Diabetes was seriously underrated as a threat to global public health until very recently. However, the situation is now changing and the world can no longer ignore the inexorable rise in prevalence of type 2 diabetes in particular. A collection of Reviews in The Lancet and The Lancet Diabetes & Endocrinology, released to coincide with the World Diabetes Congress 2013 in Melbourne, VIC, Australia, addresses several key issues related to diabetes, which now ranks as one of the greatest public health challenges in the history of mankind.

The most recent predictions from the International Diabetes Federation show that there are now 382 million people with diabetes, and predict that by 2035 this number will climb to almost 600 million worldwide. Although once thought mainly to be a disease of western Europe and North America, diabetes prevalence is increasing worldwide, particularly in Asia. For example, a recent report from China suggested that there are 114 million people with diabetes—in other words, almost one in three people with diabetes worldwide live in China.

Prevention and treatment of type 2 diabetes needs a clear understanding of causal factors. However, many of the mysteries surrounding type 2 diabetes are yet to be revealed despite intensive research into its natural history, pathophysiology, genetics, epigenetics, and environmental determinants. Thus, treatment remains a challenge because of the lack of knowledge regarding diabetes pathophysiology, and the heterogeneity and progressive nature of the disease. Achievement of excellent glycaemic control with oral hypoglycaemic drugs remains a formidable challenge; long-term management usually needs combination therapy and increasing doses of hypoglycaemic drugs, including insulin. The associated pandemic of obesity has led to increases in rates of bariatric surgery, which has impressive results on diabetes as well as weight loss. Overall, however, many aspects of diabetes pathophysiology remain unknown, limiting understanding of how best to intervene.

Nevertheless, there have also been impressive steps forward in the past few years. For example, more than a decade ago, the discovery of adiponectin (a cytokine produced by adipose tissue) and its possible role in the pathogenesis of type 2 diabetes created great interest and excitement. The potential of adiponectin and its receptors in obesity-associated disorders is summarised in a Comment by Takashi Kadowaki and colleagues. In human beings, low plasma concentrations of adiponectin are associated with the development of type 2 diabetes, and adiponectin has direct insulin-sensitising and antidiabetic properties. Small-molecule agonists of adiponectin have recently been developed that improve a range of diseases associated with obesity (eg, type 2 diabetes and fatty liver) in mouse models. In the future, drugs targeted at adiponectin pathways might become available for the treatment of obesity-related disorders.

Kahn and colleagues provide an update on the putative causes of type 2 diabetes, highlighting the key feature of type 2 diabetes—dysregulation of a feedback loop involving the islet β cell and insulin-sensitive tissues. When insulin resistance is present, the β cell maintains normal glucose tolerance by increasing insulin output. The authors discuss the need for more effective therapies that slow the progressive loss of β-cell function and that long-term studies of drugs and bariatric surgery are needed to identify novel approaches to prevention and treatment.

Diabetes is a much more heterogeneous disease than the conventional subdivision into type 1 and type 2 diabetes assumes. Type 2 diabetes, particularly, has many faces and is highly heterogeneous. Tuomi and colleagues discuss the importance of accurate classification of diabetes, particularly when the lines between type 1 and type 2 diabetes become blurred. Appropriate classification of diabetes is essential for both effective treatment and prevention. They explain that many patients carry genetic predispositions to both type 1 and type 2 diabetes, resulting in hybrid forms of diabetes. One example of this category is latent autoimmune diabetes in adults (LADA), a common form described first by Tuomi and colleagues in 1993. Additionally, type 2 diabetes is increasingly reported in much younger age groups, even in children and adolescents. In the future, with improved phenotyping of patients with diabetes, the range of subgroups could become even more diverse and include forms of diabetes specific to ethnic groups. Our hope is that delineation of these subgroups will serve to develop a more individualised therapeutic and preventive approach.
An inexorable and unsustainable increase in global health expenditure attributable to diabetes is a real possibility, making prevention essential. But can the diabetes tsunami be stopped by disease prevention? Zimmet and colleagues describe how lifestyle programmes can prevent type 2 diabetes in high-risk people, although the widespread practicality of these programmes is doubtful unless communities and governments become involved. Comprehensive attention has been given to traditional risk factors for type 2 diabetes—eg, genes, lifestyle, and behavioural changes. Yet, the current spotlight on epigenetics and the effect of the intrauterine environment on future risk in adult life highlights the urgency to find novel approaches to prevention that focus on maternal and child health. Indeed, epigenetic modifications can be transmitted through generations, thus creating a vicious cycle that will continue to feed the diabetes epidemic.

Major increases in type 2 diabetes have occurred in China and Cambodia 40–50 years after severe famines. These increases raise the possibility of future hotspots of type 2 diabetes in regions that have droughts and famine at present (eg, the Horn of Africa) if economic and living conditions improve during the next few decades. Thus, attention must be directed to establish which countries will bear the brunt of diabetes in the future, and make these regions a priority for prevention. Nevertheless, type 2 diabetes will remain one of the greatest challenges to health-care systems for many years to come.

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We declare that we have no conflicts of interest.