

# People with 'healthy obesity' are still at increased risk of disease

June 10 2021

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A new study published in *Diabetologia* reveals that having a normal metabolic profile does not mean that a person with obesity is actually healthy (referred to as metabolically healthy obesity), since they face an

increased risk of diabetes, heart diseases, strokes, and respiratory diseases.

The research was conducted by Dr. Frederick Ho and colleagues at the Institute of Health and Wellbeing, University of Glasgow, Glasgow, UK, and examined whether individuals who had [obesity](#) and a normal metabolic profile are healthy, or if they too have a higher risk of developing obesity-related health issues.

It is estimated that globally there are over 300 million people with obesity, and if current trends continue then this figure will likely exceed 1 billion people by 2030 and comprise 20% of the world's adult population. The ongoing global epidemics of type 2 diabetes (T2D), hypertension, cardiovascular disease (CVD), and many other serious health problems are linked with obesity.

Obesity typically leads to metabolic problems, characterised by elevated [blood sugar](#), increased blood pressure (BP), insulin resistance, and other adverse metabolic changes. These effects are not universal, and some people with obesity have normal blood pressure, favourable blood fats, little or no systemic inflammation, and a healthy level of insulin. This is sometimes referred to as having 'metabolically [healthy obesity](#)' (MHO), and its occurrence is estimated to be 3% to 22% in the whole general population.

This study looked at the association between MHO and all-cause mortality, T2D, [heart](#) attack and stroke, heart failure (HF) and [respiratory diseases](#), including chronic obstructive pulmonary disease (COPD). MHO was defined as a body mass index (BMI) of 30 kg/m<sup>2</sup> or above as well as meeting at least four of the six metabolically healthy criteria. These include [blood pressure](#) and 5 blood-based biomarkers: C-reactive protein (CRP, a marker of inflammation), triglycerides (fats), [low-density lipoprotein](#) (LDL/'bad' cholesterol) and [high-density](#)

[lipoprotein](#) (HDL/'good' cholesterol), and glycated haemoglobin (HbA1c, a measure of average blood glucose over the previous 2-3 months). Based on metabolic and obesity status, participants were categorised as: metabolically healthy non-obese (MHN), metabolically healthy obese (MHO), metabolically unhealthy non-obese (MUN), and metabolically unhealthy obese (MUO).

The authors analysed the details of 381,363 individuals (excluding those classed as 'underweight') for a median follow-up period of 11.2 years. They were part of the UK Biobank project: a large-scale prospective cohort study that recruited participants from the general population across England, Scotland, and Wales between 2007 and 2010.

The authors found that MHO individuals were generally younger, watched less television, exercised more, had higher education level, lower deprivation index, higher red and processed meat intake, and were less likely to be male and non-white than participants who were MUO.

Compared to metabolically healthy participants without obesity (MHN), participants with MHO were 4.3 times more likely to have T2D, 18% more likely to suffer heart attack or stroke, had a 76% higher risk of heart failure, were 28% more likely to suffer respiratory disease and 19% more likely to suffer COPD. Compared to metabolically unhealthy people without obesity (MUN), those classed as MHO were 28% more likely to have heart failure.

The authors say: "Generally, rates of cardiovascular and respiratory outcomes were highest in MUO, followed by MUN and MHO, except for incident and fatal heart failure, and incident respiratory diseases. For these outcomes, people with MHO had higher rates than those with MUN."

They add: "People with metabolically healthy obesity were at a

substantially higher risk of diabetes, heart attack and stroke, heart failure, respiratory diseases, and all-cause mortality compared with people who were not obese and with a healthy metabolic profile. Particularly worth noting is that people with metabolically healthy obesity had a higher risk of heart failure and respiratory disease than metabolically unhealthy participants without obesity."

Furthermore, the team also found that, amongst a subset of participants with follow-up metabolic and obesity data, one third of those with metabolically healthy obesity at the beginning of the study period became metabolically unhealthy within 3 to 5 years.

The researchers conclude: "People with metabolically healthy obesity are not 'healthy' as they are at higher risk of [heart attack](#) and stroke, [heart failure](#), and respiratory diseases compared with people without obesity who have a normal metabolic profile."

They advise: "Weight management could be beneficial to all people with obesity irrespective of their metabolic profile. The term 'metabolically healthy obesity' should be avoided in clinical medicine as it is misleading, and different strategies for defining risk should be explored."

**More information:** Ziyi Zhou et al, Are people with metabolically healthy obesity really healthy? A prospective cohort study of 381,363 UK Biobank participants, *Diabetologia* (2021). [DOI: 10.1007/s00125-021-05484-6](https://doi.org/10.1007/s00125-021-05484-6)

Provided by Diabetologia

Citation: People with 'healthy obesity' are still at increased risk of disease (2021, June 10)

retrieved 21 June 2024 from <https://medicalxpress.com/news/2021-06-people-healthy-obesity-disease.html>

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