

## Covid-19 and obesity : The major factor in the global pandemic

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*A major report from the World Obesity Federation shows that of the 2.5 million deaths caused by COVID-19 globally, the vast majority (88%) of these deaths have been in countries where more than half of the population is overweight.*

It is now clearly established that obesity is a condition that increases the likelihood of developing a wide range of chronic diseases, including cardiovascular disease, type 2 diabetes and several types of cancer.

The COVID-19 pandemic has revealed that being overweight also represents a significant risk of complications from infectious diseases: more than 40 systematic reviews and 20 meta-analyses of clinical studies carried out over the past year have indeed shown that overweight people who are affected by COVID-19 have an increased risk of hospitalization, admission to intensive care, requiring ventilatory assistance and dying from the disease.

### A GLOBAL PROBLEM

Comparing data collected from more than 160 countries around the world, the World Obesity Federation report notes that this close association between deaths from COVID-19 and the prevalence of overweight in the adult population is seen globally (1).

Based on currently available data, COVID-19-related death rates were more than 10 times higher in countries where the prevalence of overweight exceeds 50% of adults (weighted average of 66.8 deaths per 100,000 adults) compared to countries where the prevalence of overweight is less than 50% of adults (weighted average of 4.5 deaths per 100,000 adults).

| Prevalence of overweight | COVID-19 Mortality (per 100,000 people) | Number of countries |
|--------------------------|---|---------------------|
| < 30 %                   | 6,6                                     | 38                  |
| 30 - 40 %                | 0,5                                     | 19                  |
| 40 - 50 %                | 3,2                                     | 19                  |
| 50 - 60 %                | 67,9                                    | 55                  |
| 60 - 100 %               | 65,6                                    | 39                  |

These data are independent of the socioeconomic status of the countries. For example, the United Kingdom and the United States are among the countries with the highest prevalence of obesity and the populations of these two countries have been hit very hard by COVID-19.

Conversely, two countries of equivalent economic status, Japan and South Korea, have only a small percentage of obese adults and these countries show much lower mortality from COVID-19.

### THE AMERICAN EXAMPLE

The United States is a particularly tragic example of the burden imposed by obesity: Despite making up less than 5% of the world's population, Americans still account for about 25% of deaths from COVID-19.



This high vulnerability to the coronavirus reflects the high prevalence of this population, which is in poor metabolic health, with three quarters of them being overweight, almost half who are diabetic or prediabetic and almost half who are hypertensive.

A recent study confirms the contribution of these pathologies to the burden imposed by COVID-19 on the American population (2). The researchers observed that of the approximately 900,000 hospitalizations due to COVID-19 that occurred as of November 18, 2020, obesity was the leading cause with 30% of cases, followed by 26% for hypertension, 20% for diabetes and 11% for heart failure. Overall, they estimate that nearly two-thirds (63.5%) of hospitalizations were attributable to these four cardiometabolic conditions, alone or in combination.

As the authors point out, these results are not surprising when one considers that cardiometabolic diseases, including diabetes mellitus, heart failure, hypertension, and obesity, are all associated with decreased innate and adaptive immune responses. Each of these cardiometabolic conditions also initially involves dysfunction of blood vessels and chronic systemic inflammation, two targets that are affected by the coronavirus.

People who are obese, diabetic and / or hypertensive are therefore much more at risk of developing an excessive inflammatory response and problems affecting the blood vessels (coagulopathies) following an infection by the coronavirus, hence the importance of following the body mass index in pandemic populations.

The impact of comorbidities is huge: A CDC analysis indicates that a 35-year-old with diabetes, hypertension, cardiovascular disease, obesity or other chronic health problems has a risk of COVID-19-related hospitalization similar to that of a 75-year-old without any of these conditions (3).

Poor metabolic health associated with obesity therefore causes a dramatic acceleration in biological aging and, at the same time, vulnerability to the coronavirus responsible for COVID-19.

- (1) World Obesity Federation. COVID-19 and Obesity: the 2021 Atlas. Available at <https://www.worldobesity.org/>
- (2) O'Hearn M et al. Coronavirus disease 2019 hospitalizations attributable to cardiometabolic conditions in the United States: a comparative risk assessment analysis. *J. Am. Heart Assoc* (Published online, February 25<sup>th</sup>, 2021)
- (3) Stokes EK et al. Coronavirus Disease 2019 case surveillance—United States, MMWR Morb. Mortal. Wkly Report. 2020 ; 69:759-765.