

# DIABETES AND COVID-19: THE SILENT 45 BILLION EURO PROBLEM

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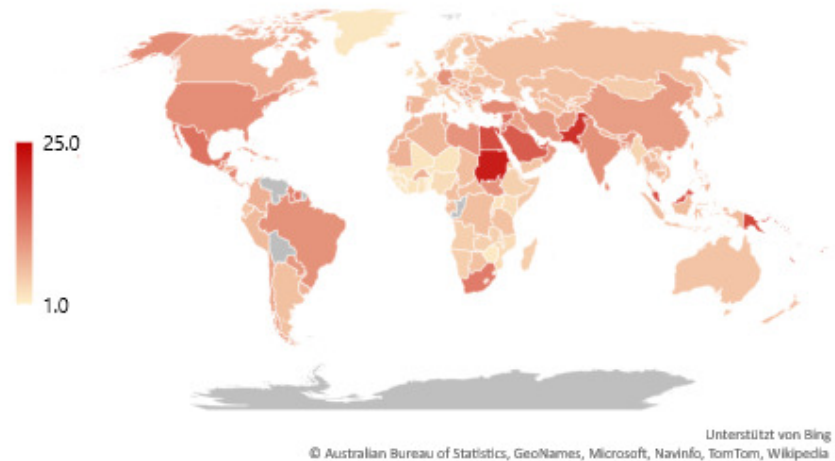
**People suffering from diabetes have a higher risk of getting and developing a severe form of Covid-19. At the same time, the Covid-19 pandemic has increased the risk of developing diabetes in the long run, as lockdowns exacerbated another widespread disease: overweight. A further rise in the prevalence of diabetes could add 25 million people suffering from diabetes worldwide, causing 45 billion euro of direct health costs per year.**

While the world is struggling to fight the Covid-19 pandemic, the number of people suffering from diabetes has kept increasing rather unnoticed. According to the International Diabetes Federation (IDF) meanwhile around 537 million people live with diabetes, that is every 10<sup>th</sup> adult aged between 20 and 79 years. 20 years ago, the prevalence in this age group was merely 4.6% with the total number of people having diabetes amounting to 151 million<sup>1</sup>.

The marked increase was mainly driven by the developments in Asia, the Middle East, Latin America, and Oceania, where the prevalence rates doubled in recent years. In 2021, almost half of all people suffering from diabetes worldwide lived in China, India, and Pakistan. This is mainly due the development in China, where the number of people with diabetes increased from 23 million to 140 million since the turn of the century, lifting the country's world share from 15% to 26%. Between 2011 and 2021, the age-adjusted prevalence of diabetes increased from 8.8 to 10.6 in China, in India it reached 9.6 and in Pakistan it climbed to 30.8, one of the highest prevalence worldwide (see Figure 1, p. 2).

<sup>1</sup> This number refers to persons aged between 20 and 79 years. See International Diabetes Federation (2000): IDF Diabetes Atlas 1<sup>st</sup> edition and IDF (2021) Key global findings 2021; <https://diabetesatlas.org/>, (accessed 08.11.2021). According to UN Population Division, the number of adults aged between 20 and 79 amounted to 3.65bn in 2000 and 5.05bn in 2020. See UN Population Division (2019): World Population Prospects, 2019 Revision.

Figure 1: Age-adjusted prevalence of diabetes



Source: International Diabetes Federation.

In the course of this development, diabetes advanced also to one of the Top 10 causes of death worldwide, accounting for 1.5 million deaths in 2019, an increase of 70% compared to 2000.<sup>2</sup> Yet, as it is a major risk factor for developing infections and a leading cause of cardiovascular diseases, such as heart attacks and stroke, chronic kidney disease or failure as well as blindness and lower limb amputation, it probably contributes indirectly to a much higher number of deaths. In fact, the IDF estimates that diabetes will be responsible for 6.7 million deaths worldwide in 2021.<sup>3</sup> This would be higher than the number of registered Covid-19 deaths since the begin of the pandemic.

To prevent or at least delay diabetes complications, people with diabetes need not only medication, they need also regular monitoring to maintain blood glucose levels, blood pressure, and cholesterol at or close to normal level.<sup>4</sup> The American Diabetes Association estimated that the annual per capita health care expenditures for people with diabetes are 2.3 times the costs which had occurred in the absence of diabetes.<sup>5</sup> Worldwide health expenditures caused by diabetes are expected to amount to 790 billion Euro in 2021.<sup>6</sup>

<sup>2</sup> See WHO (2020): Global Health Estimates 2019: Estimated deaths by cause and region, 2000 and 2019; <https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates>; (accessed 10.11.2021). Between 2000 and 2016 there was also a 5% increase in premature mortality from diabetes, while the probability of dying from any one of the other main noncommunicable diseases, cardiovascular diseases, cancer and chronic respiratory diseases, between the ages of 30 and 70 decreased by 18%. See WHO (2021): Factsheet diabetes. <https://www.who.int/news-room/fact-sheets/detail/diabetes>; (accessed 08.11.2021).

<sup>3</sup> See IDF (2021): Key global findings 2021; <https://diabetesatlas.org/>; (accessed 08.11.2021).

<sup>4</sup> See IDF (2020): Diabetes complications.

<sup>5</sup> In 2017, health expenditures per capita for persons with diabetes amounted to around 16.700 Euro, thereof 7.850 Euro were attributable to diabetes. In sum, diabetes expenditures amounted to 194 billion Euro or almost 7% of total health expenditures. However, the health expenditures for diabetes, i.e., the direct costs, account only for around 70% of the total economic costs of diabetes, productivity losses included, total costs reached 267 billion Euro. See American Diabetes Association (2018): Economic Costs of Diabetes in the U.S. in 2017, p. 24, in: Diabetes Care, vol. 41, May 2018, p. 917-928; Economic Costs of Diabetes in the U.S. in 2017 ([diabetesjournals.org](https://diabetesjournals.org/)), (accessed 10.11.2021) National Center for Health Statistics. Health, United States, 2019: Table 44. Hyattsville, MD. 2021. Available from: <https://www.cdc.gov/nchs/hus/contents2019.htm>. (accessed 10.11.2021).

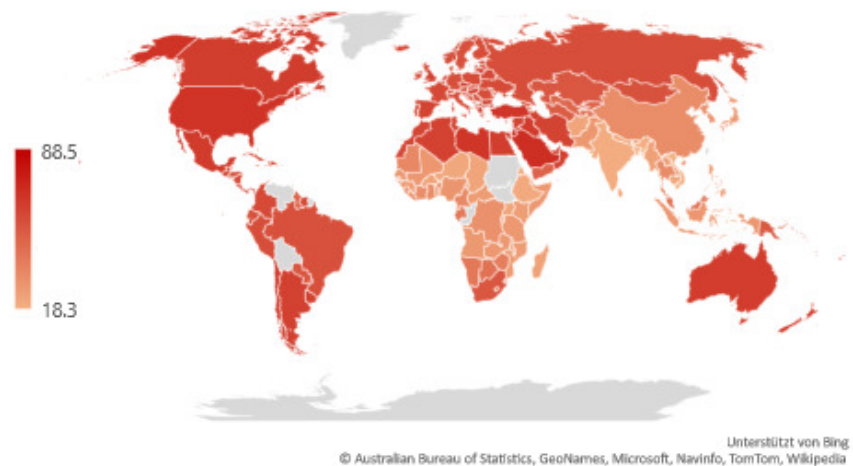
<sup>6</sup> See International Diabetes Federation (2000): IDF Diabetes Atlas 1st edition and IDF (2021) Key global findings 2021; <https://diabetesatlas.org/>; (accessed 08.11.2021).

Almost two thirds of the global health expenditures for diabetes were spent in four countries: The health expenditures in the United States accounted for 39%, those in China for 17 % and Brazil's and Germany's each for 4% of the global health expenditures for diabetes.<sup>7</sup>

There are three types of diabetes<sup>8</sup>: Type 1, type 2 and gestational diabetes mellitus. Type 1 diabetes, which was previously known as insulin-dependent, juvenile or childhood-onset diabetes, is the major cause of diabetes in childhood but can occur at any age. It is characterized by deficient insulin production and requires daily administration of insulin. At present, neither the cause of Type 1 diabetes nor the means to prevent it are known. Gestational diabetes occurs during pregnancy. However, the most common form of diabetes is type 2 diabetes: 90% of all people with diabetes have type 2 diabetes, also known as non-insulin dependent or adult-onset diabetes. It results from the body's ineffective use of insulin. The onset of type 2 diabetes can be prevented or at least delayed by a healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco, as major risk factors are excess body weight and physical inactivity.

Against this background, efforts to dampen the increasing prevalence of overweight in societies gain in importance. According to the latest available WHO the share of persons being overweight, i.e., having a BMI of 25 or higher, ranged between 15% in Vietnam to 85.6% in Nauru. In most major industrialized countries, more than 50% of the population were overweight, in the USA for example the share has increased to 64.5%. A major exception is Japan, where merely 24% of the population were overweight<sup>9</sup> (see Figure 2).

Figure 2: Prevalence of overweight in adult population, in percent



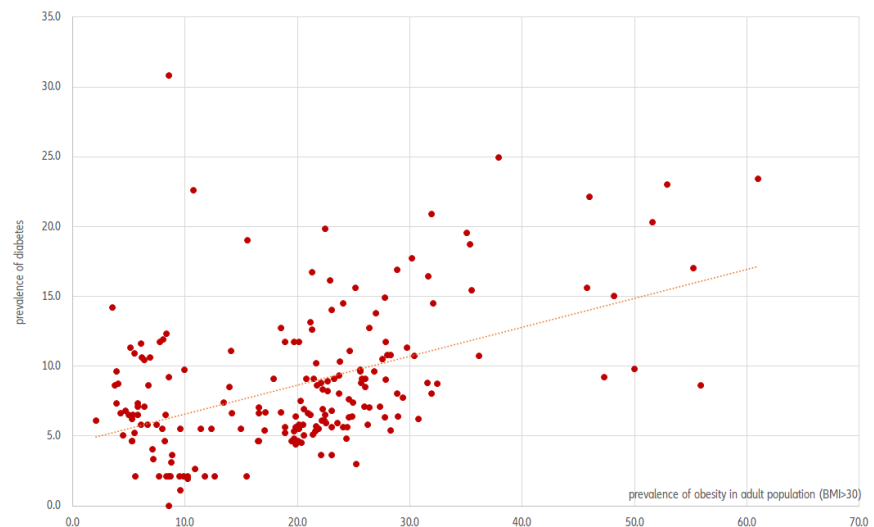
Source: World Health Organization.

<sup>7</sup> See International Diabetes Federation (2021): IDF Diabetes Atlas, 10<sup>th</sup> edition 2021, Diabetes-related health expenditure: Total diabetes-related health expenditure, USD million (diabetesatlas.org), (accessed 11.11.2021).  
<sup>8</sup> See WHO (2021): Diabetes Factsheet and IDF (2021): IDF Diabetes Atlas 10<sup>th</sup> edition.  
<sup>9</sup> Data refers to 2016. See WHO (2021): Prevalence of overweight among adults; [\(https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-overweight-among-adults-bmi-25-\(age-standardized-estimate\)-\(-\)](https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-overweight-among-adults-bmi-25-(age-standardized-estimate)-(-)) (accessed 11.11.2021).

In this respect the Covid-19 pandemic hit not only diabetes patients in particular, but had also a severe impact on the efforts to dampen the further increase of the prevalence of overweight and diabetes. People suffering from diabetes have been affected by the Covid-19 pandemic in several ways. They have not only a higher risk of getting Covid-19, but also a higher risk of developing a severe form of Covid-19.<sup>10</sup> They were also affected by the reduction of regular medical treatment and care due to lockdowns and the overload of the health system by Covid-19 cases. Data from the UK show that regular standard examinations and prescriptions decreased by an average 20% last year.<sup>11</sup> Furthermore, there is also a risk that many new cases remained undetected due to the lockdowns. In the medium and longer term, this may lead to burdensome and costly diabetes complications that are otherwise largely preventable, like cardiovascular or kidney diseases.

At the same time, the lockdowns reduced the possibilities for physical activities and led to an increase of the average weight and thus the average BMI in most countries. The highest risk of weight gain was reported among people younger than 40 years. In Germany, for example, an average weight gain of 1kg was reported, implying an increase of the average BMI from 25.9 to 26.4.<sup>12</sup> As the risk of developing diabetes increases almost linearly with overweight, the Covid-19 pandemic is very likely to lead to a rise of diabetes in the coming years. Without measures to reduce these risk factors, the Covid-19 pandemic would add another 25 million diabetes cases worldwide, causing around 45 billion euro additional direct health costs each year<sup>13</sup> (see Figure 3).

Figure 3: Prevalence of obesity and diabetes



Sources: World Health Organization, International Diabetes Federation.

<sup>10</sup> In the early phase of the pandemic, nearly one-third of all COVID-19-related deaths in the UK occurred in people with diabetes. See Carr, Matthew J. et al. (2021): Impact of COVID-19 restrictions on diabetes health checks and prescribing for people with type 2 diabetes: a UK-wide cohort study involving 618 161 people in primary care, in: BMJ Quality and Safety, Published Online First, 12 October 2021, p. 1–12; doi:10.1136/bmjqs-2021-013613 (accessed 05.11.2021).

<sup>11</sup> Carr, Matthew J. et al. (2021): Impact of COVID-19 restrictions on diabetes health checks and prescribing for people with type 2 diabetes [...].

<sup>12</sup> DPA (2020). RKI-Umfrage: Im Corona-Lockdown nahmen die Deutschen zu, published on 09.12.2020.

<sup>13</sup> Based on the global average health expenditures per capita according to the IDF Diabetes Atlas.

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