coverage trends, see: GLP-1s and Obesity (LLY): Gathering recent payer commentary).
- **Medicare coverage from Jan 1, 2027, increasing the no. pts with access by ~25M.** We model coverage from January 1, 2027 (assuming TROA goes through in 2024) (see: Will Medicare ever cover obesity medicines?!). Admittedly, this is a best guess - while we feel confident in saying Medicare won't cover these drugs in 2023/2024, it is not exactly clear when it will. We assume 100% of on-label patients would be covered, per TROA draft legislation. Certain pockets of the obesity population could theoretically be captured earlier than this if manufacturers can secure approval in certain obesity-related comorbidities such as obstructive sleep apnea (OSA) and heart failure, where Medicare already covers drugs in these areas.
- **Medicaid coverage increases significantly, coincident with Medicare coverage.** This could expand the eligible patient pool by ~13M.
- **The % individuals seeking treatment will increase over time.** Demand for AOMs by patients outstrips supply at the moment, and does not seem to be a limiting factor to near-term uptake - and this is likely to increase as more drugs come online and as payers begin to reimburse more. A recent survey by KKF revealed ~50% of respondents said they were interested in taking a safe, effective weight loss drug - but only 4% said they were currently taking one. Surveys like this are useful, but often only directional. It's not clear how representative they are of 1) the on-label population, 2) ex-US attitudes, and 3) how many of those who are "interested" will actually go on to visit a doctor, get a prescription, and fill that prescription. We remain more conservative and model a gradual increase from the 10% figure NOVO references. Specifically, for the US, we assume 30% will seek treatment by 2026, and ~40% by 2032. Ex-US is lower at 20% by 2026 and ~30% by 2032. We assume the same %s for obese and overweight patient groups w/risk factors, although in reality, this may differ.

Exhibit 1 - WR estimated US total addressable adult obese non-T2D population and penetration

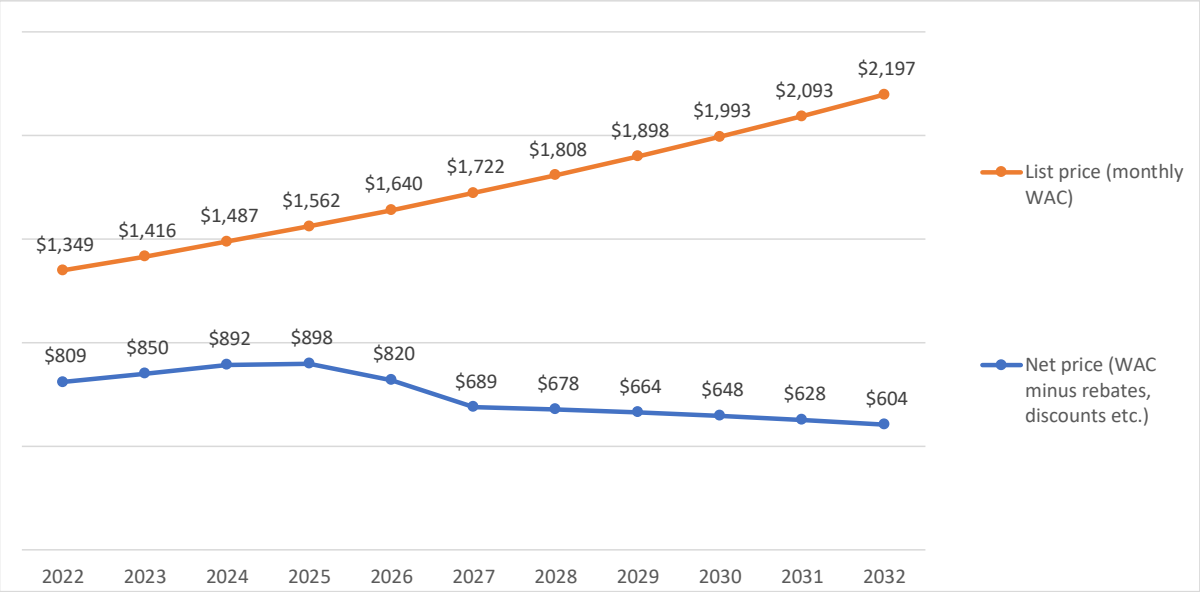


Source: Wolfe Research

- **Supply limitations are a finite problem.** Not all treatment-seeking eligible patients with access will actually start medical therapy. A key near-term limitation is manufacturing constraints by both NOVO and LLY, leading to a mismatch in demand:supply. Both companies suggest this will continue in 2023, with 2024 opening up more, as additional sites come online and ramp up production - this has not been quantified.
- **Treatment rates in our model are still relatively low, compared to something like hypertension.** For the US, our model shows ~15% of eligible patients (i.e. on-label, non-T2D patients) are treated with branded novel AOMs by 2032, compared to <1% for any AOM today. Ex-US, this figure is just ~7%. When we look at studies on treatment rates for something like hypertension, these numbers are much higher - US treatment rates for hypertension are 73% in women and 66% in men, and WW treatment rates are 47% in women and 38% in men (NCD Risk Factor Collaboration, 2021). The more that obesity becomes "medicalized," the higher the treatment rate is likely to become.
- **As with most disease categories, a sizable percentage of patients will stop taking their medicines.** Compliance by patients with drug therapy is commonly a problem, regardless of the disease. We assume obesity is no different. In our new model, we assume that 50% of patients who start therapy on a given year will drop off by year 1, that an additional 10% with drop off by year 2, with additional attrition continuing (albeit at a lesser annual rate), in years 3+. In any given year of treatment, we assume that patients only take 8-9 months' worth of drug therapy. Actual, real-world data on stay-time on drugs like Wegovy has not been shared yet by NOVO, that we are aware of.
- **Today's "list price" of AOMs is $1,349/mo in the US (~$250/mo ex-US) - annually, this equates to $16.2K/yr (~$3.0K/yr ex-US).** We base our assumptions on current list prices of NOVO's Wegovy and Saxenda. We do not yet know whether LLY will launch tirzepatide for obesity under the same brand as Mounjaro, or a different one, which could impact the WAC (i.e. same brand will likely have a slightly lower WAC given Mounjaro has a list price of $1,023/mo as of Jan 1, 2023). For simplicity, we assume tirzepatide will have the same list price as Wegovy in obesity. We increase list prices by +5% annually in the US; ex-US (which, in our model, only consists of traditional developed markets where the industry generates sales) we model -5% annual price declines.
- **The US "list price" is heavily rebated - and rebating continues to grow, reducing US net pricing over time from today's levels.** We assume that rebating off of WAC in the US is currently 40%, and that this grows over time to reach >70% by the early 2030's. This means the annual net cost of drug therapy drops from $6.8k/yr in 2023, to $5.4k/yr in 2032. Many stakeholders claim these drugs are "expensive" - at this price, they are not. Rather, it's that so

many patients will seek to use these therapies, so the cumulative spend is large. While it hasn't been proven yet, very likely, these drugs will be found to be "cost effective" over the longer-term due to things like reduced cardiovascular complications, better mental health, less progression to diabetes, fewer joint replacements, and more.

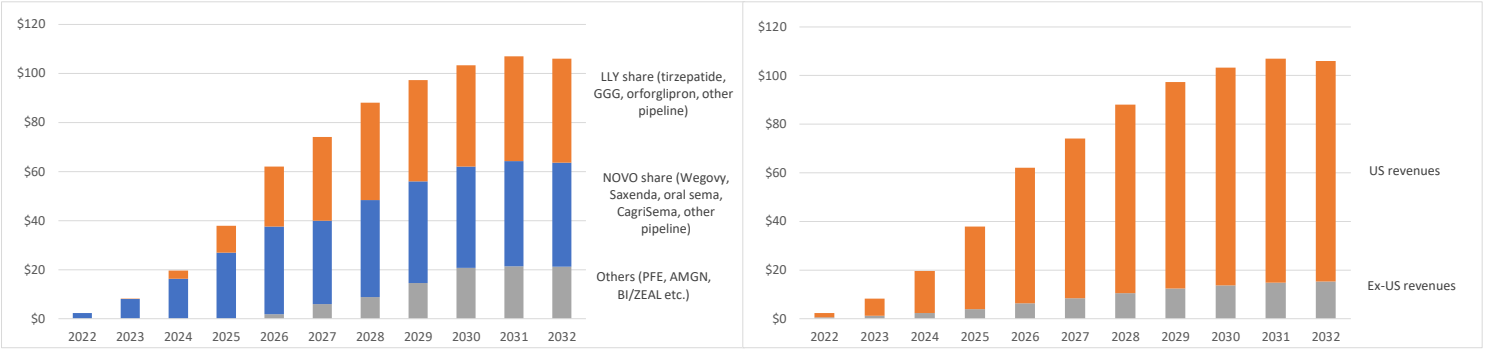
Exhibit 2 - WR estimated US list price (monthly WAC) vs US net price, through 2032



Source: PriceRx, Wolfe Research

- **NOVO and LLY to have roughly equal market share by 2027.** LLY and NOVO will have the market to themselves over the next few years. LLY will launch tirzepatide for obesity by end-2023, and will quickly ramp up its share, given the superior product profile. However, given NOVO's head start, we don't expect LLY to reach an equal share until 2027.
- **New oral and injectable offerings in 2026/2027 should help to expand the market.** There are several potential new launches expected around 2026/2027 including both orals (e.g. LLY's orforglipron, PFE's danuglipron) and injectables (e.g. LLY's GGG, NOVO's CagriSema, AMGN's AMG133). We expect these will help grow the market, while simultaneously driving down price. For our prior report on oral AOMs, see: LLY, PFE, NOVO (uncovered): Oral obesity drugs - who's doing what?.
- **LLY and NOVO will each retain ~40% market share longer term.** We expect LLY and NOVO will remain leaders in the obesity space and retain ~80% share of the market, split equally between them (i.e. ~$42B each by 2030s). This is because both companies are early entrants, and are already leaders in the diabetes space, which has basically been a duopoly. The remaining 20% of the obesity market will be split among other manufacturers including PFE, BI/ZEAL, AMGN, all of which are further behind. Most revenues will come from the US. See **Exhibit 3.**

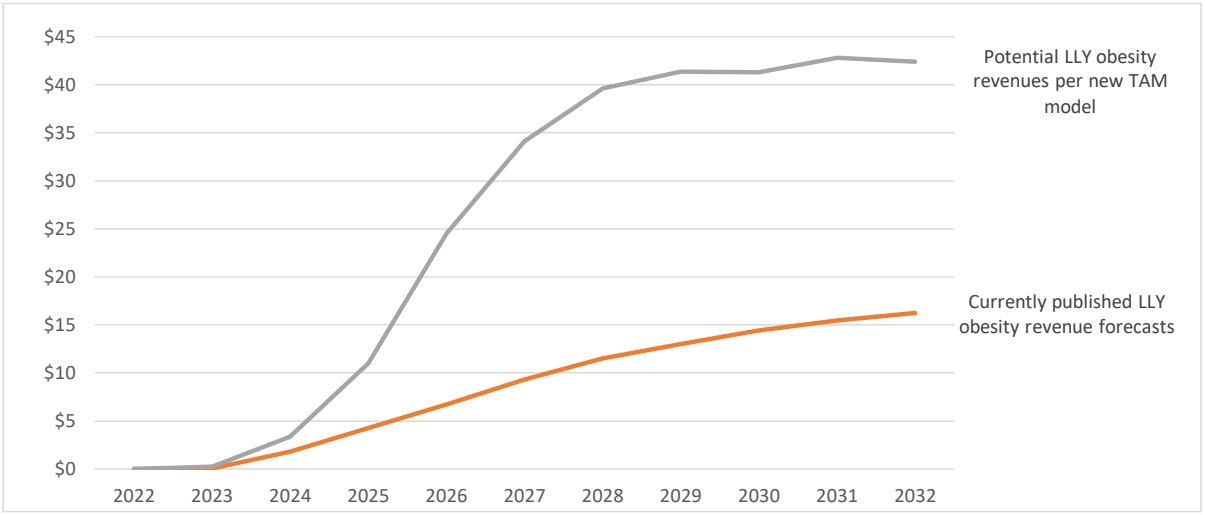
Exhibit 3 - LLY and NOVO franchise market share (left); obesity revenue split between US/Ex-US (right) ($B)



Source: Wolfe Research

- **This forecast model suggests there could be substantial upside to the current forecasts we formally carry in our LLY model.** In 2032, for example, we currently model tirzepatide sales of $16B, compared to the $42B our new obesity model predicts. At the moment, however, we are making no changes to our LLY forecasts.

Exhibit 4 - WR LLY WW obesity forecast (tirzepatide) vs potential LLY revenues per obesity model



Source: Wolfe Research

If interested in a working version of this model, contact us or your salesperson.

Exhibit 5 - WR US revenue build

US PATIENT MODEL

US - ADDRESSABLE POPULATION

Adult obesity + overweight	Input/source	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
US adult population	UN population	255	258	260	262	264	267	269	271	273	275	277
Addressable obese non-T2D adult population (BMI ≥30)												
Adult obesity prevalence	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%
No. obese adults		107	108	109	110	111	112	113	114	114	115	116
% eligible for AOMs	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
No. eligible for AOMs		107	108	109	110	111	112	113	114	114	115	116
Non-T2D pts	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%
No. non-T2D pts		82	83	84	85	85	86	87	88	88	89	89
% non-T2D pts seeking treatment		10%	15%	20%	25%	30%	32%	34%	36%	38%	40%	41%
No. non-T2D pts seeking treatment		8	12	17	21	26	28	30	32	33	35	37
% w/ access to AOMs (via health insurance coverage)		26%	30%	34%	42%	47%	84%	87%	87%	87%	88%	88%
No. w/ access to AOMs (via health insurance coverage)		2	4	6	9	12	23	26	27	29	31	32
Addressable obese non-T2D adult population		**2**	**4**	**6**	**9**	**12**	**23**	**26**	**27**	**29**	**31**	**32**
Addressable overweight non-T2D adult population (BMI ≥27 to <30 w/ co-morbidity)												
% adults w/ BMI ≥27 to <30	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
No. adults w/ BMI ≥27 to <30		45	46	46	46	47	47	48	48	48	49	49
% w/ ≥1 co-morbidity (excl. T2D)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
No. non-T2D pts eligible for AOMs		23	23	23	23	23	24	24	24	24	24	25
% seeking treatment		10%	15%	20%	25%	30%	32%	34%	36%	38%	40%	41%
No. seeking treatment		2	3	5	6	7	8	8	9	9	10	10
% w/ access to AOMs (via health insurance coverage)		26%	30%	34%	42%	47%	84%	87%	87%	87%	88%	88%
No. w/ access to AOMs (via health insurance coverage)		0.6	1.0	1.6	2.4	3.3	6.3	7.0	7.5	8.0	8.5	8.8
Addressable overweight non-T2D adult population		**0.6**	**1.0**	**1.6**	**2.4**	**3.3**	**6.3**	**7.0**	**7.5**	**8.0**	**8.5**	**8.8**
TOTAL addressable non-T2D adult population		**2.7**	**4.8**	**7.3**	**11.3**	**15.5**	**29.4**	**32.7**	**35.0**	**37.3**	**39.6**	**41.0**
- patients already on treatment			0.3	1.0	2.4	4.7	7.5	10.6	12.7	14.2	15.4	16.3
- patients who dropped off treatment (and don't come back)				0.1	0.6	1.6	3.3	5.9	9.0	12.1	15.1	17.8
Addressable pts not already on treatment		**2.7**	**4.5**	**6.2**	**8.2**	**9.1**	**18.5**	**16.2**	**13.2**	**10.9**	**9.2**	**6.9**
% pts starting on branded novel AOMs		10%	20%	30%	40%	50%	30%	33%	35%	38%	40%	43%
No. pts starting on branded novel AOMs		**0.3**	**0.9**	**1.9**	**3.3**	**4.6**	**5.6**	**5.3**	**4.6**	**4.1**	**3.7**	**2.9**
Total pts on therapy (branded novel AOMs)												
Total no. pts on therapy (branded novel AOMs)		**0.3**	**1.0**	**2.4**	**4.7**	**7.5**	**10.6**	**12.7**	**14.2**	**15.4**	**16.3**	**16.7**
Total no. pts who dropped off therapy, gone from prevalent pool			**0.1**	**0.5**	**1.0**	**1.8**	**2.5**	**3.1**	**3.1**	**2.9**	**2.7**	**2.6**

US - REVENUES

	Input/source	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Pricing (branded novel AOMs)												
Monthly WAC		$ 1,349	$ 1,416	$ 1,487	$ 1,562	$ 1,640	$ 1,722	$ 1,808	$ 1,898	$ 1,993	$ 2,093	$ 2,197
Price increases/decreases, annual			5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Average months-per-year of treatment		8	8	8	8	9	9	9	9	9	9	9
Average annual WAC (gross)		$ 10,792	$ 11,332	$ 11,898	$ 12,493	$ 14,757	$ 15,495	$ 16,270	$ 17,084	$ 17,938	$ 18,835	$ 19,776
Gross-to-net discount		40%	40%	40%	43%	50%	60%	63%	65%	68%	70%	73%
Net annual WAC		$ 6,475	$ 6,799	$ 7,139	$ 7,184	$ 7,379	$ 6,198	$ 6,101	$ 5,979	$ 5,830	$ 5,650	$ 5,439
US Branded novel AOM market		**$1,766**	**$7,044**	**$17,314**	**$34,042**	**$55,703**	**$65,635**	**$77,555**	**$84,916**	**$89,635**	**$92,217**	**$90,701**
LLY share (tirzepatide, GGG, orforglipron, other pipeline)		0%	4%	18%	30%	40%	46%	45%	43%	40%	40%	40%
LLY treated pts		-	0.0	0.3	1.0	1.8	2.6	2.4	2.0	1.6	1.5	1.2
LLY obesity revenues		**$0**	**$247**	**$3,117**	**$10,213**	**$22,281**	**$30,192**	**$34,900**	**$36,089**	**$35,854**	**$36,887**	**$36,280**
NOVO share (Wegovy, Saxenda, oral sema, CagriSema, other pipeline)		100%	97%	82%	70%	57%	46%	45%	43%	40%	40%	40%
NOVO treated pts		0.273	0.9	1.5	2.3	2.6	2.6	2.4	2.0	1.6	1.5	1.2
NOVO obesity revenues		**$1,766**	**$6,798**	**$14,197**	**$23,829**	**$31,750**	**$30,192**	**$34,900**	**$36,089**	**$35,854**	**$36,887**	**$36,280**
Others (PFE, AMGN, BI/ZEAL etc.)		0%	0%	0%	0%	3%	8%	10%	15%	20%	20%	20%
Others treated pts		-	-	-	-	0.1	0.4	0.5	0.7	0.8	0.7	0.6
Others obesity revenues		**$0**	**$0**	**$0**	**$0**	**$1,671**	**$5,251**	**$7,756**	**$12,737**	**$17,927**	**$18,443**	**$18,140**

Source: Wolfe Research
all patient numbers and revenues in millions

Exhibit 6 - WR Ex-US revenue build and WW revenues

EX-US PATIENT MODEL

EX-US ADDRESSABLE POPULATION

Adult obesity + overweight	Input/source	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Addressable obese adult population (BMI ≥30)												
Developed market adult population	UN population	695	695	696	697	698	699	700	701	702	702	703
Developed market adult obesity prevalence	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
		132	132	132	132	133	133	133	133	133	133	133
% eligible for AOMs		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
No. eligible for AOMs		133	133	133	133	134	134	134	134	134	134	134
Non-T2D pts	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%
No. non-T2D pts		102	102	103	103	103	103	103	103	103	104	104
% non-T2D pts seeking treatment		10%	13%	15%	18%	20%	22%	24%	26%	28%	30%	31%
No. non-T2D pts seeking treatment		10	13	15	18	21	23	25	27	29	31	32
% w/ access to AOMs (via health insurance coverage)		10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%
No. w/ access to AOMs (via health insurance coverage)		1	2	3	4	6	8	10	12	14	17	19
Addressable obese non-T2D adult population		**1**	**2**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**17**	**19**
Addressable overweight adult population (BMI ≥27 to <30 w/ co-morbidity)												
Developed market adult overweight population (BMI ≥27 to <30)	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%	18%
		123	123	123	123	124	124	124	124	124	124	124
% w/ ≥1 co-morbidity (excl. T2D)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
No. non-T2D pts eligible for AOMs		62	62	62	62	62	62	62	62	62	62	62
% seeking treatment		10%	13%	15%	18%	20%	22%	24%	26%	28%	30%	31%
No. seeking treatment		6	8	9	11	12	14	15	16	17	19	19
% w/ access to AOMs (via health insurance coverage)		10%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%
No. w/ access to AOMs (via health insurance coverage)		1	1	1	2	3	4	5	6	8	9	11
Addressable overweight non-T2D adult population		**1**	**1**	**1**	**2**	**3**	**4**	**5**	**6**	**8**	**9**	**11**
TOTAL addressable non-T2D adult population		**2**	**3**	**4**	**7**	**9**	**12**	**15**	**19**	**22**	**26**	**30**
- patients already on treatment			0.2	0.6	1.3	2.3	3.5	4.9	6.3	7.9	9.2	10.4
- patients who dropped off treatment (and don't come back)				0.1	0.4	0.9	1.8	3.1	4.9	7.0	9.4	12.1
Addressable pts not already on treatment		**1.6**	**2.4**	**3.7**	**5.0**	**6.1**	**6.7**	**7.1**	**7.3**	**7.4**	**7.8**	**7.4**
% pts starting on branded novel AOMs		15%	20%	25%	30%	35%	40%	45%	50%	50%	50%	50%
No. pts starting on branded novel AOMs		**0.2**	**0.5**	**0.9**	**1.5**	**2.1**	**2.7**	**3.2**	**3.7**	**3.7**	**3.9**	**3.7**
Total pts on therapy (branded novel AOMs)												
Total no. pts on therapy (branded novel AOMs)		**0.2**	**0.6**	**1.3**	**2.3**	**3.5**	**4.9**	**6.3**	**7.9**	**9.2**	**10.4**	**11.3**
Total no. pts who dropped off therapy, gone from prevalent pool			**0.1**	**0.3**	**0.5**	**0.9**	**1.3**	**1.7**	**2.1**	**2.5**	**2.6**	**2.8**

EX-US REVENUES

	Input/source	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Pricing (branded novel AOMs)												
Monthly WAC		$ 250	$ 238	$ 226	$ 214	$ 204	$ 193	$ 184	$ 175	$ 166	$ 158	$ 150
Price increases/decreases, annual			-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%
Average months / year of treatment		8	8	8	8	9	9	9	9	9	9	9
Average annual WAC (gross)		$ 2,000	$ 1,900	$ 1,805	$ 1,715	$ 1,833	$ 1,741	$ 1,654	$ 1,571	$ 1,493	$ 1,418	$ 1,347
Gross-to-net discount												
Net annual WAC		$ 2,000	$ 1,900	$ 1,805	$ 1,715	$ 1,833	$ 1,741	$ 1,654	$ 1,571	$ 1,493	$ 1,418	$ 1,347
as % of US price		31%	28%	25%	24%	25%	28%	27%	26%	26%	25%	25%
Ex-US Branded novel AOM market		**$492**	**$1,162**	**$2,324**	**$3,860**	**$6,395**	**$8,459**	**$10,491**	**$12,425**	**$13,667**	**$14,810**	**$15,273**
LLY share (tirzepatide, GGG, orforglipron, other pipeline)		0%	0%	10%	20%	35%	46%	45%	43%	40%	40%	40%
LLY treated pts		-	-	0.1	0.3	0.7	1.2	1.4	1.6	1.5	1.6	1.5
LLY obesity revenues		**$0**	**$0**	**$232**	**$772**	**$2,238**	**$3,891**	**$4,721**	**$5,281**	**$5,467**	**$5,924**	**$6,109**
NOVO share (Wegovy, Saxenda, oral sema, CagriSema, other pipeline)		100%	100%	90%	80%	62%	46%	45%	43%	40%	40%	40%
NOVO treated pts		0.2	0.5	0.8	1.2	1.3	1.2	1.4	1.6	1.5	1.6	1.5
NOVO obesity revenues		**$492**	**$1,162**	**$2,091**	**$3,088**	**$3,965**	**$3,891**	**$4,721**	**$5,281**	**$5,467**	**$5,924**	**$6,109**
Others (PFE, AMGN, BI/ZEAL etc.)		0%	0%	0%	0%	3%	8%	10%	15%	20%	20%	20%
Others treated pts		-	-	-	-	0.1	0.2	0.3	0.6	0.7	0.8	0.7
Others obesity revenues		**$0**	**$0**	**$0**	**$0**	**$192**	**$677**	**$1,049**	**$1,864**	**$2,733**	**$2,962**	**$3,055**
WW Branded novel AOM market		**$2,258**	**$8,207**	**$19,638**	**$37,902**	**$62,097**	**$74,094**	**$88,046**	**$97,341**	**$103,302**	**$107,027**	**$105,975**
LLY share (tirzepatide, GGG, orforglipron, other pipeline)		$0	$247	$3,349	$10,985	$24,519	$34,083	$39,621	$41,370	$41,321	$42,811	$42,390
NOVO share (Wegovy, Saxenda, oral sema, CagriSema, other pipeline)		$2,258	$7,960	$16,289	$26,917	$35,715	$34,083	$39,621	$41,370	$41,321	$42,811	$42,390
Others (PFE, AMGN, BI/ZEAL etc.)		$0	$0	$0	$0	$1,863	$5,928	$8,805	$14,601	$20,660	$21,405	$21,195
Total		**$2,258**	**$8,207**	**$19,638**	**$37,902**	**$62,097**	**$74,094**	**$88,046**	**$97,341**	**$103,302**	**$107,027**	**$105,975**

Source: Wolfe Research
all patient numbers and revenues in millions

*****That's it for today. Thanks for reading. You know how to reach us with additional questions *****

Tim & team

For additional information *on these and other covered names, including upcoming catalysts, bull-/bear-case, and more, see our WEBINAR from August 14th (SLIDES here).*

Model links: ABBV, AMGN, AZN, BIIB, BMY, GILD, GSK, LLY, MRK, NOVN, PFE, REGN, ROG, SAN

Comp sheet: Global Pharmaceuticals & Biotech Comp Sheet

Select **prior Drug Daily notes:**

- Aug 16, 2023. Big pharma in Emerging Markets: MRK leading the pack most recently.
- Aug 15, 2023: Outlook for large pharma & biotech - webinar recap (w/ slides).
- Aug. 11, 2023: Refresh on TIGIT Category: Recent News & Upcoming Events.
- Aug. 9, 2023: LLY post-Q2 review & outlook. Remains a "must own" name.
- Aug. 7, 2023: GLP-1s and Obesity (LLY): Gathering recent payer commentary.
- July 24, 2023: BIIB/LLY: Will uptake of AlzDz drugs be fast, as we model it? Survey results suggest it could be
- July 13, 2023: LLY: Obesity drug suicide risk - Acomplia 2.0, a red herring, or somewhere in between?!
- July 10, 2023: BMY: Mapping Out the Oral Immunology Landscape.
- Jun. 29, 2023: GSK: "Pipelines Unplugged" webcast highlights.
- Jun. 27, 2023: LLY, PFE, AMGN (& others): Obesity drug comparisons in 2 charts
- Jun. 26, 2023: AZN: Highlights from "Pipelines Unplugged" webcast.
- Jun. 13, 2023: AZN: When it comes to MET, is it better to be selective? A comparison to JNJ.
- Jun. 12, 2023: BIIB/LLY: ~1mo away will be CRITICAL Alzheimer's disease data
- Jun. 7, 2023: MRK sues, stock drops?? + BMY "Strategy Sessions" #3 highlights
- Jun. 5, 2023: NOVN: ASCO investor event & NATALEE highlights. What to do now?
- Jun. 3, 2023: GSK: Highlights from "Strategy Sessions" Webcast #2.
- Jun. 2, 2023: ABBV, AMGN, others: "Mayhem" in the I&I category? Who has the most exposure?
- May 25, 2023: LLY, PFE, NOVO (uncovered): Oral obesity drugs - who's doing what?
- May 24, 2023: AZN: Chinese versions of Enhertu?
- May 23, 2023: ABBV: Highlights from "Strategy Sessions" webcast
- May 19, 2023: PFE: Highlights from "Pipelines Unplugged" webcast.
- May 17, 2023: ABBV: Lagging lately, but durable LT growth. "Strategy Sessions" call today to discuss
- May 12, 2023: LLY: Obesity SURVEY results - off-label use, who's paying, CVOT importance?
- May 11, 2023: Big Pharma in Emerging Markets: Who's doing what?
- May 8, 2023: "Thesis review" on Roche (ROG-CH)
- May 4, 2023: LLY: Key points from our Alzheimer's disease WEBCAST.
- May 2, 2023: MRK: Taking the pulse on oral PCSK9i, MK-0616 - SURVEY results
- Apr. 25, 2023: LLY Verzenio in prostate (what'd we learn?) + Status of ROG's TIGIT in esophageal??
- Apr. 19, 2023: AZN: A refresh on what MARIPOSA is...and isn't.
- Apr. 17, 2023: Merck and Moderna's "cancer vaccine" data at AACR.
- Apr. 12, 2023: AZN's ph3 MEDI-5752 (CTLA4/PD1 bispecific) - a disruptor?!
- Apr. 11, 2023: LLY's Verzenio...in prostate cancer?! Ph2 at AACR, ph3 results ~1y away.
- Apr. 5, 2023: Obesity drugs (LLY): Are payors blocking them...or enabling their use?!
- Mar. 29, 2023: GSK in COPD w/Nucala: another bite at the apple?
- Mar. 28, 2023: Thesis review of Novartis (NOVN-CH) - NATALEE positive, now what?
- Mar. 23, 2023: PFE's Prevnar franchise - competition intensifying, no alarm bells yet
- Mar, 22, 2023: Thesis review on Bristol-Myers Squibb (BMY). Too cheap, but can it work NT?
- Mar. 19, 2023: BMY's Sotyktu - putting Takeda's ph2 results into perspective
- Mar. 15, 2023: Merck's (MRK) Gardasil in China, growing like gangbusters
- Mar. 14, 2023: Important Leqembi (AlzDz) updates by BIIB's partner, Eisai
- Mar. 13, 2023: Sanofi/REGN's other big COPD bet: IL-33 (AZN & ROG also chasing)
- Mar. 8, 2023: Weight Watchers to LLY: "I'll be your free Contract Sales Organization!"
- Mar. 7, 2023: Merck (MRK) ACC recap (& there's more to the story than just that!)
- Mar. 3, 2023: BMY's Sotyktu - New survey shows high usage already

- Mar. 2, 2023: BMY, Bayer, others: FINALLY, the Factor XIa ph3 trials have begun
- Mar. 1, 2023: Will Medicare ever cover obesity medicines?!
- Feb. 27, 2023: LLY's new ph3 safety trial with donanemab (Alz Dz)?
- Feb. 23, 2023: Two "cancer vaccine" updates for Merck (MRK) & Moderna (MRNA)
- Feb. 22, 2023: Two rating changes: MRK higher, ABBV lower
- Feb. 16, 2023: On R&D output, China climbs, US holds, EU shrinks; BIIB's slow reinvention and outlook post Q4
- Feb. 15, 2023: GSK's Zejula - is the broad label in 1L ovarian cancer maintenance at risk?
- Feb. 14, 2023: Obesity drugs... No doc? No Problem! + ROG Vabysmo/ophtho update
- Feb. 9, 2023: China: Drug Co's Backing Away From NRDL Listing To Preserve Sales - Will It Work
- Feb. 8, 2023: 5 charts on Roche's Vabysmo vs Regeneron's Eylea
- Feb. 7, 2023: "Austerity measures" to impact drug pricing or not? + AZN & ABBV preQ4 updates
- Jan. 23, 2023: Who's doing what in Trop-2? GILD, AZN, and now MRK
- Jan. 20, 2023: LLY's donanemab CRL (our between-the-lines reading)
- Jan. 10, 2023: ROG's upcoming TIGIT readout + 3rd RSV vaccine hits (GSK, PFE, MRNA)
- Jan. 5, 2023: Why not Sanofi+SGEN? The other “Jan. 6th” (lecanemab). 3 things to bring to Calif. next week
- For additional notes, click here

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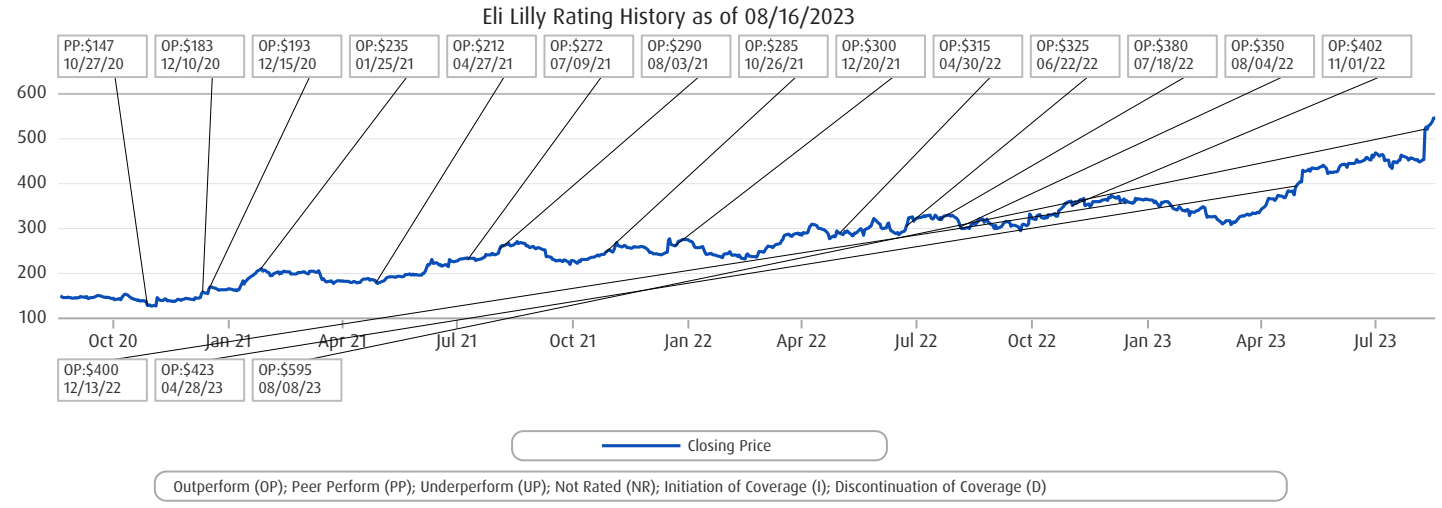

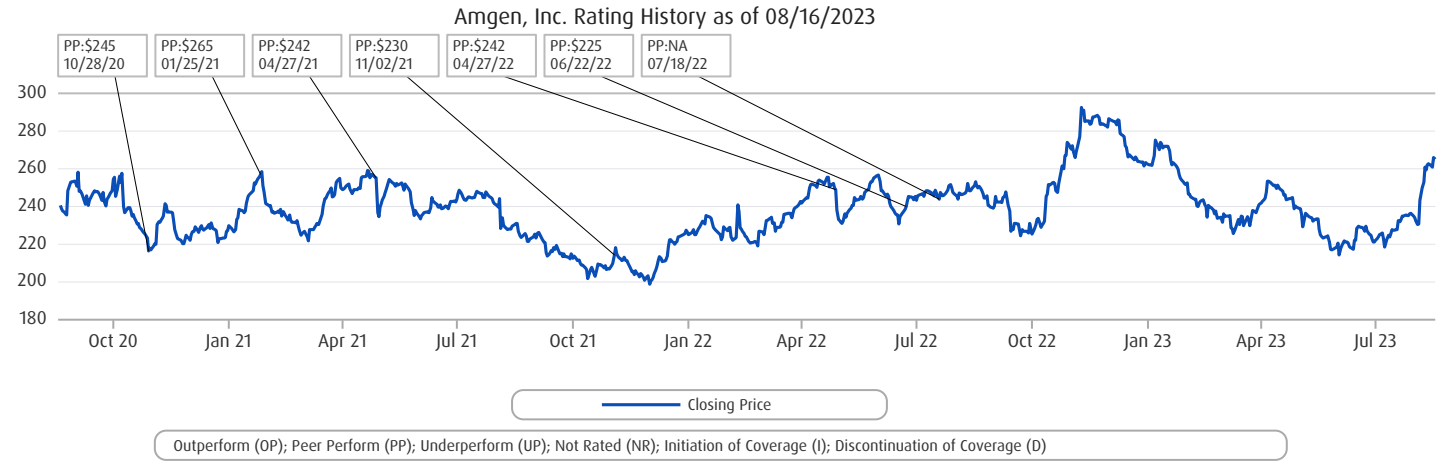

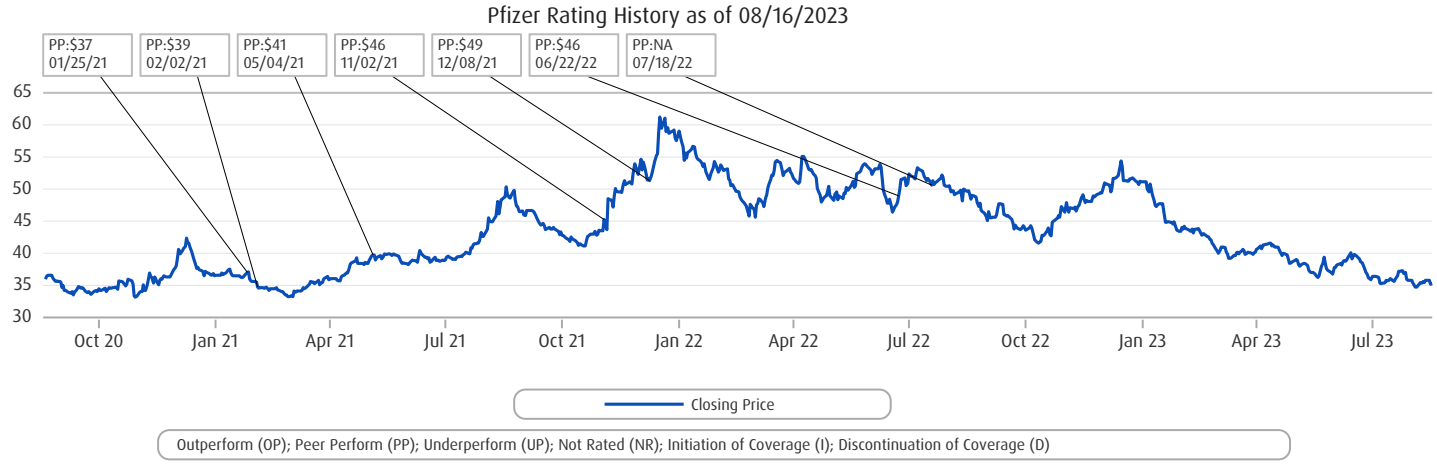

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Company:	Fundamental Valuation Methodology:
Amgen, Inc.	Price targets at our firm are no longer assigned for stocks rated Peer Perform; instead, "fair value" ranges are given. Our fair value assessment of AMGN is in the range of $235 - $255, which is based on a P/E multiple range of 12-13x on 2023 "underlying EPS" (i.e. excludes both the impact of IPR&D for US companies, and COVID solution sales where applicable).
Eli Lilly	P/E target multiple on forward EPS estimate
Pfizer	Price targets at our firm are no longer assigned for stocks rated Peer Perform; instead, "fair value" ranges are given. Our fair value assessment of PFE is in the range of $35 - $38, based on a SOTP where we apply a P/E multiple range of 11-12x on 2024 "underlying EPS" (i.e. excludes both the impact of IPR&D for US companies, and COVID solution sales where applicable) and add to that our DCF of COVID solutions (about $7/share).

Wolfe Research, LLC Fundamental Recommendation, Rating and Target Price Risks:

Company:	Risks That May Impede Achievement of the Recommendation, Rating or Target Price:
Amgen, Inc.	Upside Risks: Positive Lumakras updates including combo data that drives meaningful efficacy improvements; Emergent pipeline assets, like the BiTEs or olpasiran, generative competitive profiles generating pipeline excitement; AMGN adds to the late-stage pipeline through business development; AMGN delivers higher growth than expected for key brands and Biosimilars that increase confidence in its LT guidance. Downside Risks: Negative Lumakras updates; Generic erosion in the base could continue to surprise to the downside; Mid-stage assets fail to backfill a relatively thin late-stage pipeline; Otezla's growth is materially impaired by BMY's TYK2; Further negative updates around AMGN's IRS tax dispute.

Eli Lilly	Downside risks: 1) donanemab fails to get approved or to secure CMS coverage, 2) a tirzepatide safety issue arises, or faces greater competitive threats than we are anticipating, 3) other key pipeline drugs fail to get approved, such as lebrikizumab.
Pfizer	Upside risks: 1) Late-stage pipeline gains more traction than we anticipate, 2) COVID Solutions are larger and more durable than anticipated, 3) Large cash windfall provides optionality for transformative assets to backfill later 2020 LOEs. Downside risks: 1) Key late-stage pipeline assets fail to make it to market, 2) Ibrance growth stalls and loses share in metastatic setting, 3) Prevnar is not as durable as we and consensus are modeling due to competitive threats

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Company:	Research Disclosures:
Amgen, Inc.	None
Eli Lilly	None
Pfizer	None

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