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# Obesity and covid-19: the role of the food industry

The viral pandemic makes tackling the obesity pandemic even more urgent

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Increasing evidence indicates that obesity is an independent risk factor for severe illness and death from covid-19.<sup>1-6</sup> In the UK, a population cohort study (428 225 participants; 340 admitted to hospital with confirmed covid-19, 44% of whom were overweight and 34% obese)<sup>1</sup> and the OpenSAFELY study using linked electronic health records (17 425 445 participants, 5683 covid-19 deaths (29% overweight, 33% obese))<sup>2</sup> have shown a dose-response relation between excess weight and severity of covid-19. After potential confounders, including age, sex, ethnicity, and social deprivation, were adjusted for, the relative risk of critical illness from covid-19 increased by 44% for people who were overweight (relative risk 1.44, 95% confidence interval 1.08 to 1.92) and almost doubled for those with obesity (1.97, 1.46 to 2.65) in the cohort study.<sup>1</sup>

Similarly, in the OpenSAFELY study, after all other risk factors (including comorbidities) were fully adjusted for, the risk of dying from covid-19 increased with obesity severity, from a 27% higher risk in the first obesity category (body mass index (BMI) 30-34.9; hazard ratio 1.27, 1.18 to 1.36) to more than doubling of the risk in the most obese category (BMI >40; 2.27, 1.99 to 2.58).<sup>2</sup> Smaller studies from the Asia-Pacific region, Europe, and the US have confirmed these findings.<sup>3-6</sup>

Multiple mechanisms could explain the relation between obesity and covid-19. Angiotensin converting enzyme-2 (ACE-2), the transmembrane enzyme that SARS-CoV-2 uses for cell entry, exists in larger quantities in people with obesity. Whether this is the result of higher ACE-2 expression in the adipocytes of people with obesity or having more adipose tissue in general (and thus a greater number of ACE-2 expressing cells) is not yet clear.<sup>7,8</sup> The adipose tissue of people with obesity may therefore be a potential target and viral reservoir for SARS-CoV-2 before it spreads to other organs, as has proved to be the case for other viruses.<sup>7,8</sup>

Obesity can also alter immune responses, as has been shown with the influenza virus, leading to weakened host defence and a greater chance of a cytokine storm with covid-19.<sup>9,10</sup> Finally, obesity diminishes lung function through greater resistance in the airways and more difficulty in expanding the lungs. When patients with obesity need to be admitted to intensive care units it is challenging to improve their oxygen saturation levels and ventilate them.<sup>9</sup>

## Unhealthy environment

The covid-19 outbreak seems to be yet one more health problem exacerbated by the obesity pandemic. In 2016 more than 1.9 billion adults were overweight or obese worldwide, and this number continues to

rise rapidly.<sup>11</sup> The prevalence of overweight and obesity has now reached 65-70% in the UK and US adult populations.<sup>12,13</sup> Obesity is a major cause of high blood pressure, type 2 diabetes, heart disease, stroke, and cancer and places a great burden on health systems and economies.<sup>11</sup> In 2014-15 the NHS spent more than £6bn (€6.7bn; \$7.6bn) on tackling the direct consequences of obesity.<sup>14</sup>

The obesity pandemic is the result of living in food environments where it is difficult not to overconsume calories. The global food industry produces and extensively promotes cheap, sugar sweetened beverages and ultraprocessed foods high in salt, sugar, and saturated fat that provide only a transient sensation of fullness. Governments have done too little, with one of the few successes being taxes on sugar sweetened beverages—in particular, the industry levy in the UK that has resulted in reformulation to reduce the sugar content.<sup>15</sup>

It is now clear that the food industry shares the blame not only for the obesity pandemic but also for the severity of covid-19 disease and its devastating consequences. During the covid-19 pandemic an increase in food poverty, disruptions to supply chains, and panic buying may have limited access to fresh foods, thus tilting the balance towards a greater consumption of highly processed foods and those with long shelf lives that are usually high in salt, sugar, and saturated fat. Moreover, since the start of the covid-19 pandemic the food industry has launched campaigns and corporate social responsibility initiatives, often with thinly veiled tactics using the outbreak as a marketing opportunity (for example, by offering half a million “smiles” in the form of doughnuts to NHS staff).

Food industries around the world must immediately stop promoting, and governments must force reformulation of, unhealthy foods and drinks. In the UK, incremental targets have already gradually reduced the amount of salt added to foods, resulting in lower salt intake, blood pressure, and cardiovascular mortality.<sup>16</sup> Reducing salt, sugar, and saturated fat across the board would improve the diet of the entire population and bring even greater benefits for people who are most socially deprived. The toll of morbidity and mortality from covid-19 has made this more apparent and more urgent than ever.

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