

# Malaysia



# Country report card

This report card contains the latest data available on the Global Obesity Observatory on overweight and obesity . Where available, data on common and relevant obesity drivers and comorbidities are also presented.

View the latest version of this report on the Global Obesity Observatory at <u>https://data.worldobesity.org/country/malaysia-</u>130/.



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# **Obesity prevalence**

#### Adults, 2023

Obesity Overweight



Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m², obesity refers to a BMI greater than 30kg/m².



Obesity Overweight





#### 0-5 years, 2022

Overweight or obesity





# % Adults living with obesity in Malaysia 1993-2023



Healthcare Demand: Technical Report; 2024. Available at <u>https://iku.nih.gov.my/nhms-2023</u> (last accessed 04.02.25)

Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.



#### Women





References: 1993: Ismail MN, Zawaih H, Chee SS, Ng KK. Prevalence of obesity and chronic energy deficiency (CED) in adult Malaysians. Malays J Nutrition. 1995; 1:1-9

2006: Khambalia AZ, Seen LS. Trends in overweight and obese adults in Malaysia (1996-2009): a systematic review. Obesity Reviews 2010; 11:403-412

2007: Mohamud WN, Musa KI, Khir AS, Ismail AA, Ismail IS, Kadir KA, Kamaruddin NA, Yaacob NA, Mustafa N, Ali O, Isa SH, Bebakar
 WM.Prevalence of overweight and obesity among adult Malaysians: an update. Asia Pac J Clin Nutr. 2011;20(1):35-41.
 2015: Institute for Public Health (IPH) 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable

Diseases, Risk Factors & Other Health Problems; 2015.

2019: Institute for Public Health (IPH), National Institutes of Health, Ministry of Health Malaysia. 2020. National Health and Morbidity Survey (NHMS) 2019: Vol. I: NCDs – Non-Communicable Diseases: Risk Factors and other Health Problems 2023: Institute for Public Health (IKU). National Health and Morbidity Survey (NHMS) 2023: Non-Communicable Diseases and

Healthcare Demand: Technical Report; 2024. Available at https://iku.nih.gov.my/nhms-2023 (last accessed 04.02.25)

Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m², obesity refers to a BMI greater than 30kg/m².



### % Adults living with overweight or obesity in Malaysia 1993-2023

#### Men

Survey type:

• Overweight or obesity



#### Measured

References: 1993: Ismail MN, Zawaih H, Chee SS, Ng KK. Prevalence of obesity and chronic energy deficiency (CED) in adult Malaysians. Malays J Nutrition. 1995; 1:1-9

2006: Khambalia AZ, Seen LS. Trends in overweight and obese adults in Malaysia (1996-2009): a systematic review. Obesity Reviews 2010; 11:403-412

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 2015: Institute for Public Health (IPH) 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable

Diseases, Risk Factors & Other Health Problems; 2015.

2019: Institute for Public Health (IPH), National Institutes of Health, Ministry of Health Malaysia. 2020. National Health and Morbidity Survey (NHMS) 2019: Vol. I: NCDs – Non-Communicable Diseases: Risk Factors and other Health Problems

2023: Institute for Public Health (IKU). National Health and Morbidity Survey (NHMS) 2023: Non-Communicable Diseases and

Healthcare Demand: Technical Report; 2024. Available at https://iku.nih.gov.my/nhms-2023 (last accessed 04.02.25)

Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m², obesity refers to a BMI greater than 30kg/m².



#### Women

• Overweight or obesity



2023: Institute for Public Health (IKU). National Health and Morbidity Survey (NHMS) 2023: Non-Communicable Diseases and

Healthcare Demand: Technical Report; 2024. Available at https://iku.nih.gov.my/nhms-2023 (last accessed 04.02.25)

Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.



% Adults living with obesity in selected countries in the Asia/Oceania Region 1975-2019, selected countries



#### Men



References: 1976, 1981, 1986: Yoshiike N, Seino F, Tajima S, Arai Y, Kawano M, Furuhata T, Inoue S. Twenty-year changes in the prevalence of overweight in Japanese adults: The National Nutrition Survey 1976-95. Obesity Reviews 2002;3:183-190

> 1993, 2005, 2013: Chang HC, Yang HC, Chang HY, et al. Morbid obesity in Taiwan: Prevalence, trends, associated social demographics, and lifestyle factors. PLoS One. 2017;12(2):e0169577. Published 2017 Feb 2. doi:10.1371/journal.pone.0169577

> 1995, 1996: Martorell R, Khan LK, Hughes ML, Grummer Strawn LM. Obesity in women from developing countries. EJCN (2000) 54;247-252

1998: Colaguir S, Colagiuri R, Na'ati S, Muimuiheata S, Hussain Z and Palau T. (2002). The prevalence of diabetes in the Kingdom of Tonga. Diabetes care, 25: 1378 - 1383.

2000: Asia Pacific Cohort Studies Collaboration. The burden of overweight and obesity in the Asia-Pacific region. Obesity Reviews 2007;8:191-196.

2001: SCN (2004). 5th Report on the World Nutrition Situation. Nutrition for Improved Development Outcomes. Appendix 11 2002: Report of the 2002 China National Nutrition and Health Survey. 2004. (In Chinese). Chinese Ministry of Public Health (CMPH).

2003: <a href="http://www.fnri.dost.gov.ph/files/fnri%20files/nns/factsandfigures2003/anthropometric.pdf">http://www.fnri.dost.gov.ph/files/fnri%20files/nns/factsandfigures2003/anthropometric.pdf</a> (last accessed June 14th 2011) 2004: Tonga STEPS Survey 2004

2006: Gerritsen S, Stefanogiannis N, Galloway Y, Devlin M, Templaton R and Yeh L. A portrait of health: key results of the 2006/07 New Zealand Health Survey.

2007: Australian Bureau of Statistics (ABS). National Health Survey: Summary of results. Canberra, Australia, ABS, 2009. WHO Global InfoBase reference:102910

2008: Food and Nutrition Research Institute-Department of Science and Technology (FNRI-DOST). 2010. Philippine Nutrition Facts and Figures 2008. DOST Complex, FNRI Bldg., Bicutan, Taguig City, Metro Manila, Philippines.

2009: Yan, S., Li, J., Li, S., Zhang, B., Du, S., Gordon-Larsen, P., Adair, L. and Popkin, B. (2012), The expanding burden of cardiometabolic risk in China: the China Health and Nutrition Survey. Obesity Reviews. doi: 10.1111/j.1467-789X.2012.01016.x

2011: National Institute of Population Research and Training - NIPORT/Bangladesh, Mitra and Associates/Bangladesh, and ICF International. 2013. Bangladesh Demographic and Health Survey 2011. Dhaka, Bangladesh: NIPORT, Mitra and Associates, and ICF International.

2012: New Zealand Health Survey. <u>https://www.health.govt.nz/publication/annual-update-key-results-2018-19-new-zealand-health-survey</u> (last accessed 14.07.20)

2014: National Institute of Population Research and Training - NIPORT/Bangladesh, Mitra and Associates, and ICF International. 2016. Bangladesh Demographic and Health Survey 2014. Dhaka, Bangladesh: NIPORT, Mitra and Associates, and ICF International.. <u>http://www.dhsprogram.com/publications/publication-FR311-DHS-Final-Reports.cfm</u> (last accessed 11th April 2016)

2015: Institute for Public Health (IPH) 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health Problems; 2015.

2016: Ministry of Health - MOH/Nepal, New ERA/Nepal, and ICF. 2017. Nepal Demographic and Health Survey 2016. Kathmandu, Nepal: MOH/Nepal, New ERA/Nepal, and ICF.





#### Women



References: 1976, 1981, 1986: Yoshiike N, Seino F, Tajima S, Arai Y, Kawano M, Furuhata T, Inoue S. Twenty-year changes in the prevalence of overweight in Japanese adults: The National Nutrition Survey 1976-95. Obesity Reviews 2002;3:183-190

1993, 2005, 2013: Chang HC, Yang HC, Chang HY, et al. Morbid obesity in Taiwan: Prevalence, trends, associated social demographics, and lifestyle factors. PLoS One. 2017;12(2):e0169577. Published 2017 Feb 2. doi:10.1371/journal.pone.0169577

1995, 1996: Martorell R, Khan LK, Hughes ML, Grummer Strawn LM. Obesity in women from developing countries. EJCN (2000) 54;247-252

1998: Colaguir S, Colagiuri R, Na'ati S, Muimuiheata S, Hussain Z and Palau T. (2002). The prevalence of diabetes in the Kingdom of Tonga. Diabetes care, 25: 1378 - 1383.

2000: Asia Pacific Cohort Studies Collaboration. The burden of overweight and obesity in the Asia-Pacific region. Obesity Reviews 2007;8:191-196.

2001: SCN (2004). 5th Report on the World Nutrition Situation. Nutrition for Improved Development Outcomes. Appendix 11 2002: Report of the 2002 China National Nutrition and Health Survey. 2004. (In Chinese). Chinese Ministry of Public Health (CMPH).

2003: <a href="http://www.fnri.dost.gov.ph/files/fnri%20files/nns/factsandfigures2003/anthropometric.pdf">http://www.fnri.dost.gov.ph/files/fnri%20files/nns/factsandfigures2003/anthropometric.pdf</a> (last accessed June 14th 2011) 2004: Tonga STEPS Survey 2004

2006: Gerritsen S, Stefanogiannis N, Galloway Y, Devlin M, Templaton R and Yeh L. A portrait of health: key results of the 2006/07 New Zealand Health Survey.

2007: Australian Bureau of Statistics (ABS). National Health Survey: Summary of results. Canberra, Australia, ABS, 2009. WHO Global InfoBase reference:102910

2008: Food and Nutrition Research Institute-Department of Science and Technology (FNRI-DOST). 2010. Philippine Nutrition Facts and Figures 2008. DOST Complex, FNRI Bldg., Bicutan, Taguig City, Metro Manila, Philippines.

2009: Yan, S., Li, J., Li, S., Zhang, B., Du, S., Gordon-Larsen, P., Adair, L. and Popkin, B. (2012), The expanding burden of cardiometabolic risk in China: the China Health and Nutrition Survey. Obesity Reviews. doi: 10.1111/j.1467-789X.2012.01016.x

2011: National Institute of Population Research and Training - NIPORT/Bangladesh, Mitra and Associates/Bangladesh, and ICF

International. 2013. Bangladesh Demographic and Health Survey 2011. Dhaka, Bangladesh: NIPORT, Mitra and Associates, and ICF International.

2012: New Zealand Health Survey. https://www.health.govt.nz/publication/annual-update-key-results-2018-19-new-zealand-healthsurvey (last accessed 14.07.20)

2014: National Institute of Population Research and Training - NIPORT/Bangladesh, Mitra and Associates, and ICF International. 2016. Bangladesh Demographic and Health Survey 2014. Dhaka, Bangladesh: NIPORT, Mitra and Associates, and ICF International.. <u>http://www.dhsprogram.com/publications/publication-FR311-DHS-Final-Reports.cfm</u> (last accessed 11th April 2016)

2015: Institute for Public Health (IPH) 2015. National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health Problems; 2015.

2016: Ministry of Health - MOH/Nepal, New ERA/Nepal, and ICF. 2017. Nepal Demographic and Health Survey 2016. Kathmandu, Nepal: MOH/Nepal, New ERA/Nepal, and ICF.





# Overweight/obesity by education

#### Adults, 2023





Cutoffs:

Overweight BMI 23-27.4kg/m2, Obesity =>27.5 kg/m2

Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m², obesity refers to a BMI greater than 30kg/m².







=>+2SD



#### 0-5 years, 2016

Overweight or obesity



**Definitions:** 



# Overweight/obesity by age

#### Adults, 2023

Notes:

Obesity Overweight



 References:
 Institute for Public Health (IKU). National Health and Morbidity Survey (NHMS) 2023: Non-Communicable Diseases and Healthcare

 Demand: Technical Report; 2024. Available at <a href="https://iku.nih.gov.my/nhms-2023">https://iku.nih.gov.my/nhms-2023</a> (last accessed 04.02.25)

Asia cut off also available

Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.







# Overweight/obesity by region

#### Adults, 2023

Obesity Overweight



Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.









### 0-5 years, 2022

Overweight or obesity





# Overweight/obesity by socio-economic group

### Adults, 2023

Obesity Overweight



Age:	18+
Sample size:	10130
Area covered:	National
References:	Institute for Public Health (IKU). National Health and Morbidity Survey (NHMS) 2023: Non-Communicable Diseases and Healthcare Demand: Technical Report; 2024. Available at <u>https://iku.nih.gov.my/nhms-2023</u> (last accessed 04.02.25)
Notes:	Malaysian Cut off also available
	Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m², obesity refers to a BMI greater than 30kg/m².



Obesity Overweight





#### 0-5 years, 2019

Overweight or obesity



Definitions:



# Overweight/obesity by ethnicity

Ethnic groups are as defined by publication of origin and are not as defined by WOF. In some instances ethnicity is conflated with nationality and/or race.



Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.









#### 0-5 years, 2022

Overweight or obesity





# Double burden of underweight & overweight

#### Adults, 2022









# Insufficient physical activity

#### Adults, 2022





Men, 2022





#### Women, 2022









#### Boys, 2016





#### Girls, 2016




## Average daily frequency of carbonated soft drink consumption

#### Children, 2010-2015





## Estimated per capita fruit intake







## Prevalence of less than daily fruit consumption

#### Children, 2010-2015



Definitions:

Prevalence of less-than-daily fruit consumption (% less-than-daily fruit consumption)



## Prevalence of less than daily vegetable consumption

## Children, 2010-2015





## Average weekly frequency of fast food consumption

#### Children, 2010-2015





## Estimated per-capita processed meat intake





## Estimated per capita whole grains intake





## Mental health - depression disorders





## Men, 2021

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R2500		
5-2000		
82000		
1500		
1000		
500		
0	Malaysia	
Age:	20+	
Area covered:	National	
References:	Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Global Burden of Disease (GBD) Study 2021. Seattle, WA: IHME, University of Washington, 2023. Available from http://vizhub.healthdata.org/gbd-compare. (Last accessed 23.04.25)	
Definitions:	Number living with depression per 100,000 population (adults 20+ years)	



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4000			
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% of pogulation			
ofp			
%			
2000			
1000			
0			
	Malaysia		
Age:		20+	
Area covered:		National	
References:	Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Global Burden of Disease	(GBD) Study 2021.	
	Seattle, WA: IHME, University of Washington, 2023. Available from http://vizhub.healthdata.org/gbd-compare. (Last	accessed 23.04.25)	
Definitions:	Number living with depression per 100,000 population (adults 20+ years)		



## Children, 2021



# 

## Boys, 2021





## Girls, 2021





## Mental health - anxiety disorders





## Men, 2021

4500			
4000			
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u3000 boond to 2500 2000 2000			
چَ2000			
1500			
1000			
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0			
	Malaysia		
Age:		20+	
References:	Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Global Burden of Disease (GBD) Study 2021. eattle, WA: IHME, University of Washington, 2023. Available from <u>http://vizhub.healthdata.org/gbd-compare.</u> (Last accessed 23.04.25).		
Definitions:	Number living with anxiety per 100,000 population		



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Age:		20+	
References:	Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Global Burden of Disease	(GBD) Study 2021.	
	Seattle, WA: IHME, University of Washington, 2023. Available from <u>http://vizhub.healthdata.org/gbd-compare.</u> (Last	accessed 23.04.25).	
Definitions:	Number living with anxiety per 100,000 population		

## Children, 2021



Seattle, WA: IHME, University of Washington, 2023. Available from http://vizhub.healthdata.org/gbd-compare. (Last accessed 23.04.25)



## Boys, 2021

**References:** 

Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Global Burden of Disease (GBD) Study 2021. Seattle, WA: IHME, University of Washington, 2023. Available from <a href="http://vizhub.healthdata.org/gbd-compare">http://vizhub.healthdata.org/gbd-compare</a>. (Last accessed 23.04.25)



## Girls, 2021





## % Infants exclusively breastfed 0-5 months

#### 0-5 years, 2007-2023



Notes: Full details are available. Original citation United Nations Children's Fund, Division of Data, Analysis, Planning and Monitoring (2023). Global UNICEF Global Databases: Infant and Young Child Feeding: Exclusive breastfeeding, New York, October 2023.



## Percent of population who cannot afford a healthy diet

#### 60 50 40 % 30 20 10 0-Philippines Fiji Malaysia Australia South Korea Japan Vietnam China Mongolia Laos Area covered: National References: The Food Systems Dashboard. The Global Alliance for Improved Nutrition (GAIN), The Columbia Climate School, and Cornell University College of Agriculture and Life Sciences. 2024. Geneva, Switzerland. https://www.foodsystemsdashboard.org. DOI: https://doi.org/10.36072/db.



## **Oesophageal cancer**

#### Men, 2022









## **Breast cancer**

Age 20 Age 20+





## **Colorectal cancer**

#### Men, 2022









## Pancreatic cancer

#### Men, 2022





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1		
0.5		
0	 Malaysia	
A		20+
Age:		
Area covered:		National
References:	Ferlay J, Ervik M, Lam F, Laversanne M, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2 bservatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gcu	
		accessed [16.07.24]
Definitions:	Inc	idence per 100,000



## Gallbladder cancer

#### Men, 2022









## **Kidney cancer**

#### Men, 2022









## Cancer of the uterus





## Raised blood pressure

#### Adults, 2015



Definitions:

Age Standardised estimated % Raised blood pressure 2015 (SBP>=140 OR DBP>=90).



## Men, 2015



Definitions:

Age Standardised estimated % Raised blood pressure 2015 (SBP>=140 OR DBP>=90).





Definitions:

Age Standardised estimated % Raised blood pressure 2015 (SBP>=140 OR DBP>=90).



## **Raised cholesterol**

#### Adults, 2008



Definitions:

% Raised total cholesterol (>= 5.0 mmol/L) (age-standardized estimate).
# WORLD SITY

# Men, 2008



Definitions:

73







# Raised fasting blood glucose

#### Men, 2014



# 





# **Diabetes prevalence**

#### Adults, 2024



Reproduced with kind permission International Diabetes Federation. IDF Diabetes Atlas, 11th edn. Brussels, Belgium:International Diabetes Federation, 2025. <a href="http://www.diabetesatlas.org">http://www.diabetesatlas.org</a>



## **Ovarian Cancer**





# Leukemia

Men, 2022											
4											
3											
2											
1											
0											
<sup>-1</sup> _1	0	1	2	3	4	5	6				
Age: Area covered:							20+ National				
References:	Ferlay J, Ervik M, Lam F, Laversanne M, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2024).Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: <u>https://gco.iarc.who.int/today</u> , accessed [16.07.24]										
Definitions:						Incidence p	er 100,000				
	Unless ot	herwise noted, overw	eight refers to a BMI b	between 25kg and 29.	.9kg/m², obesity refer	s to a BMI greater tha	n 30kg/m².				



4							
3							
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-1 -1							
_	0	1	2	3	4	5	6
Age: Area covered:							20+ National
References:					Znaor A, Soerjomataran n Cancer. Available fron		oal Cancer . <u>int/today</u> ,
Definitions:						Incidence pe	r 100,000
	Unless othe	rwise noted, overw	eight refers to a BMI	between 25kg and 2	9.9kg/m², obesity refers	to a BMI greater thar	1 30kg/m².



## Leukemia





Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.







# Liver and intrahepatic bile duct Cancer

#### Men, 2022











## Multiple Myeloma

#### Men, 2022



Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.







## Non Hodgkin Lymphoma

#### Men, 2022



Unless otherwise noted, overweight refers to a BMI between 25kg and 29.9kg/m<sup>2</sup>, obesity refers to a BMI greater than 30kg/m<sup>2</sup>.







## **Thyroid Cancer**

#### Men, 2022









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