

Predicting GLP-1 Trends

Insights from Markov Models and California Benefit Reviews

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Speaker

John Rogers, ASA, MAAA, MS, is a Management Consultant and Product Development Leader at Milliman. John has 15 years of experience in actuarial analysis and business intelligence. John leads Milliman's engagement with the health plan of America's premier children's hospital. John currently leads actuarial analysis for proposed laws impacting pharmacy costs in California. He also works with a variety of health tech companies to connect data to outcomes.

John is a former surface warfare officer and was awarded 3 navy achievement medals.



Speaker

An-Chi Tsou, is Principal Analyst at the California Health Benefits Review Program, where she leads analytical teams and manages external affairs. She also develops educational materials to inform the California Legislature and the public about health insurance and benefits. An engineer and scientist by training, An-Chi brings extensive experience from both the legislative and regulatory branches of state government. She previously served as a Governor's appointee at the California Department of Consumer Affairs and as lead health policy staffer for then–Assemblymember, now Attorney General, Rob Bonta. She has also worked as a policy consultant, focusing on healthcare, racial and social equity, and workforce issues. An-Chi holds a BS in Engineering Science from Smith College and a PhD in Bioengineering from UC Berkeley, where she conducted research on blood cancers.



WHAT IS CHBRP?



**Established in
2002 through
legislation**



**Responds to
requests from
the California
Legislature**



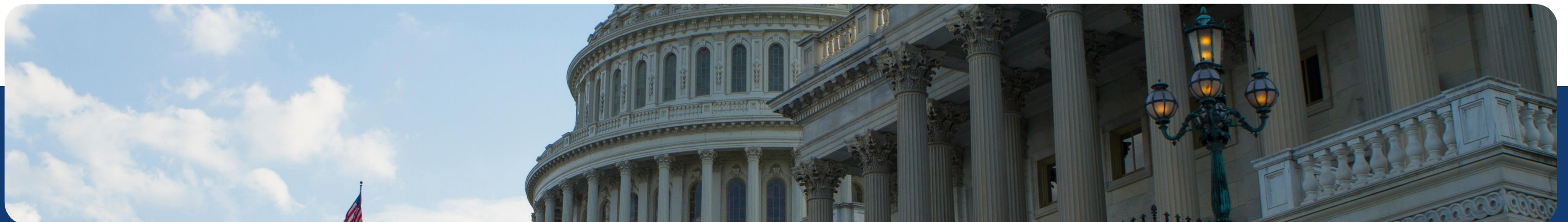
**≤60 days for
turnaround**



**Evidence-
Based, Neutral
Analyses**



**Resources on
Health
Insurance
Benefits**



PEOPLE

Staff & Contractors

Milliman

Task Force of
Faculty &
Researchers

Content
Experts

National
Advisory
Council

Librarians



WHAT DOES CHBRP ANALYZE?



Health Benefit Mandates

e.g., coverage for screenings / tests / treatments; services from specific provider; supplies and equipment

Reimbursement Rates

e.g., state reimbursements to specified licensed professionals

Healthcare Financing

e.g., medical loss ratios, single-payer

Cost Sharing

e.g., prohibitions, caps, etc.



WHAT CHBRP DOESN'T ANALYZE

- Licensing requirements and professional standards
- Health facilities
- Food and nutrition labels
- Other topics unrelated to health insurance benefits

CHBRP ANALYSIS BREAKDOWN

Policy Context	Medical Effectiveness	Cost	Public Health
• Affected markets • Related state and federal laws • Other states	• Existing evidence on proposed benefit • Strength of evidence	• Coverage • Utilization • Cost Change	• Population-level health • Number of enrollees impacted



SAMPLE OF 2025 LEGISLATIVE ANALYSES

- Insulin cost sharing caps
- Menopause treatment
- Prescription hormone therapy
- Maternal mental health
- Medicare supplemental coverage
- HEPA purifiers
- Antiretroviral drugs
- Essential health benefits benchmark plan

POSSIBLE POST-CHBRP ACTIONS



At any point, author's amendments and technical assistance from state regulators could change the bill language; CHBRP provides updates with directional impacts unless requested to provide a detailed update.

**Legislation: a perfect example of how small
changes can make a big impact**





A TALE OF TWO GLP-1 BILLS

SENATE BILL 535

- Mandate coverage for “***at least one FDA-approved antiobesity medication (AOM)***” for the treatment of obesity.
- Silent on prior authorization

ASSEMBLY BILL 575

- Mandate coverage for “***at least one glucagon-like peptide-1 receptor agonist*** for the treatment or prevention of obesity.”
- Prohibition on prior authorization

CONTEXT: BASELINE STATS

Total enrollees with health insurance subject to state benefit mandates	22,207,000	58.4% of CA pop
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Total enrollees with health insurance subject to either SB 535 or AB 575	13,570,000	35.7% of CA pop
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Enrollees with coverage for obesity treatments

<i>With coverage for GLP-1 AOMs</i>	17.40%
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<i>With coverage for non-GLP-1 AOMs</i>	93.20%
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ADDITIONAL CONTEXT: \$\$\$



	GLP-1 AOMs (30-day supply)	Non-GLP-1 AOMs
Average unit cost	\$499	\$9
Average cost sharing	\$57.75	\$1.21



COMPLIANCE ASSUMPTIONS

SB 535: AOM mandate

- Choice between high-cost and low-cost drugs
- High baseline coverage for low-cost drugs

CHBRP assumption: if already compliant due to non-GLP-1 coverage, plans would not choose to cover GLP-1s.

AB 575: GLP-1 mandate

- No lower cost drug option
- Prior auth is only utilization management prohibited

CHBRP assumption: plans would comply with the new law and cover GLP-1s if not already covered; step therapy and other UM compliant.

BASELINE MILLIMAN DATA

*Postmandate utilization
assumption of 7.5% in
first year, based on
Milliman data.*

Eligible populations

Number of enrollees with obesity	3,065,012
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Number of overweight enrollees with comorbidities	756,350
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Utilization with coverage

Number of enrollees using GLP-1 AOM	37,632
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Number of enrollees using non-GLP-1 AOM	53,318
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Utilization without coverage

Number of enrollees using GLP-1 AOM	42,813
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Number of enrollees using non-GLP-1 AOM	2,023
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OTHER CONSIDERATIONS



- **Cost offsets**

- If evidence shows that use of one service would lower the overall cost of care due to reduction in need of other services, CHBRP estimates that “offset” in total cost.
- GLP-1 Mandate: Medical costs would decrease \$100 per GLP-1 user per year due to reduction in risk of heart failure after 12-18 months of treatment.

- **Side effects and potential harms**

- Utilization estimates changed based on evidence in literature reviews

ESTIMATED EXPENDITURES



	SB 535: AOM Mandate	AB 575: GLP-1 mandate
Total Premiums	\$530,000	\$1,000,000,000
Cost Sharing	\$98,000	\$153,000,000
Noncovered Expenses	(\$219,000)	(\$256,000,000)

*By Year 2, increase to \$1.5B and
~12,600 newly uninsured*

Approach to CHBRP Forecasts

60-day timeline require a pro-active approach

- Prework (Live Cost Model)
- Ambiguous bill language
- Prioritize real world data
- Share a live model with CHBRP
- One- or two-year forecast



Senate Bill 839 (2023)
Obesity Treatment Parity Act
Analysis at a Glance
as amended on 5/10/2023

Bill Summary	Context
SB 839 would require comprehensive coverage for obesity treatments, including: ■ Bariatric surgery ■ IBT ■ Prescription drugs approved by the FDA with an indication for chronic weight management, including glucagon-like peptide 1 (GLP-1) receptor agonists and non-GLP-1 drugs. Coverage criteria could not be more restrictive than the FDA-approved indications. SB 839 would also require that cost sharing for obesity treatments not be different or separate from treatments for other illnesses, conditions, or disorders.	Obesity is a chronic health condition characterized by an increase in the size and amount of fat cells in the body. Individuals with a BMI of 25 or higher are categorized as overweight and those with a BMI of 30 or higher are categorized as obese. Causes of obesity are multifaceted and can include: lifestyle habits, environment, socioeconomic factors, and individual characteristics such as genetics and metabolism. There are many health consequences of obesity such as an increased risk of heart disease, diabetes, and certain cancers, as well as reduced life expectancy. Nearly 3 million Californians with obesity and a half million overweight Californians with comorbidities are enrolled in health insurance that would be subject to SB 839.
Insurance Subject to the Mandate SB 839 would apply to the health insurance of approximately 14 million enrollees (36% of all Californians) ☐ Medi-Cal ☒ CDI and DMHC Regulated (Commercial & CalPERS) ☐ Federally Regulated Body Mass Index (BMI), California Health Benefits Review Program (CHBRP), California Department of Insurance (CDI), California Department of Managed Health Care (DMHC), Food and Drug Administration (FDA), Glucagon-like peptide-1 (GLP-1), Intensive behavioral therapy (IBT), Senate Bill (SB)	Benefit Coverage and Expenditures At baseline, among enrollees with health insurance that would be subject to the mandate, coverage fully compliant with the mandate varies: ■ 99% for bariatric surgery and IBT; ■ 10.1% for GLP-1s; ■ 32.5% for non-GLP-1s. Postmandate, all would have fully compliant coverage. Total net annual expenditures increase by \$1.27 billion or 0.9% for enrollees with plans and policies regulated by DMHC and CDI. Because premium changes would exceed 1% for several market segments, 10,000 enrollees would become uninsured.
	Public Health Impacts Postmandate, 149,000 enrollees would use either GLP-1s (a 90% increase) or non-GLP-1s (a 68% increase). Enrollees who used consistently would see a 5-14% decrease in body weight. Long-Term Impacts Continued use of the prescription drugs with an FDA indication for weight management could lead to: ■ Reduction in the prevalence of obesity and obesity-related chronic disease ■ Reduction in downstream effects such as impacts on premature death It is unclear if long-term use is associated with severe or persistent harms.

www.chbrp.org

What are the most recent GLP-1 trends that your organization has seen?

Greater than 20%

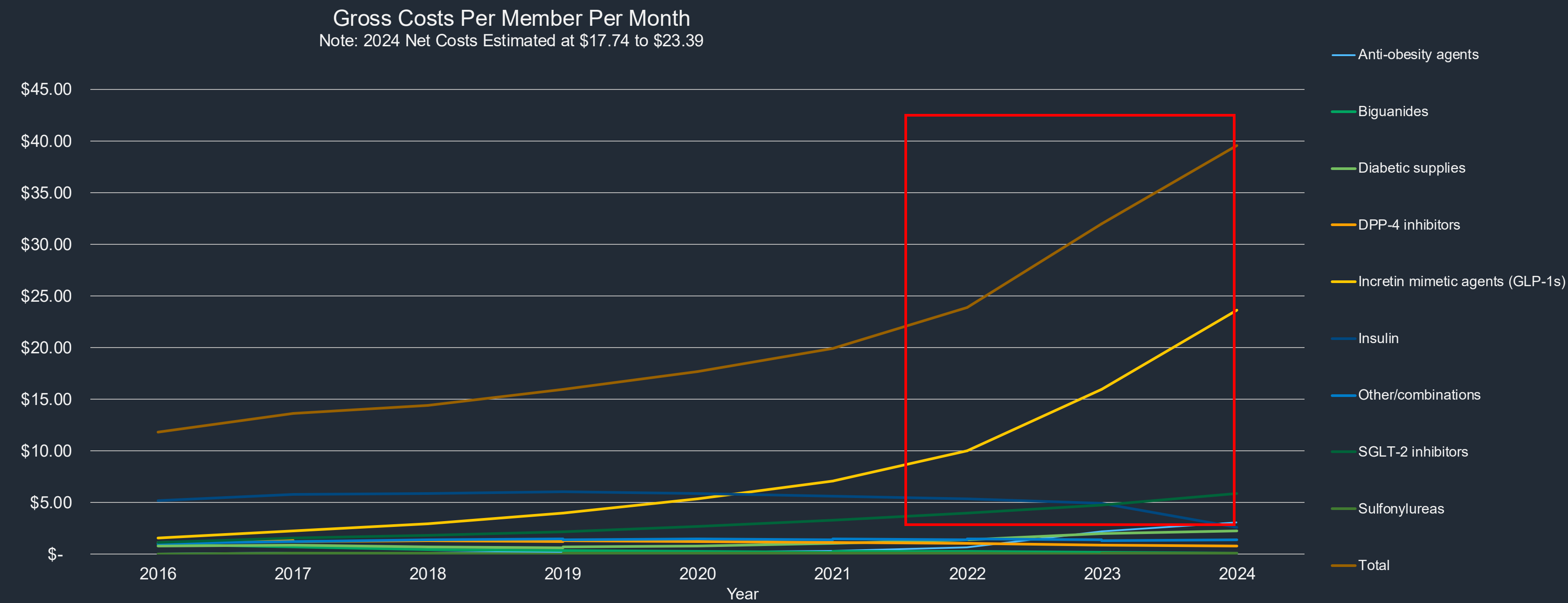
Greater than 40%

Greater than 60%

Greater than 80%

Greater than 100%

GLP-1's are a key primary driver of medical trends



Source: *Understanding the Cost Dynamics of Antidiabetic Medications: A Trend Analysis (2016-2024)*. <https://www.milliman.com/en/insight/cost-antidiabetic-medications-trend-analysis>. Accessed 14 Aug. 2025.

**“When are we going to see these
GLP-1 trends subside?”**

— Brian Anderson

When might we see GLP-1 trends subside?

- A. The next few years (2026 or 2027)**
- B. A little further out (2028 to 2030)**
- C. Early 2030s**
- D. Late 2030s**
- E. Never**

Intro to Linear Algebra – So many uses, so little time!

Use Cases

Predictive Modeling linear regressions may be solved a system of linear equations

Computer Graphics and Robotics
Rotating objects in 3 dimensions

Quantum Mechanics Interaction of subatomic particles

Signal Processing Discrete Fourier Transform / Fast Fourier Transform

Milliman Use Case – Long Term Forecast

An array of 8 numbers represents the percentage of enrollees in each of eight groups, modeling the following characteristics:

Drug Use

- GLP-1 Utilizers / Non-utilizer

Health History

- Represents an enrollee's medical history using ICD-10 data from medical claims:
No History / History of Obesity / History of Diabetes

Start and End States

- New and terminating enrollees

Intro to Linear Algebra – A Day at Walt Disney World

The first matrix $\begin{bmatrix} \text{EPCOT} & \text{Magic Kingdom} & \text{Animal Kingdom} \end{bmatrix}$ describes how many tourists start at each attraction. Suppose 100 tourists start at EPCOT.

Let's suppose Matrix A represents how we expect tourists to move amongst three attractions: EPCOT, the Magic Kingdom, and Disney's Animal Kingdom. Each hour, a tourist will always leave the attraction they're at, with a 50/50 chance of moving to one of the other two attractions.



Courtesy of Jedi94 – Wikipedia, CC BY-SA 4.0

All Tourists start at EPCOT:

$$\begin{bmatrix} 100 & 0 & 0 \end{bmatrix} \times \text{Matrix A: } \begin{bmatrix} 0 & .5 & .5 \\ .5 & 0 & .5 \\ .5 & .5 & 0 \end{bmatrix} = \begin{bmatrix} (100*0+0*.5+0*.5) & (100*.5+0*0+0*.5) & (100*.5+0*.5+0*0) \end{bmatrix} = \begin{bmatrix} 0 & 50 & 50 \end{bmatrix}$$

Expected location of tourists in one hour:

Intro to Linear Algebra – A Day at Walt Disney World

Matrix A:

$$\begin{bmatrix} 0 & .5 & .5 \\ .5 & 0 & .5 \\ .5 & .5 & 0 \end{bmatrix}$$

Matrix B:

$$\begin{bmatrix} 0 & .5 & .5 \\ .5 & 0 & .5 \\ .5 & .5 & 0 \end{bmatrix}$$

$\times$

$=$

$$\begin{bmatrix} (0*0 + .5*.5 + .5*.5) & (0*.5 + .5*0 + .5*.5) & \dots \\ (.5*0 + 0*.5 + .5*.5) & \dots & \dots \\ (.5*0 + .5*.5 + 0*.5) & \dots & \dots \end{bmatrix}$$

$=$

$$\begin{bmatrix} .5 & .25 & .25 \\ .25 & .5 & .25 \\ .25 & .25 & .5 \end{bmatrix}$$

Matrixes

Each matrix represents how we expect tourists to move amongst three attractions: EPCOT, the Magic Kingdom, and Disney's Animal Kingdom. Each hour, a tourist will always leave the attraction they're at, with a 50/50 chance of moving to one of the other two attractions.

Linear transformations

These matrices are also known as linear transformations. This example combines two linear transformations into one, so that it can be applied in a single step. This now represents the probability of where individuals go after two hours, and is also a linear transformation

Intro to Linear Algebra – A Day at Walt Disney World

1 Hour

$$\begin{bmatrix} .000 & .500 & .500 \\ .500 & .000 & .500 \\ .500 & .500 & .000 \end{bmatrix}$$

2 Hours

$$\begin{bmatrix} .500 & .250 & .250 \\ .250 & .500 & .250 \\ .250 & .250 & .500 \end{bmatrix}$$

3 Hours

$$\begin{bmatrix} .250 & .375 & .375 \\ .375 & .250 & .375 \\ .375 & .375 & .250 \end{bmatrix}$$

4 Hours

$$\begin{bmatrix} .375 & .313 & .313 \\ .313 & .375 & .313 \\ .313 & .313 & .375 \end{bmatrix}$$

All Tourists start
at EPCOT

$$\begin{bmatrix} 100 & 0 & 0 \end{bmatrix}$$

After 8+ Hours

$$\begin{bmatrix} .33 & .33 & .33 \\ .33 & .33 & .33 \\ .33 & .33 & .33 \end{bmatrix}$$

=

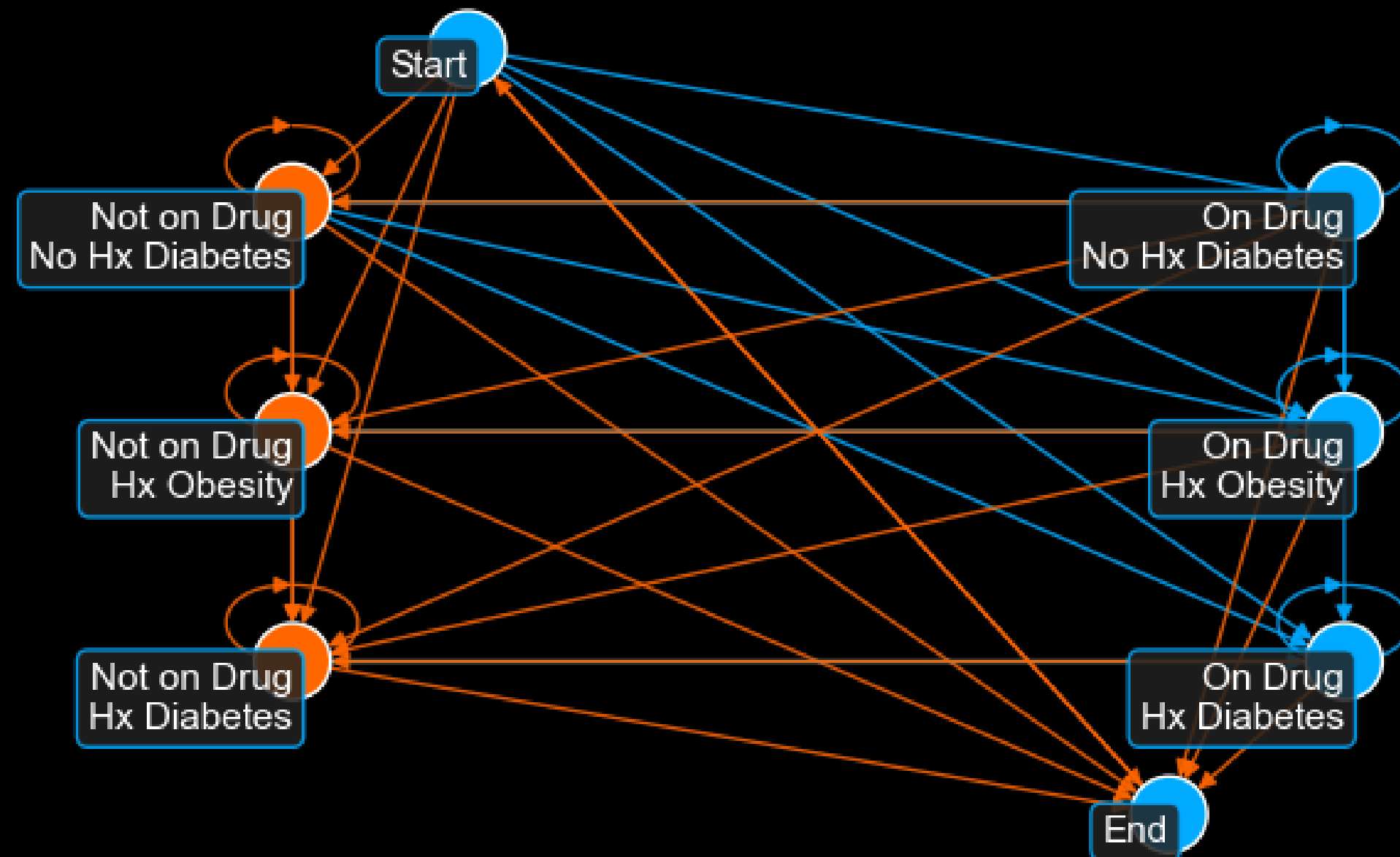
$$\begin{bmatrix} (100 * .33 + 0 * .33 + 0 * .33) & (100 * .33 + 0 * .33 + 0 * .33) & (100 * .33 + 0 * .33 + 0 * .33) \end{bmatrix}$$

=

$$\begin{bmatrix} 33 & 33 & 33 \end{bmatrix}$$

At the end of the day, Tourists
are anticipated to be evenly
distributed throughout the park

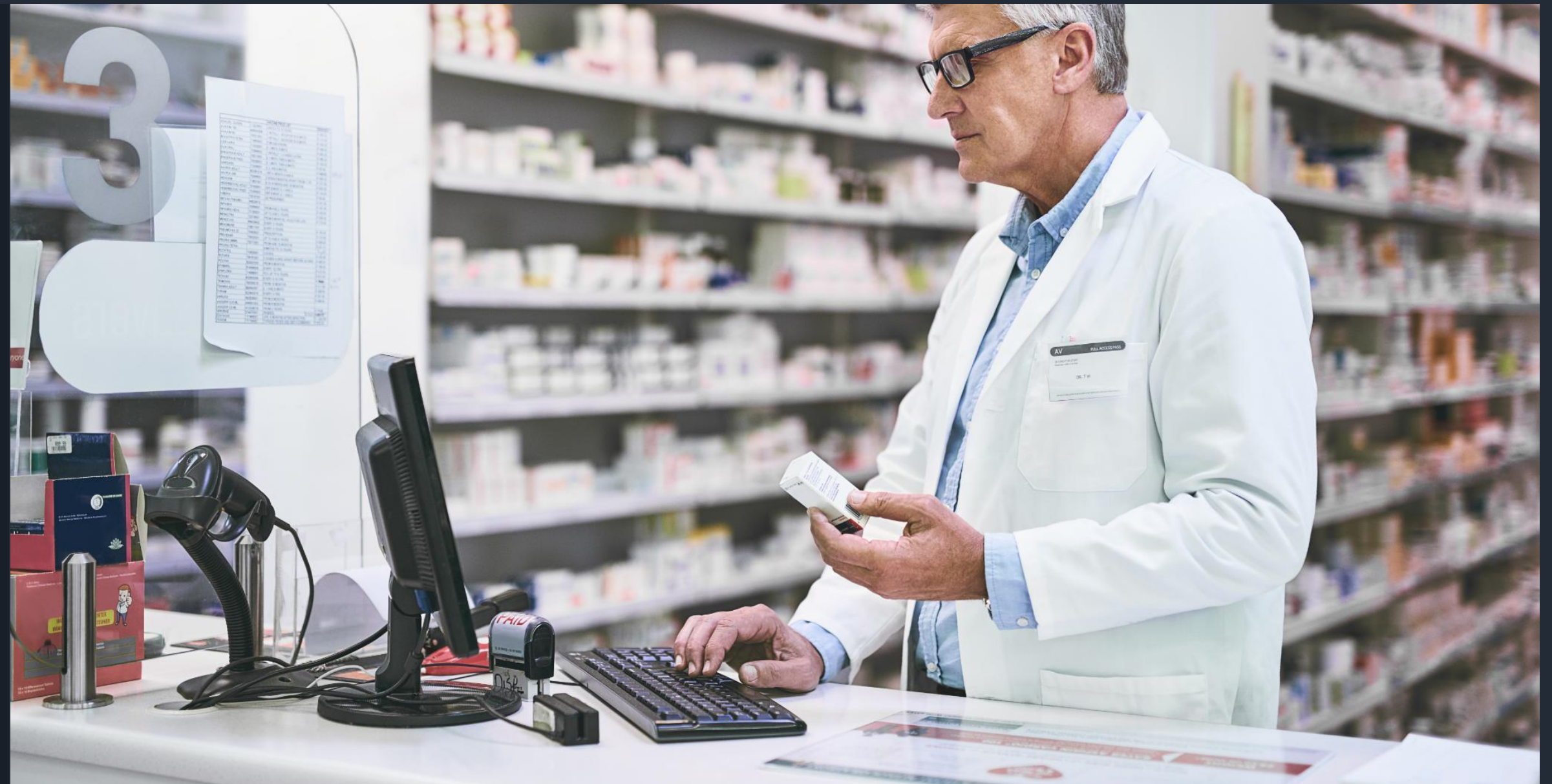
Our Markov Model



Uses real world data to set the transition probabilities

Trend Considerations

Formulary coverage
Side effects / adverse drug events
New indications
Advertising
New GLP-1 variants
Other AOMs
Utilization management and
Responsible prescribing
Telehealth / compounding
Generic availability
Demographic and health trends
Societal norms

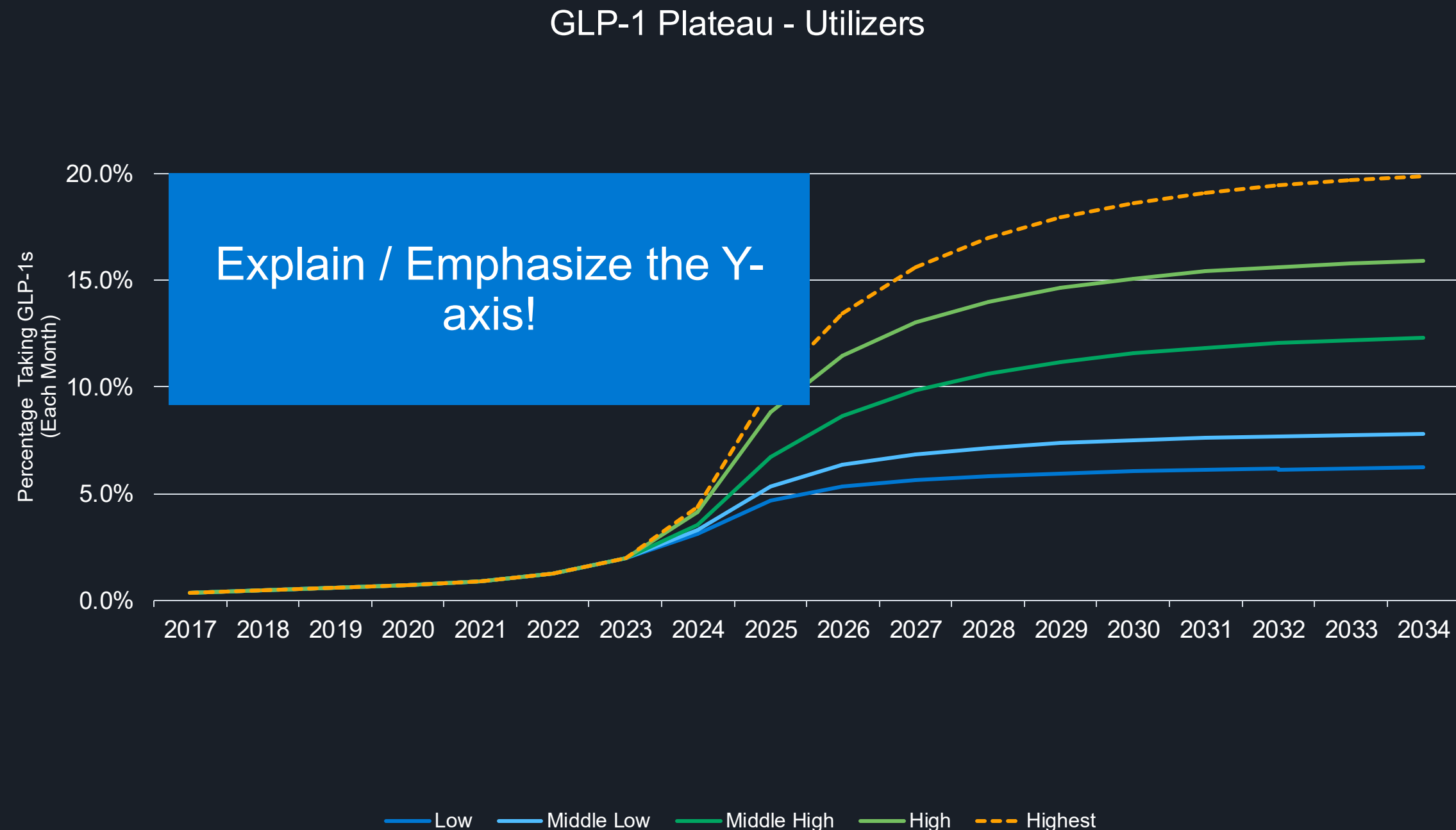


Let's consider a commercial population with coverage of GLP-1s for weight loss. We anticipate marked increases from 2025-2027 and that utilization of GLP-1s will stabilize sometime between 2028 and 2030.

This forecast is valid for a typical employer-sponsored commercial health plan covering these drugs for weight loss. It is not a reasonable estimate for labor groups, trusts, public employers, and other employer groups with low costsharing or unusual demographics such as early retirees. It is not a reasonable estimate for VA beneficiaries.

Our estimates are based upon the assumptions discussed below and are sensitive towards emerging research, coverage by plan sponsors, formulary strategies, availability through cash pay options, and prescriber practice patterns.

Those taking GLP-1s each month include all enrollees taking GLP-1s regardless of whether indicated for management of diabetes, chronic weight management, or otherwise. A typical commercial population includes children.



Questions and Discussion



Thank You

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