

ESG Matters - Global

From Waistlines to Bottom lines: ESG & Obesity Solutions

Investment Strategy

Health and Wellbeing hitting peak popularity

The SDG 3 Good Health and Wellbeing index has outperformed its broad benchmark by 13pp in last 3-5 years. Healthcare companies have long been part of ESG portfolios (Novo held by 35% funds), where impact investor allocations have risen at a 5-yr CAGR of 26%. Among corporates, about 1 in 2 claims to be addressing SDG 3. Google searches reflect these trends with "Health and Wellbeing" and "GLP-1" hitting an all-time high.

Obesity in 2035, the next COVID? EMs are not ready

On World Obesity Day, we take a closer look at the global obesity crisis and explore the ESG investment case. Over the next decade, more than half the world will be overweight/obese, costing 3% of global GDP (\$4.3trn) – equivalent to COVID-19. According to the WOF, India and China will see the highest increase in adult obesity (CAGR 5%). India least prepared, while the economic impact on China will surpass that of the US, at \$1.3trn.

Investing in obesity to support SDG targets

We believe obesity is intrinsic to the UN SDGs (2.2, 3.4, 3.8). Evidence indicates a higher BMI is the main risk for NCDs like diabetes, cancer and stroke, which count for 74% of all deaths. Moderate food insecurity can lead to obesity. One in 8 people are living with obesity while c.7% are underweight. Over 40% could not afford a healthy diet and COVID plus 40-year-high inflation have made things worse. Investing in solutions can support innovative medical treatment, promote healthier lifestyles, and address food security.

Opportunities: global GLP-1 and Food companies

We highlight 17 GLP-1 stocks in **Exhibit 28-29**. The highly effective anti-obesity drugs suppress appetite, cravings, and addictive behaviours. BofA analysts expect 15% US adults to be on GLP-1 by 2035 (vs. c1% today). See **Exhibit 14** for 21 food stocks prioritizing affordable nutritious food, 8 have over a third revenue exposure to EMs.

Minimizing negative impact: productivity, emissions

Addressing obesity is likely to decrease lost productivity at work by reducing absenteeism, disability, and workers' compensation (SDG 8). GLP-1 could also reduce consumption of packaged food (meaning less waste, SDG 12), tobacco smoking, and alcohol (SDG 3) and ultimately lead to less calorie consumption and emissions (SDG 13).

Policies: PFAS ban, calorie labelling, drug reimbursement

We could see a PFAS ban in food packaging across US states, with an EU draft expected in 2024. Other measures include soft drink levies, calorie labelling, and bans on unhealthy promotions across nations. The UK plans to make GLP-1 accessible; some EU countries might reimburse the cost while progress on TROA is key in the US.

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Refer to important disclosures on page 25 to 27.

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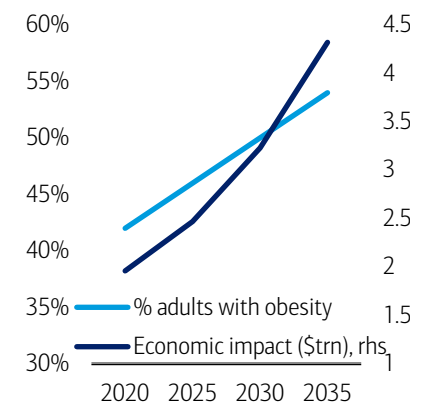
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Exhibit 1: Obesity to cost \$4trn by 2035

Global economic impact of high BMI (BMI $\geq 25\text{kg/m}^2$) 2020–2035E



Source: World Obesity Federation, 2023b
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SDGs: Sustainable Development Goals

PFAS: Per- and Polyfluorinated Substances

NCDs: Noncommunicable diseases

GLP-1: Glucagon-like peptide-1

TROA: Treat and Reduce Obesity Act

WOF: World Obesity Federation

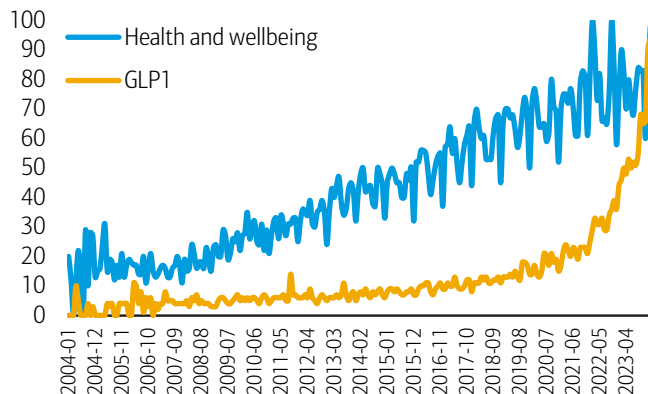
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Increased focus on Health and Wellbeing

Exhibit 2: Health and Wellbeing searches are at peak popularity

Numbers represent search interest relative to the highest point on the chart.
100 = peak popularity, 0 = not enough data

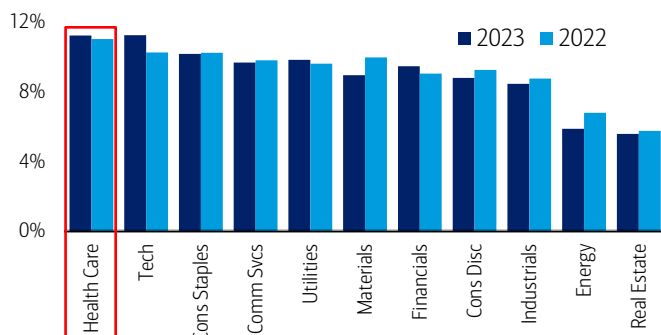


Source: Google trends, 2004- Feb 2024

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Exhibit 4: On average, a health care company is held by more ESG investors than other sectors

Average % of ESG funds holding a Stoxx 600 company, by sector

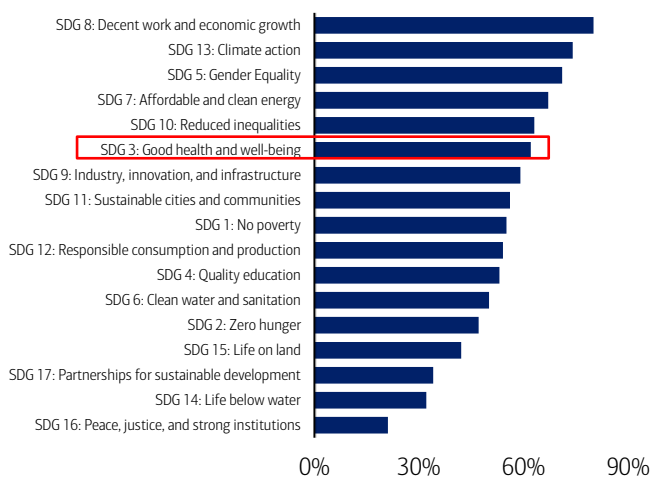


Source: FactSet Ownership. Note: Based on 1629 (EUR 357bn) ESG funds with geographical focus as Europe and Global but domiciled in UK and Eurozone, as of 12/29/23

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Exhibit 6: More than 6 in 10 Impact investors target SDG 3

SDGs targeted by investors, n =297, Respondents could select multiple SDGs

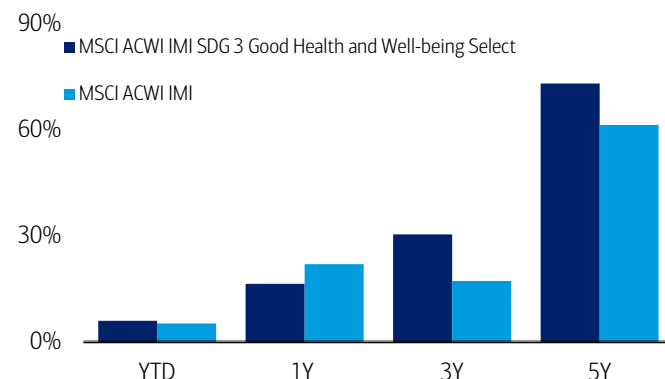


Source: Global Impact Investing Network (GIIN), 2023 GIINight: Impact Investing Allocations, Activity & Performance

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Exhibit 3: Health and Well-being index outperformed the benchmark by 13pp over 3-5 year period

Net Return USD Index (%)

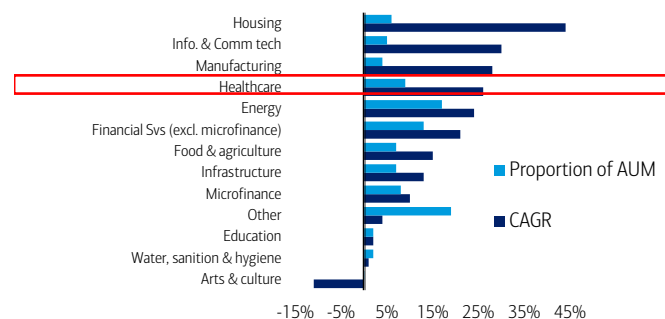


Source: Bloomberg, as of 03/01/2024

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Exhibit 5: Impact investors allocated 26% more to the Healthcare sector annually over the last 5 years

Investor asset allocation by sector (n =303, \$198bn AUM), Growth rates in allocations across sectors (n=88)



Source: Global Impact Investing Network (GIIN), 2023 GIINight: Impact Investing Allocations, Activity & Performance

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Exhibit 7: 1 in 2 MSCI World companies say they address SDG 3

Latest company reported data on SDG alignment from Refinitiv,

Sustainable Development Goals	Asia	EMEA	AMRS	Total
SDG 1 No Poverty	26%	27%	16%	21%
SDG 2 Zero Hunger	23%	24%	17%	19%
SDG 3 Good Health and Well-Being	69%	66%	41%	52%
SDG 4 Quality Education	53%	56%	35%	43%
SDG 5 Gender Equality	67%	70%	46%	55%
SDG 6 Clean Water and Sanitation	43%	41%	31%	35%
SDG 7 Affordable and Clean Energy	71%	62%	41%	52%
SDG 8 Decent Work and Economic Growth	82%	81%	50%	63%
SDG 9 Industry Innovation and Infrastructure	70%	62%	37%	50%
SDG 10 Reduced Inequality	56%	47%	40%	43%
SDG 11 Sustainable Cities and Communities	66%	44%	32%	41%
SDG 12 Responsible Consumption and Production	77%	76%	47%	60%
SDG 13 Climate Action	85%	85%	57%	68%
SDG 14 Life Below Water	38%	27%	16%	23%
SDG 15 Life on Land	51%	41%	25%	34%
SDG 16 Peace and Justice Strong Institutions	48%	49%	23%	35%
SDG 17 Partnerships to achieve the Goal	58%	49%	24%	38%
Total	89%	92%	64%	72%

Source: Refinitiv, as of Feb 2024

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Let's talk obesity...

On World Obesity Day, we take a closer look at the global obesity crisis and explore the ESG investment case more broadly.

What is Obesity?

Overweight and obesity result from an imbalance of energy intake (diet) and energy expenditure (physical activity)

BMI is the most common to measure obesity. WHO defines 'obesity' as a body mass index (BMI) of equal to or more than 30 and 'overweight' as a BMI of equal to or more than 25. BMI is calculated as the weight in kilograms divided by the square of the height in meters (kg/m²). However, some academic research argues that BMI leads to misinformation because it does not distinguish between excess fat, muscle, or bone mass.

Tackling obesity = addressing SDGs

Some countries acknowledge obesity as intrinsic to the Sustainable Development Goals (SDGs), e.g. Ireland includes obesity under SDG2 (Zero Hunger) by reporting it in Voluntary National Reviews of SDG progress, Türkiye under SDG3 (Good Health and Well-Being), while Europe includes it in both SDG3 and SDG2. The World Obesity Federation linked Obesity to 13 relevant goals and accompanying targets Exhibit 8.

In this note, we focus on the direct and indirect relationship of obesity (measured by high BMI) to SDG2 and SDG3 and spillover effects to SDG12 (Responsible Consumption and Production) and SDG13 (Climate Action).

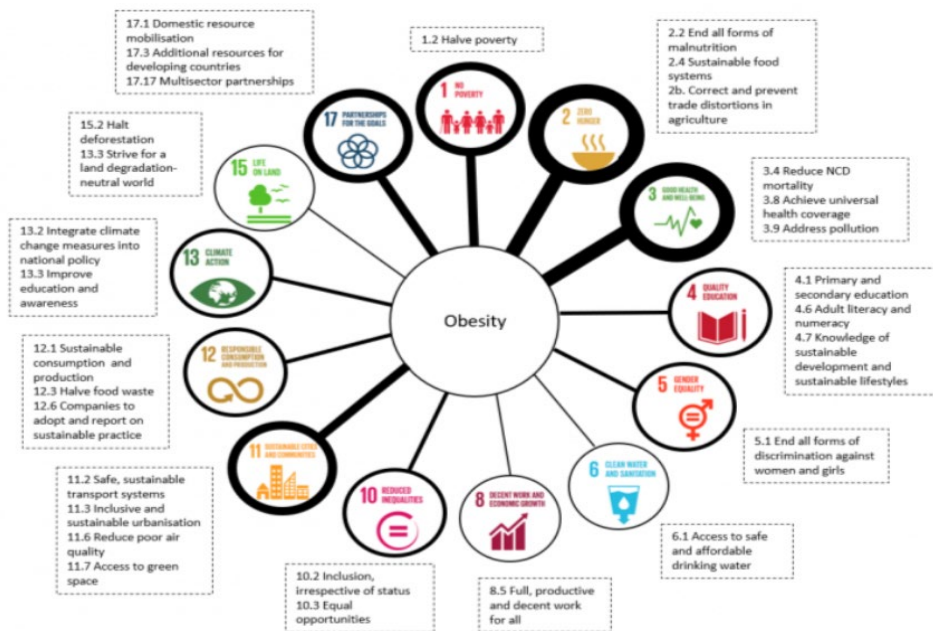
What are SDGs? In 2015, the United Nations established its Sustainable Development Goals (SDGs) – a universal set of 17 goals, 169 targets and 304 indicators of how 193 member state governments, the private sector, and civil society can achieve the **goals of ending poverty, protecting the planet, and ensuring prosperity** for all as part of a new sustainable development agenda. These SDGs are intended to be achieved by 2030.

Only 18% of the SDG targets are on track to be achieved globally by 2030

The Sustainable Development Report 2023 estimates that only 18% of the SDG targets are on track. Those related to hunger, sustainable diets, and health outcomes are particularly off-track, as are the goals on biodiversity, urban pollution, housing, strong institutions, and peaceful societies

Exhibit 8: Obesity has the strongest relationship with SDG 2 (Zero Hunger) and SDG 3 (Good Health and Well-Being)

The thickness of the lines gives an indication of the strength of the relationship between each goal and obesity.



Source: World Obesity Federation, Obesity and the SDGs: an opportunity hidden in plain sight, 2019


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SDG 2.2: Obesity – a consequence of food insecurity

SDG Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons.

The term malnutrition addresses 3 broad groups of conditions: undernutrition, micronutrient-related malnutrition, and overweight, obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes and some cancers).

Exhibit 9: UN SDG Goal 2: Zero Hunger
The combined burden of underweight and obesity has increased in most countries, driven by an increase in obesity

	2.1 Ensure access to safe nutritious, and sufficient food	2.2 End all forms of malnutrition
	2.3 Double the productivity& income of small-scale food producers	2.4 Deliver sustainable, resilient food systems
		2.5 Maintain agrobiodiversity

Source: UN Sustainable Development Goals

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One in 8 people are living with obesity while c.7% are underweight

Mild or Moderate food insecurity is linked to obesity, while extreme food insecurity can lead to undernutrition (FAO). In many countries, undernutrition and obesity coexist and both can be consequences of food insecurity. Globally, the prevalence of moderate to severe food insecurity was estimated at 29.6% in 2022 (vs. 22.7% in 2016). In 2022, 2.5 billion adults were overweight, including 890 million who were living with obesity, while 390 million were underweight.

Obesity in both children and adults is on the rise. Children facing hunger, food insecurity and undernutrition today may have a higher risk of overweight, obesity and chronic diseases like diabetes later in life. Moreover, the availability and price of unhealthy food versus healthy food is soaring obesity rates in many island nations. Eating highly processed food (energy-dense, high in saturated fats, sugars, salt) may mean missing essential nutrients.

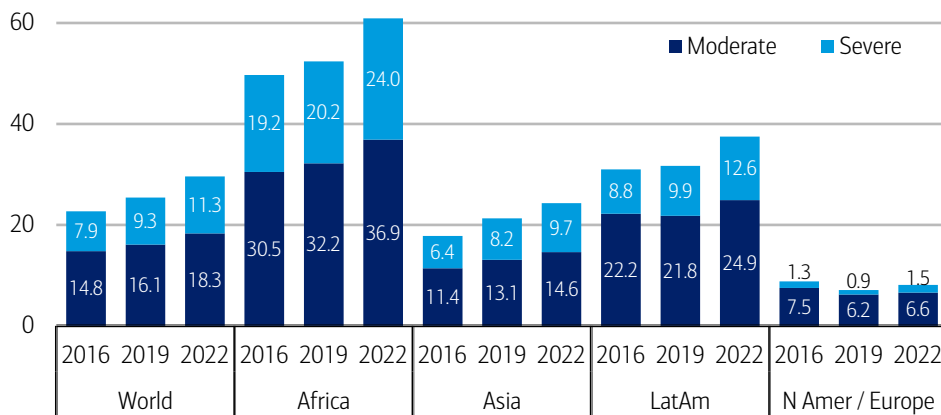
The Lancet editorial 2024¹ indicates the combined burden of underweight and obesity has increased in most countries, driven by an increase in obesity, while underweight and thinness remain prevalent in south Asia and parts of Africa. Transition to healthy nutritious foods can help tackle persistent underweight issues while also combating and reversing obesity.

¹ The Lancet study, Feb 2024, Worldwide trends in underweight and obesity from 1990 to 2022



Exhibit 10: Moderate to severe food insecurity by region (shown in % of population)

Food insecurity has worsened in most regions since 2016 and since pre-pandemic levels (2019)



Source: FAO, IFAD, UNICEF, WFP and WHO. 2023. The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural-urban continuum. Rome, FAO.

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>40% of the world can't afford a healthy diet

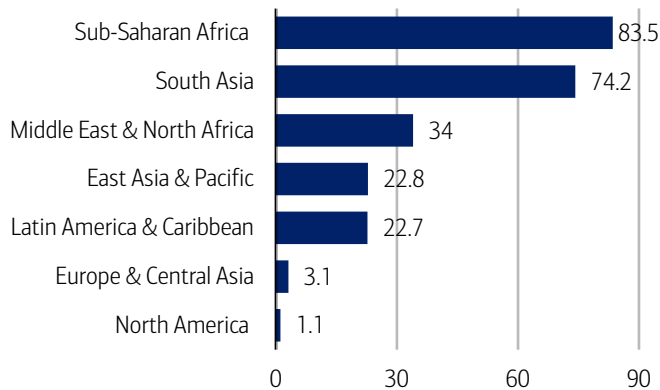
About 42% of the global population (c.3.1 billion) could not afford a healthy diet in 2021. This was much higher at 70-80% of the population in Africa and South Asia (excluding China).

A 'healthy diet' consists of the lowest cost set of foods available that would meet requirements in government / public health agency dietary guidelines. A diet is considered unaffordable if it costs more than 52% of a household's income (World Bank).

Food affordability is a driver of food choice and one component of food security. Food security itself is a measure of an individual's ability to access food that is nutritious and sufficient in quantity

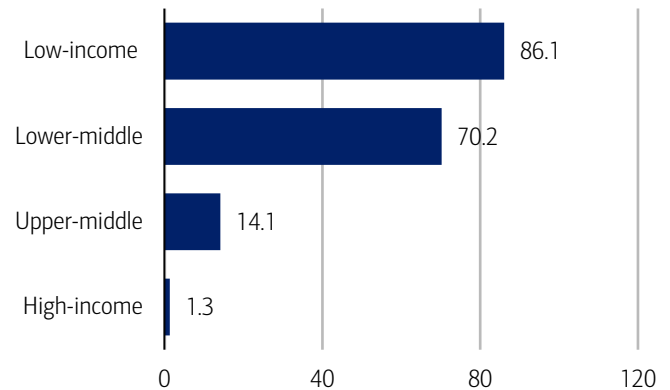
When adjusted for differences in cost of living, the price of a healthy diet is higher in most of Africa than it is in North America (this figure is not adjusted for inflation).

Exhibit 11: Share of population who cannot afford a healthy diet, %
In Sub-Saharan Africa and South Asia, over 3 in 4 can't afford 'healthy'



Source: Our World in Data, 'Share of the population who cannot afford a healthy diet, 2021.'
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Exhibit 12: Share of population who cannot afford a healthy diet, %
Going from lower- to upper-middle income vastly improves affordability



Source: Our World in Data, 'Share of the population who cannot afford a healthy diet, 2021.'
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40-year high inflation exacerbated food insecurity

The Food & Agriculture Organization of the United Nations estimates that the pandemic increased incidence of hunger and lack of access to adequate food by over 300mn people from 2019 to 2020 alone – this rose further (due to war in Ukraine and inflation) in 2021 and 2022. Reasons include the rising cost of healthy diets, income inequality and persistent poverty.

By the end of 2022, 66% of countries saw food prices up by more than 10% year-on-year compared to just 15% at the end of 2019 (just before the pandemic). Lingering high prices – and in developing markets, weak currencies – are exacerbating food insecurity issues. For more, see [Food \(in\)security: hungry for change](#)

Exhibit 13: Share of countries recording food price inflation > 10%*

66% of countries saw food prices up >10% as of end-2022 versus 15% at end-2019 (pre-pandemic)



Source: FAO (FAOSTat), BofA Global Research. *Last data point as of 31 December 2022.

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21 stocks to address Food Insecurity

Consumption of healthy diets by all addresses all forms of malnutrition, including overweight and obesity.

Food companies are not prioritizing health

Currently, less than 20% consumer-facing companies share progress on their reformulation activities to improve the nutritional quality of their products, and only a handful have set targets to increase sales of healthy foods, with retailers leading the way. With rapid expansion of out-of-home meals, restaurants and food service providers need to step up their food offerings to be healthier (World Benchmarking Alliance, Food and Agriculture Benchmark 2023)

Screening for companies with better 'Nutrition' Score and EM exposure

We use World Benchmarking Alliance, Food and Agriculture Benchmark Score for 'Nutrition' category. The 350 companies (of part of WBA's SDG2000, \$45trillion revenue across 86 economies), assessed in the benchmark encompasses companies active in the agricultural inputs, agricultural products and commodities, animal proteins, manufacturing and processing, retail and food service segments. The score ranges from 0 to 100, 100 being the best and is calculated based on 5 components -

- Availability of nutritious foods,
- Accessibility and affordability of nutritious foods,
- Clear and transparent labelling,
- Responsible marketing and promotion of nutritious foods,
- Workforce nutrition and Food safety.

We screen for companies with a combined score of at least one-third in both 'availability' and 'accessibility and affordability' score and highlight those with at least a third exposure to emerging markets. These companies are leaders with production of a variety of affordable, nutritious, culturally appropriate, and safe foods, particularly in low-income countries.

Exhibit 14: Companies with a combined score of at least one-third in both 'availability' and 'accessibility and affordability' of nutritious foods

Highlighted companies have at least a third exposure to emerging markets. Out of 350 Food and agriculture companies of SDG2000 list monitored by World Benchmarking Alliance

Ticker	Company name	Sub-Industry	Nutrition Score	Availability of nutritious foods	Accessibility and affordability of nutritious foods
NESN SW	Nestlé	Packaged Foods & Meats	66	0.6	0.6
ULVR LN	Unilever	Personal Care Products	64	0.8	0.6
BN FP	Danone	Packaged Foods & Meats	50	1	0.4
WOW AU	Woolworths Group	Food Retail	50	1	0.2
SBRY LN	Sainsbury's	Food Retail	43	1	0.4
TSCO LN	Tesco	Food Retail	41	1	0.4
BIMBOA MM	Grupo Bimbo	Packaged Foods & Meats	36	0.6	0.2
CPF TB	Charoen Pokphand Group	Packaged Foods & Meats	36	0.4	0.2
K US	Kellogg's	Packaged Foods & Meats	35	0.4	0.2
2802 JP	Ajinomoto Group	Packaged Foods & Meats	34	0.8	0.2
COL AU	Coles Group	Food Retail	32	0.6	0.4
AD NA	Ahold Delhaize	Food Retail	29	0.6	0.4
CPB US	Campbell's	Packaged Foods & Meats	29	0.4	0.2
KYGA ID	Kerry Group	Packaged Foods & Meats	28	0.4	0.2
NOMD US	Nomad Foods	Packaged Foods & Meats	26	0.4	0.2
CA FP	Carrefour	Food Retail	26	0.4	0.2
JMT PL	Jeronimo Martins	Food Retail	26	0.4	0.2
GREEN BB	Greenyard	Packaged Foods & Meats	23	0.4	0.2
ABF LN	Associated British Foods	Packaged Foods & Meats	23	0.4	0.2
DELM SP	Del Monte Pacific	Packaged Foods & Meats	17	0.4	0.2
ARMK US	Aramark	Restaurants	13	0.4	0.2

Source: World Benchmarking Alliance, Food and Agriculture Benchmark 2023, as of October 2023, See WBA-2023-Food-and-Agriculture-Benchmark-methodology. ABF, BN, K revenue breakup for EM is approximate

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SDG 3.4: Obesity pushes up NCD-related deaths – the 2030 goal beyond reach

SDG Target 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being

The latest stats on 2022, indicate more than one billion people were living with Obesity, this means increasing NCD-related deaths and putting **SDG 3.4** beyond reach five years before the 2030 deadline.

Exhibit 15: UN SDG Goal 3: Good Health and Wellbeing

Obesity is linked to SDG 3.4 and 3.8

3 GOOD HEALTH AND WELL-BEING 	3.1 Reduce maternal mortality ratio	3.2 End preventable deaths under 5 years of age	3.3 End the epidemics of AIDS, TB, Malaria & other communicable diseases	3.4 Reduce premature mortality by NCDs & promote mental health
	3.5 Strengthen the prevention and treatment of substance abuse	3.6 Reduce deaths and road traffic injuries	3.7 Ensure universal access to sexual and reproductive health-care services	3.8 Achieve universal health coverage
				3.9 Reduce deaths and illnesses from hazardous chemicals & pollution

Source: Sustainable Development Goals

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Obesity – one of the leading causes of death worldwide

About 74% of all deaths globally are due to NCDs (noncommunicable diseases). Every 2 seconds someone aged 30 to 70 years dies prematurely from one – 86% of these deaths occur in low- and middle-income countries.

And around 5 million² people died prematurely in 2019 because of obesity, making it one of the leading causes of death worldwide (Exhibit 16)

Unhealthy diets and a lack of physical activity may lead to metabolic risk factors like raised blood pressure, increased blood glucose, elevated blood lipids and obesity - leading NCDs in terms of premature deaths. Other modifiable behavioural risk factors include tobacco use, the harmful use of alcohol and air pollution. NCDs include:

- cardiovascular diseases (mainly heart disease and stroke), which were the leading cause of death in 2012;
- diabetes;
- musculoskeletal disorders (especially osteoarthritis – a highly disabling degenerative disease of the joints);

² Global Burden of Disease 2019 by IHME (Institute for health metrics and evaluation)

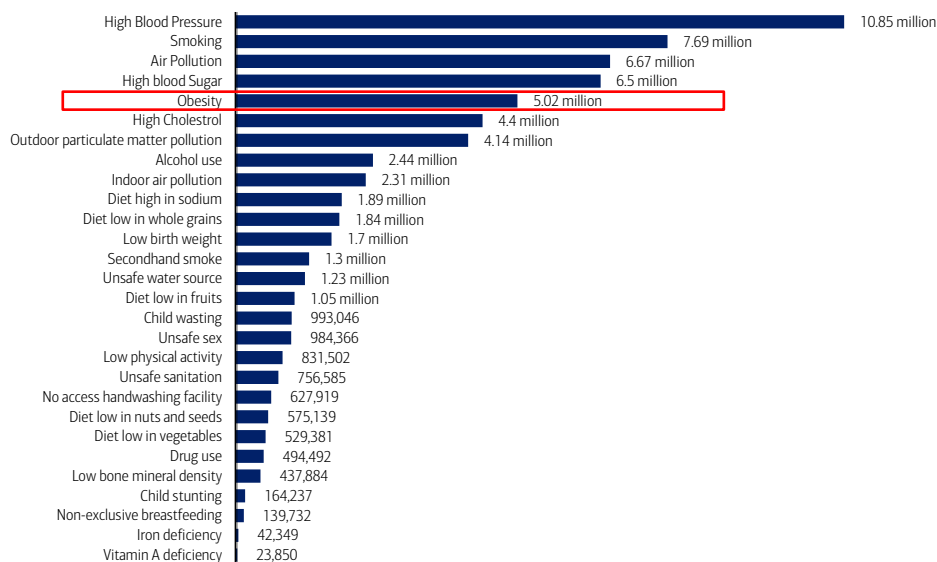
- some cancers (including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon).

Obesity in youngsters has quadrupled since 1990, expected to rise to 39% by 2035.

Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. Moreover, obese children experience breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular disease, insulin resistance and psychological effects. Children and adolescents (aged 5-19 years) overweight or obesity is predicted to rise from 22% of the global population 39% by 2035 (World Obesity Federation, 2024)

Exhibit 16: Deaths by risk factor, World, 2019

The estimated annual number of deaths attributed to each risk factor. Estimates come with wide uncertainties, especially for countries with poor vital registration



Source: IHME, Global Burden of Disease (2019)

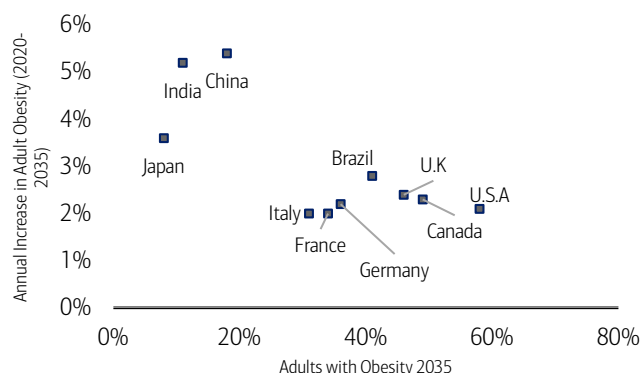
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Concerns mount over rising Obesity in low/middle-income countries

Once considered a high-income country problem, overweight is on the rise in low- and middle-income countries (LMICs) which are least prepared to deal with the crises. About 79% (of 1.53 billion) of adults and 88% of children with overweight and obesity will be living LMICs by 2035. And among the 10 largest economies (by GDP), according to the : World Obesity Federation India and China are expected to see the highest annual increase in adult obesity. India looks least prepared, meanwhile Europe and Western Pacific are most prepared to treat obesity-related NCD.

Exhibit 17: India & China are expected to see highest annual increase in adult obesity by 2035.....

Data for 10 largest economies by GDP (of 183), Y axis is CAGR 2020 to 2035.

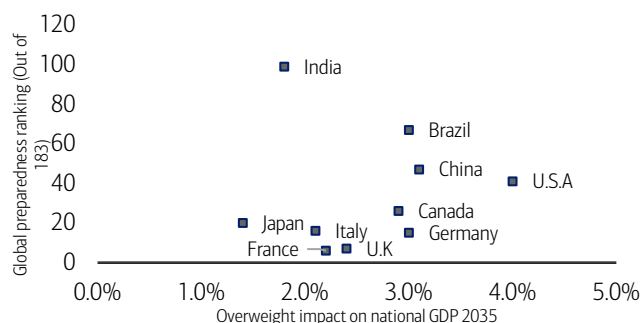


Source World Obesity Federation, 2023a

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Exhibit 18:but are least prepared to deal with the crisis. The US will have 60% of adults with obesity, impacting GDP by 4%

Data for 10 largest economies by GDP (of 183), Y axis is Global Preparedness ranking of all 183 countries to tackle obesity, from 1=best to 183=worst

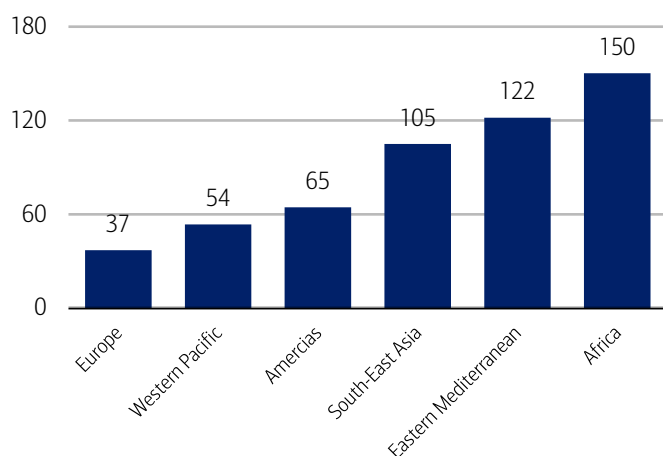


Source: World Obesity Federation, 2023a. Note: Projected GDP and the economic impact of ill-health and productivity losses estimated by RTI International (Okunogbe, 2021, 2022; World Obesity Federation 2022i)

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Exhibit 19: The Obesity-NCD Preparedness Rankings, by region

Population-weighted average rank (out of 183), from 1=best to 183=worst

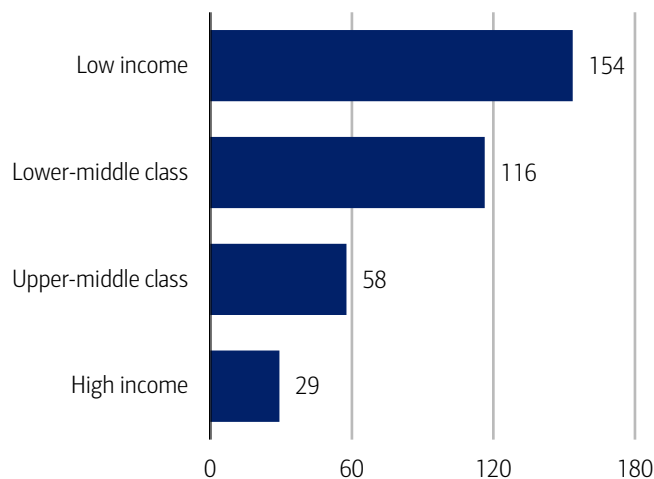


Source: World Obesity Federation, 2022

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Exhibit 20: The Obesity-NCD Preparedness Rankings, by income group

Population-weighted average rank (out of 183), from 1=best to 183=worst



Source: World Obesity Federation, 2022

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SDG 3.8: impacted by obesity-related healthcare spend

SDG Target 3.8: By 2030, achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all

2035E Obesity costs = 3% of global GDP

51% of the world (4 billion people) will be overweight or obese by 2035, and 1 in 4 people will have obesity, placing huge pressure on the health and care system. This will

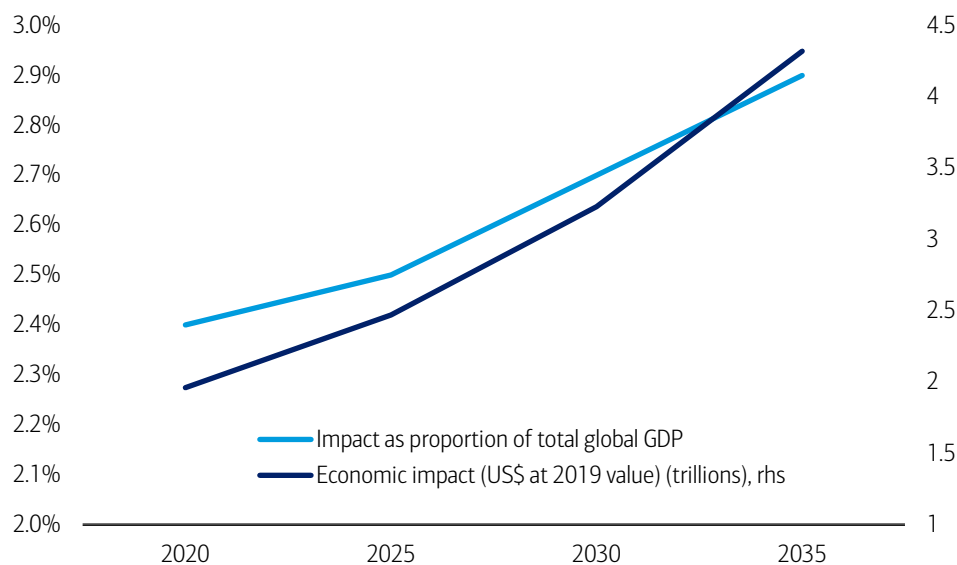
cost the global economy over \$4.3 trillion³ of potential income in 2035, which is almost 3% of current global GDP and equivalent to impact of COVID-19 in 2020.

High BMI saw more COVID impact and vice-versa

Although difficult to assess, one of the studies⁴ indicate c.30% of COVID-19-related hospitalisations could be attributed to overweight and obesity. Moreover, several surveys of health behaviours and obesity prevalence before and during lockdown demonstrated the reverse as well: reduced physical activity and increased consumption of processed foods during lockdown led to a rise in the prevalence of overweight and obesity, especially among children.

Exhibit 21: Global economic impact of high BMI (BMI $\geq 25\text{kg/m}^2$) 2020–2035

Economic impact includes both the healthcare costs of treating obesity and its consequences and the impact of high BMI on economic productivity: it contributes to absenteeism, presenteeism (reduced productivity while at work), and premature retirement or death.



Source: Estimates by RTI International (Okunogbe, 2021, 2022; World Obesity Federation 2022i)

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Obesity costs the US health care system nearly \$173 billion a year

According to a 2021 study⁵, obesity costs the US health care system nearly \$173 billion a year. A Medicare beneficiary with obesity costs \$2,018 more than a non-obese beneficiary, and Medicare spent \$50 billion on obesity in 2014 alone, according to TROA (Treat and Reduce Obesity Act of 2021) text.

Annual spend on obesity/diabetes treatment in the UK is higher than the amount spent on police, fire service and judicial system combined

In the UK, obesity costs the NHS around £6.5bn annually and is the second-biggest preventable cause of cancer. Annual spend on the treatment of obesity and diabetes is greater than the amount spent on the police, the fire service and the judicial system combined.

³ World Obesity Federation, 2023a

⁴ Hamer, Kivimäki et al (2020)

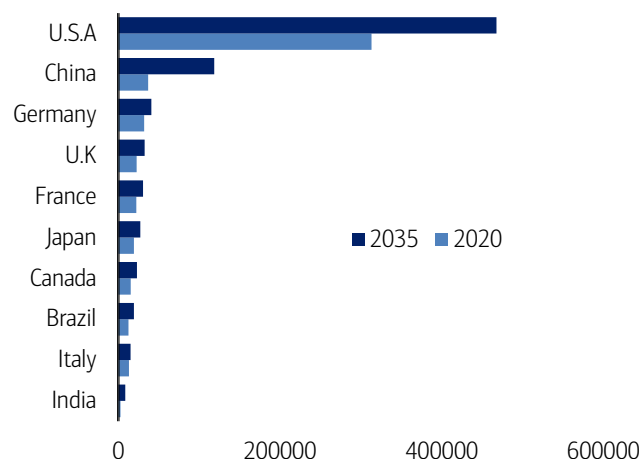
⁵ Ward ZJ, Bleich SN, Long MW, Gortmaker SL (2021) Association of body mass index with health care expenditures in the United States by age and sex. PLoS ONE 16(3): e0247307. <https://doi.org/10.1371/journal.pone.0247307>

Economic impact of high BMI in India and China to be more than 200% by 2035

As discussed before, lower-middle-income countries with large populations, such as India, Pakistan, Indonesia and Nigeria, may quite quickly follow the pattern of upper-middle-income countries such as Mexico, Brazil, and Türkiye, in seeing a rapid rise in obesity prevalence, especially among children and adolescents. Among top ten largest economies, India and China would see the largest increase in Obesity related Healthcare costs while the economic impact on China will surpass that of the US, at \$1.3trn.

Exhibit 22: India and China would see the largest increase in Obesity related Healthcare costs

Healthcare impact of BMI $\geq 25\text{kg/m}^2$, US\$ million for top 10 economies by GDP

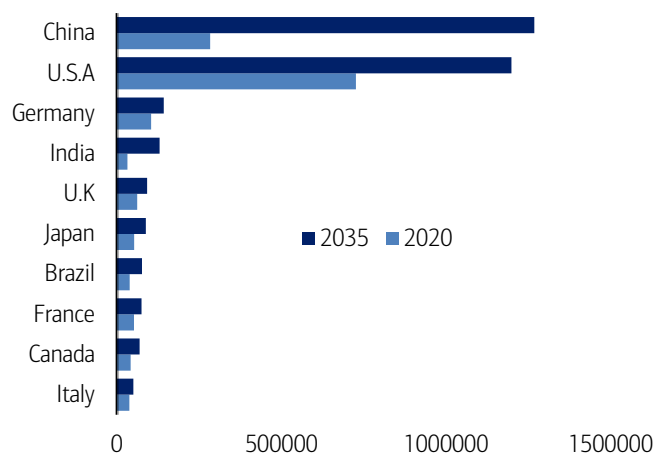


Source: World Obesity Federation, 2023a. Note: Projected GDP and the economic impact of ill-health and productivity losses estimated by RTI International (Okunogbe, 2021, 2022; World Obesity Federation 2022i)

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Exhibit 23: China will overtake US with largest economic impact of obesity, by 2035

Total economic impact of BMI $\geq 25\text{kg/m}^2$, US\$ million for top 10 economies by GDP



Source: World Obesity Federation, 2023a. Note: Projected GDP and the economic impact of ill-health and productivity losses estimated by RTI International (Okunogbe, 2021, 2022; World Obesity Federation 2022i)

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Higher BMI = higher insurance premium

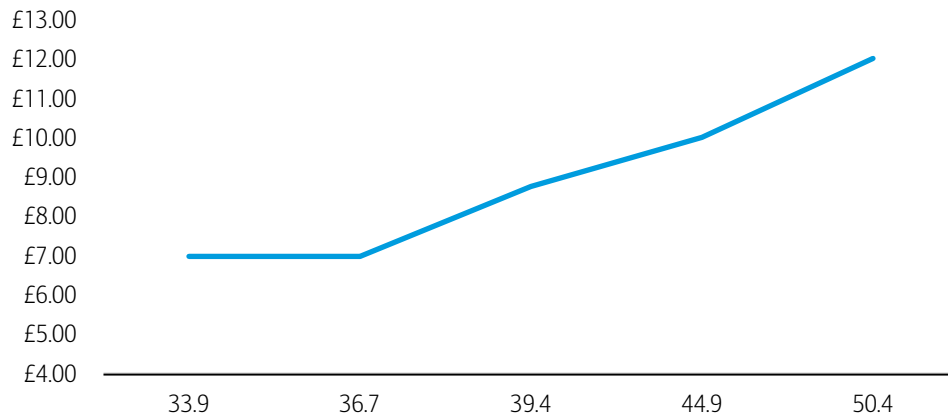
The cost of insurance cover is affected by BMI, as a high BMI implies greater risk of developing health-related issues and therefore increases the likelihood of a valid claim – making life insurance more expensive. Insurers may have a maximum limit for BMI, usually up to 45-47 depending on the age. In some cases, very high BMIs may lead to coverage exclusions or limitations.

Life insurance premiums for an overweight individual depend on:

- Current health
- BMI ratio, and age
- The type of insurance product (income protection, critical illness cover, travel insurance)
- The term of policy
- Smoking habit

Exhibit 24: How much is life insurance for people with high BMI?

Examples of typical premiums for life insurance based on BMI, BMI (x-axis) vs Premium (Y-axis)



Source: iamINSURED, Life Insurance for overweight Guide 2024. Note: Based on prices generated on 11/2/21 and do not include any other health, medical or other factors so prices may vary

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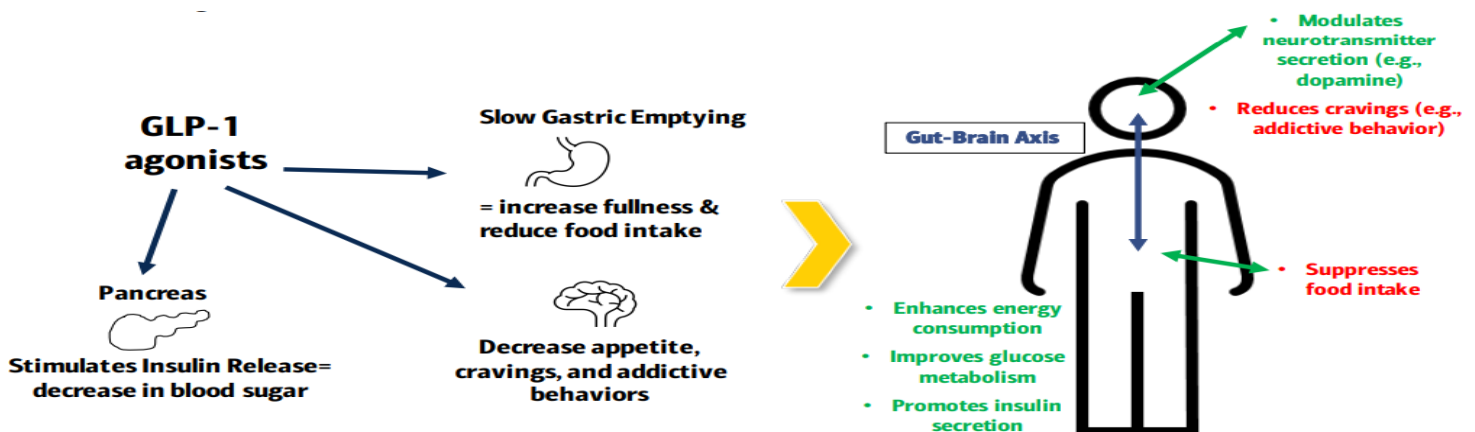
GLP1- an investment opportunity**What are GLP-1's?**

Glucagon-like peptide 1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP) are hormones responsible for the “incretin effect” or the augmentation of insulin secretion. GLP-1s have been used to treat Type 2 Diabetes (T2D) since 2005, and have more recently been FDA approved for chronic weight management. There are many downstream effects of GLP-1 drugs such as Novo Nordisk's Wegovy (and Ozempic) and Eli Lilly's Mounjaro, which can lead to dramatic weightloss.

The launch of new, highly effective drugs (GLP-1 agonists) for obesity by Eli Lilly and Novo Nordisk could be one of the biggest in the history of Biopharma. These drugs trigger receptors in the brain to suppress appetites, cravings and addictive behaviors. BofA global research analysts have extensively written on this topic across regions, see the latest note [BofA Insights into GLP-1 Market Trends: Week of 2/19 26 February 2024](#)

Exhibit 25: What are GLP-1: glucagon like peptide 1?

GLP-1 : how do they work and what are the effects?



Source: BofA Global Research

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Reducing Obesity by 5% would mean \$2.2trn annual costs savings

Reducing projected overweight and obesity prevalence by 5% annually from current trends or keeping it at 2019 levels will translate into savings of \$430 billion or \$2.2 trillion in costs respectively every year between 2020 and 2060 globally (World Obesity Federation).

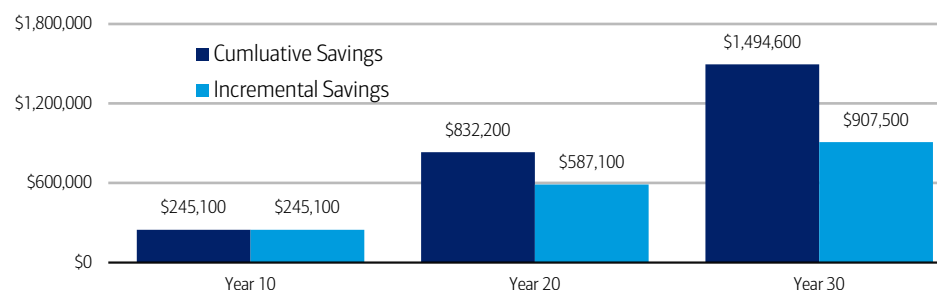
\$1.5trillion in savings from GLP-1s in US Medicare over 30 years, with widespread adoption

A study conducted in April 2023 by Schaeffer Center estimates that coverage for new obesity treatments could generate \$245bn in cost offsets to Medicare in the first ten years alone. By 30 years, cost offsets to Medicare would increase to \$1.5T which he notes as relatively modest (given Medicare spends >\$1tn annually). These savings estimates assume that 100% of the people who are obese take the drug. The ability of drug companies to supply for the potential demand could be another gating factor to how quickly there is a widespread adoption. As a result, our US analyst expect that the impact over the next ten years is likely to be well below the worst case 100% adoption assumption, but likely is still meaningful (33%-75% of the worst-case impact depending on the subsector). They see these drugs as inflationary, as the cost of the drug is immediate, but the health care benefits take some time to develop.

While only about 1% if the adult US population uses GLP-1s now, Geoff Meacham expects 15% to use these drugs by 2035, see [Investment Strategy: From AI to EVs - 10 Themes for 2024 from Fundamental Analysts 14 February 2024](#)

Exhibit 26: Some studies pointing to trillions in savings for the system over time

Estimated savings from GLP-1s in Medicare over time (millions)



Source: Schaeffer Center White Paper Series

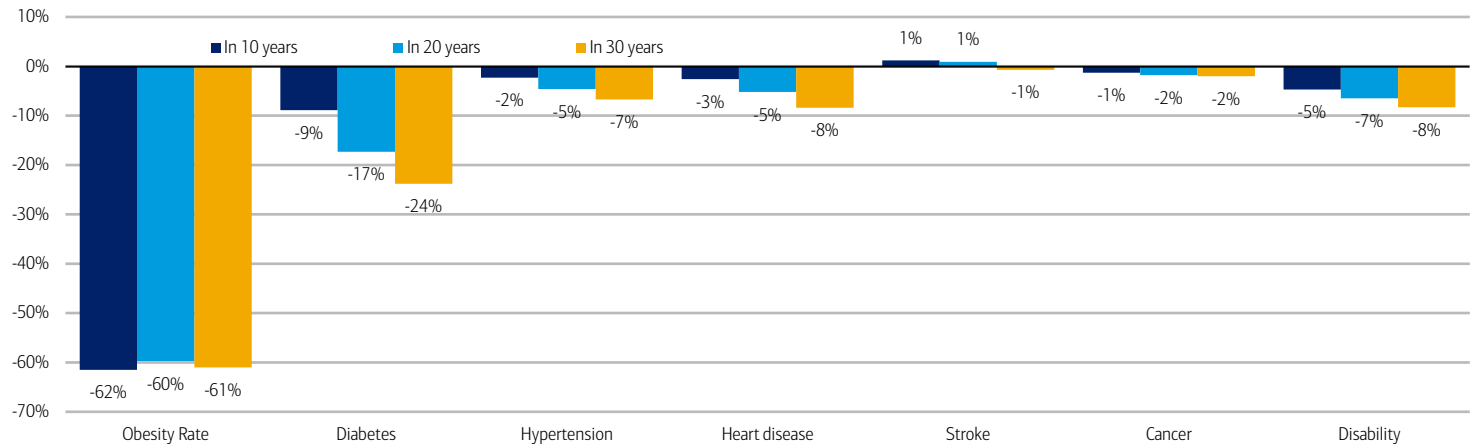
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And a >60% reduction in obesity

The cost savings of \$1.5 trillion assume that Medicare would rapidly see a >60% reduction in obesity, which is maintained for the full 30-year study period. While some of the health benefits start to materialize immediately, the full benefit of the reduction in prevalence of diabetes or heart disease isn't predicted to materialize until 30 years after coverage for obesity is approved. There is some evidence that within a year there are benefits in reducing heart disease, kidney failure, sleep apnea, etc. and health benefits are likely to build over time. GLP1s are likely to reduce utilization of a broad swath of health care services, but the impact would vary by subsector. Our US analysts see dialysis and sleep impacted more/earlier than other sectors with an ultimate modest headwind to hospital volumes, see [Quantifying the potential impact of GLP-1s on MCOs \(+\), Facs \(- varies by sector\) 22 September 2023](#)

Exhibit 27: Reduction in health care spending could take 30 years to come to fruition

Estimated reduction in prevalence of health conditions in the Medicare population from GLP-1s over time



Source: Schaeffer Center White Paper Series

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17 Global companies with approved or under development GLP-1 agonists

Exhibit 28: Global companies with approved GLP-1s

GLP-1 RAs approved for marketing as of YE2023

Target	Name	Brand	Company	Approved	MW (Da)	Base	Indication	Plasma half-life	Frequency	Route
GLP-1R	Exenatide	Byetta	Amylin and Eli Lilly	2005 (FDA), 2009 (NMPA)	4.2	Exendin-4	Type 2 diabetes	2.4h	Twice daily	Injection
		Bydureon	Amylin and Eli Lilly	2012 (FDA), 2017(NMPA)	4.2	Exendin-4	Type 2 diabetes	N.A.	Once weekly	Injection
	Liraglutide	Victoza	Novo Nordisk	2010 (FDA), 2011(NMPA)	3.8	mammalian GLP-1	Type 2 diabetes	13h	Once daily	Injection
		Saxenda	Novo Nordisk	2014 (FDA)	3.8	mammalian GLP-1	Obesity	13h	Once daily	Injection
	Albiglutide	Tanzeum	GlaxoSmithKline	2014 (FDA) (withdrawn 2017)	73.0	mammalian GLP-1	Type 2 diabetes	~5D	Once weekly	Injection
	Dulaglutide	Trulicity	Eli Lilly	2014 (FDA), 2019(NMPA)	59.7	mammalian GLP-1	Type 2 diabetes	~5D	Once weekly	Injection
	Lixisenatide	Lyxumia	Sanofi	2016 (FDA), 2017(NMPA)	4.9	Exendin-4	Type 2 diabetes	2-4h	Once daily	Injection
	Beinaglutide	YI SHENG TAI	Benemae Pharmaceutical	2016 (NMPA)	3.3	mammalian GLP-1	Type 2 diabetes	1-2mins	Three times daily	Injection
	Semaglutide	Ozempic	Novo Nordisk	2017 (FDA), 2017(NMPA)	4.1	mammalian GLP-1	Type 2 diabetes	1 week	Once weekly	Injection
		Wegovy	Novo Nordisk	2021 (FDA)	4.1	mammalian GLP-1	Obesity	1 week	Once weekly	Injection
		Rybelsus	Novo Nordisk	2019 (FDA)	4.1	mammalian GLP-1	Type 2 diabetes	1 week	Once daily	Oral
	PEG-loxanatide	FU LAI MEI	Hansoh	2019 (NMPA)	44.2	Exendin-4	Type 2 diabetes	~5D	Once weekly	Injection
GLP-1R/GIPR	Tirzepatide	Mounjaro	Eli Lilly	2022 (FDA)	4.8	mammalian GLP-1 and GIP	Type 2 diabetes	~5D	Once weekly	Injection

Source: BofA Global Research, Company data

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Exhibit 29: Global Companies with GLP-1 agonists under development

Multiple-target GLP-1 agonist has potential to deliver higher efficacy for obesity

Ticker	Company	Indication
ALT US	Altimmune	Type 2 diabetes, obesity, NASH
AMGN US	Amgen Inc	Obesity
AZN LN	AstraZeneca	Type 2 diabetes, obesity, NASH, chronic kidney disease, renal failure, creatine transporter defect
LLY US	Eli Lilly	Type 2 diabetes, obesity, renal failure
128940 KS	Hanmi Pharmaceuticals	Obesity
1801 HK	Innovent Biologics Inc	Obesity



Exhibit 29: Global Companies with GLP-1 agonists under development

Multiple-target GLP-1 agonist has potential to deliver higher efficacy for obesity

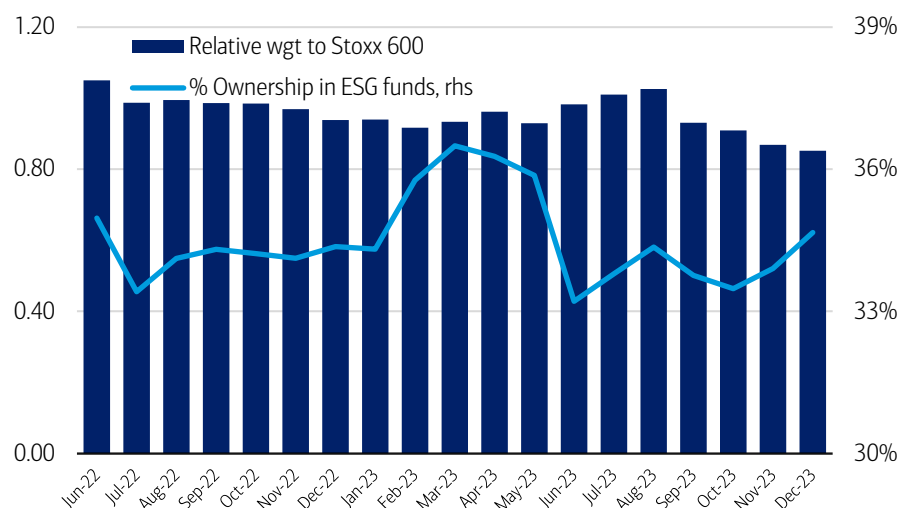
Ticker	Company	Indication
MRK US	Merck	Type 2 diabetes, obesity, chronic renal failure, NASH
NOVOB DC	Novo Nordisk	Obesity
GPCR US	Structure Therapeutics Inc	Obesity; Type 2 Diabetes
VKTX US	Viking Therapeutics Inc	Obesity
ZEAL DC	Zealand Pharma AS	Obesity; Type 2 Diabetes
3933 HK	United Laboratories	Obesity

Source: GlobalData

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Exhibit 30: 35% of European ESG fund have exposure to Novo Nordisk

European ESG fund positioning in Novo Nordisk. Relative weight of ESG funds vs Stoxx 600 and % of funds owning the stock (June -22 to Dec 23)



Source: FactSet Ownership. Note: December data is based on 1629 (EUR 357bn) ESG funds with geographical focus as Europe and Global but domiciled in UK and Eurozone, as of 12/29/23

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SDG 13: Obesity vs. Environment, two directional

BMI, GHG emissions and waste per capita are correlated

High BMI and environmental indicators like greenhouse gas emissions, plastic waste and consumption of animal products are correlated, Exhibit 31.

High body mass needs greater energy (30%⁶ more calories) via greater food consumption (means greater food production) and when combined with motorised transport (rather than physical activity) would lead to higher emissions than an average person. The amounts are not trivial, with one estimate suggesting that high BMI adds an extra 700 megatons of CO₂eq emissions annually – the equivalent of 1.6% of worldwide GHG emissions or is associated with c.20% more GHGs than the average person's footprint (Magkos et al, 2020).

⁶ Pradhan P, Reusser DE, Kropp JP (2013) Embodied Greenhouse Gas Emissions in Diets

Exhibit 31: High BMI and environmental factors are positively correlated

Correlations between adult and child high BMI and environmental indicators

	GHG emissions CO2 equivalent tonnes/capita/year (2015)	%urban population (2020)	Plastic waste kg/capita (latest year)	% adults taking insufficient physical activity (2016)	% youth 11- 19y taking insufficient physical activity (2016)	Consumption of animal protein g/cap/day (2021)	Consumption of sugar and sweeteners kg/cap/yr (2021)
Countries with data	n=144	n=182	n=147	n=153	n=127	n=176	n=176
Adult high BMI prevalence 2016	r=0.48 (p<0.001)	r=0.57 (p<0.001)	r=0.45 (p<0.001)	r=0.48 (p<0.001)	r=-0.19 (p<0.001)	r=0.67 (p<0.001)	r=0.49 (p<0.001)
Child high BMI prevalence 2016	r=0.54 (p<0.001)	r=0.47 (p<0.001)	r=0.46 (p<0.001)	r=0.49 (p<0.001)	r=-0.07 (p<0.001)	r=0.61 (p<0.001)	r=0.44 (p<0.001)

Source: World Obesity Federation, 2024

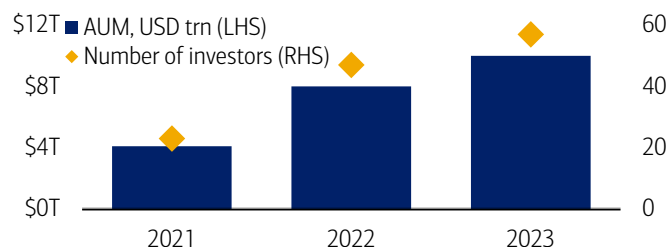
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Obesogens/PFAS - a contributing factor to the obesity epidemic

Obesogens (or endocrine disruptors) are chemicals found in everyday items like food containers, toys, cookware, personal care products, plastic packaging, clothes, furniture and medical supplies and may contaminate food, water, or air. A 2022 research study in Environmental Science and Technology journal concluded that obesogens have endocrine-affecting properties which promote weight gain and obesity. The exposure to potential obesogenic pollutants may increase as globalisation and exposure to ultraprocessed foods in countries, particularly lower-middle income countries, increases.

Exhibit 32: The number of investors calling for a phase-out of PFAS has more than doubled in the last 3 years

AUM (USD trn; LHS) and number of global investors (RHS) that signed an annual letter calling for PFAS producers to phase out PFAS as part of the Investor Initiative on Hazardous Chemicals (IIHC), 2021-2023



Source: BofA US ESG Research, ChemSec, Reuters, Financial Times. On the back of the letters signed by investors in 2021 and 2022, the Investor Initiative on Hazardous Chemicals (IIHC) was formally created in February 2023.

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Shareholder advocacy and the call for PFAS-free products

Per- and polyfluoroalkyl substances (PFAS), a diverse group of fluorinated chemicals, are considered potential obesogens. The tide of consumer awareness is growing, amplified by a surge in shareholder activism advocating for heightened transparency and urging a shift away from these compounds in everyday products. Last year, a coalition of 50 investors, managing >\$10T, pooled their efforts in the Investor Initiative on Hazardous Chemicals (IIHC). Simultaneously, there's a noticeable uptick in companies disclosing toxic chemical reduction initiatives, signifying a growing commitment to addressing these concerns. The chemicals industry lacks transparency, as only five of the 50 largest global companies plan to phase out hazardous chemicals.

GLP- 1: minimizing negative impact via behavioural change

Weight loss with GLP-1s could have effects on consumer behavior (e.g., lower appetite/ a reduction in addictive behaviors). While the Pharma impact has been quantified, the impact of these downstream effects is much less clear to the market. See [GLP-1's in obesity: Evaluating the impact across several key consumer markets 06 October 2023](#)

High impact on Waste, Alcohol (SDG 12 and SDG 3)

The increasing use GLP-1 drugs has caused chatter among packaged food companies as they could potentially lead to a shift in eating behaviour. There are still many unknowns to clearly understand long-term impact on consumption for patients that use GLP-1's over time. BofA analyst see highest impact to **alcohol** (if consumers consume less and potentially experience reduced impulse to drink), **snacking relative to meals** (which will translate to less waste), and **non-alcohol beverages**. In their view, weight management

products (shakes, frozen meals) could also be at risk if their function is no longer relevant. This is line with Nestle's comment that usage of GLP-1 drug could impact the frozen food side of things, confectionery and to some extent ice cream. This will have a help reduce plastic waste as food and beverage packaging accounts for 40% of all plastic packaging in the EU.

Modest impact on Tobacco and Gambling (SDG 3)

They expect modest impact on **nicotine** as smokers for weight loss likely have limited access to these drugs due to their income, location, and insurance. Also based on existing academic research out of Australia, the UK, and the US, there could be some connection and overlap between obesity prevalence and **problem gambling**. Prevalence of problem gambling is 1.6 per 100k, and in a downside, our analyst estimate problem gambling could make up 10-30% of all gaming revenue. the usage of GLP-1 could create a 0-4% revenue headwind for US commercial gaming

Impact Labour Productivity (SDG 8)

Eli Lilly researchers found that individuals with high BMI may have higher loss of work productivity where costs due to absenteeism was \$891 higher per year for people with obesity.

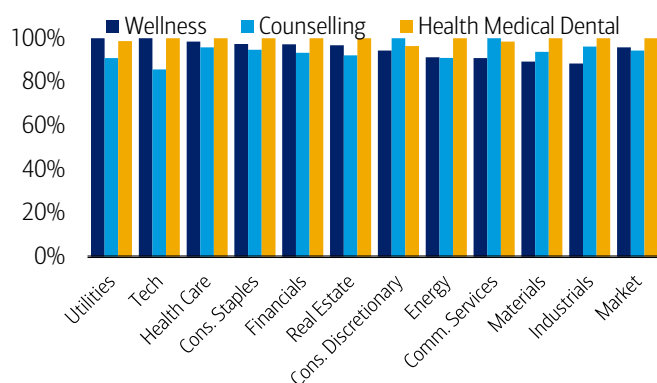
Employees with overweight or obesity are more likely to develop weight-related comorbidities such as type 2 diabetes, hypertension, sleep apnea, cardiovascular disease, and cancer, which all contribute to lower work productivity.

According to research funded by Eli Lilly and Company, based on MarketScan databases loss of work productivity was greater with each higher BMI category. Moreover, the percentage of employees with work loss, number of hours/days lost from work, and costs associated with productivity loss were higher among people with overweight or obesity. The costs associated with absenteeism, short and long-term disability, and workers' compensation were \$891, \$623, \$41 and \$112 higher per year (respectively) for people with obesity compared to those with normal weight.

Health Care, Wellness and Counselling employee benefits are more common in the US than in Europe, with 90% of S&P500 companies providing them vs 62% Stoxx 600 companies providing all the three.

Exhibit 33: Wellness and Counselling benefits are provided by more than 90% of US companies....

% of companies that have relevant benefits within S&P 500

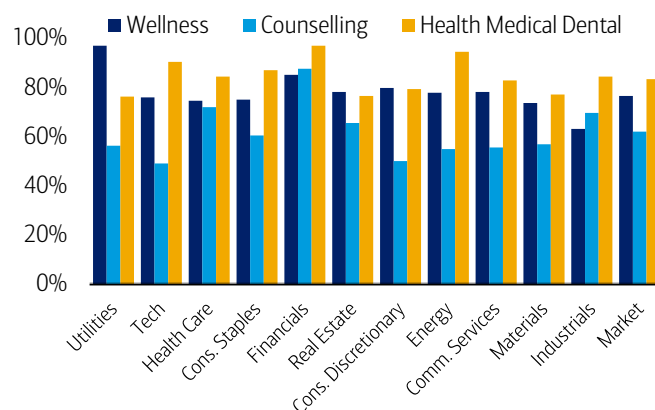


Source: ICE Data Services

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Exhibit 34: ...while counselling benefits are less common in Europe

% of companies that have relevant benefits within Stoxx 600



Source: ICE Data Services

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National Policies

The UK is planning to make GLP-1 accessible. Some EU countries might reimburse the cost and TROA should be a key US driver. We could see a PFAS ban in food packaging across US states, with an EU draft expected in 2024. Other measures include soft drink levies, calorie labelling, and bans on unhealthy promotions across nations.

In the UK, restrictions on the placement of less healthy food in shops and online are expected to bring health benefits of over £57 billion and provide NHS savings of over £4 billion, over the next 25 years.

GLP-1 adoption: High cost, limited access, and reimbursement a challenge

Wider adoption is highly dependent on payer coverage expansion, improved next-gen versions to lower side effects, and ease of administration from injection to oral dosage. The price point (cost of US\$1,000/month for Ozempic⁷) is inhibitive for broader adoption without reimbursement.

Private health insurance policy is a key driver in the GLP-1 adoption. US PHI coverage of GLP-1 drugs has dropped by 50% since Dec22⁸ on cost concerns. BofA analyst, Geoff Meacham, believes that limited access + reimbursement remains by far and away the biggest overhang in the obesity space currently. While the Treat and Reduce Obesity Act (TROA) was reintroduced to Congress to add coverage of anti-obesity medications for Medicare / Medicaid patients, we still don't have a line of sight into timing for an outcome. Regardless, he suspects Medicare/ Medicaid coverage is a "when" not "if", especially as legislative bodies receive increasing public pressure to provide coverage (see [note on reimbursement here](#)). From a commercial perspective, expect commercial insurance to follow Medicare/ Medicaid.

⁷ Fierce Pharma. (2023). List prices for Ozempic, Wegovy far higher in the US than in peer nations: KFF.

⁸ Fierce Healthcare. (2023). GLP-1 drugs are still in demand. Insurers are cutting back coverage in response, Found study shows.

European governments have so far taken a restrictive approach (particularly Germany) to paying for weight-loss treatments. The UK on the other hand is committed to the safe introduction of new weight loss drugs into the NHS and is actively exploring ways to increase access to more people who meet the relevant eligibility criteria.

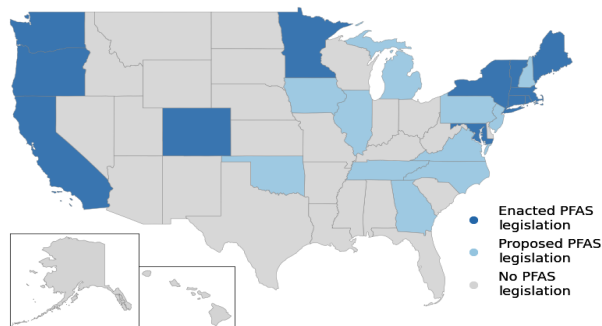
Brace for impact with new PFAS ban regulations in 2024

In the EU and UK, no detailed rules exist for food packaging yet. Several sub-group PFAS are regulated at the European level via the EU chemical regulation REACH. A draft on PFAS ban extending to other areas is expected in 2024.

US regulations vary by state, with Maine and Minnesota considering comprehensive PFAS bans. State laws often focus on PFAS in food packaging, while only 3 states have introduced regulations to address PFAS in pesticides, paints, and other chemicals. With 2024 upon us, expect numerous effective dates for federal and state PFAS laws. See more details on PFAS and 13 BofA-covered stocks or "solution-providers" [Treading the dark waters of PFAS 11 January 2024](#)

Exhibit 35: Growing number of states are enacting PFAS consumer product laws

State consumer product laws on PFAS

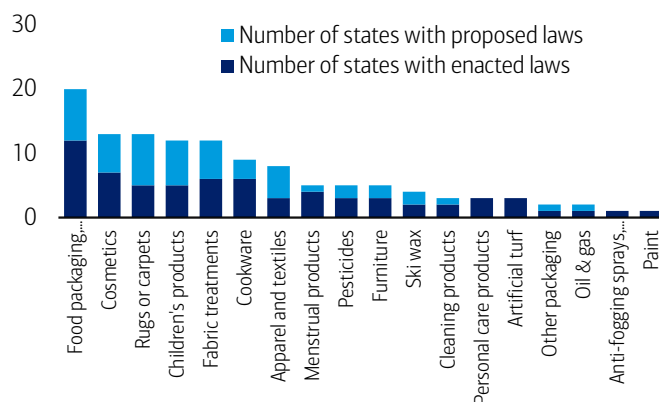


Source: BofA US ESG Research, Bryan Cave Leighton Paisner LLP. As of November 2023.

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Exhibit 36: Food packaging most common focus among state PFAS consumer product laws

Number of states with enacted or proposed laws by product type



Source: BofA US ESG Research, Bryan Cave Leighton Paisner LLP. As of November 2023.

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Soft Drinks Industry Levy or Sugar Tax

Globally, an increasing number of countries have implemented a soft drinks tax, including 16 European, 21 Latin America and the Caribbean countries. The average sugar content of retailer and manufacturer branded drinks subject to this tax in the UK was reduced by 46% between 2015 and 2020. Overall, UK 'sugar reduction programme has seen a 14.9% reduction of sugar in retailer and manufacturer branded breakfast cereals and 13.5% reduction in yogurts and fromage frais

Calorie and Nutrition Labelling

Calorie labelling empower people to make informed choices. The US FDA has been at the forefront with the rule for nutrition labelling in chain restaurants and similar retail food establishments since 2014. Australia also a mandatory rule to display calorie content of standardised food items on menus in chain food service outlets and vending machines. In the UK, calorie labelling is expected to bring health benefits of £4.6 billion and provide NHS savings of £430 million over 25 years.

Advertisement of less healthy products

In 2022, the UK mandated additional restrictions on ads for "less healthy" food and drink products aiming to further mitigate the potential impact of advertising on children's dietary choices. A new less healthy product rules will ban the advertisement of less healthy products on television and on-demand programmes before the watershed (from

9pm to 5.30am) and online 24/7 from October 2025. UK will also ban multibuy promotions like Buy One Get One Free (BOGOF) on less healthy food from 2025.

Disclosures

Important Disclosures

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R1}
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

^{R1} Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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