# CDMOs and GLP-1s: Former Novo Nordisk Global Products Lead Discusses GLP-1 Manufacturing Supply Risks, Corporate Strategy and Market Growth Opportunities

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**Herluf Nis Thomsen**, Former Global Product Lead for Ozempic and Victoza - Novo Nordisk

## AGENDA

- What is the overall manufacturing process for GLP-1 analogs like Wegovy and Mounjaro? What are the key risks? How does the workflow compare to existing peptides? How easily will generic manufacturers find production when the drugs go off-patent?
- How can existing capacity be repurposed to deal with excess demand? What aspects of CDMOs pose the greatest regulatory risks? What profit margins could be realized if DTC online demand is met? How should fixed asset depreciation be modeled?
- How are novel CDMO service providers such as Lonza providing opportunities for Big Pharma companies to extend shelf life and lengthen the duration of action? What are the expectations for inventory levels, and what opportunities could this present?
- How is capex spend likely to evolve among the CDMOs? Might fixed assets allocated to one client pose a conflict of interest for a key competitor? What fill-finish gaps remain, and what role could automation play in meeting growing demand?

## HIGHLIGHTS

> 'API is definitely where the bottleneck right now is' and 'I think that Novo Nordisk knows that Mounjaro is more efficacious than Wegovy ultimately'
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> Advisor states, that 'Novo Nordisk might actually not be that concerned over the launch of Mounjaro, as they are struggling so much to meet demand' going on to state that 'the board will be trying to delay new launches and indeed, a broadening out of the indication as much as possible'

**Alexander Pye:** Good morning everybody. My name is Alexander Pye with Guidepoint. And today, once again, we're going to be looking at the GLP-1 space with a particular focus on Novo Nordisk, but also looking at the CDMO space in terms of strategy and growth opportunities for them going forward. As is always the case, if you have any questions for our expert Advisor, please feel free to email me any time during the call at Ask@Guidepoint.com.

Ask@Guidepoint.com and I'll leave any questions that you might have anonymously into the question sets as I go along. I will take this opportunity to remind everybody, as I have to, that we are not allowed to discuss the stock pricing or the specifics of how a company such as Novo Nordisk or Eli Lilly maybe valued.

We will be talking about some of the publicly available clinical trial data that has come out and the potential impact of that. Also some upcoming clinical trials to how that may steer market growth and sentiment. With that, let me introduce our expert advisor today. It's a gentleman who is an ex-Novo global product lead actually here responsible for Ozempic and Victoza, Mr. Herluf Nis Thomsen. Herluf, would it be okay for you to give an introduction about yourself? Actually, for anybody who might be listening?

**Herluf Nis Thomsen:** As you said, Alexander, my name is Herluf Nis Thomsen. I'm a Danish citizen. I've been working for Novo Nordisk for about 15 years in different roles in global, in business areas and in affiliate sales companies. I've been covering a fair amount of different space within commercial. All the way from public affairs, PR, communication, product management, market access and others.

**Alexander Pye:** Excellent. Just by way of opening the discussion then, in terms of Novo Nordisk and the ongoing supply issues that they currently find themselves having, how big of an issue is this and for how long is it likely to remain so?

**Herluf Nis Thomsen:** I think one of the things that Novo Nordisk is really good at is essentially producing and Novo has been good at that for centuries. Not always been first to market but what they have been good at is essentially to produce and distribute. It's the first time in the 15 years I've been in the company that I heard that somebody else was going to produce for Novo Nordisk. I think it's fair to say that it's a relatively large issue for Novo. They basically can't keep up. They were very surprised by demand.

And I think you can also see the fact that Catalent was brought in with some difficulty, I must say, because in the beginning there were a few hiccups in terms of FDA approval etc. I suppose that the same thing would probably happen with Thermo Fisher, they're looking at people who could get in and take over where Novo just couldn't deliver. And it's quite difficult to find somebody who's at the same standards as Novo and they're

as good as they were, or they are. I think that's the main issue that it's really not an easy thing to do.

It's not easy to produce GLP-1 and I think Novo has tried to find the best out there. I just don't think that there are that many out there that can actually just step in and do it. They needed to find somebody who was almost ready to do it or could step up quite fast. And that was the case for Catalent. It went a little too fast for them because they did get a warning letter. They're hoping that they can bridge that with Thermo Fisher. I also know that internally Novo is doing everything they can to redirect LO production capacity towards GLP-1. Essentially, I know that they are holding back on all sorts of other sales initiatives just to make sure that everything is channeled towards GLP-1.

In terms of timing, I think it's hard to say. No one has just invested twice in two new factories. It takes about at least 3-5 years to convert a factory or build a new one. It does take a lot of time to get there. They've invested something like 25 billion DKK within this last year in upgrading other product lines and essentially in building new factories. They're doing everything they can, but I don't think you'll see this resolved within a short term.

**Alexander Pye:** The comments that the CEO has made recently and then we look at if we compare them to the beginning of the year, Jorgensen, he said he was 'confident that Catalent would resolve their facility'. He did allude to what you said that 'very few companies can make products at such scale'. He mentioned the phrase of 'leveraging CDMOs', but then he went on to say that it would 'be quite some years before Novo Nordisk can satisfy the whole market'. What time frame do you think here are we looking at realistically?

**Herluf Nis Thomsen:** A couple of years. Demand will continue to grow. What you're seeing is that all the launches of Wegovy have been pushed back. You'll probably see something similar with Eli Lilly or it'll be interesting to see if they've learned the lesson. I think that they would probably be in the same position that this is really in demand. They are probably also going to have to struggle with production capacity. What I think is that it will take a few years, but you'll see Wegovy being pushed back in terms of launches.

They've obviously launched in five countries now, with two European countries coming on board right now, Germany and UK. Those two are big ones. I think they're doing everything they can, but all the smaller countries where they would already be able to launch, all that has been pushed and it will probably be pushed in the future as well. It will be one of those rollouts that essentially takes somewhere between 3-5 years, rather than 2-4 years, something like that.

In terms of getting the product out there. What will happen in the meantime is that all those countries, you're seeing a cannibalization because when people can't get Wegovy, what they do is that then they go for Ozempic and for Rybelsus given that it's the same active ingredient. Even those products in certain countries are not delivered; they are out of stock because they basically can't deliver because of the demand. It's something which, if they could, they would obviously increase the production of Ozempic as well, but they can't. Essentially you're seeing the bottlenecks on all the GLP-1s.

**Alexander Pye:** What do you think will be Novo Nordisk's baseline strategy between orals and injectables? Is it not the case that Rybelsus uses nearly 150 times more API than the sub-cut? Would it not make a lot more sense to throttle that oral supply?

**Herluf Nis Thomsen:** I think what you'll see is that Novo hasn't been pushing rebels so hard. And that's exactly the reason why. The API is really expensive and what they thought would be the usual strategy would be that they would decrease in cost over time because they would be better at producing it. They just can't afford that this time round so they will be pushing the injectables for some time. And I believe that even though Rybelsus hasn't been submitted, then it's ready to be submitted to FDA.

They'll probably push that as well just because they don't want to get into the situation where they have to deliver even more API. I think what you'll see is that they'll continue with injectables in this space for some time, at least until they've got everything ramped up and they start to feel the competition coming in. That would be obviously Lilly, but others are also in the horizon. What they will be looking very hard at is when will you start seeing the Pfizer's and the Lilly's coming in with oral medication in this space. Then they will probably ramp up at that point in time. Until then, I think they'll push for injectables.

**Alexander Pye:** What's easier to produce, in your opinion, Wegovy or Mounjaro?

**Herluf Nis Thomsen:** I don't know. I think from a technical point of view, it's the same thing. It's relatively large molecules. They are quite complicated to make and difficult to copy, which is also why there are few players out there who could actually do it for Novo or for Lilly.

**Alexander Pye:** OK. In terms of that, you mentioned the Thermo Fisher contract. Are we allowed to read into that a little bit that perhaps Novo Nordisk had already approached Thermo Fisher earlier on, didn't like the terms and yet now they've been forced to go back? Can we begin to expect manufacturing margin compression in terms of external suppliers and trying to bring in these external CDMOs to meet capacity? Is that something that is inevitable?

**Herluf Nis Thomsen:** I think what we're talking about is the fact that it's very difficult to produce. There are very few out there who are able to do it. I think Novo would have had this conversation with them as well. Not just Catalent, but others as well. It's a question of can they do it or can they not, and how much would they need to invest upfront in knowhow and in capacity, not only in terms of building the capacity but also in terms of knowhow. Can they actually do it and how well can they do it?

I think what Novo is doing is that they're working very closely together with those CDMOs that might have a chance to do it. Then that's why they probably went with Catalent first because that was an easier match. I think there were a few things lacking with Thermo Fisher in terms of that know-how and basically ensuring that the quality was up to speed. That's more the question. In terms of margins, they're not that many anymore, but on the other hand everybody wants in on this. I'm sure that both parties would really like to enter into this cooperation because there's definitely something to be made in terms of money for both parties, in this case. The market is almost endless so there's a huge prospect in that.

**Alexander Pye:** I'm just taking a step back here in terms of I possibly should have asked you this at the beginning of the call, but quantitatively, in your opinion, where Novo Nordisk currently find themselves, what multiple of shortfall are we looking at here in terms of what their existing capacity and where it needs to be? What factor do you estimate we're looking at here?

**Herluf Nis Thomsen:** I don't know the details of that, I left the company two years ago, but I believe that when we were talking about these things back then, there were already voices saying we might actually face a situation where we couldn't deliver. Now it could be sold at least 5 or 8 times of what they're looking at. If you imagine that they could roll out with the original launch plans, then they would have been up to somewhere between 10 and 15 countries or markets already, which they are not. I would suppose that somewhere between 5 and 8 times is probably realistic.

**Alexander Pye:** Given those discussions when you were at Novo Nordisk, how do they find themselves in this situation? Why have they anticipated demand so badly? Who is to blame and could it occur again?

**Herluf Nis Thomsen:** When we started working on the first generation of the obesity drugs in the noughties, that was Liraglutide, which came out under the product name Saxenda. I was part of launching that and I was part of doing the market development there or the business development. We were trying our best to make sure that people understood that obesity is a disease. There was a massive amount of campaigns going into that. Basically to convince the market that this was a disease because then it could be pursued in the same way that diabetes is pursued.

You could go for reimbursement, but that took a really long time. It took the better part of ten years to get to the point where the U.S., UK, Canada, those countries were actually accepting this as well and saying this is a disease. None of them came to reimbursement; at least not in the way that Novo wanted it to happen .We tend to forget that that preceded the Wegovy market today. There's been a push for about ten years or so where Saxenda was pushed into the market and Saxenda has slightly less efficacy than Wegovy does, but you still lose weight and you do it considerably compared to other products in the market. It took some time before we got there, but then everything took off in a much unexpected way; saw a hockey stick that I have never seen before in pharma.

It's two things, all of a sudden it became meaningful when you start crossing that threshold of losing 15% of your body weight, then it's really meaningful. There were a lot of people who lost that weight. The product got better and essentially you also had the fact that Ozempic was out there. People were looking at people with diabetes and they were realizing these guys are losing weight. It was not just something we talked about. Most doctors had actually experienced it with Ozempic.

Once they have experienced it with Ozempic, the doctors know it's the same thing. They had something that they had already tried just in a different patient group, but it worked. Then add social media and all the other stuff to it, then it basically took off. It's not something that started two years ago; we started this work ten years ago with Saxenda. The market has been prepared somewhat, at least the most important KOLs have been. They knew the product very well. The difference around this time now is that now it's the patients asking for it. Before they had to introduce them to Ozempic, now they don't need to, even people who don't have diabetes are asking for Ozempic.

**Alexander Pye:** Herluf at the beginning of the call we talked about Catalent and Thermo Fisher as two large CDMOs. What other CDMO names are you aware of when it comes to Novo Nordisk trying to meet supply and the likes of Stevanato for Fill Finish, West Pharma, Aspen Pharmacare and other names that are in the mix?

Which of these, or possibly others are likely to be approached going forward? Have they all been done so already?

**Herluf Nis Thomsen:** I don't know the names. I haven't been close to that process, and I think that's probably kept relatively close. They are pretty much talking to everyone they can talk to. That's one thing. The other thing which would probably surprise me when you start looking at more entrants into the market, then you'll probably see some of the other bigger companies going together to produce. I suppose the only ones that could really do this are the big ones in pharma.

If one of those misses out on their candidate, then they might enter into a partnership with a smaller originator. In that sense, you'll probably see a different scenario because right now it's the big ones, it's Novo, it's Lilly, and they are probably looking to expand their own capacity and then hire in CDMOs.Soon you'll probably see some of the small ones coming in and they might enter into partnerships and that could change the dynamics of the market.

**Alexander Pye:** You mentioned how there was a lot of money to be made. What time frame do you think now? The CDMO sometimes can be a little bit reluctant to deploy capex? Are you getting a sense that they're fully on board on Novo Nordisk giving them cash specifically for their reserved capacity? What runway is that likely to have for them? Was that just going to be for five years until they get their own in house facilties up and running?

**Herluf Nis Thomsen:** Yes, that's a big question that is a huge market. I've never seen anything like it. It will take years before they're up to delivering this to everyone. The margins are not going to be under pressure for the foreseeable future because you have Novo and its being ripped off the shelves. You have Lilly coming in and those will be the two first and they'll have the market between them for at least three, four years before the next entrant comes.

In terms of that, and you're talking about somewhere around a billion people worldwide who would be ideal candidates for this product. I think it's not going to be a short-term thing. To be honest, when I heard that Novo had entered into a production agreement with Catalent I was really surprised because that's something Novo has prided themselves with for years. That's what Novo has been really good at. That as a first was a surprise. Now the second one comes along with Thermo Fisher. Then I'm seeing that this is massive. It's huge. It's just so big.

**Alexander Pye:** You mentioned a couple of times that you've echoed what the CEO said in terms of 'very few companies could make products at such as scale' and that 'the GLP-1s are not easy to make'. Where is the difficulty exactly? Where's the bottleneck right now then in terms of meeting capacity? Is it API production and is the speed of that or is it still fill and finish from the pandemic?

**Herluf Nis Thomsen:** It's AP production. Essentially it's a complicated drug because it's a big molecule and it's a complicated biological process. We've done insulins, anybody can do insulins, but changing that into GLP-1 hasn't been as easy as foreseen because otherwise there would be so many others entering into the market. Novo Nordisk is not the only one, or Lilly that do GLP-1. There are loads of other companies that do GLP-1, but

I don't see any of those stepping in essentially at that scale and at that speed. It can be done and they'll probably be able to do so within 5 years. It really takes time at that scale and investment, obviously.

**Alexander Pye:** Just to clarify, it's the API, it's the very beginning of the process and actually making the GLP-1. It's not the glass files, it's not the Autoinjectors or mateiral sourcing sterilization.

**Herluf Nis Thomsen:** No. That you can buy from anyone, any CDMO could do that. That's definitely not the problem. The fact that the best one to do it, at least in Novo's opinion Catalent they basically didn't manage to do so and the production was halted for the better part of a year because they basically failed to do so at the quality required. It tells you it's not an easy thing to do.

**Alexander Pye:** Also multiple times it's been said that there is, as you just said now, an unprecedented ramp-up in terms of capacity and meeting demand. To what degree is that causing the problems with Catalent, you're trying to run before you can walk, things are being missed, ultimately that's not going to be resolved for quite a while? That risk is going to carry on recurring over the next 18-2 years due to accelerated response?

**Herluf Nis Thomsen:** I don't know exactly what the reasons were, why they got the warning letter, but essentially it was multiple things. There were a number of issues with the production also. Given the time that it took to resolve it, it wasn't just because they had missed the one too many vials or whatever it was.

It seemed to be a relatively serious thing because Novo also went out a couple of times and said, this is going to be resolved. We're working as hard as possible. They couldn't give any timeline. It took some time before they actually got through it. Whether it's going to happen again. FDA won't approve it until they've got it under control that would be speculation on my side. I just don't know the details of that.

**Alexander Pye:** Herluf, at the beginning of the call we talked about the API differential between orals and injectables. Given that, in your opinion, is changing Novo Nordisk's strategy going to involve more of a focus on multiple doses versus single dose disposables? Would it not make more sense to produce something that was okay for, say, 4 doses over 4 weeks rather than having single dose?

**Herluf Nis Thomsen:** I've been working closely with that. We had an issue really big issue during Covid and this was just with the device which essentially the PD2/90 is called is a device which was made for insulin. I think about 15 years ago, right when I started in Novo, the former head of finance, the guy who went to Teva, called Schultz. He essentially scrapped the single-dose device back then. He said there's no need to develop that because essentially the PD2/90 is a wonderful pen.

For the sake of production, let's just stick to one. That has ridden Novo ever since because during Covid when the doctors weren't seeing the patients. The patients didn't go to the clinics, what happened was that the doctors perceived Lilly's pen, which is a single-dose device, as a much easier pen to get a patient-initiated on. We basically saw that really changed the market dynamics during Covid. Essentially we were growing faster than Lilly. What happened was Covid hit and then they started growing faster than us and we flatlined.

Panic entered and we were looking at could we do a single dose device. We tried acquiring a company that

did that. Essentially I believe that in the US, Wegovy is sold in a single dose device or another market, I don't remember. There was a certain market where they did this. In terms of capacity, this company that had been acquired or this product that had been acquired just couldn't deliver in terms of speed. They basically went back to the old device. It's a mistake that's been made many years ago.

They're still paying for it, so to speak. For insulin, it's a wonderful device. There's nothing wrong with it. Competition has one, which is a single-dose device, much easier to use for patients. That is a slight advantage to Lilly's initiation of patients compared to what Novo does. Novo would definitely like to do that. I was in a project where we started looking at what the business case would be, but we basically scrapped it because it would take too long and it would be too close to patent expiry. The decision was made to stick to that.

I think today it's probably because of the fact that then you have to develop, approve and produce a new device. They've got plenty on their hands in terms of producing API. It's not going to happen any time soon unless they acquire someone that does it.

**Alexander Pye:** What's the potential for that? You talked about Eli Lilly building out that capacity within themselves. Would it not be easier, more economically feasible, to have a CDMO, perhaps a smaller one that does it your way and then buy it?

**Herluf Nis Thomsen:** Yes, I think they could do it, but right now they don't care because right now that's not the issue. The issue is to produce anything they can ship out. If they could do it in vials, people would buy it with their own injections or whatnot. It's not such a big issue anymore, it was an issue during COVID because we saw Lilly was selling more than Novo did. Today that's not the issue. The same thing goes for many of the other things. Novo is doing a lot of research in terms of RCTs, in terms of adjacent areas like Nash, like kidney disease, etc.

All of those things are probably also going to be halted because there's probably no reason to do that right now because the problem is just to get enough product out there. I think what Novo would normally do or what Lilly or who else would do would be to expand the label and try to expand the label with other diseases or what not. I don't see that happening right now. What I hear from former colleagues is that they're putting some of these things on hold or investing less in it, if not directly divesting in some of those trials because there's really no need for any label expansion right now. Right now it's selling itself.

**Alexander Pye:** We alluded to earlier on the Denmark facility, I think it was $2.3 billion earmarked to expand. To what degree does Novo Nordisk, and to some part Eli Lilly, have the ability to pay extra cash to bring that capacity forward, to bring those manufacturing facilities to come online earlier? Maybe 2 or 3 months could make a significant difference. To what degree can they do that and will they do that?

**Herluf Nis Thomsen:** I think Novo can. Essentially, because they're first to market, you probably follow the numbers, but you've seen how much this is bringing in. It's massive. I don't think it's a cash flow issue with Novo itself. If we're talking about Lilly. Lilly has a vast amount of money already and they have loads of other products that they're working on, so they can probably direct or redirect some of that investment.

I don't think it would be an issue for any of those two, but for other players that are coming in, say Amgen, say some of the other slightly smaller ones, it might be a bit of an issue, but they'll be third or fourth to market. At that point of time it's probably a different game for them.

**Alexander Pye:** To what degree is or perhaps not so at all, but is Novo Nordisk concerned about sharing CDMO facilities such as Stevanato for Fill Finish or API with some others, with Eli Lilly? Is there a conflict there? How would that be managed, or is that just a race to whoever's first to market and securing supply there and then?

**Herluf Nis Thomsen:** What do you mean? Building factories elsewhere or sharing API with CDMOs or what do you mean?

**Alexander Pye:** Actually sharing CDMO capacity. Say for example, if Eli Lilly and Novo Nordsik. How is that going to be?

**Herluf Nis Thomsen:** Ah, I see what you are getting at. I think they would probably go for exclusivity. I'm not the one making those decisions, but I probably would. It depends on how many CDMOs can do this job and what the CDMO market dynamics are, because I think it's a fairly limited number of companies that can actually fulfill what Lilly and Novo would be asking for. Once the CDMO step up, then maybe they can get better terms. If I was Novo, I would obviously ask for exclusivity.

**Alexander Pye:** Then what does that imply? When Jorgensen says talks about 'leveraging CDMOs' that will very quickly reach a brick wall when they're not, because if you've got the exclusivity, there's not that much capacity that they can leverage beyond is there?

**Herluf Nis Thomsen:** No, there isn't. That's essentially what he went out and said. He basically said there are very few players who could actually do this. Otherwise they would have probably reached out and gotten to them already. I think it's probably a partnership that is maybe a little bit beyond what the normal CDMO does.

It's not just putting things into vials. In this case, I think it goes a little bit deeper. That might also be why it takes time to land those contracts with Thermo Fisher and others.

**Alexander Pye:** How do you think Novo Nordisk is going to manage the expectations of the market, but also the communication through updates and financial updates? Are they going to be conservative, and surprise on the upside periodically?

**Herluf Nis Thomsen:** Novo has always underpromised and overdeliverd. I think the new CEO, he's not new anymore, but I think he will probably do the same. It's becoming more difficult because before it was under the radar somehow. It was just diabetes. Now everybody's eyes are on them, they probably need to be realistic as well. They've always been conservative.

**Alexander Pye:** You think that when the capacity comes online, they won't necessarily announce it as and when they'll wait until the 'bird is in the hand', so to speak?

**Herluf Nis Thomsen:** Yes, they've done that with the UK and the German market that was the way they did it. They didn't announce in advance that this was coming. They were basically almost saying it to the day. I think right now it's almost probably very short-term planning that they're doing out there because they basically need the product before they can announce anything because they're also aware that you've seen shortages in those markets where Wegovy has come out, they've seen shortages both in the U.S., here in Denmark, Norway.

They probably want to avoid that as much as possible, which is basically why they're being very conservative and only announcing it when this stuff is ready. As I said before, they don't need to announce it because everybody wants it. As soon as it'll be on the shelf, then people will know.

**Alexander Pye:** Where do you think in terms of the margins across the whole manufacturing, you mentioned how API was the real bottleneck and it wasn't necessarily the glass vials? Does that imply that they would have margins squeeze, they would give that away and they'd be able to recover it from a Scott Pharma or from Stevanato?

Do you think that their margins are going to be squeezed going forward anyway? I'm interested in terms of whether they're going to be able to defend their margin or whether that's inevitably going to go down and by how much roughly?

**Herluf Nis Thomsen:** I don't know how it works with the CDMO's because I haven't worked in the company when we were contracting CDMOs at that level. I can say that what Novo does or has done in the past is essentially they come out with a product where in the beginning it would be very small margins, but as soon as they ramp up production, then costs start going down and quite dramatically, at least what I've seen internally because they get better at producing it. That as I said before, it's one of the strengths of Novo.

They're really good at doing that. How that will play out together with the CDMO, I don't know. How those contracts are put together, I don't know. I suppose that given that Novo has this ability or has had this ability in the past to start with a relatively smaller margin and then over time basically increasing the margin because they produce more effectively and cheaper, then this is probably also what they're going to be looking at in contracting with CDMOs. You'll probably see some creative contracting with some of the CDMOs where it will be tied into volume and it will be tied into how fast they can do it and the quality of what they do. I suppose that Novo is looking at the same business model as they've had for years for the better part of the century, which is essentially to recover costs as they become more and more efficient in production.

**Alexander Pye:** Earlier on, Herluf, you mentioned Eli Lilly. We were talking about tirzepatide with regards to Semaglutide, and then you said others on the horizon. Can I just ask from Novo Nordisk's point of view, when you've been discussing with colleagues, what are the names that they're concerned about that are on the horizon as competitors?

**Herluf Nis Thomsen:** If we're talking products, then I think Lilly's product is superior to Novo Nordisk. Mounjaro or whatever it's going to be called for obesity is going to be a tremendous competitor. Novo has obviously the nice thing of being first to market but Lilly's product is a bit more efficient than Novo's. And Lilly's product is a dual-action product so it's a GIP and GLP-1.

Novo is coming up with the CagriSema which is an Amylin analog and then GLP-1, which is probably going to top Lilly's by a little bit. Those are going to be tremendous competitors in this space. The question is who else is going to do that? What Novo would be worried about is Lilly has a candidate for oral, which I think is in phase two now, but that would probably be something that triggers some action in Novo Nordisk in terms of Rybelsus and making that available for obesity. Apart from that, I've heard that Pfizer also has one, I think it's called Danu something, not sure, anyhow.

**Alexander Pye:** Danuglipron.

**Herluf Nis Thomsen:** Yes, exactly. That product is a GLP-1. It seems to have some people lose weight faster. It's only in phase two. It could be a number of things yet. It's a bit too early to speculate whether and how to compare it to the others, but I think those are the main competitors that these guys are looking out for.

**Alexander Pye:** You said that in your opinion Novo Nordisk's Mounjaro was superior to Wegovy, right?

**Herluf Nis Thomsen:** Yes.

**Alexander Pye:** Does that imply then, that by not following in Eli Lilly's footsteps and combining their own GLP-1 with a GIP, Novo Nordisk might not be confident enough that their GLP-1 was superior also?

**Herluf Nis Thomsen:** No, it's not a question of that. It's essentially when you put them together. Novo also had a GLP-1, but I think the side-effect profile was too harsh. They basically canned that and then they went with this one where you had the Amylin, which is a different mechanism of action. The question is, what they want to do is obviously to top the standard of care. By now the standard of care is Wegovy. If you can do something better than that, that would definitely help you.

**Alexander Pye:** I'm interested as to whether through CagriSema is Eli Lilly going for broader but slightly less efficacious. Doctors can just pick one, prescribe it to everyone if it doesn't work maybe switch rather than having to try and stratify their population. Is that their strategy, given what you have said about tirzepatide being more efficatious?

**Herluf Nis Thomsen:** No, I don't think so. I think having been in market access as well, your strategy would probably be that you constrict yourself if you have a couple of issues. If you don't have the perfect product or you have a very expensive product, then you might go for a smaller population and then you would expand it from there. Both Lilly and Novo have been doing that with Ozempic and Mounjaro. Novo just came out with the CVD study.

I know that Lilly are doing the same thing for Muonjaro, those things will come out and in this case they're probably not looking at expanding the population, what they're looking for is probably to maintain prices. I think these authorities will start some price pressure on this because everybody wants it. It's going to be pretty tough to keep up prices. I think even Novo Nordisk's CEO said at some point that he would essentially accept a price reduction if this was reimbursed.

There might be some tradeoffs there. I think we're looking at a price or trying to keep the price up rather than trying to expand the population because the population is there. People are pulling it off the shelves. The normal game would be that you start expanding because you want to increase sales. In this case, there's no need for those activities.

I think what I've heard from my former marketing colleagues is that there's really no need for any sales tactics because this essentially sells itself. There will be some different issues when you have other entrants and Lilly coming in at the end of this year, it's probably going to change the market a little bit. I don't think right now, Novo is not afraid of that. They're probably almost looking forward to Lilly entering because they can't keep up themselves.

**Alexander Pye:** Just coming back. We mentioned about the CDMO in terms of the finished product. We talked about oral versus injectable and the different forms of autoinjectors for example. Can I just ask you now with regards to dosing, what's Novo Nordisk's strategy to meeting there, would they rather that everybody started on a lower dose and got some, would they rather that some inventory was kept for the titrating up of some patients that had started? Does it not make more sense for them to produce more 0.5 or 1mg, for example and to just meet that and maybe 2.4 Wegovy takes a backseat?

**Herluf Nis Thomsen:** Yes, but it's a difficult discussion because essentially the products, the nature of GLP-1, and that goes both for Novo and for Lilly. You do have side effects, but these are transitory. Titrating the product or increasing the dose slowly makes very good sense in terms of making people able to take it and to stay on drugs. In that sense, changing that formula would require quite a bit. It would probably also require that the authorities thought that was a good idea. Given the profile in terms of adverse events and in terms of GI issues,

I don't think that's going to happen. On the contrary, I think what is happening is, and Novo has done that already, they have basically said that they were not going to provide the products to very large amounts of people. Instead of starting up new patients on the product, they were basically holding back to make sure that there was enough product for those people who had titrated up and who were already using the product.

That was the way that Novo thought might be wisest. Instead of initiating more patients and then running into the potential issues of stockout, then they were basically saying, let's not start any more patients, but let's just provide to those that have already started. I think that's probably the case. You're not going to see that it'll be different in terms of the titration of the product when you start.

**Alexander Pye:** I completely see your point that 'that's Novo Nordisk's strategy', but in reality, that might not be how real world physicians use it, or would want to prescribe it? Isn't it down to them ultimately, despite Novo's best attempts?

**Herluf Nis Thomsen:** That's obviously their discretion to decide. I believe that Mounjaro has an even longer titration period. What you do see, and obviously Novo would like because they have a flat pricing in the sense that it doesn't matter for them whether you are using 0.5 or 0.7 or 1, they're basically going to sell the same. At least that's the idea. They would rather have the people they use the right protocol and that's also what they

have to say in terms of FDA and EMEA. The doctors can decide whether they want to stop on 0.75 instead of going up to one.

They don't have to follow those steps. I think I've seen among patients and discussions where people are saying to avoid GI side effects or whatever, then instead of taking an injection once a week, then maybe you take it twice a week just to half dose because that would be easier to use. Others and we've seen that with Victoza as well.

The doctor basically decides that it's fine, you just stay where you are or go down in dose or whatnot, which are difficult for Novo or Lilly to enter into those discussions because they have a very simple protocol and they need a simple protocol to go through FDA. Also in terms of marketing, you don't want to have something that is completely out of control from the company.

**Alexander Pye:** You mentioned earlier on how they were trying to wind back launches and that you were of the belief that they would actually wind back FDA approvals and slow down a broadening out of indication. I can understand that aspect. When they start pulling the marketing from, say, Germany and they delay the launches, even though people are widely aware of Wegovy, at what point does that start hurting demand? Speaking to many clinicians, they said that they would take a less efficacious drug if we could get supply of it and we would start the patients on that. At what point does that retarding of indication broadening out start hurting them?

**Herluf Nis Thomsen:** I think when you see Lilly coming in. Right now, it doesn't hurt because nobody's there to replace them. The only actual threat, which is way beyond anything commercial but it's that you start seeing fake products coming out of China or India or places like that. That's not a real threat in terms of the financial aspects of this. Obviously, it's a threat for patient safety, which is a concern in itself. From a financial point of view, I don't think there are any issues with this, especially if they don't announce it.

That's what they're doing. They're not saying we're going to go start selling almost before they do it. People know its coming. People have Ozempic on the market already, what you're seeing is that people start taking Ozempic instead of Wegovy. At the point in time where Lilly enters, then you'll see Novo Nordisk stepping in and doing these smaller launches or launches with subsequent relaunches or stuff like that. They're not doing that until competition is on the market.

**Alexander Pye:** Just purely objective here Herluf, if we fast forward 5 years because I guess the key question here is to whether that demand for Novo Nordisk has been delayed or has gone. As you said when Eli Lilly come in, I'm interested as to whether they will take a part of the market and keep it. Then you will be incrementally infringing on Novo Nordisk. To what degree do you think that's how things will end up? Do you believe that Eli Lilly will take more market share than Novo Nordisk over, say, five years' time? What's your opinion?

**Herluf Nis Thomsen:** I think Novo would probably be the leader. I think Lilly will enter and they are a formidable competitor. They are probably better at sales than Novo is and their home market is the US. There'll be a massive competitor and you'll probably see a division between those two companies where it's

roughly that they have the largest part of the market and they probably have 50/50 when we're talking about US or places like that.

Obviously, Novo has the advantage of having been on the market longer than Lilly. It might take Lilly some time to get there but on the other hand, what speaks for their product is that it's a bit more efficacious than the Novo's product. Novo will essentially up the dose of Semaglutide so that it can compete with Mounjaro or tirzepatide until CagriSema comes. Then we'll see how CagriSema fares. If it will beat Mounjaro, then there'll be an advantage to Novo. Otherwise I think in five years time, it's probably those two companies that will run this stuff and then maybe you'll have Pfizer coming in with their product.

**Alexander Pye:** You said that Pfizer were formidable in sales, does that imply they will focus more on the U.S. market because that is the largest obesity market? Does that mean that Novo Nordisk will be pushed to focusing more on European, have European manufacturing for a European market?

**Herluf Nis Thomsen:** No. Any pharmaceutical company global player focuses on the US market because the US market is by far the most profitable. It would be completely out of their minds if they would abandon the US market. That's just not an option. I think it's more than half of Novo Nordisk's revenues anyway, so that's not going to happen.

They're not going to abandon it. They're going to fight with everything they have to keep the market share up when Lilly enters. The issue is not so much market share gain because the market right now is so big that there's plenty of space for both of them. They can't even service within the next 2-3 years, not even Novo and Lilly can serve the full market.

**Alexander Pye:** You mentioned China, how worried is Novo Nordisk about generics given many people have said that they're difficult to make? Is that going to be a significant worry?

**Herluf Nis Thomsen:** I think not yet. Neither is Lilly, for that matter. Generics in this space take a lot of investment and it takes a lot of know-how, which is not easy to copy. It's not a chemical compound. It's really difficult to do this. To give you an example, Liraglutide, which is Novo Nordisk's previous GLP-1 or the first generation GLP-1, I think Teva is the only company who's actually tried to copy that.

I might be wrong, but from that point of view, you could say, why didn't anybody copy that GLP-1? It's been off-patent for some time so they could actually do it, but you haven't seen it. It's not like insulin. Insulin is the top layer, the second layer could probably and even the third layer could do insulin in different forms. With GLP-1, we're still talking about second generation. It's not that easy to produce and it goes to the same thing around the CDMOs. If CDMOs had the capacity to build a GLP-1 at mass scale, they would probably have been contracted by somebody who wants to do Victoza.

**Alexander Pye:** I'd be interested to hear your thoughts on off-label use and off-label prescribing. Will Novo Nordisk be proactive, but will they now be proactive to work with the Department of Health and other governments to strangle that off-label use?

**Herluf Nis Thomsen:** They have to. It's not just a question of image, their own success is biting them as well, because a lot of people are looking at what happens in terms of revenue for these companies in the same layer. Why on earth isn't there a product for people with diabetes when you're selling this to other indications to people who are obese, mind you, there are still a lot of people out there who think that it's your own fault if you're obese. Which obviously is not the case for Novo or for how they see it.

The common person on the street looks at this and sees, hey, they're making massive amounts of money they can't produce for people with diabetes, but they're selling it at double price to people who are obese. That's not fair. Novo is really doing a lot and have to do a lot. I think the same thing would go for Lilly that they have to make sure that the doctors don't use this off-label.

I've seen letters already in Denmark, probably also in the U.S., but I've seen them in Denmark where the authorities are writing out to the prescribers saying you really need to watch this because we can't have the public funds are inundated with prescriptions for Ozempic and that's basically what's happening. Novo is doing this and they should probably do it a bit more proactive, but they know that this is an issue.

**Alexander Pye:** What does that mean for the likes of companies like Well Man, Numan, and Weight Watchers even, whereby their business model may depend on being able to ensure supply to consumers for a much higher price, do you think ultimately they're going to lose out and be locked out?

**Herluf Nis Thomsen:** I think in Denmark we've started to see parallel imports where essentially to make sure that there was supply and then there has been buying from other countries or whatever where essentially the price went up. I've seen examples of that. I think everybody wants a piece of the pie.

**Alexander Pye:** What do you think the number one risk then right now for Novo Nordisk is? We talked about capacity, we talked about meeting demand. Is it the slightest regulatory hiccup? Is it the slightest issue in terms of supply? What's going to be the main thing you talked, are they putting other R&D on the back burner here now for everything GLP-1?

**Herluf Nis Thomsen:** For Novo itself, it's obviously becoming very, very dependent on one molecule which given the state of that molecule is wonderful and it seems to be good for everything. That could be an issue if there is any hiccups, if there is any signals coming out then that could be a very big issue for the company. However, the molecule has been in the market for ten-plus years. When you're talking about liraglutide and now Semaglutide as well. And there haven't been any signals that have been worth any concerns yet.

I haven't seen them before and I think there have been some things coming up recently, something about suicide thoughts, something about cancer. The cancer issue was already discussed during Liraglutide. There was nothing there. There were also discussions about this when Ozempic was launched, but it also died out.

There essentially weren't anything in those signals. I'm not too concerned about those things. I wouldn't be too concerned about those things. The actual issue might be that there's just that one product. The other thing is price, obviously, and not necessarily because Wegovy or Ozempic is particularly expensive, but the amount of people being prescribed, that has an impact on public funding. That's going to be an issue and they're

probably going to have to face that somehow. You'll see price pressure from the public, obviously.

**Alexander Pye:** Just lastly, Herluf, anything else you think just purely from Novo Nordisk's point of view in terms of strategy, we've covered capacity and meeting demand. What's going to be their next big challenge? Is there anything we haven't discussed that you think is actually quite important for the company?

**Herluf Nis Thomsen:** I think the whole price thing, because it could come out positively or negatively. It could come out positively if played right, because you are seeing discussions in public space in Denmark, Norway, especially those countries where they are saying that it seems unfair that people who have the means can get thin and healthy while others are not.

There is a push towards making Wegovy and similar products to make them available broader basically with reimbursement. Then prices need to come down and it'll be interesting to see what Lilly does in that space as well. That can be both positive. The other thing could be negative if it's a shit storm then and its big greedy pharma then the price pressure could be a different kind. There are pros and cons in that discussion.