

# **Carga de las enfermedades metabólicas: Perspectivas desde América Latina**

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## Disclaimer

CJTH has served as a Public Health Advisor in the Vice-Ministerial Office of Public Health at the Ministry of Health of Peru (MINSA), Consultant for the National Institute of Health (INS), and Director of the Health Technology Assessment Unit at the Institute for Health Technology Assessment and Research (IETSI) – EsSalud.

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## Global burden of metabolic diseases, 1990–2021

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## Objectives and road-map

- Explain data source & metrics
- Compare Latin-American burden with global patterns
- Highlight country-level stand-outs
- Discuss trends & policy implications

## Data & Definitions

- Source: GBD 2021 analysis (Zhang et al., Metabolism 2024;160:155999)
- Five conditions: T2DM, high systolic blood pressure (hypertension), high body mass index (obesity), high LDL cholesterol (hypercholesterolaemia), MASLD
- Metric: DALYs = YLL + YLD (age-standardised rates per 100 000)

## Latin America in the global context

Disease	Global DALYs	LA country in global top-5 (absolute burden)
T2DM	~75 m	<b>Mexico</b> (rank 4) ~3.07 m DALYs (2 344 /100 k)
Hypertension	~226 m	None (highest LA values below global Top-5)
Obesity	~129 m	<b>Brazil</b> (rank 5) ~4.75 m DALYs (1 875 /100 k)
Hypercholesterolaemia	~88 m	None
MASLD	~3.67 m	<b>Mexico</b> (rank 3) 0.27 m DALYs (201.9 /100 k)

## Why focus on DALYs?

- DALYs = YLL + YLD (age-standardised rates per 100 000)
- Captures premature mortality **and** disability
- Comparable across heterogeneous datasets
- Aligns with WHO SDG monitoring framework

Leading causes 1990	Age-standardised rate of deaths per 100 000, 1990	Leading causes 2019	Age-standardised rate of deaths per 100 000, 2019	Leading causes 2021	Age-standardised rate of deaths per 100 000, 2021
1 Ischaemic heart disease	158.9 (147.4 to 165.4)	1 Ischaemic heart disease	110.9 (102.5 to 116.9)	1 Ischaemic heart disease	108.7 (99.8 to 115.6)
2 Stroke	144.3 (134.0 to 152.3)	2 Stroke	89.3 (81.6 to 95.6)	2 COVID-19	94.0 (89.2 to 100.0)
3 COPD	71.9 (64.6 to 77.5)	3 COPD	46.1 (42.0 to 49.8)	3 Stroke	87.4 (79.5 to 94.4)
4 Lower respiratory infections	61.8 (57.0 to 66.8)	4 Lower respiratory infections	34.7 (31.5 to 37.5)	4 COPD	45.2 (40.7 to 49.8)
5 Diarrhoeal diseases	60.6 (46.7 to 79.6)	5 Neonatal disorders	30.7 (26.8 to 35.3)	5 Other pandemic-related death	32.3 (24.8 to 43.3)
6 Neonatal disorders	46.0 (43.5 to 48.9)	6 Alzheimer's and other dementias	25.0 (6.2 to 65.0)	6 Neonatal disorders	29.6 (25.3 to 34.4)
7 Tuberculosis	40.0 (34.1 to 44.6)	7 Lung cancer	23.7 (21.8 to 25.8)	7 Lower respiratory infections	28.7 (26.0 to 31.1)
8 Lung cancer	27.6 (26.1 to 29.0)	8 Diabetes	19.8 (18.5 to 20.8)	8 Alzheimer's and other dementias	25.2 (6.4 to 65.6)
9 Alzheimer's and other dementias	25.1 (6.0 to 66.1)	9 Chronic kidney disease	18.6 (16.9 to 19.8)	9 Lung cancer	23.5 (21.2 to 25.9)
10 Cirrhosis	24.4 (22.3 to 27.5)	10 Diarrhoeal diseases	17.1 (12.4 to 23.2)	10 Diabetes	19.6 (18.2 to 20.8)
11 Stomach cancer	22.0 (20.1 to 24.0)	11 Cirrhosis	17.1 (15.9 to 18.5)	11 Chronic kidney disease	18.5 (16.7 to 19.9)
12 Road injuries	21.8 (20.9 to 22.8)	12 Hypertensive heart disease	16.9 (14.1 to 18.6)	12 Cirrhosis liver	16.6 (15.2 to 18.2)
13 Hypertensive heart disease	20.9 (17.1 to 23.3)	13 Road injuries	15.1 (14.2 to 16.0)	13 Hypertensive heart disease	16.3 (13.7 to 18.1)
14 Diabetes	18.2 (17.0 to 19.1)	14 Tuberculosis	14.9 (13.7 to 16.4)	14 Diarrhoeal diseases	15.4 (10.9 to 20.9)
15 Colorectal cancer	15.6 (14.5 to 16.3)	15 Colorectal cancer	12.6 (11.6 to 13.4)	15 Road injuries	14.6 (13.6 to 15.6)
16 Congenital defects	15.2 (9.6 to 19.7)	16 Stomach cancer	11.5 (9.9 to 12.9)	16 Tuberculosis	14.0 (12.6 to 15.8)
17 Self-harm	14.9 (12.8 to 15.8)	17 Falls	10.3 (8.8 to 11.2)	17 Colorectal cancer	12.4 (11.2 to 13.4)
18 Chronic kidney disease	14.9 (13.7 to 16.4)	18 HIV/AIDS	9.8 (9.0 to 11.0)	18 Stomach cancer	11.2 (9.6 to 12.6)
19 Malaria	12.5 (6.1 to 26.0)	19 Malaria	9.3 (3.7 to 18.3)	19 Malaria	10.5 (3.9 to 21.4)
20 Measles	11.0 (3.9 to 22.6)	20 Self-harm	9.2 (8.6 to 9.7)	20 Falls	9.9 (8.5 to 10.8)
21 Falls	10.9 (9.8 to 11.8)	21 Congenital defects	8.9 (7.7 to 10.9)	21 Self-harm	9.0 (8.3 to 9.6)
34 HIV/AIDS	5.9 (4.5 to 7.8)	67 Measles	1.4 (0.5 to 3.0)	22 HIV/AIDS	8.7 (8.1 to 9.6)

■ Non-communicable diseases  
■ Communicable, maternal, neonatal, and nutritional causes  
■ Injuries

Leading Level 3 causes of global deaths and age-standardised death rate per 100000 population for males and females combined, 1990, 2019, and 2021 (Source: GBD 2021 Diseases and Injuries Collaborators. Lancet, 2024).



Leading causes, 2010	DALY count (millions)	Leading causes, 2020	DALY count (millions)	Leading causes, 2021	DALY count (millions)
1 Neonatal disorders	236.3 (218.9–256.4)	1 Neonatal disorders	192.6 (168.2–220.6)	1 COVID-19	212.0 (198.0–234.5)
2 Ischaemic heart disease	159.9 (153.8–164.9)	2 Ischaemic heart disease	185.1 (175.2–194.5)	2 Ischaemic heart disease	188.3 (176.7–198.3)
3 Stroke	144.3 (137.3–150.3)	3 Stroke	158.2 (146.4–168.8)	3 Neonatal disorders	186.3 (162.3–214.9)
4 Lower respiratory infections	127.3 (115.4–140.0)	4 COVID-19	123.4 (116.3–132.5)	4 Stroke	160.4 (148.0–171.7)
5 Diarrhoeal diseases	104.1 (86.7–123.2)	5 Lower respiratory infections	88.2 (78.1–99.4)	5 Lower respiratory infections	82.5 (72.9–93.2)
6 Road injuries	74.3 (70.9–78.4)	6 COPD	78.4 (72.1–84.3)	6 COPD	79.8 (74.0–86.0)
7 HIV/AIDS	67.8 (60.4–78.3)	7 Diabetes	76.5 (64.9–92.2)	7 Diabetes	78.9 (66.8–94.5)
8 Congenital birth defects	67.5 (55.9–82.5)	8 Low back pain	69.3 (49.5–92.8)	8 Other COVID-19 outcomes	77.4 (59.7–101.9)
9 COPD	67.0 (62.9–70.5)	9 Road injuries	65.1 (61.0–69.8)	9 Low back pain	70.2 (50.2–94.1)
10 Malaria	66.4 (37.7–105.9)	10 Diarrhoeal diseases	61.6 (49.6–75.5)	10 Road injuries	65.1 (60.7–69.8)
11 Tuberculosis	61.8 (57.4–66.8)	11 Malaria	55.4 (21.5–110.5)	11 Diarrhoeal diseases	59.3 (47.4–73.2)
12 Low back pain	58.8 (42.0–78.7)	12 Depressive disorders	55.3 (38.6–75.3)	12 Depressive disorders	56.3 (39.3–76.5)
13 Diabetes	52.7 (45.3–62.2)	13 Congenital birth defects	54.5 (47.3–65.1)	13 Malaria	55.2 (22.6–108.7)
14 Cirrhosis	45.9 (43.9–48.7)	14 Tuberculosis	48.0 (43.4–53.1)	14 Congenital birth defects	52.3 (45.2–62.6)
15 Headache disorders	41.9 (8.4–88.9)	15 Headache disorders	47.5 (9.7–99.8)	15 Headache disorders	48.0 (9.8–100.7)
16 Depressive disorders	41.3 (29.1–56.0)	16 Cirrhosis	46.1 (42.8–50.2)	16 Tuberculosis	47.0 (42.5–52.4)
17 Lung cancer	39.3 (37.5–40.9)	17 Lung cancer	45.6 (41.5–49.8)	17 Lung cancer	46.5 (41.9–51.2)
18 Falls	37.8 (31.8–45.0)	18 Other musculoskeletal disorders	44.4 (31.3–60.3)	18 Cirrhosis	46.4 (43.0–50.7)
19 Self-harm	36.1 (33.6–37.3)	19 Age-related hearing loss	43.6 (30.2–60.9)	19 Other musculoskeletal disorders	45.2 (31.7–61.4)
20 Other musculoskeletal disorders	35.3 (24.8–47.9)	20 Chronic kidney disease	43.5 (40.0–47.2)	20 Chronic kidney disease	44.5 (40.9–48.4)
21 Age-related hearing loss	33.8 (23.3–47.1)	21 Falls	43.4 (35.8–52.3)	21 Age-related hearing loss	44.4 (30.7–62.0)
22 Chronic kidney disease	33.4 (31.0–35.8)	22 HIV/AIDS	42.3 (39.0–47.5)	22 Falls	43.8 (35.9–52.8)
23 Anxiety disorders	31.8 (22.0–43.5)	23 Anxiety disorders	40.5 (28.1–54.9)	23 Anxiety disorders	42.5 (29.4–57.7)
24 Dietary iron deficiency	31.3 (21.2–45.0)	24 Other COVID-19 outcomes	39.4 (29.5–54.1)	24 HIV/AIDS	40.3 (37.2–44.8)
25 Interpersonal violence	28.3 (27.1–29.9)	25 Alzheimer's disease	34.9 (16.6–74.2)	25 Alzheimer's disease	36.3 (17.2–77.4)
26 Alzheimer's disease	24.8 (11.7–53.6)	26 Self-harm	33.2 (31.0–35.4)	26 Self-harm	33.5 (31.4–35.8)
		27 Dietary iron deficiency	32.3 (21.8–46.4)	27 Dietary iron deficiency	32.3 (21.8–46.5)
		30 Interpersonal violence	26.9 (25.3–28.6)	30 Interpersonal violence	26.8 (25.2–28.8)

■ Communicable, maternal, neonatal, and nutritional diseases  
■ Non-communicable diseases  
■ Injuries  
■ Other COVID-19 pandemic-related outcomes

Leading Level 3 causes of global DALYs in 2010, 2020, and 2021, for both sexes combined, and all ages (Source: GBD 2021 Diseases and Injuries Collaborators. Lancet, 2024).

Latin America and Caribbean	COVID-19	Ischaemic heart disease	Diabetes mellitus	Interpersonal violence	Neonatal disorders	Stroke	Other COVID-19 pandemic-related outcomes	Low back pain	Road injuries	Chronic kidney disease
Andean Latin America	COVID-19	Other COVID-19 pandemic-related outcomes	Neonatal disorders	Lower respiratory infections	Ischaemic heart disease	Diabetes mellitus	Road injuries	Anxiety disorders	Stroke	Chronic kidney disease
Caribbean	COVID-19	Ischaemic heart disease	Neonatal disorders	Diabetes mellitus	Stroke	Other COVID-19 pandemic-related outcomes	Lower respiratory infections	Interpersonal violence	Road injuries	Congenital birth defects
Central Latin America	COVID-19	Ischaemic heart disease	Diabetes mellitus	Interpersonal violence	Other COVID-19 pandemic-related outcomes	Chronic kidney disease	Neonatal disorders	Road injuries	Low back pain	Stroke
Tropical Latin America	COVID-19	Ischaemic heart disease	Interpersonal violence	Stroke	Diabetes mellitus	Low back pain	Anxiety disorders	Neonatal disorders	Road injuries	Depressive disorders

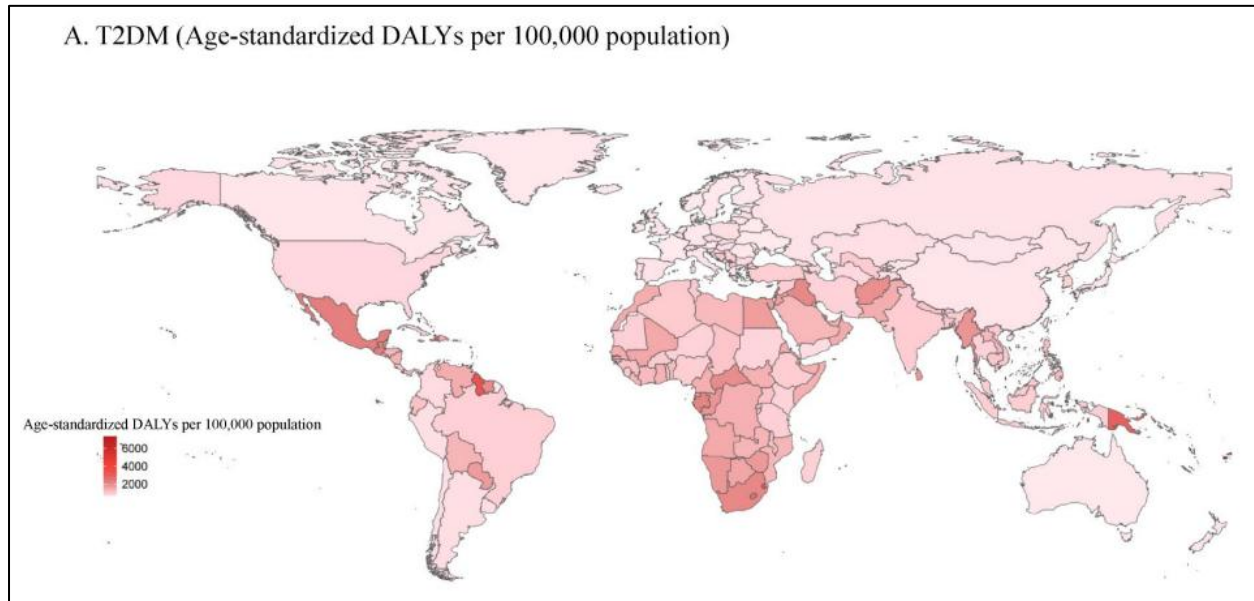
#### Annualised rate of change, 2010-21

■ <-5.3%   ■ -5.3% to <-3.7%   ■ -3.7% to <-1.9%   ■ -1.9% to <-0.8%   ■ -0.8% to <0%   ■ 0% to <0.6%   ■ 0.6% to <1.1%   ■ 1.1% to <1.9%   ■ 1.9% to <4.9%   ■ ≥4.9%

Top ten Level 3 causes by DALYs rate (Source: GBD 2021 Diseases and Injuries Collaborators. Lancet, 2024).

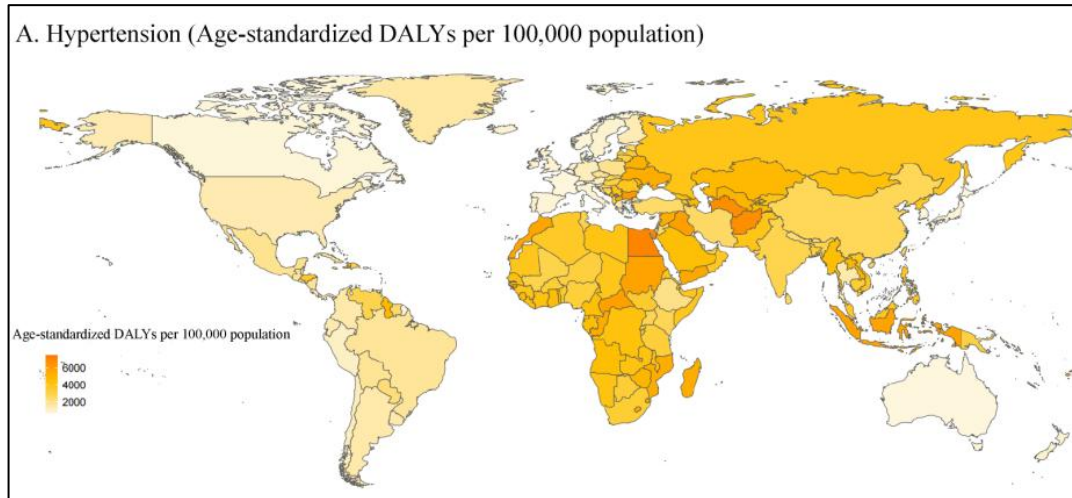
# Type 2 Diabetes Mellitus

- Mexico: ~3.07 m DALYs; rate 2 344 /100 k (APC +0.03 %)
- Regional trend: DALYs tripled since 1990 (mirrors global +200 %)



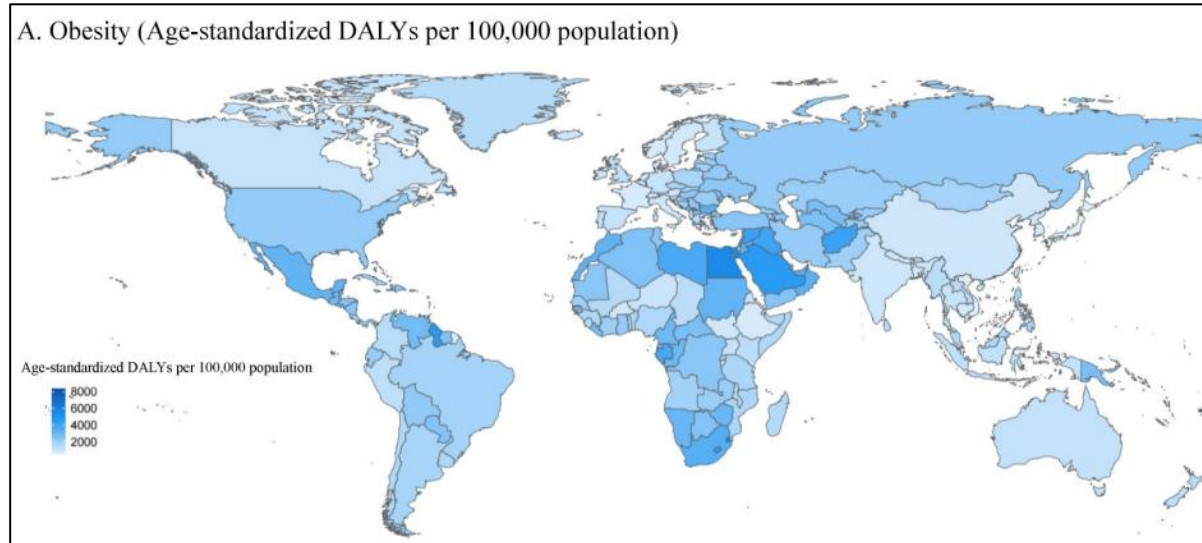
# Hypertension

- No Latin-American country in the global top-5 absolute list
- APC  $-0.3\%$  globally; regional decline mirrors improved treatment coverage
- Nevertheless, ischaemic heart disease and stroke are among the (Top 4) Leading Level 3 causes of global DALYs in 2021, for both sexes combined, and all ages



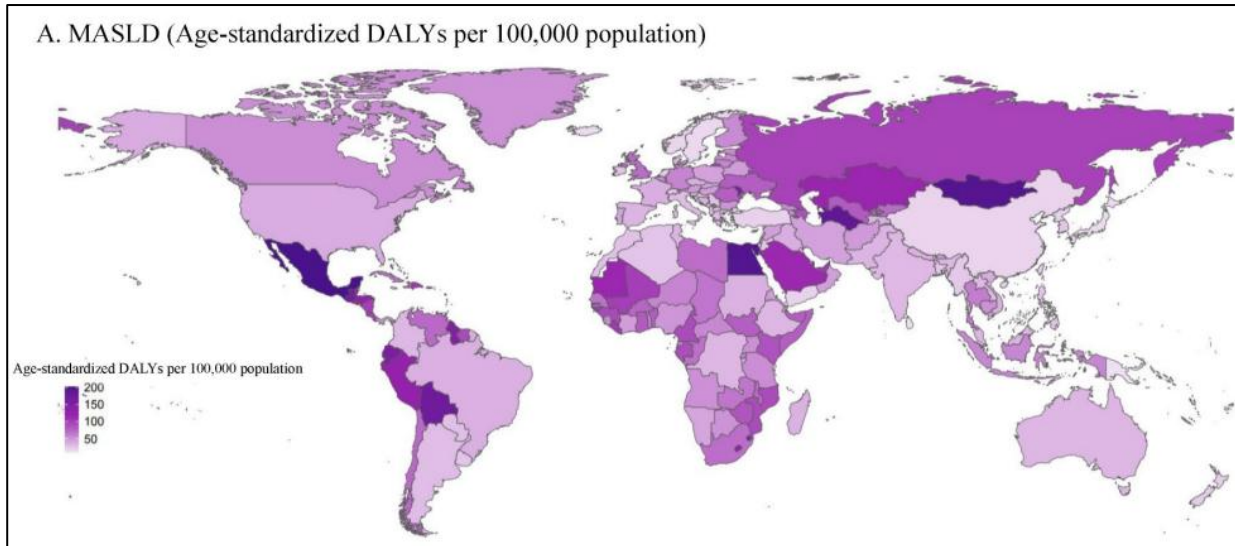
# Obesity

- Brazil in global top-5: ~4.75 m DALYs; rate 1 875 /100 k (APC +0.02 %)
- Global and regional obesity DALYs have increased three- to four-fold since 1990



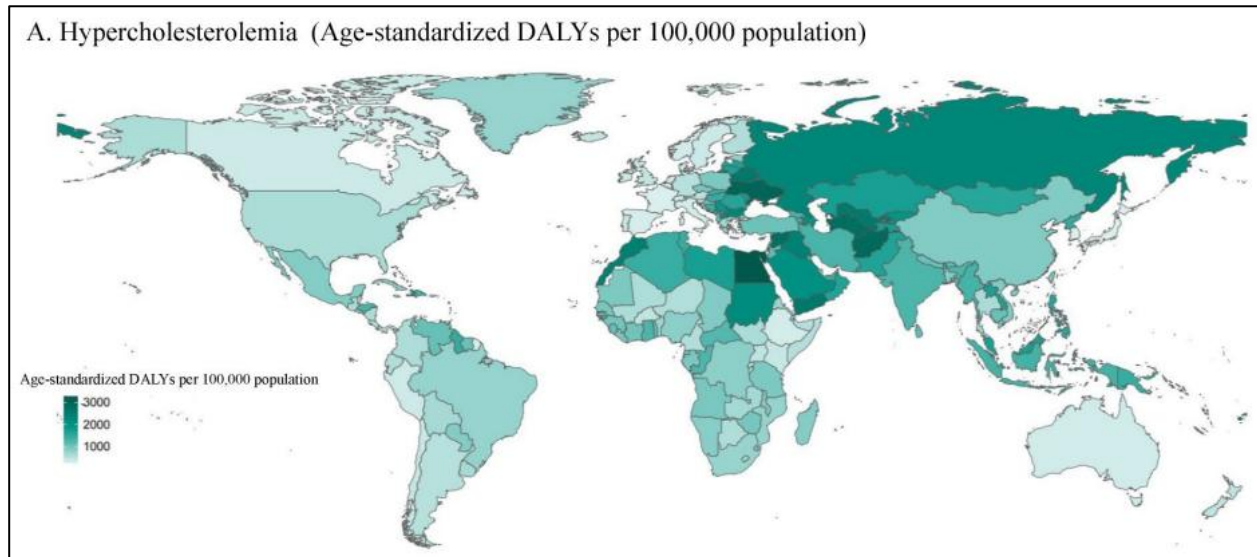
# MASLD

- Mexico: highest absolute (~270 k DALYs) **and** highest relative burden worldwide (201.9 /100 k)
- Globally MASLD DALYs up 2.2-fold, but rate stable; LA mirrors this stagnation (although Mexico had an APC of 0.2 %).



# Hypercholesterolaemia

- No LA country in top-5 absolute or relative lists
- Yet CVD deaths attributable to high LDL-C remain high; statin coverage inequitable



## Cross-cutting Trends (1990-2021) Globally

- Accelerating: T2DM (+0.42 %/yr) & Obesity (+0.26 %/yr)
- Slowing: Hypertension (−0.30 %/yr) & Hypercholesterolaemia (−0.33 %/yr)
- Flat: MASLD (+0.05 %/yr)

## Drivers in Latin America

- Rapid urban migration & dietary westernisation
- Socio-economic inequalities (Middle-SDI quintile bears highest DALYs)
- Informal work limiting healthcare access



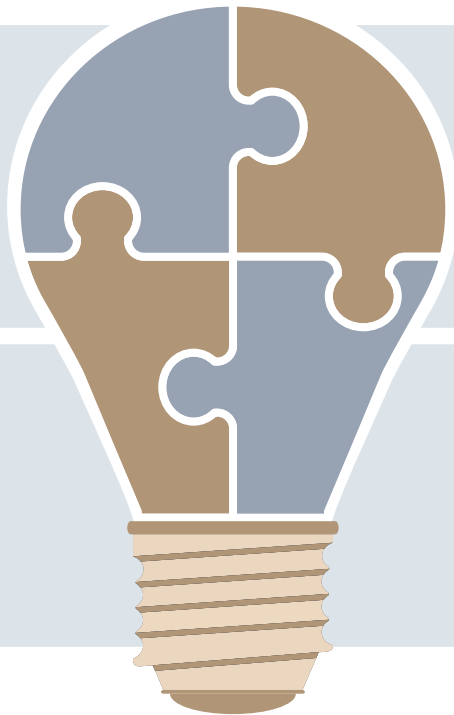
# Policy implications

Strengthen fiscal measures (e.g. sugar-sweetened beverage taxes)

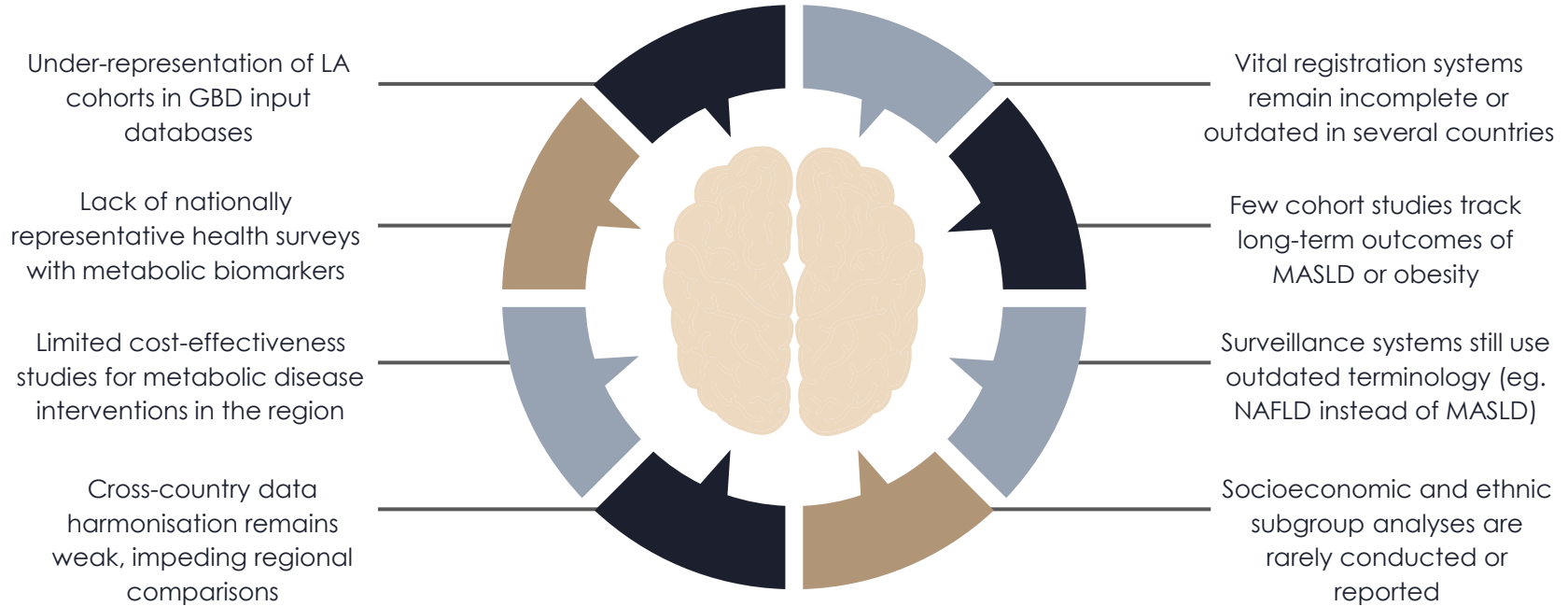
Scale-up primary-care detection & lifestyle interventions

Integrate MASLD screening into diabetes/obesity clinics

Invest in population-level food-system reform



# Research & Data gaps



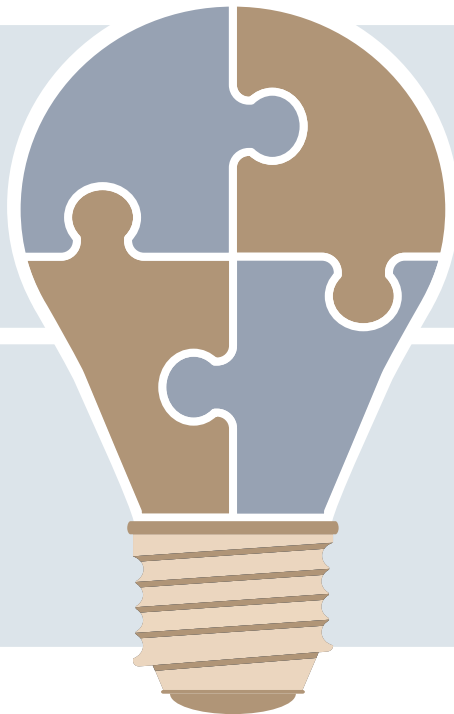
## Key take-home messages

Latin America punches above its weight for T2DM, Obesity & MASLD.

Mexico and Brazil are regional epicentres, **but...**

Hypertension & LDL-C control suggest that policy works (?)

Comprehensive, equity-focussed strategies are required to bend the curve



*¡Muchas gracias!*



**OBEMET**

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