

Metabolism and risk

Metabolic epidemics have been building for decades. They haven't created sudden and disruptive effects, but their prevalence is vast, they pose risks for cardiovascular health and premature death, and multiple interventions have been advocated—and yet they remain epidemics.

Attention has focussed on the epidemics of childhood obesity and diabetes, but given the underlying pathophysiology of type 2 diabetes and obesity, a broader view could help. What we now term metabolic syndrome has shifted in name and conceptualisation over the past half century, but in essence it is a cluster of metabolic abnormalities. Today, its central component is often considered to be impaired glucose metabolism, with other key elements being abdominal obesity, high blood pressure, and disturbed lipid metabolism. Although debate continues over how many factors should be included and how they should be measured (eg, waist circumference, fasting blood glucose, and high triglycerides), the cluster gains meaning from being a collection of risk factors for cardiovascular disease and type 2 diabetes; it is a marker of risk of threats to health later in life. In a new systematic review and modelling analysis, Jean Jacques Noubiap and colleagues estimated the global prevalence of metabolic syndrome in 2020 to be almost 3% in children aged 6–12 years and nearly 5% in adolescents aged 13–18 years, equating to about 26 million children and 36 million adolescents.

The threats to health, however, are more imminent than many think. Most patients with metabolic syndrome have type 2 diabetes, due to their fasting blood glucose concentrations, and in 2019, over 16 000 deaths in people younger than 25 years were estimated to be due to diabetes. The importance of increasing access to affordable health care is clear, as diabetes mortality was higher in lower-income countries and was inversely related to universal health-care coverage. Diabetes mortality has decreased since 1990, mostly related to type 1 diabetes, because of increased access to care and better treatment (eg, insulin pumps). But incidence of type 2 diabetes has been increasing and the declines in deaths due to type 2 diabetes since 1990 were small. Rising rates of type 2 diabetes in young people pose new challenges to health systems; adolescents with type 2 diabetes have greater overall risk of complications during adolescence than for type 1 diabetes, including renal

disease, retinopathy, poor pregnancy outcomes, and depressive symptoms.

The complications of diabetes and the risk of cardiovascular disease make it important to foreground metabolic syndrome in thinking about young people's health. Some question the clinical value of diagnosing metabolic syndrome, but tracking its prevalence and setting specific country targets will be useful to assess changes in current and potential health. Metabolic health could provide a useful focal point for policies and interventions. In turn, those interventions must focus on one of metabolic syndrome's components: obesity.

In addition to care aimed at its consequences, a new conceptual approach to type 2 diabetes focusses on obesity as a key upstream driver. Up to 61 million children and adolescents were obese in 2020. Despite the heterogeneity of type 2 diabetes, and the fact that the pathology rather than quantity of adipose tissue might drive complications, sustained weight loss is likely to help most people with type 2 diabetes. This is particularly so for adiposity-associated phenotypes, which young people are more likely to have. A new review proposes 15% bodyweight loss as a target for this group, to reduce adipose tissue pathology and improve their metabolic milieu, aiming at prevention of diabetes for those with prediabetes and at remission or reduction for those already diagnosed with type 2 diabetes.

Unlike epidemics caused by infectious diseases, like COVID-19, metabolic epidemics do not have a single identifiable cause to direct measures against. They have multiple risk factors, and single-component interventions are not effective. The rise in obesity, type 2 diabetes, and metabolic syndrome has accompanied increasing dominance of sedentary activities in young people's lives and changing food environments in which highly processed, nutrient-poor, energy-rich foods and beverages have become more available, accessible, and desirable, linked with pervasive marketing and economic growth. It has been established that interventions must be multifaceted, multisectorial, and tailored to age and cultural and geographical context, but we are not on track to make the gains needed. Metabolic health is at the core of human health and wellbeing, and efforts to care for it must be worked towards with zeal. ■ *The Lancet Child & Adolescent Health*



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For the global prevalence of metabolic syndrome in children and adolescents in 2020 see [Articles](#) page 158

For diabetes mortality and trends in people younger than age 25 years see [Articles](#) *Lancet Diabetes Endocrinol* 2022; published online Feb 7. [https://doi.org/10.1016/S2213-8587\(21\)00349-1](https://doi.org/10.1016/S2213-8587(21)00349-1)

For more on type 2 diabetes in adolescents see [Review](#) *Lancet* 2017; **389**: 2252–60

For obesity management as a primary treatment goal for type 2 diabetes see [Review](#) *Lancet* 2022; **399**: 394–405