CS Healthcare Database

CREDIT SUISSE

# Therapeutic Journeys in Diabetes 1Q23 claim trends for Ozempic and Wegovy

# Authors

**European Pharma Team**
44 207 888 0304
creditsuisse.pharmateam@credit-suisse.com

**Dominic Lunn**
44 20 7883 0471
dominic.lunn@credit-suisse.com

**Harry Sephton, CFA**
44 20 7883 5285
harry.sephton@credit-suisse.com

**Jo Walton**
44 20 7888 0304
jo.walton@credit-suisse.com

**Matthew Weston PhD**
44 20 7888 3690
matthew.weston@credit-suisse.com

**Trung Huynh**
212 325 8373
trung.huynh@credit-suisse.com

**Carson Wong**
212 325 8118
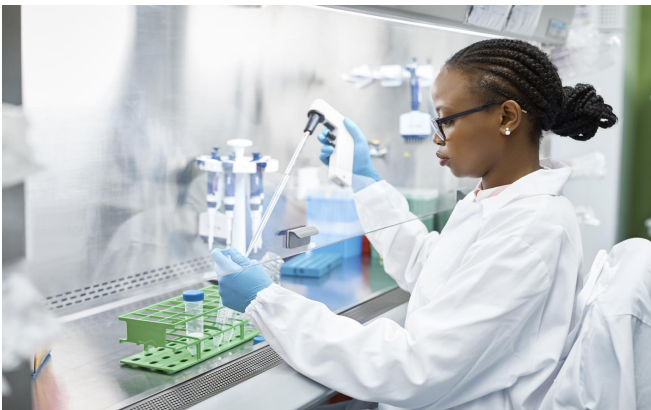carson.wong@credit-suisse.com

# Contents

# Executive summary

In our 2022 report we identified earlier diagnosis of diabetes patients which will lead to higher long-term demand. This year we identify an acceleration of treatment starts with GLPs in treatment naïve patients, but a surprising fall in treatment persistence.

**Figure 1: Proportion of patients in CS Healthcare Database starting therapy in each quarter with no prior prescriptions for diabetes medications**



Source: Credit Suisse Healthcare Database

Therapeutic Journeys in Diabetes
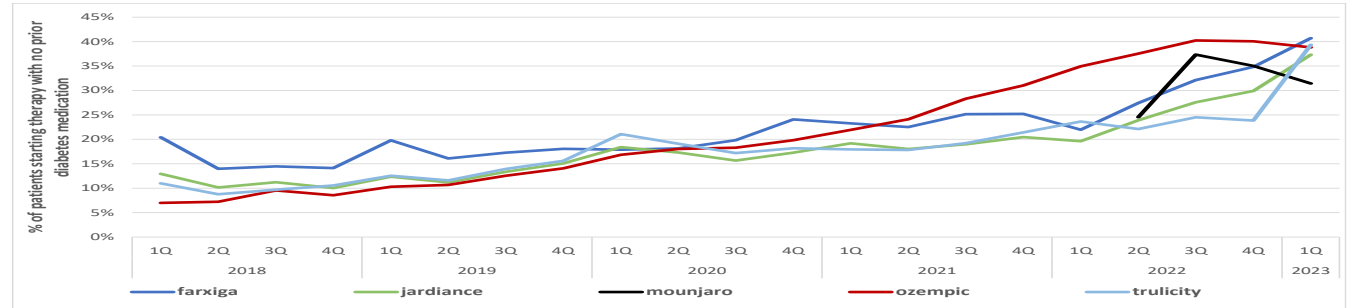
**Focusing on the growth of GLP-1 drugs:** The proprietary Credit Suisse Healthcare Database gives us unique insight into US drug usage in the real world. In this report, we leverage this database to explore the growth of the GLP-1 drugs, specifically looking at the portion of people taking the drugs as their first diabetes medicine, which we see as potentially an indication of off-label use for weight loss. Since the arrival of Novo Nordisk's Wegovy in '21 and Eli Lilly's Mounjaro in '22, we have seen accelerated demand for all the GLPs, in particular Ozempic.

Our database confirms the recent strong IQVIA Rx GLP data is translating into strong sustainable growth in paid claims for all the GLPs.

- **From a sample of 210K new patient starts in diabetes in 1Q23, 20% included GLPs** versus 10% in 1Q22. Additionally, we saw a further 44K new starts for Wegovy.

- **39% of Ozempic new patient starts in January/February '23 had no prior diabetes medication,** according to our database, slightly down from 40% seen in 3Q/4Q 22. Our database shows that Trulicity historically was used much less as a first-time treatment, but in 1Q23 it moved up to match Ozempic. For Mounjaro, a tightening of access has taken the use in treatment-naïve patients from 37% in 3Q22 down to 31% in 1Q23.

- **Persistence on GLPs is still falling,** in contrast to other diabetes classes; this may reflect more episodic use, requiring a higher number of new patients to sustain growth.

- This is a follow-up to our April 2022 report, _Therapeutic Journeys in Diabetes_.

**"** We see a continued decline in treatment persistence for GLPs, in contrast to an alternate class (the SGLT2s)

# Executive summary

The proportion of patients starting GLP or GIP-GLP treatment without prior diabetes treatment has risen substantially in recent quarters. Our analysis accords well with historical Novo and Lilly commentary **and brings the data forward to look at 1Q 2023**. We can clearly see continued strong growth in the GLP/GIP-GLP class. We can see Mounjaro supply constraints in falling patient numbers, as well as LLY's requirement for a diabetes diagnosis to qualify for co-pay assistance, in a falling percentage of use as a first treatment for diabetes.

Investors have been interested in whether Ozempic is being used off-label broadly as a weight-loss treatment, or whether high-profile examples of Ozempic mentioned in the media (e.g., during the recent Academy Awards) are in reality a limited population. As Ozempic prescription growth has accelerated rather than dropped off following the re-launch of Wegovy would suggest that demand in the diabetic population is real, despite some potential use off-label.

**Six Key Observations from the database**

1. **The number of treatment-naïve patients who begin diabetes treatment using a GLP has continued to rise**, For Ozempic this is now 39% in 1Q23, versus 35% in 1Q23 and 17% in 1Q21. For Trulicity the recent growth is even stronger from 22% in 1Q22 to 39% in 1Q23. Prior to the relaunch of Wegovy, this metric was thought a measures of "off label" use.

2. **The number of patients using a GLP as their sole diabetes treatment has been rising**: 4Q22 Ozempic 37% versus Trulicity 21%. 1Q21 Ozempic 22% versus Trulicity 17%. Ozempic has grown faster, particularly in the 26-45 age group (24% of '22 sales versus 17% of sales in '18). Ozempic has also retained higher commercial coverage (84% of FY22 claims versus 68% for Trulicity, which is has risen to 9% Medicaid in '22 from 2% in '18. Ozempic Medicaid use remains in the 2-3% range).

3. **Growth of metformin the standard starting treatment, has not slowed** and we continue to see growing use of all diabetes drugs in younger cohorts. 25% of new starts are in patients up to age 45 years up from 22% in 2018.

4. **We see a continued decline in treatment persistence for GLPs, in contrast to an alternate class (the SGLT2s).** This is falling towards that of obesity drugs which has historically been much lower. Only 36% of users who started Ozempic in '22 were still on therapy at 12 months (51% '20). For Trulicity '22 starters, the retention rate was 39% (54% '20). This contrasts with SGLT2s, where we see stable persistence (c 55% in all years). Rybelsus also shows stable persistence (38-40% at 12 months in all years).

5. **Persistence on obesity GLPs remains significantly lower than for diabetes GLPs.** Over 2018-22, we saw an average of 27% patients staying on Saxenda for a full year versus 51% for Trulicity/Ozempic over the same period. Novo has commented previously that it expects to see better persistence from Wegovy compared with Saxenda given the efficacy benefits should enhance patient motivation, but it is both too early to tell and any current data which may still reflect supply constraints. We note that our persistence data starts only with scripts that have been claimed for under a healthcare plan, and so will not include any drop-offs to coverage when only supplied by free samples.

6. **We see materially slower growth in database claims for GLPs over 2019-2022 than IQVIA TRx data suggests.** We believe that this higher IQVIA growth is reflecting an increase in bridge programs or highly subsidised scripts evident in the class since mid-2021, which are not seen in our database of paid claims.

# Credit Suisse conclusions

**This data is consistent with increased diabetes use** reflecting the 2023 ADA guidelines that focus on weight management on equal terms to blood sugar control. We believe that borderline diabetics who may in the past have relied on diet/exercise, and who were reluctant to start pharmacological treatment, may now be embracing drug treatment given the positive reinforcement of weight loss. This would appear a new bolus of treatment seeking patients.

**However, the data is also consistent with growing off label obesity use** (as evidenced by a higher percentage of first treatment, and sole agent use of GLPs, whilst the base level of metformin starts has not slowed). This interpretation is further supported by the reduced persistence of injectable GLP treatment which is characteristic of obesity drug use. This contrasts stable persistence of both oral Rybelsus and the other key diabetes drugs.

**Competition is intense.** Our database shows a 5% lower growth rate of paid claims for Ozempic and 3% lower rate for Trulicity in the past three years than would be suggested by IQVIA TRx data. We assume that despite supply constraints both companies have not been able to concentrate sales on patients with full insurance coverage and that continued use of bridge programs and copay assistance is reflected in higher gross to net. Novo's reported US gross to net has increased from 71.2% to 75.5% from 2019 to 2022. This has occurred as GLPs have grown from 42% to 63% of US sales, and insulin fell from 39% to 15%. In 2022, Novo US net sales of $12bn was accompanied by $48.8bn of rebates, up from $30.9bn of rebates in 2019.

**Mounjaro emerged as a leading drug before supply constraints hit.** We note that although 4Q realised sales of Mounjaro were seen as disappointing trends from our database suggested strong patient acceptance, beyond any "noise" from free product dispensed through company bridge programs. Our database supports **high levels of initial off-label use** in

the when 59% of patients who took Mounjaro for at least three months in '22 had made no prior diabetes claim for at least six months. Of switches, 11% came from Ozempic and 6% from Trulicity. In 1Q23, we saw a drop both in new patient starts and use in treatment-naïve patients.

**Wegovy new patient claims double that for Ozempic.** Wegovy has the same active ingredient as Ozempic but is indicated for obesity. In our database, we do see a different patient profile, with 90% of Wegovy patients having made no historical diabetes claims. Against a total of 210K new treatment starts in our database for any diabetes treatment, we saw 20K starts for Ozempic but 40K for Wegovy. Ozempic of course also benefits from a large existing recurring patient base such that overall IQVIA scripts remain five times higher for Ozempic than Wegovy as of 1Q23.

**We have reviewed the sources of new business for 2022 for both of the key established GLPs, with Ozempic achieving a higher number of new starters.** 37% of Ozempic use came from new starts to diabetes treatment (15% Trulicity). 18% of Ozempic use came from adding the drug to existing treatment (19% Trulicity). 25% of Ozempic use came from transitioning from other drugs (23% Trulicity). We saw 3% switches of Trulicity to Ozempic and the same percentage moving in the other direction. We are not yet able to review how this may have changed in 1Q23.

**Growing use of SGLT2s is supported by a recent broadening of the label to include heart failure and kidney disease.** So it is not surprising that the percentage of patients taking these drugs without a prior diabetes claim is increasing. Overall, we see higher persistence on SGLT2 therapy than the GLPs, and no difference between Jardiance and Farxiga. We have seen a move toward older patients with these additional indications and growing reliance on Medicare funding. For Farxiga, our analysis shows government funding has risen from 18% to 32% of claims from 2018 to 2022, reflecting we believe broader use in non-diabetes indications where average age of treatment is higher than in diabetes.

**"** Proportion of patients starting a GLP-1-based therapy with no prior prescriptions for diabetes medications now stabilising after strong growth
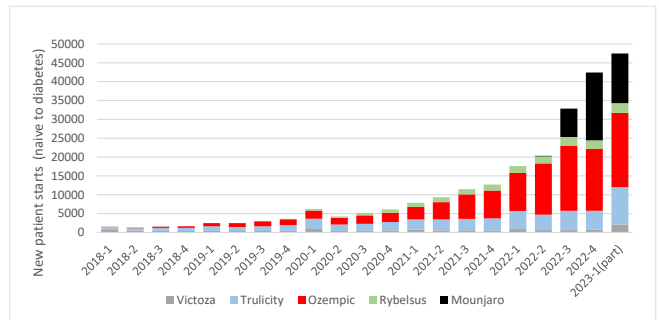
# Key charts

## Figure 2: Proportion of patients starting a GLP-1-based therapy with no prior prescriptions for diabetes medications
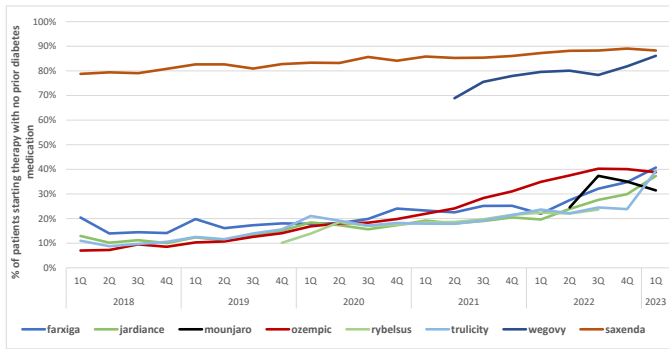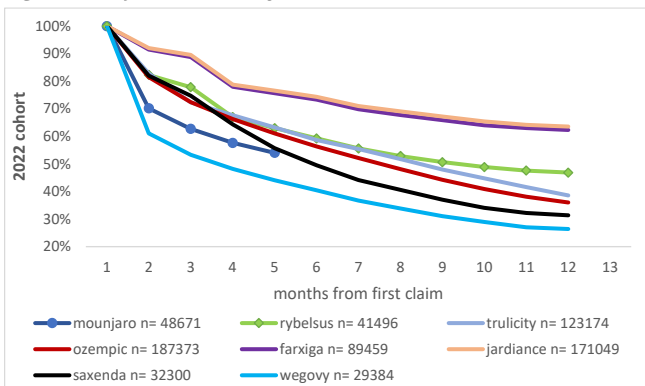


Source: Credit Suisse Healthcare Database, Credit Suisse

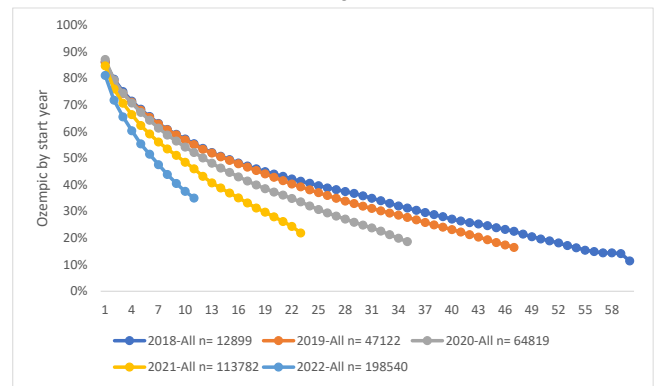## Figure 3: New patient starts naïve to diabetes medication



Source: Credit Suisse Healthcare Database, Credit Suisse

## Figure 4: Persistence highest on SGLT2s, lowest on obesity drugs; Mounjaro data only for c 6 months



Source: Credit Suisse Healthcare Database, Credit Suisse

## Figure 5: Gradual decline in persistence over time for Ozempic (also true for Trulicity)



Source: Credit Suisse Healthcare Database, Credit Suisse

## Figure 6: Simplified transitions onto GLPs 2022
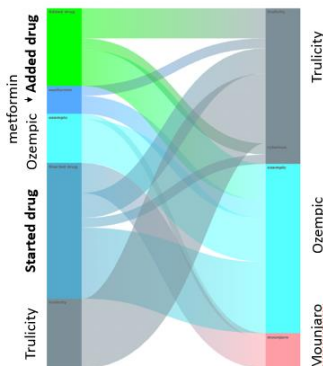


Source: Credit Suisse Healthcare Database, Credit Suisse

## Figure 7: Stable persistence over time for SGLT2s likely to reflect growing use in CKD/heart failure
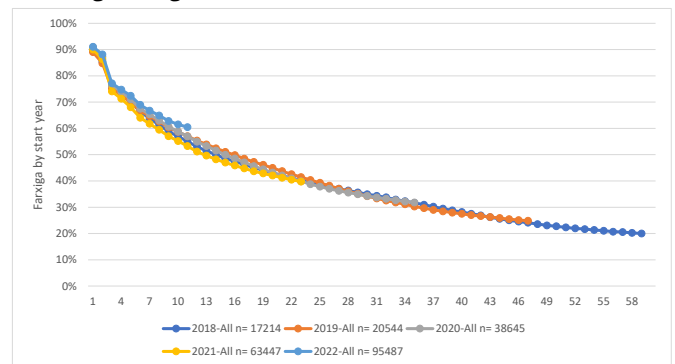


Source: Credit Suisse Healthcare Database, Credit Suisse

**❝ Diabetes treatment-naïve patients starting on Ozempic have sharply increased since 2018**

# CS Healthcare Database perspective

## Diabetes treatment-naïve patients starting on Ozempic have sharply increased since 2018

■ Our database shows **39% of patients starting Ozempic in 1Q23 versus c 40% in 3Q/4Q22 were naïve to diabetes treatment.** In 2018, the average was just 8%, 2019 (average 11%), 2020 (average 18%), 2021 (average 26%) and 2022 (average 38%). Until 1Q23, Ozempic stood out, but as of 1Q our database suggests that a similar percentage of new patient starts are seen for Trulicity and Ozempic. With Wegovy now back in full supply, any individuals previously seeking Ozempic as an "off-label" weight-loss option should now be able to access Wegovy, insurance coverage permitting.

  o Our database captures >150K US patients starting Ozempic in 2022.

■ The proportion of **patients naïve to diabetes treatment starting Mounjaro in 4Q22 dropped QoQ to 37%** (from 39% in 3Q22). This may be explained by the copay assistance changes implemented by LLY in 4Q, which required a medical diagnosis of Type 2 diabetes to be eligible for the discounted copay. This is slightly above the

1/3 of patients LLY estimated at 3Q results. However, the absolute number of new patient starts in our database rose substantially in 4Q 2022.

  o Our database captures >74K US patients starting Mounjaro in 2022 (launch 2Q22).

■ **Rybelsus has seen much less of an increase in treatment-naïve patients**, with an increase from 20% in 2021 to only 23% in 2022 and 24% in 1Q23. This is perhaps more surprisingly for Rybelsus, given its oral route of administration. We believe that Novo has been positioning it as an earlier intervention "before injections".

  o Our database captures c 37K overall new patient starts in FY22, of whom c 9K were new to diabetes treatment.

■ Trulicity saw the strongest growth in use as initial therapy in 1Q23. It is not clear to us to us what has driven this, but it may reflect stronger formulary access within elements of our database.

  o Our database captures c 75K overall new patient starts in FY22, of whom c 17K were new to diabetes treatment.

**Figure 8: Proportion of patients starting a GLP-1-based therapy with no prior prescriptions for diabetes medications**
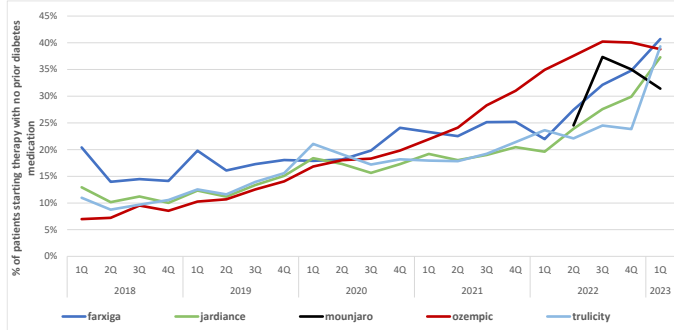


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 9: New patient starts naïve to diabetes medication**
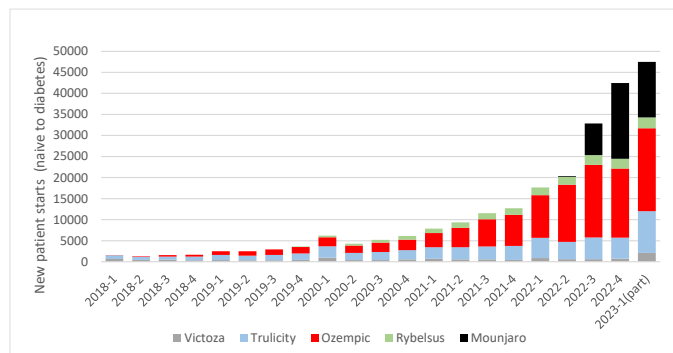


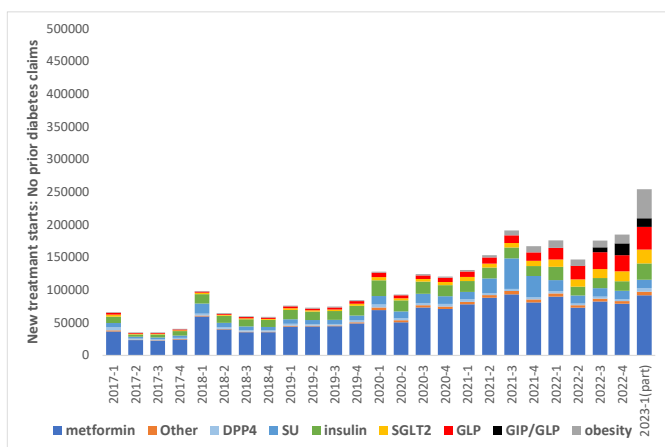Source: Credit Suisse Healthcare Database, Credit Suisse

## Analysis of growth from treatment-naïve patients and single-agent use suggests 30% obesity-focused use

In Figure 10 and Figure 11, we show the overall new treatment starts in our database for both diabetes-naïve and all starts. For interest, we also include the patients taking Saxenda/Wegovy for obesity. If we look at growth in the foundational therapy, metformin, which we see as the most likely first-time treatment, the CAGR for metformin initialisation has averaged 15% from 2018 to 2022. Within this period, growth has slowed from 24% CAGR in 2018-20 to 14% in 2020-22. We do not believe that there has been a decrease in the rate of diagnosis of diabetes and assume that the recent decline in metformin growth reflects growing use of the GLPs as genuine first-time use to treat diabetes.

Over the same period, we have seen the GLPs show average growth of 53% (33% 2018-2020 and 75% 2020-22). In Figures 39 to 43 on page 24, we look at the use of each of these drugs as sole agents without any co-prescribing of other diabetes drugs, and in combination use. We see that the sole use of Ozempic has risen from around 20% in FY'20 (Trulicity 5%) to 40% in 4Q'22 (Trulicity 21%). However, in 1Q23 we see first-time use for Ozempic essentially stabilise at 39% and that for Trulicity apparently match it. Of note, we see c 92% sole use of Saxenda – with 8% concomitant diabetes drug use (90% sole use of Wegovy).

If we assume that co-prescribing of diabetes medication indicates true diabetic use, this suggests that up to 30% of current GLP use could be obesity-focused.

**Figure 10: New treatment starts, with no prior diabetes claims, likely to reflect true diabetes starts**



Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 11: All new treatment inc. intensification of treatment, restarts post a six-month break and potential off-label usage**
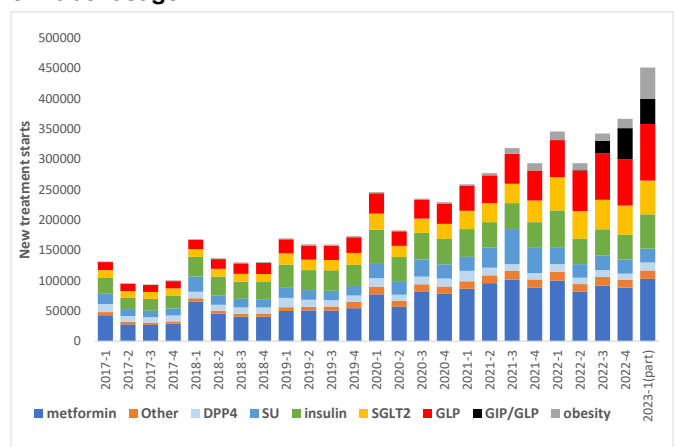


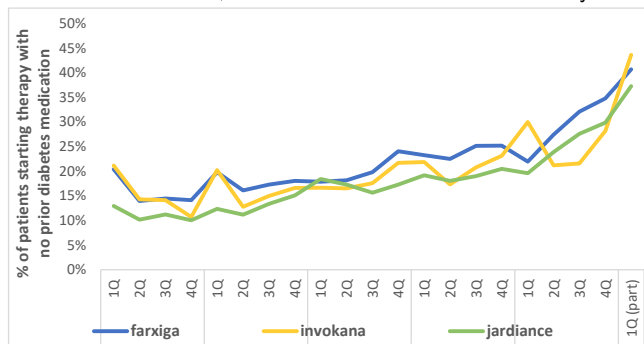Source: Credit Suisse Healthcare Database, Credit Suisse

## Proportion of diabetes-treatment-naïve patients starting on SGLT2s continues to rise

■ The SGLT2 class has been generating a wealth of data in adjacent indications to diabetes over time, leading to label extensions in heart failure and more recently in chronic kidney disease (CKD).

■ **AZN's Farxiga has the highest proportion of new patient starts where patients are naïve to diabetes treatment**. This is in line with our expectations, given Farxiga's broad label in non-diabetes indications versus peers Jardiance and Invokana. Farxiga was first approved in diabetes in the US in 2014, with subsequent label expansions for heart failure with reduced ejection fraction, HFrEF (2020), and chronic kidney disease, CKD (2021).

   o Our database includes c 68K new patient starts in FY22, of whom around 20K were naïve to diabetes.

   o We see good retention on treatment for Farxiga, with over 52% of 2021 starters still on treatment after 12 months (versus 43-48% for leading GLPs).

■ **In 4Q22, 37% of Farxiga new patient starts were naïve to diabetes treatment**, and 31% on average over 2022. This is an increase from 26% in 2021, 21% in 2020 and 18% in 2019. This compares with 31% for Invokana and 31% for Jardiance in 4Q22 (see Figure 13).

■ **Jardiance** has had a similar extension of indications beyond diabetes, adding heart failure with left ventricular reduced ejection fraction in April 2021 and more broadly with preserved ejection fraction in February 2022. The FDA accepted a supplemental indication in kidney disease in January 2023. Based on our database, use outside of diabetes is slightly lagging Farxiga.

**Figure 12: % patients starting an SGLT2 therapy naïve to diabetes medication** (note: Invokana numbers are relatively small)



Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 13: New patient starts naïve to diabetes medication**
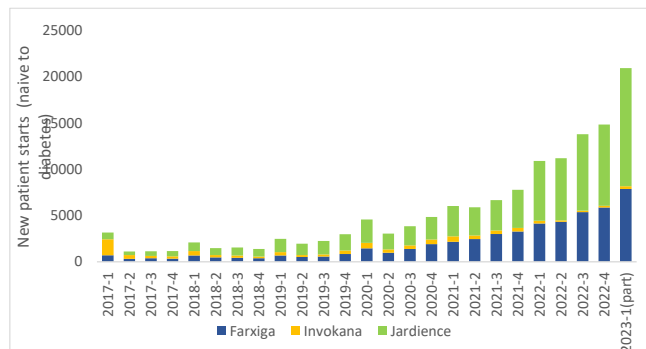


Source: Credit Suisse Healthcare Database, Credit Suisse

## Longevity (persistence) of use decreasing

Despite the life-saving nature of diabetes medication, our database continues to show a very consistent picture of use waning over time for the GLP drugs. The database is based on insurance claims and therefore will not capture free sample use, but all classes of drugs see around 20% of use stop within the first three months. The sample size for each key drug and year is shown in the legends in our charts. Data for the 2022 cohort is still immature as we need to take into account the high proportion of patients still on the drug at the end of the year who have not yet completed treatment. If we focus solely on completers, this would give an artificially high dropout rate. Conversely, assuming that all patients still on a drug at the end of any year will continue indefinitely would give too high a retention rate. For details of our methodology, please see the text surrounding Figure 57.

■ **We see a continuation of erosion for both Trulicity and Ozempic in 2022**, with current retention rates similar.

- o For the 2019 cohort of starters on Ozempic, we saw 53% retention at 12 months; this fell to 50% for the 2020 cohort and 43% for the 2021 cohort. Our initial estimate for the 2022 cohort (data to February '23) is 33% retention.

- o For Trulicity, we see 56% retention at 12 months for the 2019 cohort, falling to 54% for the 2020 cohort and 48% for the 2021cohort. Our initial estimate for the 2022 cohort of starters is 33% retention (data to February '23).

■ **Mounjaro is showing low early retention at 44% at six months, but data will be distorted by supply shortages and is clearly immature.** The data set is very limited with 78K starts, 26K completers and 51K still on treatment, of whom 32K were added in only in December.

■ **We see higher retention of SGLT2 use over GLP use in each time cohort**, with c 41% retention of the 2021 cohort for each of Jardiance and Farxiga at 24 months versus 32% for Ozempic and 36% for Trulicity.

■ **Obesity drugs as expected show highest dropouts:** We see Saxenda and Wegovy with the lowest 24-month retention (Saxenda average 10% 2018-2021, Wegovy 25% for 2022). Preliminary data suggests Saxenda starters in 2022 are persisting longer on treatment than in prior years, which may reflect the lack of availability of Wegovy for a large part of 2022. For both drugs, there is higher drop-off at three months than for diabetes-indicated drugs.

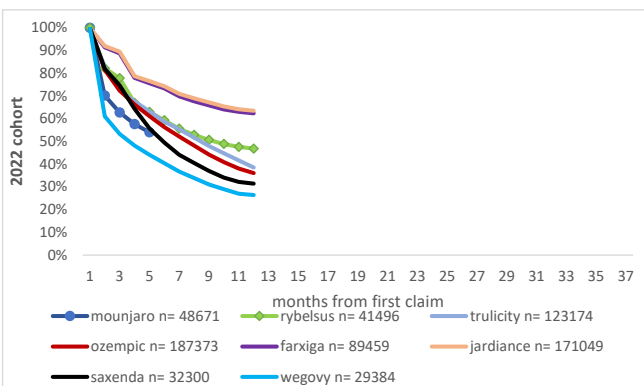**Figure 14: 2018 cohort: Persistence of use (in months)**
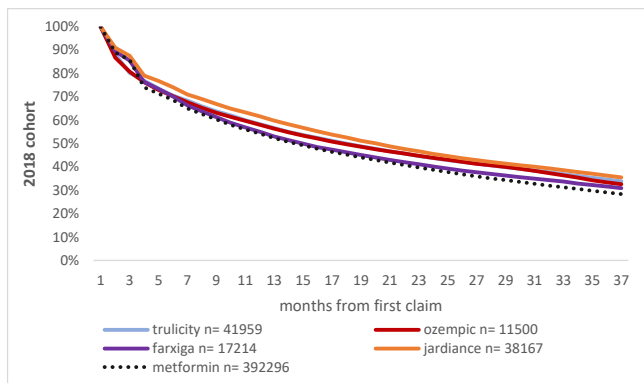


Source: Credit Suisse Healthcare Database, Credit Suisse

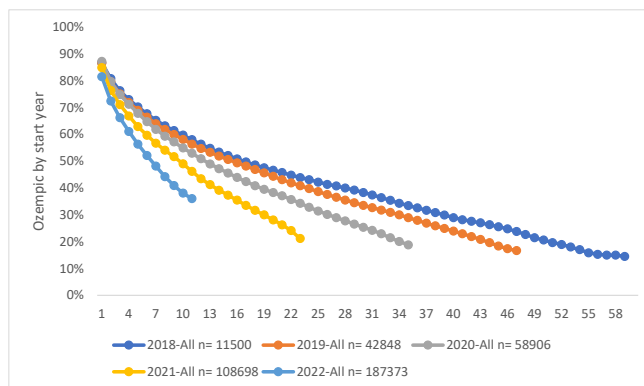**Figure 15: 2021 cohort: Persistence of use (in months)**
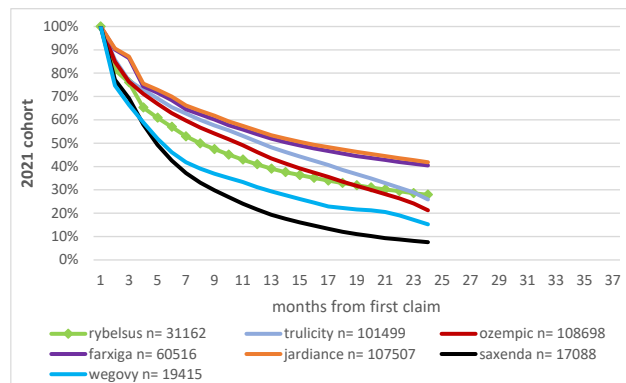


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 16: 2022 cohort: Persistence of use (in months)**



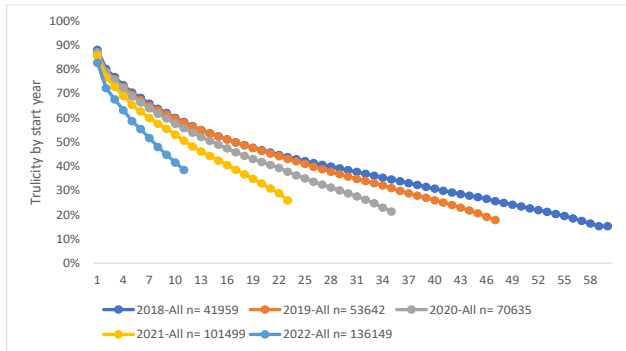Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 17: Persistence on Ozempic (in months)**



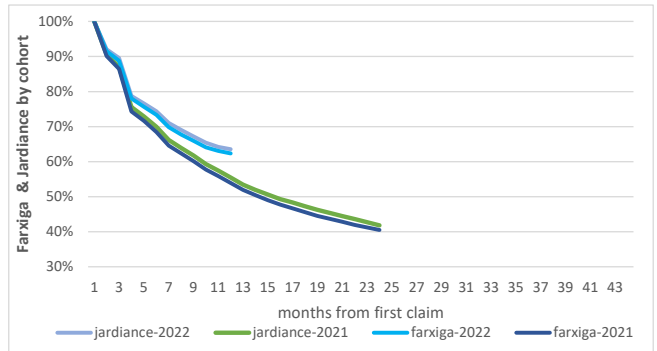Source: Credit Suisse Healthcare Database, Credit Suisse

In Figure 20, we look at adherence to treatment for those patients who claimed for treatment continuously from Sept 2021 to Sept 2022.  Mounjaro has not been available for a full year so is excluded. This analysis is based on claims made against a theoretical maximum based on 365 days of treatment and all adherence was over 75%. Lower adherence for insulins may reflect lower dosages required, as dosing is not simply set on a per-day basis. Trulicity appears to have marginally better adherence than Ozempic, and Rybelsus is perhaps surprisingly strong given the restrictions on taking the drug with food.

**Figure 18: Trulicity: Persistence by start year**



Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 19: Farxiga/Jardiance: Persistence by start year**



Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 20: Adherence to treatment for patients claiming continuously from Sept 2021 to Sept 2022**
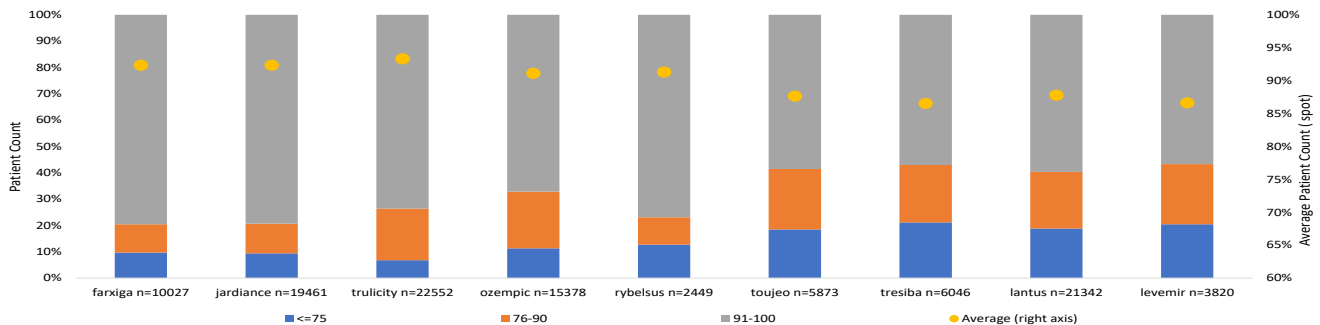


Source: Credit Suisse Healthcare Database, Credit Suisse

# Drug transitions in 2022 show

Using Sankey plots, we can look at typical patient journeys in diabetes. We look here at transitions between drugs, with a person counting as being on a drug only if they have taken at least six months of treatment. We have excluded for clarity many of the smaller brands. In Figure 21, we look at over 1.6m patients who have been stable on one therapy for a minimum of six months and look to see any transitions to other treatments that they have then held for at least three months. If through 2022 their treatment had not changed, they would be counted under the name of the drug on both sides of the Sankey plot. If they had changed from one drug to another drug, they would move, but if they added a drug to an existing treatment, they would be counted under both drugs on the right-hand side of the chart, so there is an element of double-counting.

We have highlighted in bold the patient groups identified as "Added drug" where they have added the drug identified at the end of the ribbon on the right-hand column to an existing treatment, or those as "Started drug" where the new drug on the right-hand side was the only drug added. Other patients may have kept their therapy unchanged or switched therapies.

In some charts, we identify all transitions, both onto and off drug regimes in 2022, in which case we also see "Removed drug" as highlighted; in others, for clarity we have shown transitions onto and off a particular drug in two charts.

- For most patients, the first drug they are prescribed is metformin, and we still see a large number of new starters.

- Mounjaro is featuring as a major product despite only having been available for around six months in this database.

We now look more closely at the various transitions, focusing on the course of business for the weekly GLP/GIP/GLP drugs. We see few switches between the traditional GLPs but see some switches from Ozempic and Trulicity to Mounjaro. This data does include some double-counting of patients taking more than one diabetes medication.

**Figure 21: Drug transitions between key diabetes drugs in 2022: starting drugs on the left, end drugs on the right**
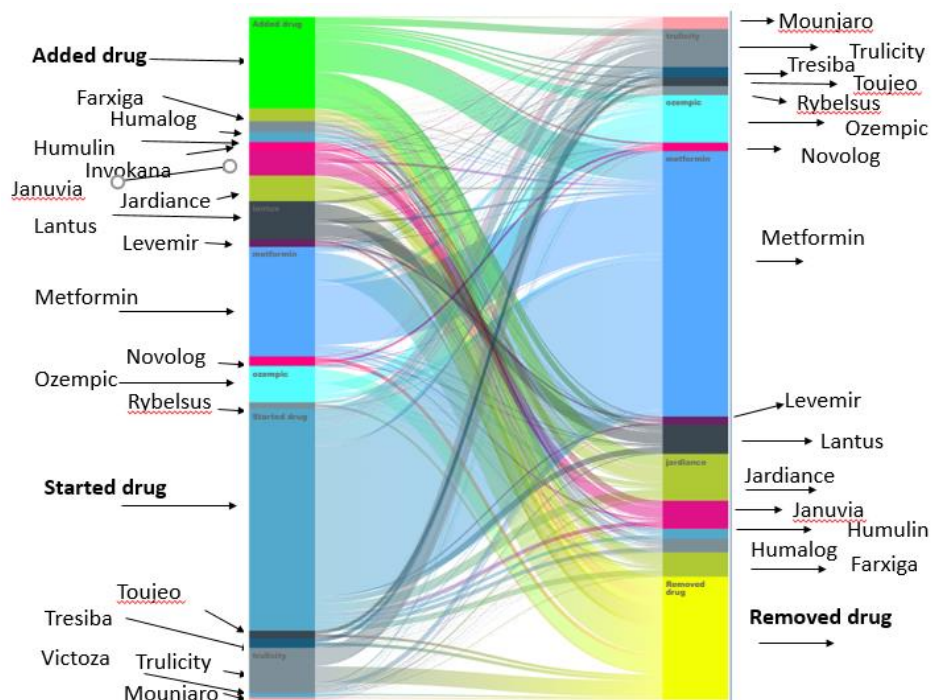


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 22: Transitions onto the two weekly GLPs and onto Mounjaro, a weekly GIP/GLP**
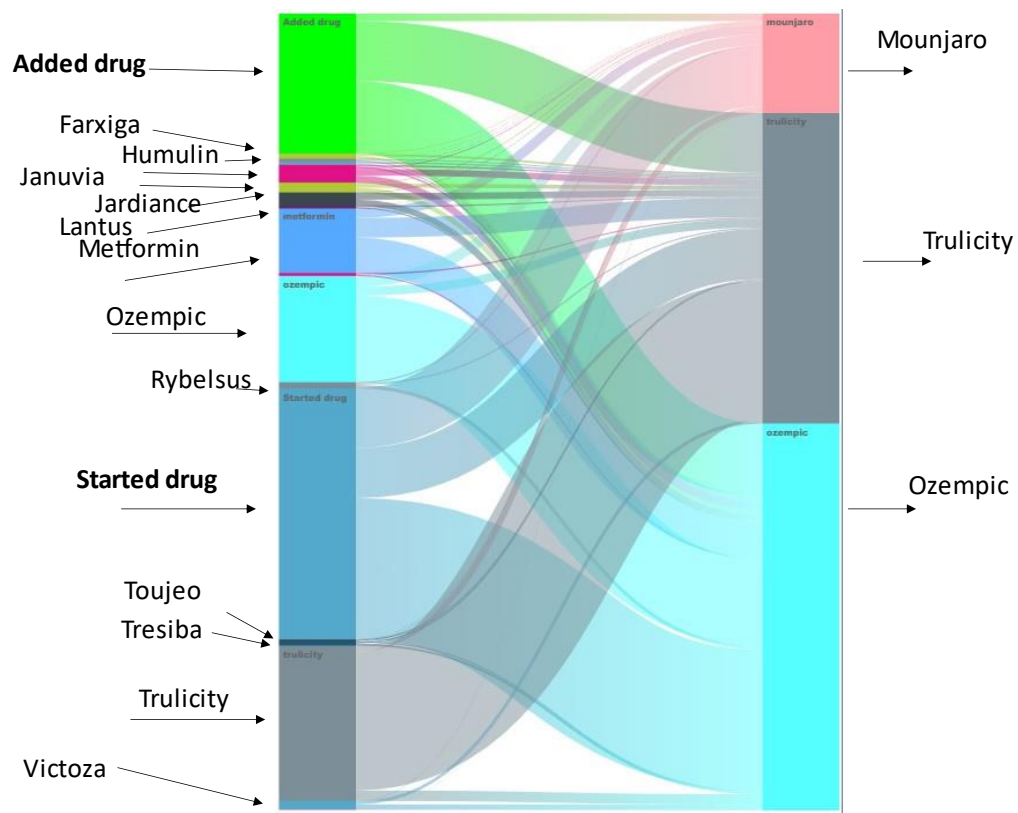


Source: Credit Suisse Healthcare Database, Credit Suisse

## Mounjaro: Strong initial uptake, taking slightly more patients from Ozempic than Trulicity

■ Around 48K patients were stable on Mounjaro in our database for a sufficient period to count in this analysis (typically six months, but this could be as little as three months if the patient was still taking the drug in December).

■ Of those, 7% added the drug to an existing regime and 59% took the drug with no prior diabetes medication in the prior six months. 10% appeared to transition away from metformin, 11% switched from Ozempic and 6% switched from Trulicity. We saw about 79K patients starting Mounjaro, of whom 18K had already stopped taking the drug by the end of the year. *Our database switch of 6% from Trulicity compares with LLY commentary at FY22 that c10% of Mounjaro patients were switches from Trulicity.*

■ The first claims we see were in June, so it is not yet meaningful to look at patients moving away, but we do see in a small sample some progression onto Ozempic.

**Figure 23: Transitions onto Mounjaro in 2022: patients must have claimed for at least three months of Mounjaro to be included**
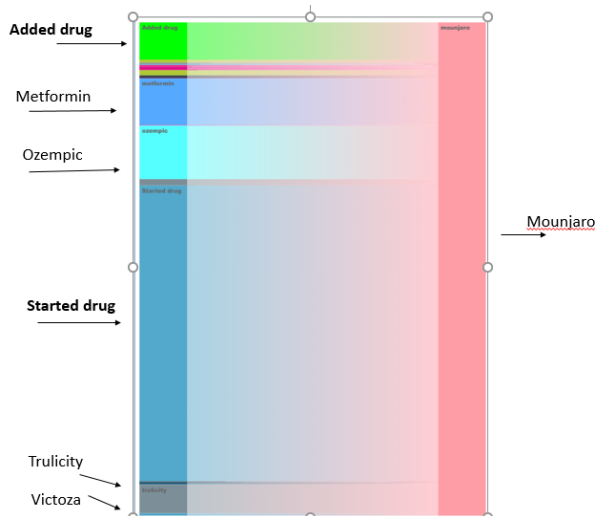


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 24: Transitions off Mounjaro**
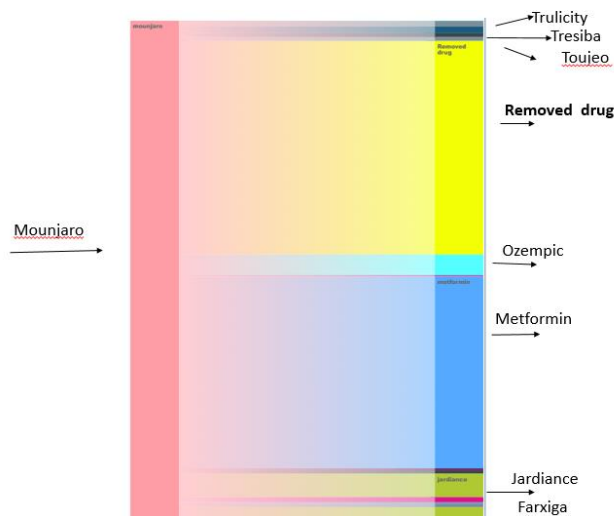


Source: Credit Suisse Healthcare Database, Credit Suisse

## Trulicity: Highly stable patient base with little leakage to Mounjaro or Ozempic

- Around 150K patients were stable on Trulicity at some point in 2022 versus around 100K on the drug at the end of 2022. We see 43% of patients stable over 2022. We see 19% added the drug to an existing regime, 15% started the drug as first therapy in at least six months, leaving 23% transitioning away from other drugs. The biggest source of switches was, unsurprisingly, metformin. Around 3% transitioned from Ozempic.

- We see 34% of patients stopping Trulicity and making no other diabetes claims in the subsequent six months. 36% remained stable on Trulicity and 30% moved to other treatments. Only 3% transitioned to Ozempic. We saw 2,700 patients switch to Mounjaro.

**Figure 25: Transitions onto Trulicity in 2022: patients must have retained treatment for at least three months to be included**
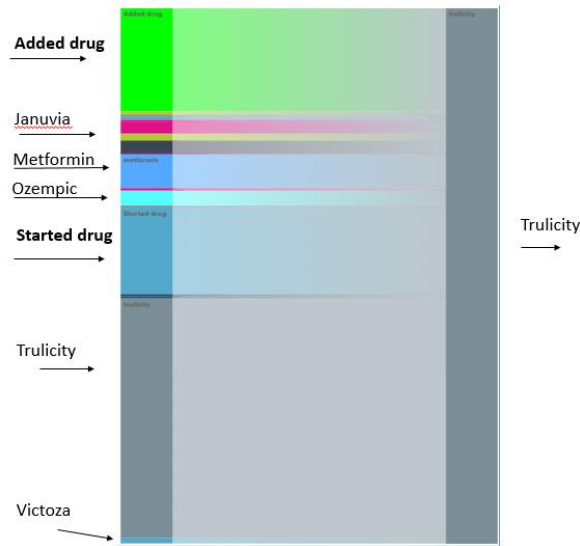


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 26: Transitions off Trulicity**
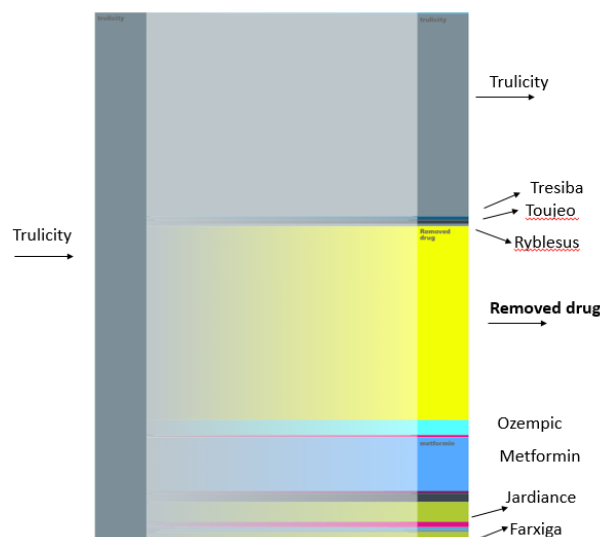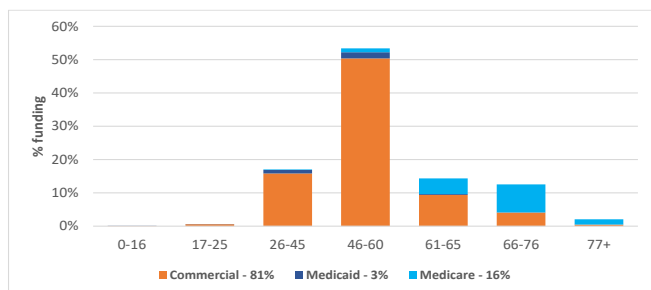


Source: Credit Suisse Healthcare Database, Credit Suisse

## Ozempic: High level of new starters, but slighter lower retention of treatment over 2022 than Trulicity

■ Around 190K patients were stable on Ozempic over 2022, with around 118K still on treatment at the end of 2022. We see around 35% started Ozempic as a new therapy, 18% added the drug to an existing regime, and 22% were stable on Ozempic, leaving 25% appearing to transition away from

other drugs, of which the biggest segment came from metformin. 3% switched from Trulicity.

■ Of those that stopped treatment with Ozempic after a period of at least six months, 37% made no other diabetes claims in the next six months or stopped taking the drug close to the end of the year. 28% stayed on Ozempic, with 35% adding other drugs.

■ We saw 5,118 patients transition from Ozempic to Mounjaro.

**Figure 27: Transitions onto Ozempic in 2022: patients must have retained treatment for at least three months to be included**
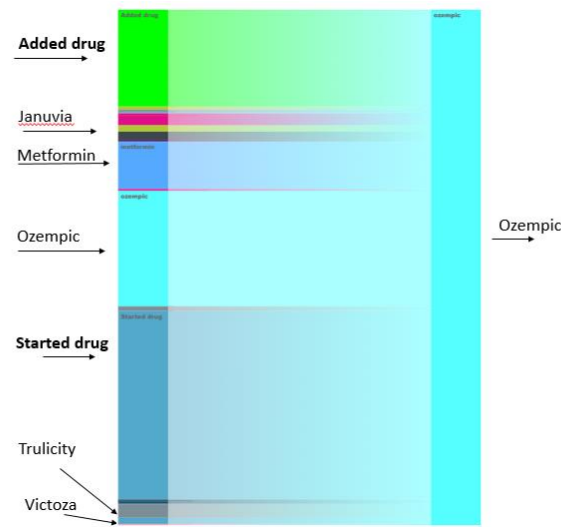


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 28: Transitions off Ozempic**
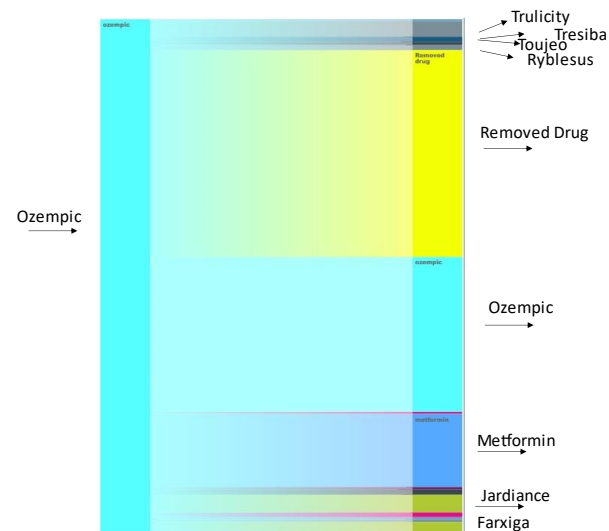


Source: Credit Suisse Healthcare Database, Credit Suisse

## Patient demographics GLPs: Average age of Ozempic users falling faster than competitor medicines

■ **Use of Ozempic in 26- to 45-year-olds rose faster between 2018 and 2022 than for other diabetes medicines.** Our database shows 24% of 2022 use of Ozempic is in patients in the 26-45 category, up from 18% in 2018. Whilst the diagnosis of diabetes is occurring in

younger ages, with earlier intervention over time, we think data may also reflect a higher proportion of off-label use for weight loss. In comparison, use of LLY's Trulicity in the 26-45 category has gone from 15% to 17% for the same period. Rybelsus and Mounjaro both launched post-2018, with 2022 data showing 17% and 32% of use in the 26-45 category, respectively. However, we also expect a greater proportion of use in a younger population closer to launch, given the typical lag in gaining Medicare coverage.

**Figure 29: Ozempic: Age and funding. Patient starts '18 n=10K**



Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 30: Ozempic: Age and funding. Patient starts '22 n=210K**
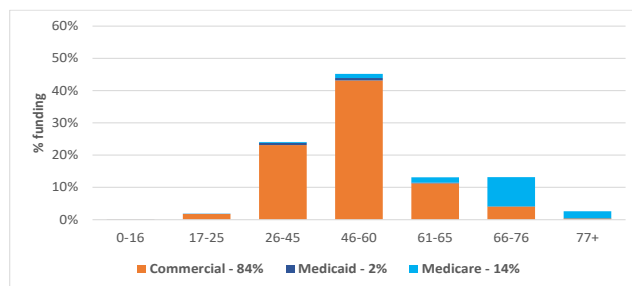


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 31: Trulicity: Age and funding. Patient starts '18 n= 33K**
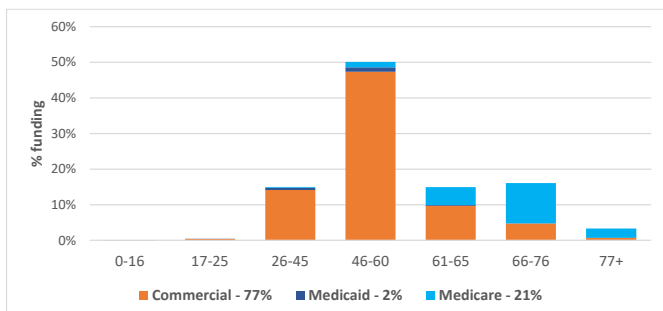


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 32: Trulicity: Age and funding. Patient starts '22 n=136K**
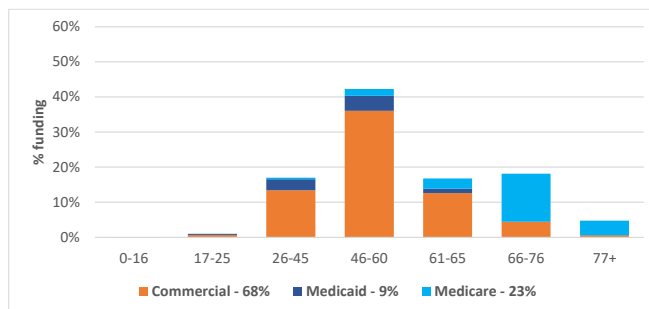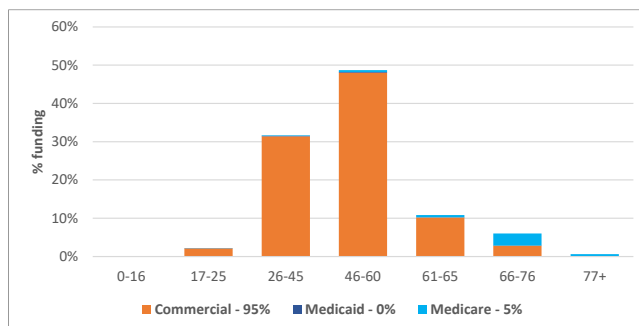


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 33: Rybelsus: Age and funding. Patient starts '22 n=46K**
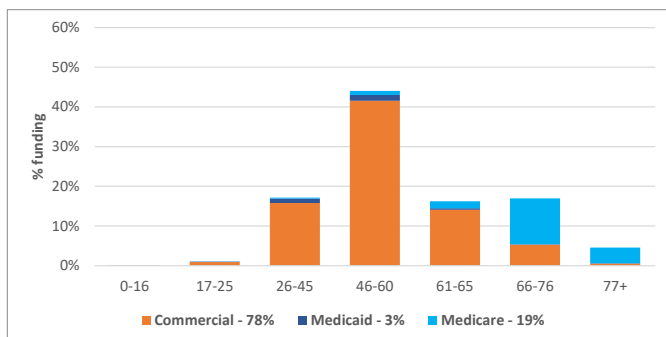


Source: Credit Suisse Healthcare Database, Credit Suisse

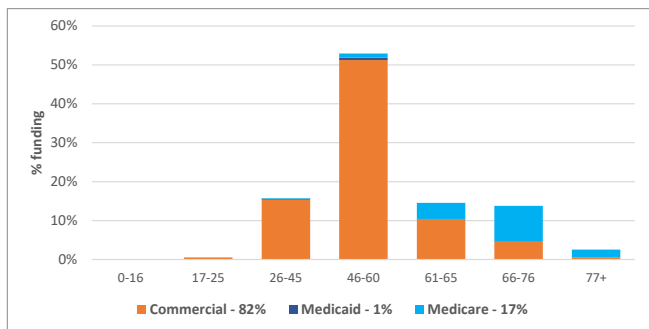**Figure 34: Mounjaro: Age and funding. Patient starts '22 n=80K**



Source: Credit Suisse Healthcare Database, Credit Suisse

## Patient demographics SGLT2s: Average age of SGLT2 users rising with use in new indications

■ We see the growth in use of SGLT2s driven by growing supportive data on prevention of death in diabetes, and extension of indications into heart failure (from 2020) and chronic kidney disease (from 2021). The most recent

approval for Jardiance in February 2022 extended the indication into heart failure with preserved ejection fraction (HFpEF), with Farxiga also showing positive data in this setting in May 2022. We note that Jardiance seems to be the preferred agent in the Medicare setting. On average, government funding has increased from 22% to 36%, with Farxiga moving from 18% to 32%.

**Figure 35: Farxiga: Age and funding. Patient starts '18 n=17K**



Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 36: Farxiga: Age and funding. Patient starts '22 n=95K**
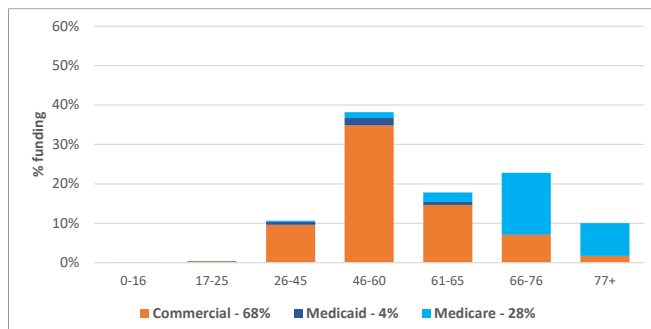


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 37: Jardiance: Age and funding. Patient starts '18 n=38K**
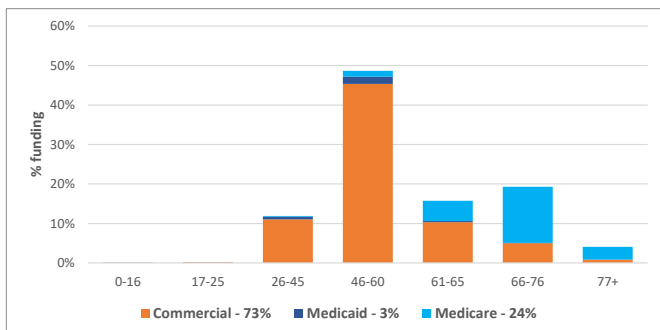


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 38: Jardiance: Age and funding. Patient starts '22 n=180K**
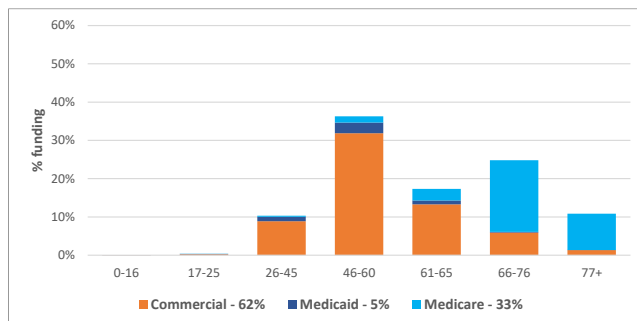


Source: Credit Suisse Healthcare Database, Credit Suisse

## Concomitant drug use: Single-agent use may suggest growing off-label use for diabetes

In this section, we highlight the percentage of patients in any quarter taking each key drug and the percentage of patients also taking other diabetes medications at the same time. Of

note, there is significantly higher use of Ozempic as a sole treatment (38% 4Q22, 44% 1Q23) than for Trulicity (21% 4Q22, 33% 1Q23). This has increased meaningfully since 1Q2021 (22% for Ozempic and 17% for Trulicity). Looking at the weight-loss-labelled GLPs Saxenda and Wegovy, we see c 10% co-prescribing with diabetes drugs.

**Figure 39: Use of diabetes combinations: Ozempic**
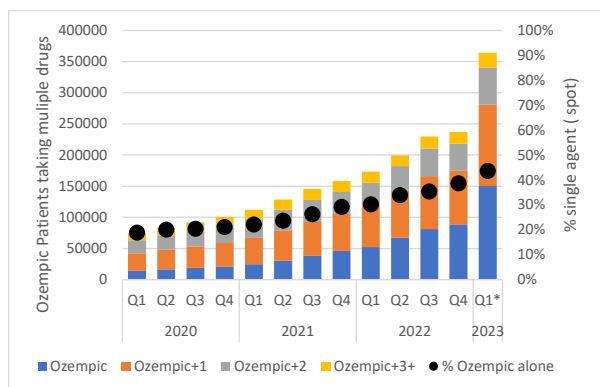


Source: Credit Suisse Healthcare Database, Credit Suisse

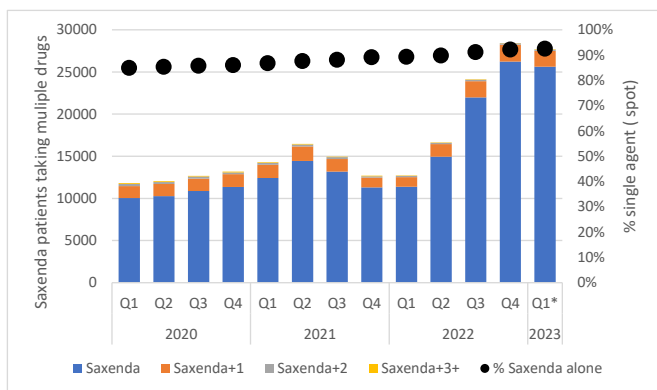**Figure 40: Use of diabetes combinations: Trulicity**
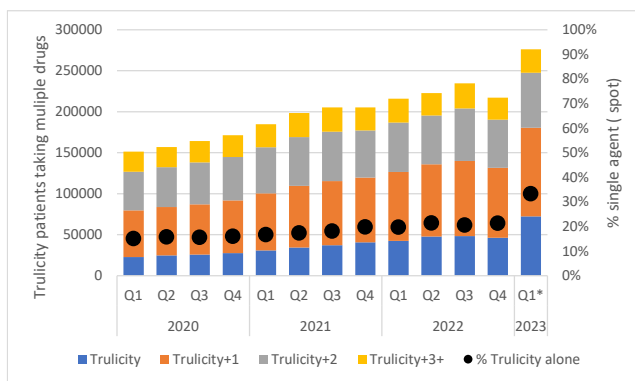


Source: Credit Suisse Healthcare Database, Credit Suisse

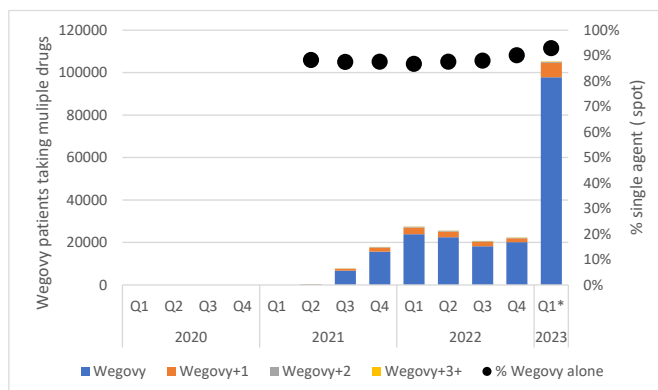**Figure 41: Use of diabetes combinations: Rybelsus**
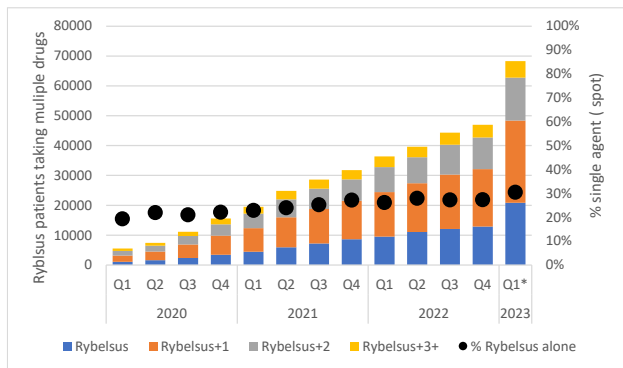


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 42: Use of diabetes combinations: Saxenda**



Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 43: Use of diabetes combinations: Wegovy**



Source: Credit Suisse Healthcare Database, Credit Suisse

## The value of looking at paid scripts from the Credit Suisse Healthcare Database

The Credit Suisse Healthcare Database looks only at paid insurance claims and patients on treatment, whereas we believe that the IQVIA Rx database includes a level of free and heavily subsidised scripts that arise from the extensive co-pay programs offered by both Lilly and Novo. When we compare the growth rate from 2019 to 2022 in relevant claims in our database, or in the number of patients making claims with IQVIA scripts, all indexed to IQVIA script levels in 2019, we see a growing disparity from mid-2021 onwards for both of the key GLPs.

We do not see the same disparity in growth of metformin script data. We note that the overall CS Healthcare Database subscriber growth rate has been c 5% between 2020 to 2022, with Diabetes Rx claims growing at 6%. The latest US census data shows no overall population growth. We would therefore expect to see indexed Rx growth in our database grow faster than IQVIA data, which is adjusted for a population basis.

We estimate the growth in insurance-claimed scripts for Ozempic has been growing at c 21% on average from 2019-22 against IQVIA TRx growth of c 26%. For Trulicity, we see average insurance claim growth of 6% versus 9% shown in IQVIA data.

Whilst Novo has been vocal on capacity constraints for Ozempic and Wegovy, it appears that it has not concentrated limited supply to fully covered patients with continued strong growth in subsidised product. This is manifest in higher gross to net over time. We see a gross to net increase for Ozempic from 41% to 63% from 2019 to 2022 based on IQVIA gross sales to reported net sales and from 51% to 63% for Trulicity.

For 1Q23, we have extracted data that we believe covers most of 1Q (with different analyses having the latest data added with a cut-off between end-February and 17 March). However, as the data is based on settled claims, which will lag audit data that is based at the point of dispensing, we would not expect this to be a complete data set as yet. However, we see no reason it would not be as representative as previous cohorts in terms of prior treatment regimes.

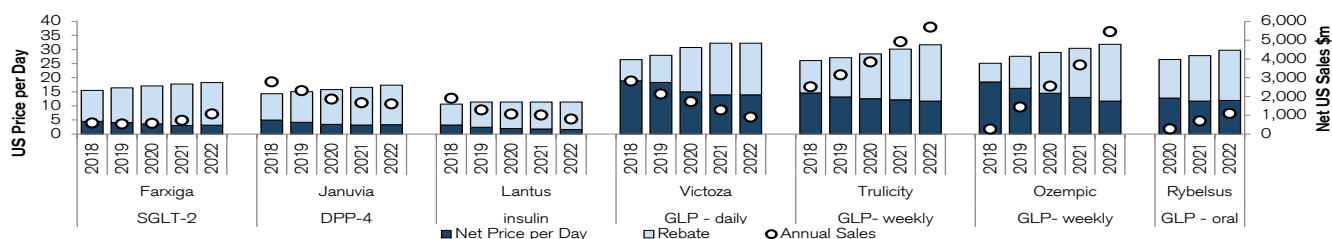**Figure 44: Ozempic CS data rebased to IQVIA 1Q2019**
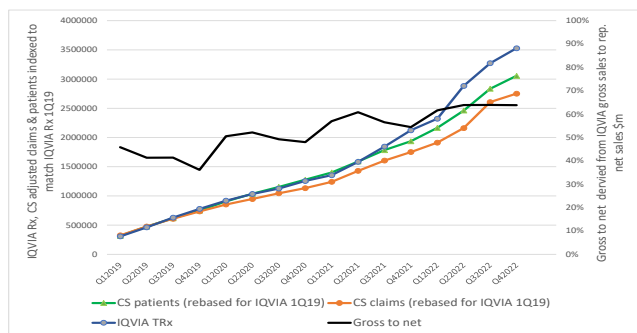


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 45: Trulicity CS data rebased to IQVIA 1Q2019**
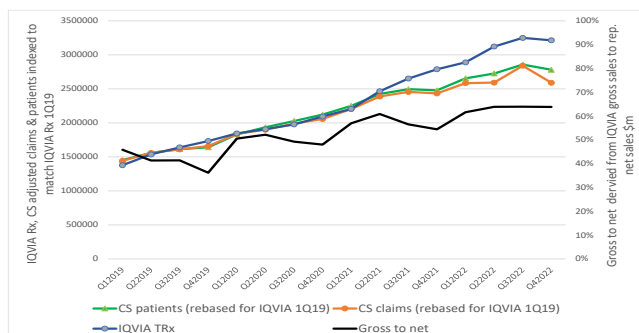


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 46: List price per day, gross to net adjustments and overall reported US sales**



Source: Company data, Price Rx, IQVIA data

## Recent guideline updates support demand growth

The GLP-1 class has on the whole had impressive launch trajectories, with fast uptakes from launch. The first to launch was Novo's Victoza in 2010. The recent uptake of Wegovy in obesity and LLY's Mounjaro in diabetes have been particularly impressive, although both of these have been distorted by supply issues. We expect the overall GLP-1 market to expand meaningfully with the entrance of these new, more efficacious treatments, with large sales expectations for the class that also encompasses obesity treatment.

A key element behind the adoption of the GLPs in our view has been the change in guidelines that now explicitly bring the GLPs to the forefront of treatment, as illustrated below. The change in the past five years between 2018 and 2023 in the emphasis on weight loss as being central to diabetes treatment is notable.
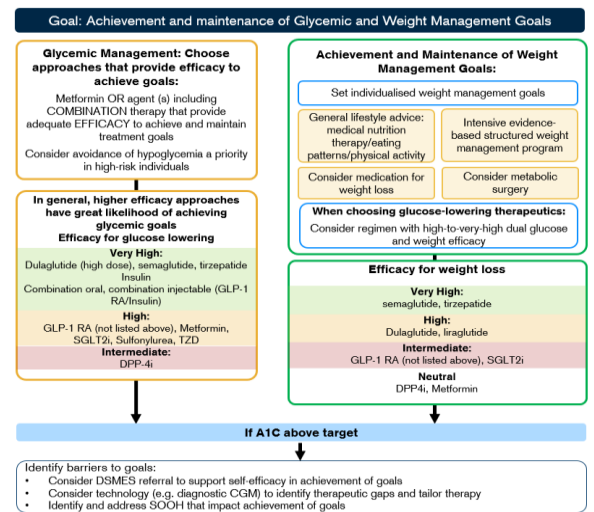
In Figure 49 to Figure 52 we show recent US audit data for the diabetes class.

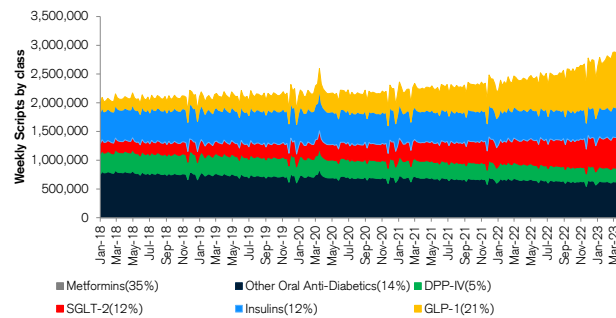**Figure 47: Extract from Jan 2018 ADA guidelines**



Source: Adapted from 2018 American Diabetes Association Guidelines, Credit Suisse

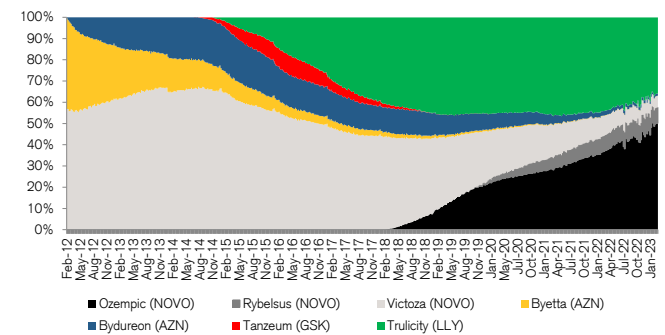**Figure 48: Extract from Jan 2023 ADA guidelines**



Source: Adapted from 2023 American Diabetes Association Guidelines, Credit Suisse

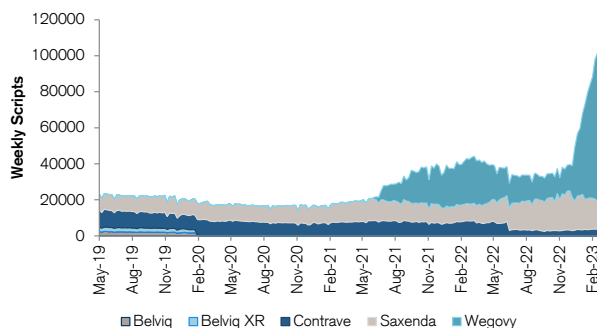**Figure 49: TRx of various diabetes classes**



Source: IQVIA Audit Data
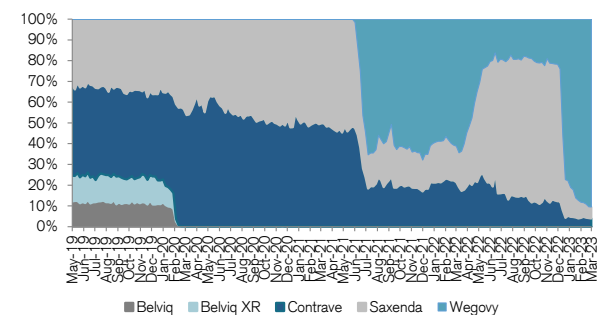
**Figure 50: TRx share of brands within the GLP class**



Source: IQVIA Audit Data

**Figure 51: TRx of various obesity drugs**



Source: IQVIA Audit Data

**Figure 52: Weekly NBRx, new to brand data**



Source: IQVIA Audit Data

Therapeutic Journeys in Diabetes

**❝** Our database allows us to look longitudinally at patient treatment choices, thus identifying patients who are naïve to diabetes medications (and may be using drugs off-label for weight loss) or those who have taken prior therapies (and are likely truly diabetic, but who may also be seeking weight loss).

# Methodology

We have once again analysed prescription claim data from the Credit Suisse Healthcare Database which includes Rx (outpatient prescriptions) and Mx (medical claims). The Rx database covers an average of 121m subscribers in 2022, with over 3.4m diabetes-related Rx claims. We believe the database is representative of the overall mix of age and funding in the US population. For more details, please see our April 2022 report, _Therapeutic Journeys in Diabetes_.

- Our database allows us to look longitudinally at patient treatment choices, thus identifying patients who are naïve to diabetes medications (and may be using drugs off-label for weight loss) or those who have taken prior therapies (and are likely truly diabetic, but who may also be seeking weight loss).

- We are also able to look in detail at patients prescribed GLP-1 treatments by age cohort and by funding.

- In this report, we look at both all-comers' data, where we look at the overall level of claims, but also censored data where we specify a lead into treatment. When we look at the data feeding into the analysis of first treatments for treatment-naïve patients (Figure 10 and Figure 11 on page 13), we narrow down the database to include patients only if we can be sure that they were active subscribers for at least six months prior to the first claim for any diabetes medication. This mitigates against us incorrectly identifying new patients to the database as new to diabetes treatment.

- It is well known that many patients take treatment only for a very short period, not renewing what should be chronic medication. IQVIA audit data sampled at the point of being dispensed will include some scripts that are essentially fully paid for by manufacturers where plans do not reimburse, and we have always assumed that there we would see a greater drop-off from this data set as patients may well decide not to continue when copays kick in, for example. Our database in contrast covers only settled insurance claims and although there may still be some co-pay assistance supporting some

patients, insurance claims will start only after free samples and bridge programs are exhausted. We believe our data, whilst suffering some lag on reporting, should have less "noise." We compare data for Ozempic and Trulicity in Figure 44 and Figure 45 on page 25.

- Longevity analysis. One of the most differentiated pieces of analysis that this database allows us to do is to follow the persistence of therapy. In this analysis, we look only at patients who we can see via any claims are continuing as active members of the database from the point at which they started the medication until at least nine months after the last claim, to ensure that we are not cutting off patients as completers merely because their insurance provider changed. We look at patients starting treatment in annual cohorts and look at the length of time that they stay on treatment. From the vantage point of the end of 2022, we can look at the data for the 2018 cohort of starters with a high degree of confidence as most of the patients will have completed treatment. Using Trulicity as an example, we saw that 42K patients in our database started treatment in 2018, of whom 33.5K stopped taking Trulicity for at least four months (full completers), and there are 8.5K patients that started Trulicity treatment in 2018 that are still on drug. In order to avoid picking up patients who have taken a treatment break as new starters, we allow a break of four months in treatment within the Sankey plot work before a patient is deemed to have stopped taking a drug.

- If we look at the 2022 starting cohort, the situation is less clear. Around 136K patients started treatment in 2022, 13K of which started treatment in December. There is no way of knowing whether a patient who took one dose in December will drop off or stay on therapy, so they contribute no valuable data to persistence; hence we exclude them from the 2022 population. This leaves 123K patients, of whom 54K had already stopped treatment by the end of the year and 69K who have taken >1 dose and remain on

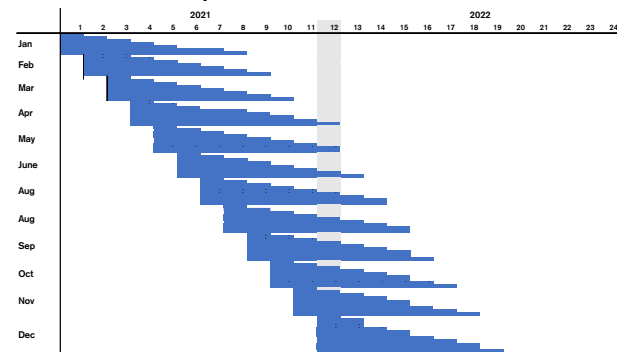**Figure 53: CS Healthcare Database patient and claim numbers**

| Year | Overall Subscribers | Avg Subscribers | Subscribers with claims | Overall Claimants | | | Diabetes Claimants | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Rx | Mx | of which Rx & Mx | Rx | Mx | of which Rx & Mx |
| 2017 | 126.2 | 117.6 | 58.2 | 31.5 | 20.7 | 15.5 | 3.08 | 1.84 | 1.23 |
| 2018 | 124.2 | 116.0 | 60.2 | 32.3 | 20.3 | 15.2 | 3.05 | 1.73 | 1.19 |
| 2019 | 130.1 | 116.1 | 64.6 | 33.4 | 21.7 | 15.4 | 3.11 | 1.83 | 1.21 |
| 2020 | 123.5 | 115.4 | 68.6 | 36.0 | 20.5 | 15.0 | 3.21 | 1.74 | 1.22 |
| 2021 | 134.6 | 125.9 | 73.1 | 43.6 | 20.9 | 15.9 | 3.55 | 1.79 | 1.25 |
| 2022 | 130.8 | 121.0 | 80.4 | 43.8 | 19.3 | 15.1 | 3.44 | 1.67 | 1.20 |

Source: Credit Suisse Healthcare Database, Credit Suisse

treatment who need to be considered. 21K of patients stopped therapy after one month, so we have a large data set where we can confidently say that 17% of patients (21K/123K) dropped off therapy after one month. However, the data gets less robust through the year as the number of patients that could have taken the increasing number of doses declines: e.g., in 2022, the only patients that could have taken 12 doses started in January (and the only ones to have taken 11 started in January or February, etc.). We know that 6.7K patients were still on treatment after 12 months, and c 500 dropped off treatment after their 11th month, so the decline in persistence after 11 months is calculated as 7% (500/6.7k+500). This data set is still relatively large for drugs like Trulicity and Ozempic, where volumes are high, but for Saxenda, for example, the sample size for month 12 persistence in 2022 is c 800, so there can be some variability in smaller data sets.

■ This methodology is slightly different to how we have presented persistence data previously, where we assumed that patients that remained on therapy (at any point) carried on treatment to perpetuity, which artificially shifted the persistence curves higher. This impacts only the analysis of the tail of data when remaining patient numbers are small or the most recent cohort data with launches mid-year (Mounjaro in 2022), where the number of dropouts is low.

■ We show a worked example below for a theoretical drug

taken by 100 patients who started in 2021, all of whom took the drug for a maximum of eight months but started at different times. We can see the trajectory of use, with full knowledge measuring this at the end of 2022, when 100% of patients have completed treatment. However, we also want to look at the 2022 cohort, of whom only 56 have completed treatment at the database cut-off.

- o If we look just at the 56 completers, we will overestimate the level of drop outs, as we will not include any of the longevity of the 43 patients still on therapy, a number of whom will have been on the drug for a considerable period, including two who will have been on the drug for eight months, the maximum period, but won't be counted as they have not yet dropped out to become completers.

- o If we look at completers but look at these as a percentage of the full starting cohort, we will underestimate the dropout rate.

- o Our methodology considers at each time point the number of months a patient could have taken the drug, be they a completer or still active on treatment. For example, at four months we would count as continuing all the patients who have completed at least four months of therapy either as a completer or continuing active patient.

**Figure 54: Example of drug with 100 patients starting treatment at various time points through 2021; 55 of them had completed treatment at Dec 2021**
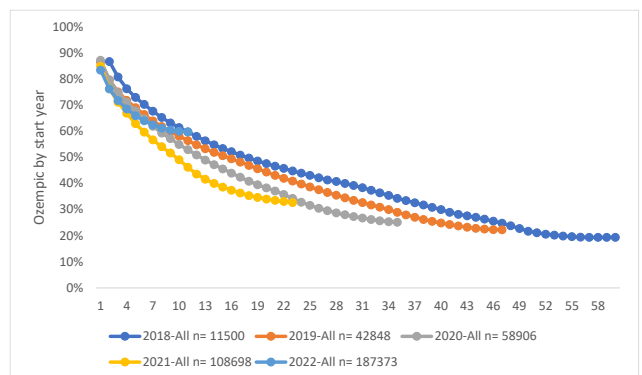


Source: Credit Suisse

**Figure 55: CS adjusted data at 12 months mirrors the eventual longevity data that can be measured on completion at 24 months**



Source: Credit Suisse

**Figure 56: New methodology output for longevity**
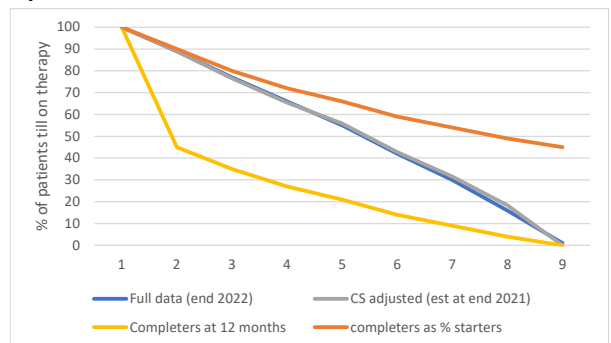


Source: Credit Suisse Healthcare Database, Credit Suisse

**Figure 57: Old methodology output for longevity**



Source: Credit Suisse Healthcare Database, Credit Suisse