



Asian Actuarial Conference 2025 Bangkok

**Developments in Medical Science that
are making an insurance risk taker both
Optimistic and worried**

13 Nov | 16:50-17:30



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2 recent developments in medical science that an insurance risk taker needs to keep track of!

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somewhat different



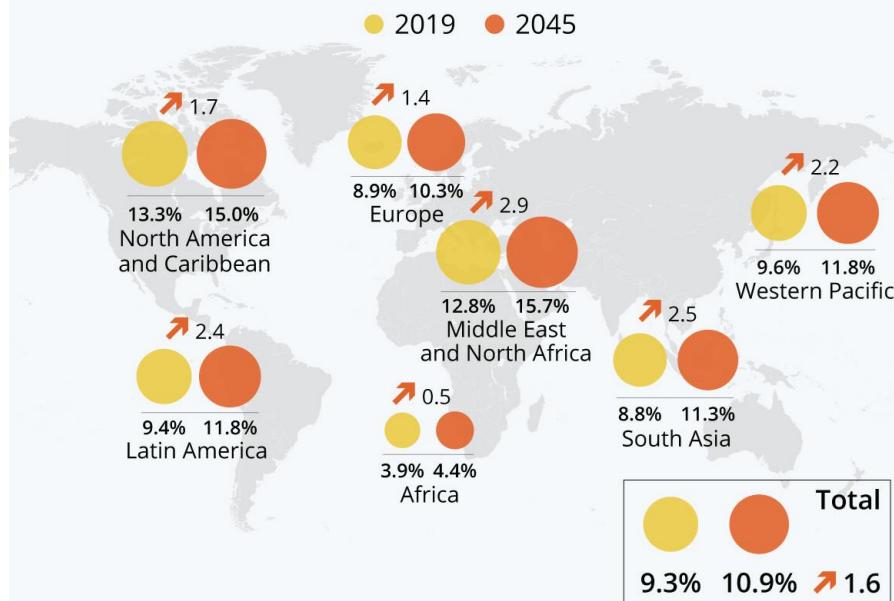
01 The rise and boom of GLP-1 drugs (Incretin Mimetics)

02 The up and coming Multi-Cancer Early Detection Tests (MCED)



Where Diabetes Burdens Are Rising

Estimated share of people 20-79 y/o with diabetes by region in 2019 and 2045 (in percent)



Source: International Diabetes Federation

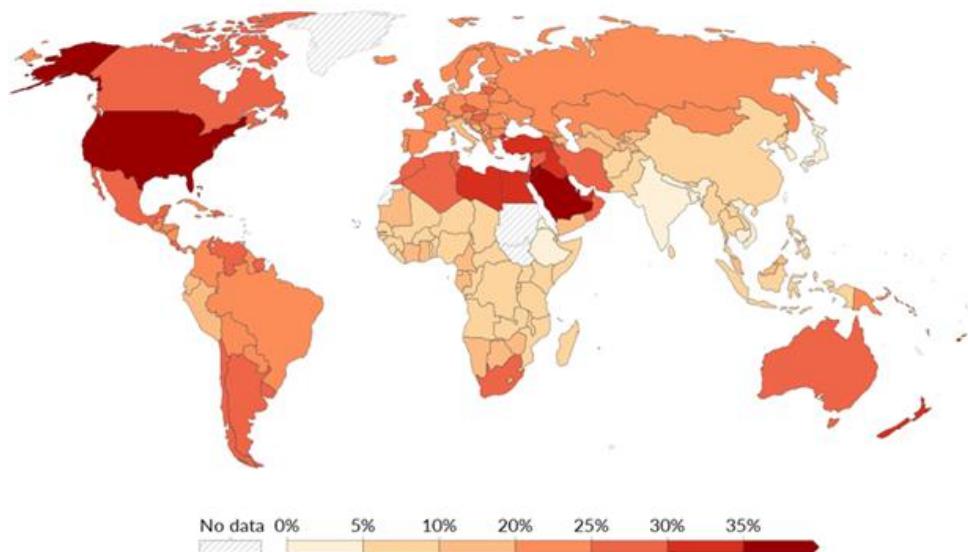


statista

Prevalence rate of obesity in adults, 2016

Estimated prevalence of obesity¹ in adults, based on general population surveys and statistical modeling. Obesity is a risk factor² for chronic complications, including cardiovascular disease³, and premature death.

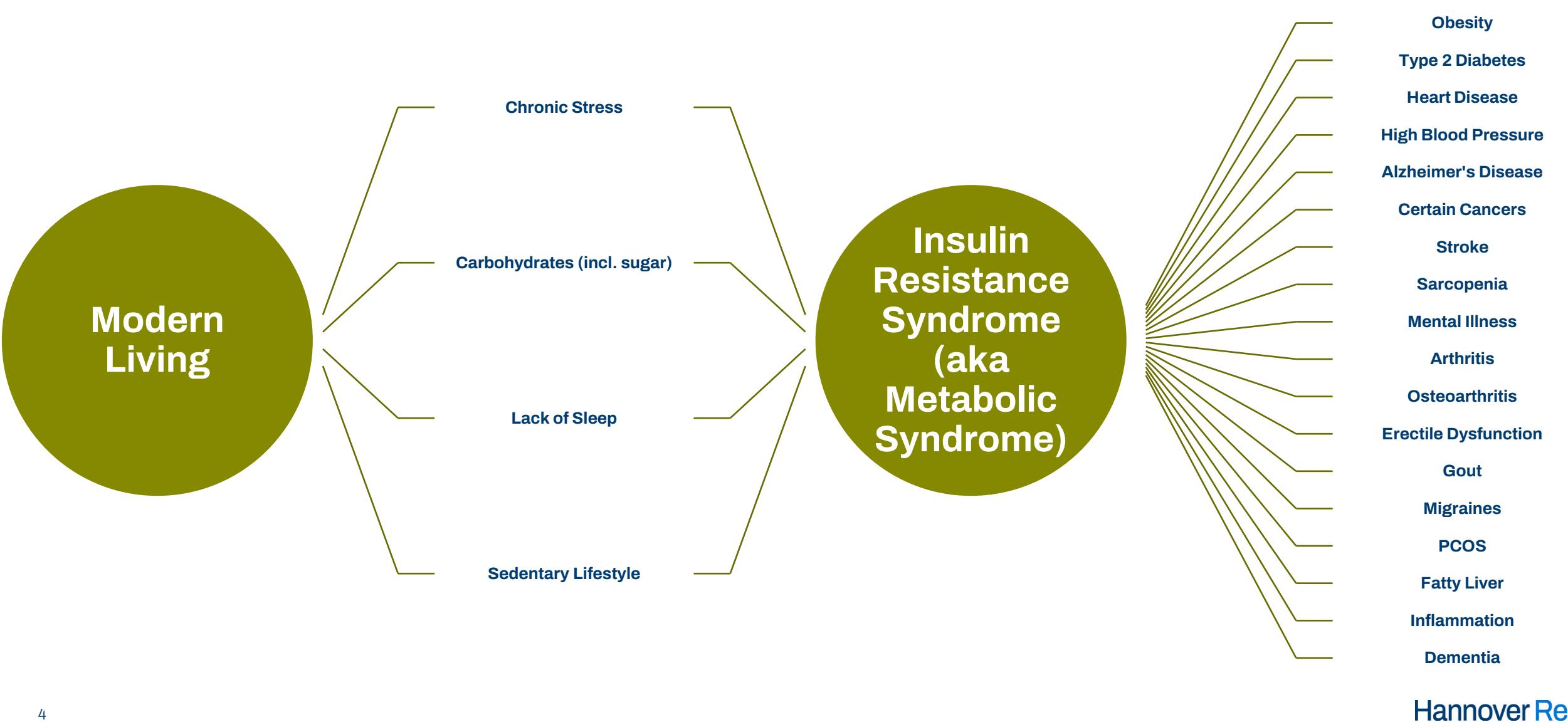
Our World in Data



Data source: World Health Organization - Global Health Observatory (2024)
Note: To allow for comparisons between countries and over time, this metric is age-standardized⁴.

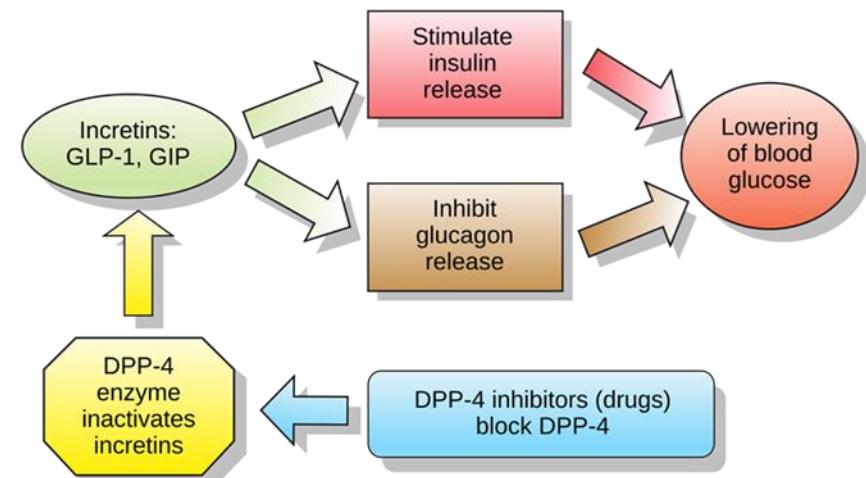
OurWorldinData.org/causes-of-death | CC BY

How did we get here and why does it matter?



What is Incretin and why it matters?

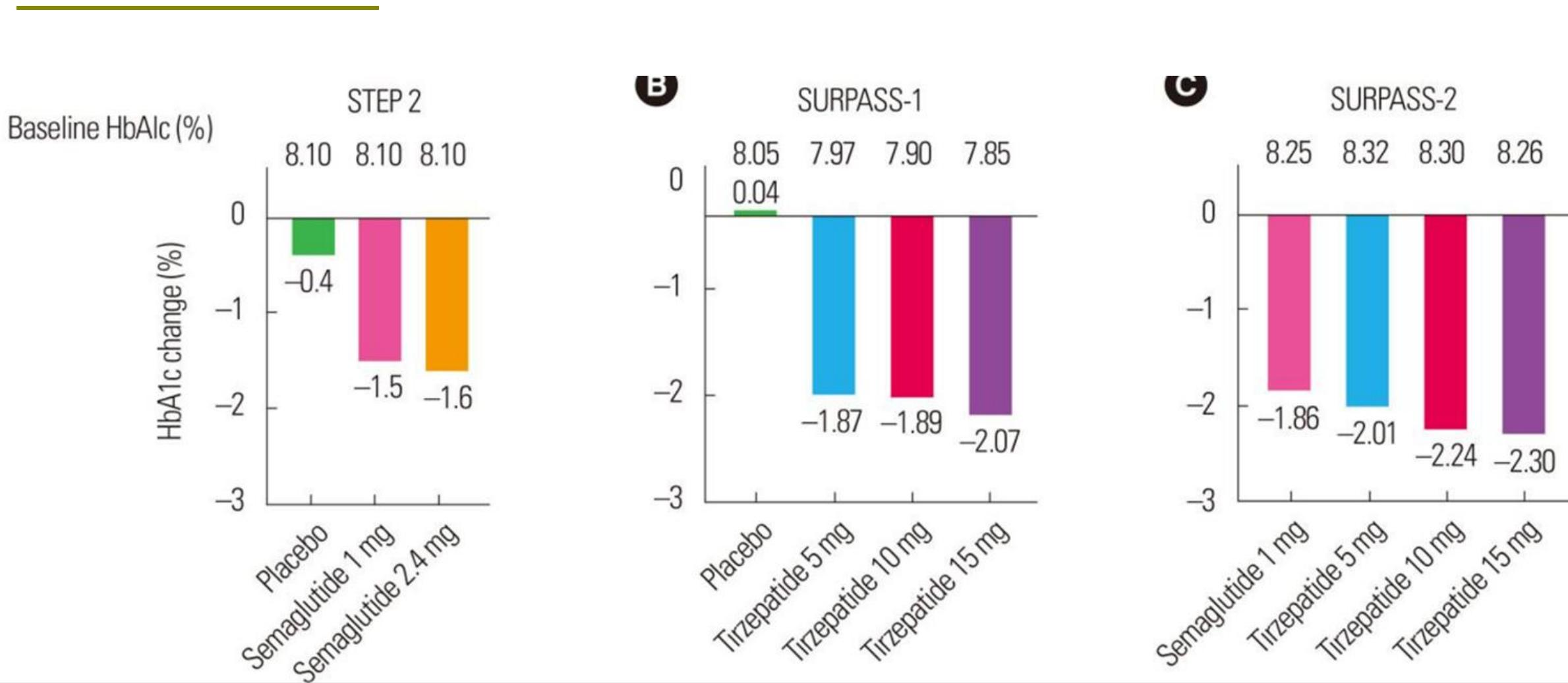
- Insulin is released in response to glucose in blood (from carbohydrates and other sources) to facilitate the uptake of glucose into muscle and adipose tissues to reduce blood sugar
- Incretins (e.g., GLP-1, GIP): Hormones released from the small intestines in the Gut that enhance insulin secretion in response to food intake.
- Incretin effect impaired in people with T2DM, leading to reduced insulin response to meals.
- Incretin Mimetics includes Semaglutide, Tirzepatide etc
 - Semaglutide - GLP-1 receptor agonist
 - Trade names: Ozempic (T2DM), Wegovy (weight),
 - Rybelsus (oral)
 - Tirzepatide: Dual GLP-1 and GIP receptor agonist
 - Trade names: Mounjaro (T2DM), Zepbound (weight)



Lee, H.A. and Kim, H.Y., 2023. Therapeutic mechanisms and clinical effects of glucagon-like peptide 1 receptor agonists in nonalcoholic fatty liver disease. International Journal of Molecular Sciences, 24(11), p.9324.

Do these medications work?

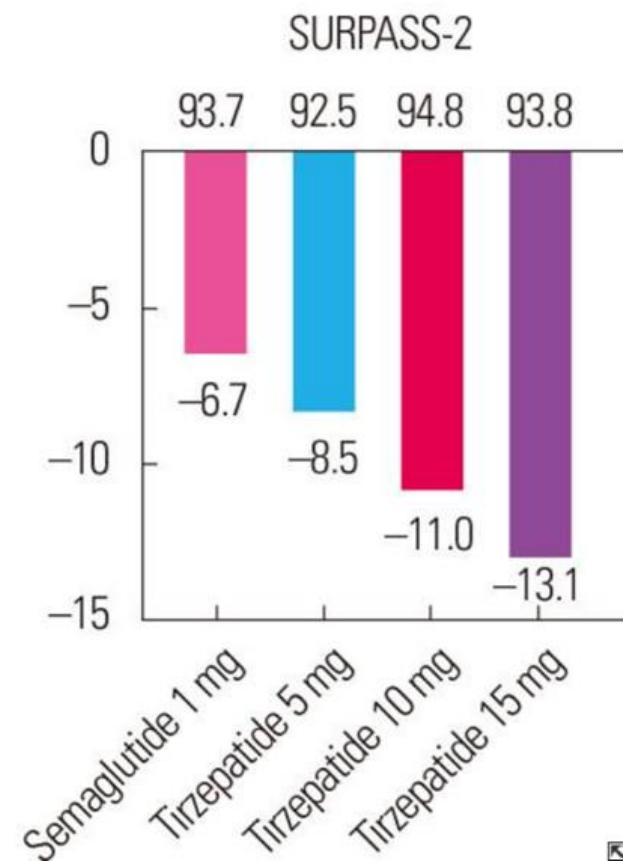
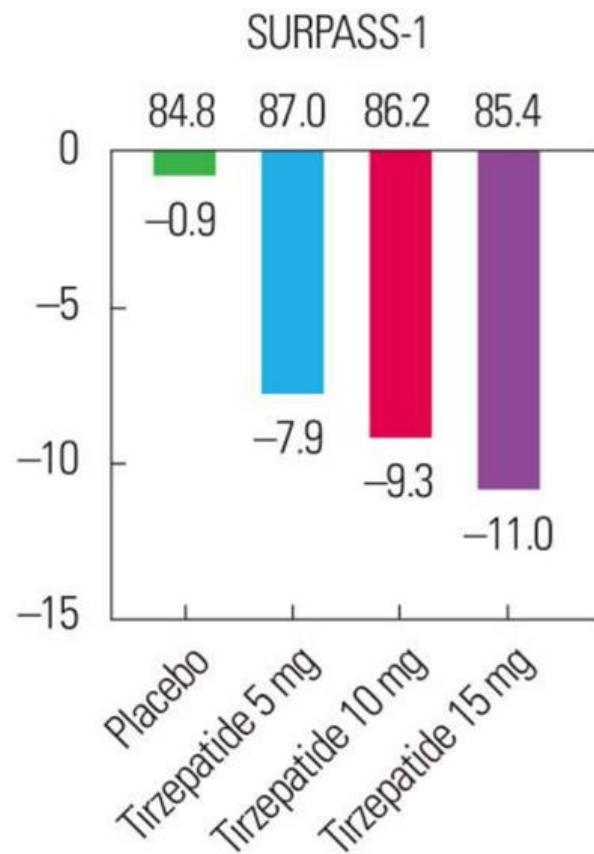
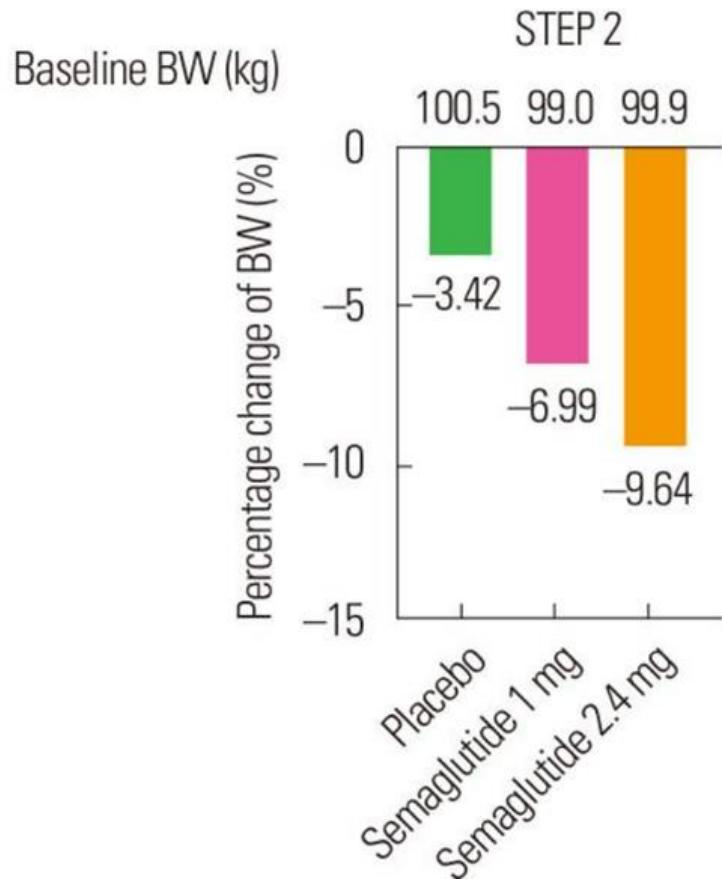
HbA1c



Jung HN, Jung CH. The Upcoming Weekly Tides (Semaglutide vs. Tirzepatide) against Obesity: STEP or SURPASS? *J Obes Metab Syndr*. 2022 Mar 30;31(1):28-36. doi: 10.7570/jomes22012. PMID: 35314521; PMCID: PMC8987449.

Do these medications work?

Body weight



Jung HN, Jung CH. The Upcoming Weekly Tides (Semaglutide vs. Tirzepatide) against Obesity: STEP or SURPASS? *J Obes Metab Syndr*. 2022 Mar 30;31(1):28-36. doi: 10.7570/jomes22012. PMID: 35314521; PMCID: PMC8987449.

Are these medications safe?

Side effects

Category	Semaglutide	Tirzepatide	References
Gastrointestinal (GI)	Nausea (12%-24%), Diarrhoea (12%-22%), Vomiting (2%-13%)	Nausea (18%), Diarrhoea (12%), Vomiting (8%)	Frias et al., 2021
Hypoglycaemia	Reported in 0.4% of patients	Reported in 0.6%-1.7%, depending on the dose	Frias et al., 2021
Severe GI Effects	Rare but may include persistent nausea and severe abdominal discomfort leading to discontinuation	Dose-dependent, including nausea, severe abdominal pain, and vomiting requiring treatment adjustment	Patel et al., 2023
Discontinuation Rates	4.1% due to adverse effects	6%-8.5% due to adverse effects	Mikhail, 2021
Muscle Loss	Muscle mass was largely preserved	Weight loss was attributed to fat rather than muscle, suggesting effective preservation of lean body mass	Uchiyama et al., 2023 Heise et al., 2023
Thyroid Cancer	Not associated with a substantially increased risk of thyroid cancer		Pasernak et al., 2024

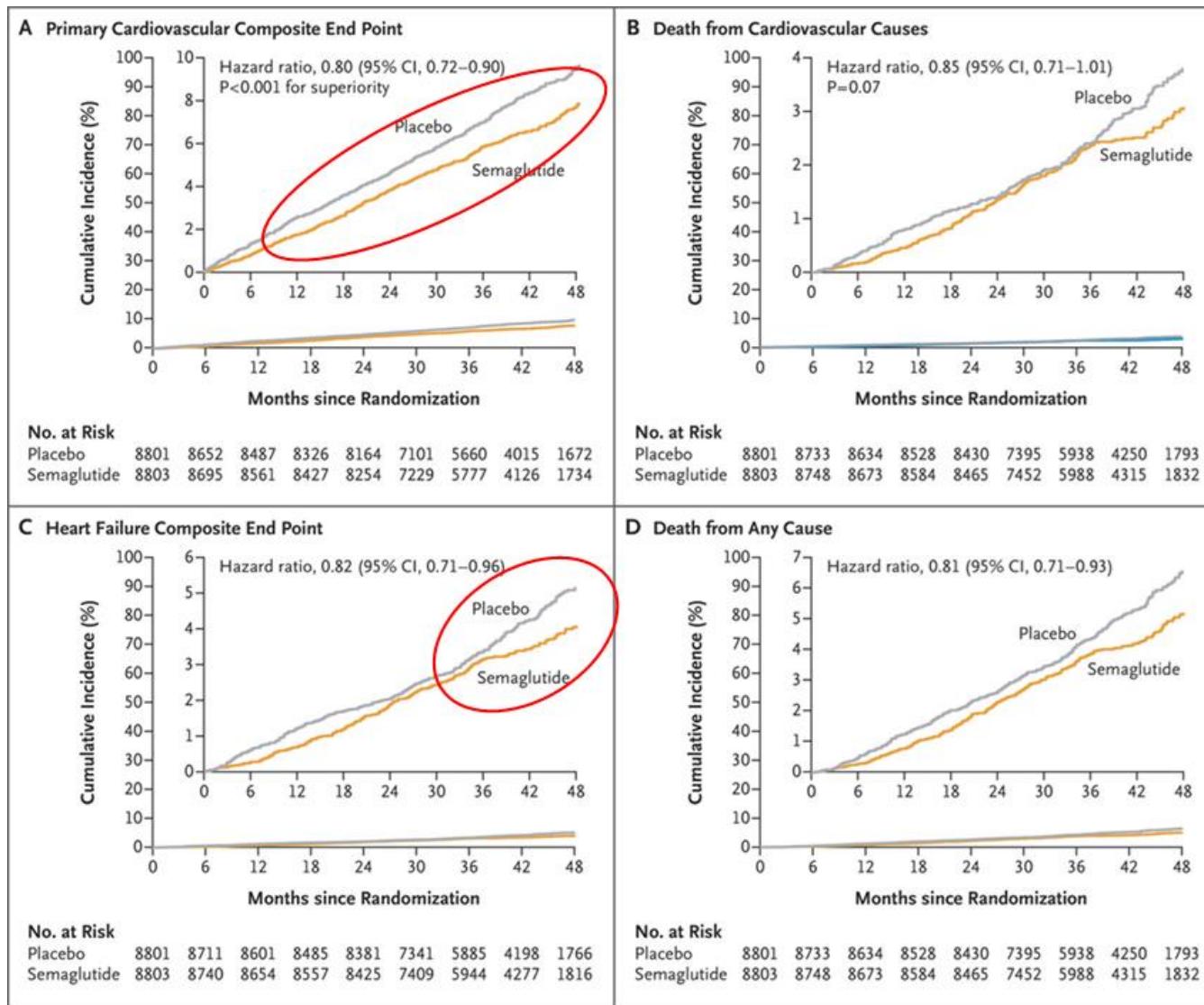
Are these medications safe?

Side effects

Category	Semaglutide	Tirzepatide	References
Pulmonary Aspiration	Delayed gastric emptying poses risk for aspiration in surgery cases requiring general anaesthesia, resulting in changes to pre-operative fasting guidelines.		
Cardiovascular Risks	Reduces major adverse cardiovascular events (MACE) in patients with type 2 diabetes and heart disease.	Greater reduction in MACE compared to semaglutide in studies like SURPASS-2.	SUSTAIN-6 trial; SURPASS-2 trial
Pancreatic Concerns	Possible risk for pancreatitis; evidence inconclusive.	Similar concerns; no definitive causal links.	Ding et al., 2023
Gallbladder Issues	Higher risk of gallbladder disease, including cholelithiasis.	Comparable risk to semaglutide.	Mikhail, 2021
Hypoglycaemia	Low risk; increases with insulin or sulfonylurea use.	Slightly higher risk, especially at higher doses.	Frias et al., 2021
Kidney Function	Rare reports of acute kidney injury from dehydration due to side effects.	Similar risk profile to semaglutide.	Patel et al., 2023
Depression & Suicidal Thoughts	No strong evidence of increased risk, but monitoring is advised.	No significant link, but monitoring recommended.	Frias et al., 2021; Ding et al., 2023

Do these medications work?

Cardiac endpoints



Lincoff, A.M., Brown-Frandsen, K., Colhoun, H.M., Deanfield, J., Emerson, S.S., Esbjaerg, S., Hardt-Lindberg, S., Hovingh, G.K., Kahn, S.E., Kushner, R.F. and Lingvay, I., 2023. Semaglutide and cardiovascular outcomes in obesity without diabetes. *New England Journal of Medicine*, 389(24), pp.2221-2232.

Positive impacts of GLP-1 drugs on other conditions

Cancer

Liver Disease

Chronic Kidney disease

Nurodegenerative disease

Respiratory Disease

Ageing

Psychiatric disorders

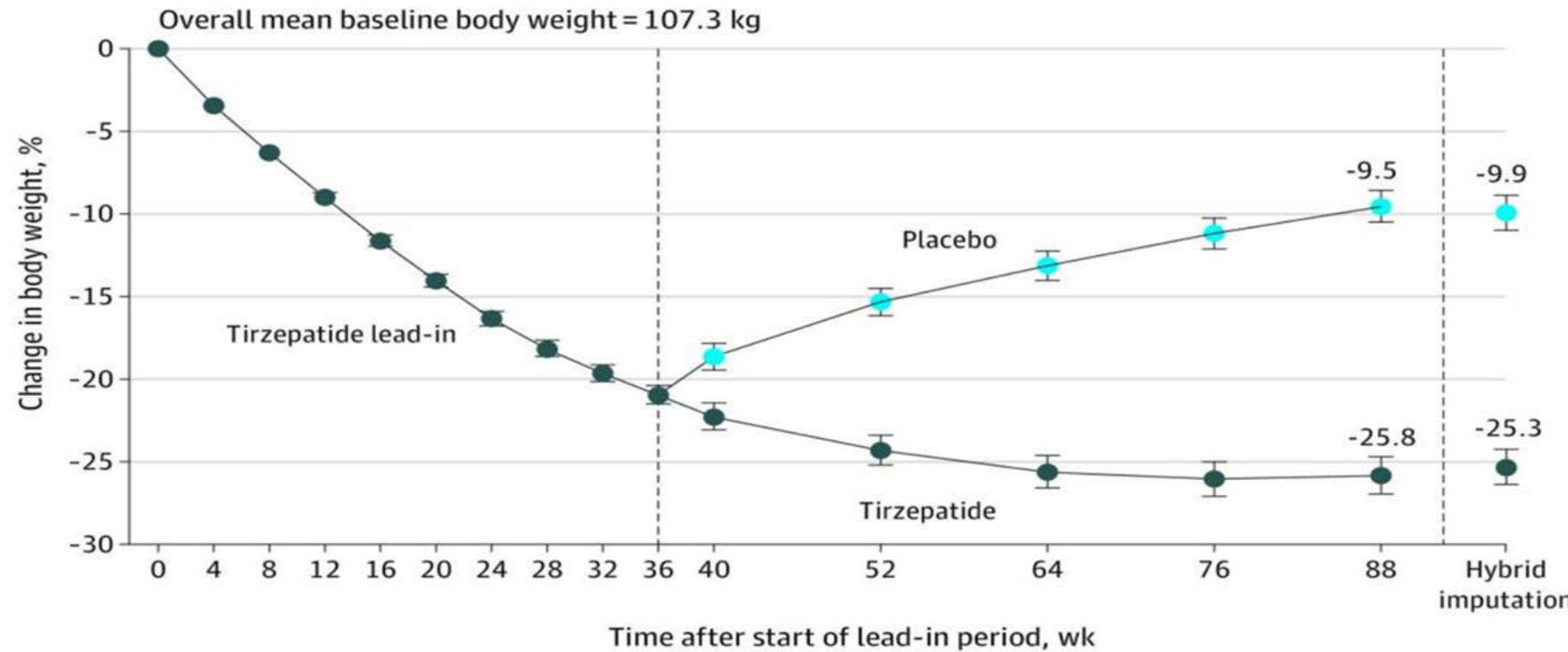
Addiction



Do these medications need to be taken indefinitely?

Impact of cessation of treatment

A Percent change in body weight (week 0-88)



Aronne, L.J., Sattar, N., Horn, D.B., Bays, H.E., Wharton, S., Lin, W.Y., Ahmad, N.N., Zhang, S., Liao, R., Bunck, M.C. and Jouravskaya, I., 2024. Continued treatment with tirzepatide for maintenance of weight reduction in adults with obesity: the SURMOUNT-4 randomized clinical trial. *Jama*, 331(1), pp.38-48

Impact of GLP-1 drugs

Mortality



Critical Illness

Disability Income

Impact of GLP-1 drugs

Medical Insurance



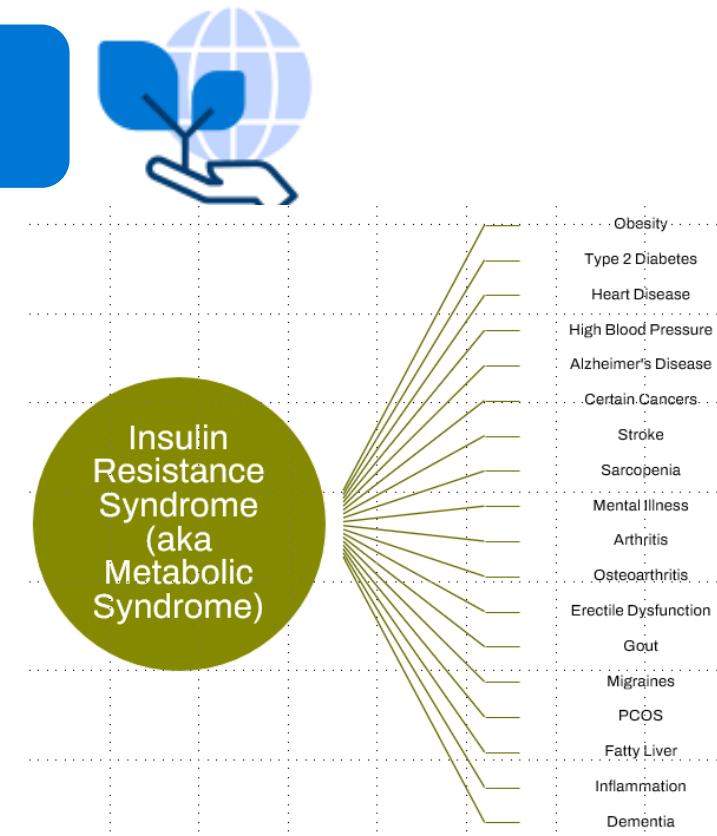
HEALTH

Is Ozempic the modern wonder drug? All the conditions the weight loss jab can tackle – from addiction to Alzheimer's

By [Tracy Swartz](#)

Published Nov. 12, 2024, 7:00 a.m. ET

16 Comments



Impact on Life & Health Insurers



NOVI Optimum Plus

Doctor-Led Weight Loss Clinic with Safe Injectable Medication in Singapore

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About This Program | What To Expect | Why Choose NOVI | Your Medical Team | FAQs

The Advantage of Medical Weight Loss

Combining Medically Supervised Treatment with Non-Medication Approaches



Enhanced Satiety & Reduced Appetite

Helps you feel fuller for longer and experience a noticeable decrease in hunger signals, supporting a reduction in calorie intake without the common struggle of dieting.



Reduced "Food Noise" Cravings & Emotional Eating

Acts on appetite centers in the brain, which helps to lessen intrusive thoughts about food (often called "food noise") and supports better regulation of cravings. Also makes it easier to manage emotional eating patterns, like stress eating.



Decreased Body Fat Percentage

Reduces overall body weight, with a primary impact on decreasing body fat mass.



Improved Insulin Sensitivity & Metabolic Health

Plays a crucial role in enhancing your body's responsiveness to insulin, both through direct actions on insulin pathways and indirectly by promoting weight loss, particularly of visceral fat linked to insulin resistance.

	Optimum Plus	Optimum 365 <small>New</small>
Overview	Doctor-led program focusing on weight loss injectable medication and personalized dietitian coaching for sustainable weight loss.	Comprehensive, doctor-led, all-in-one program integrating weight loss injectable medication, dietitian coaching, 1:1 personal training, and curated supplements.
Suited For	Ideal for those who primarily seek medical and nutritional guidance with digital tracking, without needing integrated fitness or supplements.	Ideal for those who want a holistic approach with full support for diet, exercise, and health optimization.
Doctor Consult and Support	✓	✓
Weight loss injectable medication	✓	✓
Personalized health coaching	✓	✓
1-on-1 personal training with certified fitness coaches	✗	✓
Structured exercise program	✗	✓
Curated Supplement Support	✗	✓
Protein Supplements	✗	✓
Access to NOVI Health app for tracking and messaging	✓	✓

[Book now](#)

[Discover Optimum 365](#)

Who are paying for these wonder drugs? A mix-bag for now

UK

- **BUPA – offered its customers a weight-loss management plan on a pay-as-you-go basis**
- **AXA and AVIVA – No**
- **Vitality - discounted weight loss treatments**

US

- **Coverage mainly limited to Type 2 diabetes and heart disease although some employer plans continue to provide for coverage for obesity treatment**

Japan

- **Public insurance now covers obesity treatment**

New insurance coverage launched for weight loss treatment

2024.12.19 11:15:52



Samsung Fire & Marine Insurance Co. introduced their customers to an insurance product designed to cover prescription costs for an anti-obesity medication that is sold under the brand name Wegovy.

The insurer said on Wednesday that it was granted exclusive rights for two insurance products for six to nine months. This is the first insurance coverage that is being offered specifically for Wegovy.

The new offerings include coverage for two types of GLP-1-based treatments: one for major metabolic diseases linked to obesity and another for diabetes treatment. The products provide annual insurance payouts for policyholders diagnosed with at least one metabolic condition – including hypertension, diabetes, or dyslipidemia – who are prescribed a GLP-1-based obesity medication not covered by standard insurance.

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2 Korea's FX reserves up \$1.13bn in July despite strong U.S. d...	9 Korean financial, securities stock market second day of gains
3 Korean financial, securities stock market second day of gains	8 Samsung forms AI-humanoid unit to secure future tech lead
4 Handsome Q2 operating profit down 82% amid weak fashion demand	7 Korean SMEs' H1 exports surge led by cosmetics, used cars
5 Samsung forms AI-humanoid unit to secure future tech lead	6 A Robot drives AI-powered industrial humanoid 'Alice'
6 Handsome Q2 operating profit down 82% amid weak fashion demand	5 Foreign net buying in Korean stocks surges in July
7 Korean SMEs' H1 exports surge led by cosmetics, used cars	4 Korea's coffee bean imports top 100,000t for first time in H1 –
8 A Robot drives AI-powered industrial humanoid 'Alice'	3 Hanwha tops market cap growth among Korea's 10 major conglomerates
9 Foreign net buying in Korean stocks surges in July	2 Korea's inflation rises 2.1% in July
10 Korea's coffee bean imports top 100,000t for first time in H1 –	1 Hanwha tops market cap growth among Korea's 10 major conglomerates



Who are paying for these wonder drugs?
Honestly a mix-bag for now

Use of slimming pills soaring in Belgium

Saturday 21 June 2025

By The Brussels Times with Belga



Diabetes drug Ozempic. Credit: Belga / Dirk Waem

Despite stringent eligibility criteria, the use of diabetes medications like Ozempic is surging, costing health insurance nearly €76 million annually.

Greater Philly's largest health insurer to restrict coverage for weight loss medications, citing 'exorbitant costs'

Independence Blue Cross joins other insurance companies in restricting coverage of Wegovy and Ozempic to Type 2 diabetes and heart disease.

By [Nicole Leonard](#) · Updated Dec. 23, 2024 3:04 pm

▶ Listen 1:18



Efficacy of these wonder drugs?
Only time will tell!

5 Year Net Cost of GLP-1 Script

garner

	High-Risk*	Low-Risk**
Savings from Improved Health	-\$31,797	-\$671
Cost of GLP-1 Prescription	\$62,520	\$62,520
Net Plan Cost	\$30,733	\$61,849

* High-Risk defined as one chronic disease or BMI > 40

** Low-Risk defined as BMI < 40 and no chronic diseases

Note: net costs are for the average commercial population

Poor Adherence Issues Lead to Significant Waste

A December 2023 study by JAMA ([source](#)) highlighted a critical issue: discontinuing GLP-1s prematurely results in losing nearly all benefits. Our further analysis revealed a concerning trend—65 percent of patients who initiated GLP-1 therapy have since ceased usage.

Percent of Population that Currently or Previously used GLP-1s

● CURRENT GLP1 USE ● HAS EVER USED GLP1

1.5%

1.0%

0.5%

0%

2019

2020

2021

2022

2023

-65%

no longer use
GLP-1s

garner

Hannover Re

Quantify benefits to users

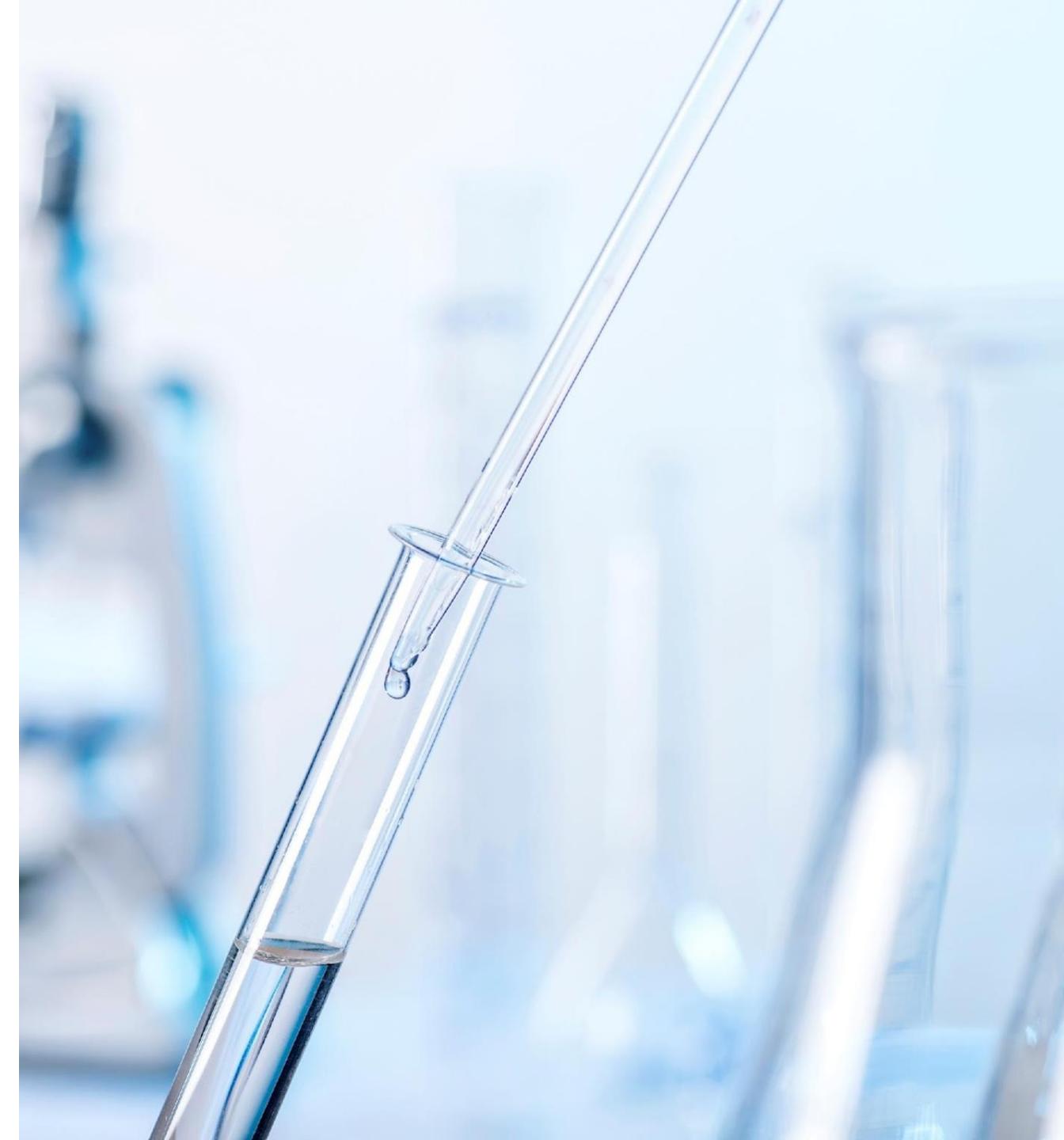
User experience

Quantify impact on business

Partnerships

01 The rise and boom of GLP-1 drugs (Incretin Mimetics)

02 The up and coming Multi-Cancer Early Detection Tests (MECD)



What is MCED and why it matters?

MCED is basically a blood test that can screen for multiple types of cancer simultaneously

It has the promise to transform the detection of cancers.

At present, a tissue biopsy – a surgical intervention to remove a piece of the cancerous tissue and test it – is still the gold standard method of diagnosis but it can be invasive, painful, time-intensive, and carries inherent risks.

The greatest potential of MCED tests lies in the early detection and treatment of cancers that are at present usually detected at a later stage with lower survivability.

Cancer Incidence Proportion by Stage at Diagnosis Ages 50-74

	In situ	Localized	Regional	Distant
Colon and Rectum	4%	40%	35%	22%
Kidney	2%	68%	16%	14%
Lung and Bronchus	0%	23%	23%	53%
Melanoma of the Skin	51%	42%	4%	2%
Non-Hodgkin Lymphoma	0%	28%	15%	56%
Pancreas	1%	12%	32%	55%

Source: US SEER Stat

Relative 5-year Survival by Stage at Diagnosis Ages 50-74

	In situ	Localized	Regional	Distant
Colon and Rectum	91%	87%	71%	15%
Kidney	84%	87%	66%	13%
Lung	78%	60%	33%	6%
Melanoma of the Skin	97%	93%	64%	24%
Non-Hodgkin Lymphoma	0%	82%	75%	66%
Pancreas	88%	44%	13%	3%

Availability of MCED tests and its current challenges

A number of MCED tests are already in various stages of development

Prices vary from under 1,000 USD to around USD 3,000 but costs expected to drop.

Note the following important terms in assessing the accuracy of the tests

- **Sensitivity**
- **Specificity**
- **CSO**



Effectiveness of tests

Some examples

Company & Test	Cancer Types	Sensitivity	Specificity	CSO Accuracy
Datar (India) – IntelliTruchek	Up to 70 cancers; single-site tests for breast, colorectal, etc.	Avg: 86.2% (range: 82–86%) Breast cancer-only: 92.1%	>99% Breast cancer-only: 100%	>96%
Eone-Diagnostic Genome Center (South Korea) – OncoCatch-E	4 cancers: colorectal, lung, breast, gastric	Colorectal: 78% Lung: 66%	—	—
Exact Sciences (US) – Cancersguard™	10+ cancers including breast, bladder, colon, etc.	Overall: 61% Stage I: 31.4% Stage II: 45.8% Stage III: 68.3% Stage IV: 87.1%	98.2%	—
GRAIL (US) – Galleri®	50+ cancers	Overall: 51.5% Stage I: 16.8% Stage II: 40.4% Stage III: 77.0% Stage IV: 90.1%	99.5%	88.7%
Guardant Health (US) – Shield™	Colorectal (lung in development)	83%	90%	—
Singlera Genomics (US) – PanSEER	5 cancers: stomach, esophageal, colorectal, lung, liver	Overall: 88% Range: 76% (colorectal) to 96% (lung)	96%	—

Availability of MCED tests and its current challenges

Currently many tests are lower in accuracy at lower cancer stages and may not be able to detect sites of cancer

Other challenges include

- **Follow up for positive results**
- **Overdiagnosis**

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Feature » BMJ Investigation

Galleri promises to detect multiple cancers—but new evidence casts doubt on this much hyped blood test

BMJ 2024 ; 386 doi: <https://doi.org/10.1136/bmj.q1706> (Published 07 August 2024)
Cite this as: BMJ 2024;386:q1706

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*Margaret McCartney, senior lecturer in general practice, freelance writer¹, broadcaster,
Deborah Cohen, investigative journalist, writer, broadcaster²*

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A blood test being trialled in large numbers of people in England is facing mounting evidence against its implementation as a screening tool for early cancer. **Margaret McCartney** and **Deborah Cohen** investigate

Big promises have been made for the Galleri blood test, which its maker, the Californian biotechnology company Grail, says is capable of detecting more than 50 types of cancer. Harpal Kumar, president of Grail Europe, has hailed the test as a “groundbreaking and potentially life-saving advance that could have a tremendous human and

Impact of MCED

Healthcare costs



Underwriting & Disclosure

Critical Illness

Impact on Critical Illness

Taking a page from previous impact studies on genetic testing?

Critical illness definitions at risk from genetic testing

Cox discussed a study from the Canadian Institute of Actuaries. The study found that if underwriters did not have access to genetic testing results, for insurance applicants diagnosed with a genetic disease, average CI claim rates are likely to increase by about **26% overall, or 16% for males and 41% for females**, in the age range 30-65; there would be a concomitant increase in CI premium rates

Table 2. Impact for each condition	
Condition	Impact
BRCA	6.4%
Lynch	9.4%
DCM	0.4%
Blindness	1.0%
PSD	4.3%
ADEO	4.5%
Total	26.0%

Wait a minute! Something Strange



Genetic Testing Model for CI: If Underwriters of Individual Critical Illness Insurance Had No Access to Known Results of Genetic Tests

Canadian Institute of Actuaries, Robert C. W. (Bob) Howard, January 2016

Proportion of the population who obtain genetic tests

The most significant factor that would impact the financial results of insurers is the proportion of the population who obtain genetic tests. See below the sensitivity for variations in this assumption:

	Base	Variation		
% of population who obtain PRS-based genetic tests	0.5%	1%	2%	5%
Increase in claims from NB anti-selection	1.8%	3.5%	7.0%	17.5%
% of in-force lapsed due to low risk result	0.1%	0.2%	0.3%	0.8%
% increase in lapse rate	0.5%	1.0%	1.9%	4.8%

Uses a different approach to the Canada

However makes a big assumption that the test will be accurate in future and project what may happen next!

Source: Institute of Actuaries of Australia "Think about life insurance through a genetic lens" prepared by Dr Damjan Vukcevic and Jessica Chen, May 2017

Is MCED a form of Genetic test?



Join at menti.com | use code 8962 4070

- Yes
- No
- Don't know



Mentimeter

Menti
My first poll



Choose a slide to present



Thank you!

somewhat different

