



OPEN ACCESS

EDITED BY

Soheil Ebrahimpour,
Babol University of Medical Sciences, Iran

REVIEWED BY

Mohammad Barary,
Shahid Beheshti University of Medical
Sciences, Iran

Arefeh Babazadeh,
Babol University of Medical Sciences, Iran
Seyed Raheleh Ahmadian,
Babol University of Medical Sciences, Iran

*CORRESPONDENCE

Ruggero Gabbrielli
✉ ruggero.gabbrielli@unitn.it

†These authors have contributed equally to
this work

SPECIALTY SECTION

This article was submitted to
Infectious Diseases: Epidemiology and
Prevention,
a section of the journal
Frontiers in Public Health

RECEIVED 23 November 2022

ACCEPTED 01 February 2023

PUBLISHED 13 March 2023

CITATION

Gabbrielli R and Pugno NM (2023) The impact
of mean body mass index on reported mortality
from COVID-19 across 181 countries.
Front. Public Health 11:1106313.
doi: 10.3389/fpubh.2023.1106313

COPYRIGHT

© 2023 Gabbrielli and Pugno. This is an
open-access article distributed under the terms
of the [Creative Commons Attribution License
\(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction
in other forums is permitted, provided the
original author(s) and the copyright owner(s)
are credited and that the original publication in
this journal is cited, in accordance with
accepted academic practice. No use,
distribution or reproduction is permitted which
does not comply with these terms.

The impact of mean body mass index on reported mortality from COVID-19 across 181 countries

Ruggero Gabbrielli^{1*†} and Nicola Maria Pugno^{1,2†}

¹Laboratory for Bioinspired, Bionic, Nano, Meta Materials and Mechanics, Department of Civil, Environmental and Mechanical Engineering, University of Trento, Trento, Italy, ²School of Engineering and Materials Science, Queen Mary University of London, London, United Kingdom

Accountability for global health issues such as a pandemic and its devastating consequences are usually ascribed to a virus, but a comprehensive view should also take into account the state of the host. Data suggests that excessive nutrition is to blame for a yet unknown but not negligible portion of deaths attributed to severe acute respiratory syndrome coronavirus 2. We analyzed the correlation between mean body mass index (BMI) and 2-year coronavirus disease 2019 (COVID-19) mortality rates reported by 181 countries worldwide. Almost two thirds of the countries included had a mean BMI greater or equal to 25, with death rates ranging from 3 to 6,280 per million. Death rates in countries with a mean BMI below 25 ranged from 3 to 1,533. When the analysis was restricted to countries where the extent of testing was deemed more representative of actual mortality, only 20.1% had a mean BMI < 25 but the mortality difference persisted. A second analysis looking at pre-vaccination mortality obtained from a different source led to similar conclusions. Due to the nature of the variables, reverse causation can be excluded while common causation can not. A mean BMI < 25 for a country seems to spare its citizens from the highest COVID-19 mortality rates. The impact of excess weight on global COVID-19 mortality is suspected to have been much higher than what currently perceived, here estimated at no less than a fourfold increase in mortality. Countries with normal mean BMI constitute precious test beds for the quantification of the effects of overeating on COVID-19 mortality.

KEYWORDS

body mass index, COVID-19, mortality, public health, overeating

Introduction

Koch's third postulate states that in order to establish a causal relationship between a microbe and a disease, the microorganism should cause disease when introduced into a *healthy organism*. No reference is made to the severity of the disease caused, nor to what constitutes a healthy organism, nor to the possibility for the organism to be in a state of partial well-being.

Hill improved upon Koch's original criteria in many aspects, but the difficulties encountered in the quantification of the initial state of health of the host and how this could affect both infectivity and mortality remain. An organism can at any time and for a variety of different reasons weaken a subset of its own defense systems, with no apparent ill effects. It is only when a new threat that specifically exploits that very weakness that the host begins to tumble.

For this reason we asked ourselves whether the COVID-19 pandemic—had the virus not found a species afflicted by overeating—would have been as deadly as it had.

Obesity, once considered by many clinicians a self-inflicted condition of little medical significance, has increased dramatically during the last four decades (1). Today we know that it carries higher risks for the development of type 2 diabetes, coronary heart disease, a number of cancers, respiratory complications and osteoarthritis. Even more modest degrees of overweight are associated with mortality (2). Health care resources are inundated by obesity and its consequences (3), with high social and economic costs, including attempts to prevent or to treat it (4).

Although failure to mention obesity as one of the preexisting diseases associated with death still occurs (5), individuals with obesity, overall and central, are more at risk for being COVID-19 positive [46% more (6)] (7–9), hospitalization (10), ICU admission (6, 9), reinfection (11) and mortality [48% more (6)] (7). Obesity and impaired metabolic health are important risk factors for severe COVID-19 (12–16). The risk of hospital admission or death due to COVID-19 starts at a body mass index (BMI) as low as 23 kg/m² (13). Central obesity and hypertension are associated with lower antibody titres in response to COVID-19 mRNA vaccine (17). Hypertension was found to be more prevalent in the first surge of the disease in Iran, where patients were also younger (18). SARS-CoV-2 infection induces neutralizing antibodies only in few obese COVID-19 patients (19). Given that BMI has a causal role in the development of severe COVID-19, the promotion of weight loss in people with obesity or overweight would help to combat the COVID-19 pandemic (12). In addition to increased risks for the subject, people with high BMI were also found to transmit the infection more easily. The number of exhaled respiratory droplets were in fact considerably higher for these individuals, and further increased with degree of COVID-19 infection (20). A positive association with death was found in previously hospitalized individuals for BMI >37 (21) and among infected underweight, obesity class II and III patients (22).

Among the very old, overweight and obesity were found not to be associated with in-hospital mortality (23). For patients aged ≥60 year, mild/moderate obesity was associated with a 13% reduced mortality risk and a 10% increased length of stay in the ICU (24). Although underweight patients had a higher risk of mortality from COVID-19 (25), overweight and obese patients outnumber them in most countries, making an analysis of mean values not futile.

The combination of increased infection rates, increased transmissibility and decreased antibody response to vaccine, all lead to a larger basic reproduction number. Quantification of the mutual amplification of such effects remains a challenge. Since the majority of the population in many high-income countries is overweight, and since both overweight adolescents and adults experience more respiratory symptoms (26), the role played by excess weight on the intensity of the initial viral diffusion and on its temporal and spatial evolution across the globe should not be ignored.

At this time, doubt pushed us to explore the patterns of mortality around the globe, and their relation to BMI, trying to go beyond both the limitations of BMI itself (definitions of overweight range from BMI ≥23 to BMI ≥25) and our struggle with estimations of exact death tolls (27). In the era of globalization,

a survey of this kind might not come as handy as one might expect, but if interpreted correctly it is still revealing.

Materials and methods

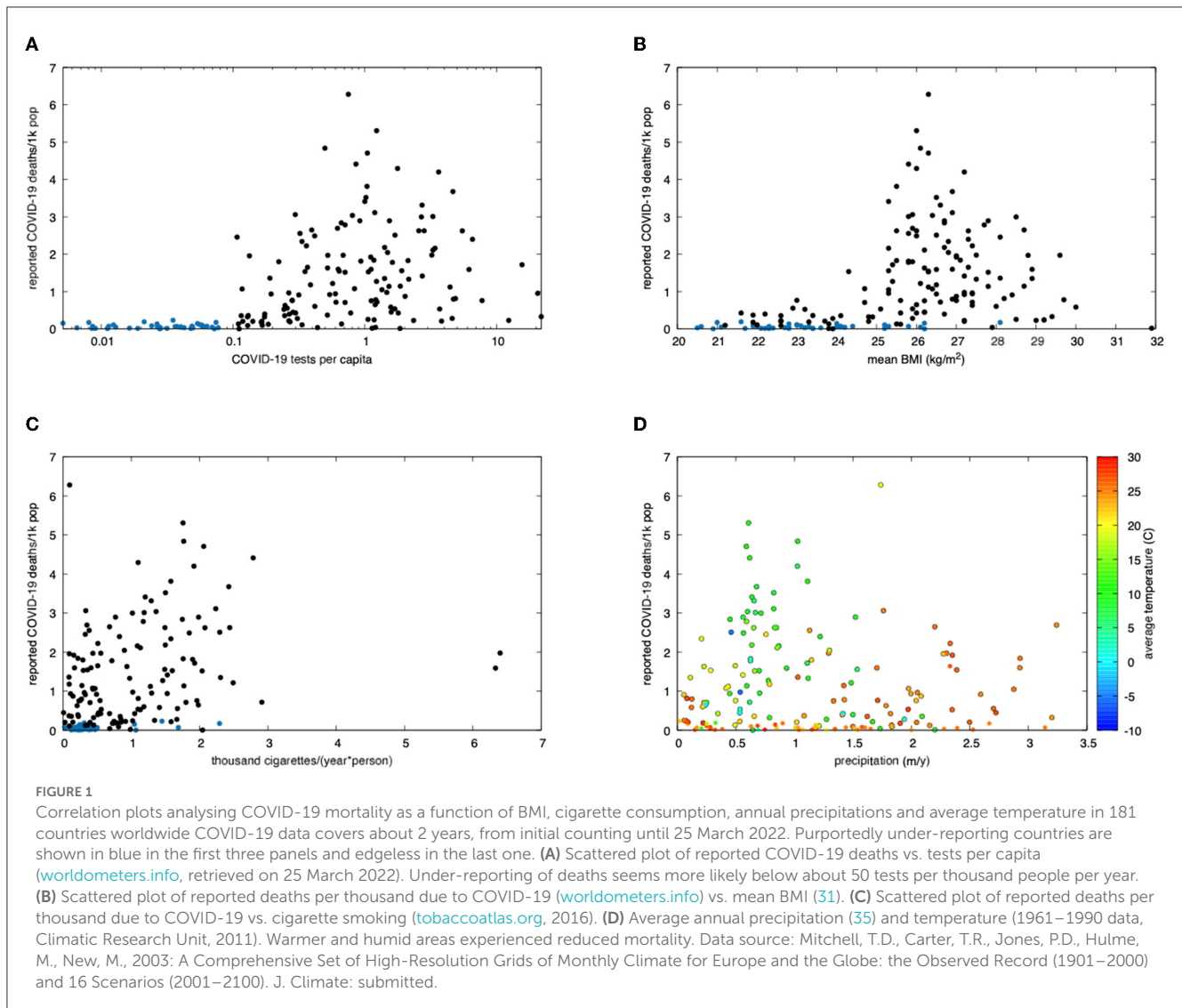
The first problem we encountered was to assess data comparability. Since under-testing and under-reporting of deaths is believed to be common in developing countries, we initially considered analyzing the correlation between COVID-19 tests per capita and reported COVID-19 deaths. The analyses included over 180 countries for which both BMI and mortality data were present. We then conducted very basic observations on the patterns of correlation between COVID-19 mortality and mean BMI, plus three additional variables that for different reasons we felt could potentially have an influence: cigarette consumption [chronic obstructive pulmonary disease worsens outcomes from COVID-19 (28)], annual average precipitation and average temperature (29, 30). Additional indices were looked at, such as the gross domestic product at purchasing power parity, but it was felt that its impact on mortality, although significant, required a socioeconomic type of analysis, which was beyond the scope of this work.

Data for each country was initially collected from a number of different sources and collated into a single file. This included mean BMI from the World Health Organization's Global Status Report on noncommunicable diseases (WHO) (31), population, COVID-19 deaths and tests from the global statistics provider Worldometers (32) and the project Our World in Data (33) (OWID), life expectancy at birth in 2019 from WHO, annual cigarette consumption per person from the Tobacco Atlas (34), annual average precipitation from the World Bank (35) and average temperature from the Climatic Research Unit (36). Data extracted from OWID, in addition to deaths and tests, included the day COVID-19 statistics recording began. This was functional to derive annual quantities, considering that different countries started official recording at different times.

A first correlation between BMI and COVID-19 deaths was evidenced by data retrieved from WHO and the statistics provider Worldometer. Countries with limited testing also reported few deaths. To limit the risk of introducing less reliable data, we restricted our analysis to countries who tested beyond a specific value. This value was chosen based on the distribution of the data itself. No sharp increase in mortality was present for an increment in testing rate up to about 0.1 tests per capita (50 tests per thousand people per year). The analysis was therefore split into two groups: one containing countries who tested up to 0.1 per capita (41) and the other containing countries who tested more (134). Six countries did not have data on the number of administered tests and were excluded (Figure 1A).

In order to eliminate the effect of vaccination, and also as a mean of comparison and validation against the first database, a second COVID-19 database was used. This was freely available from OWID. For each country, the day data were first recorded was extracted. This start date was used to compute the interval of time across which mortality was reported. Total COVID deaths, tests and population of each country were also extracted. The analysis was restricted to year 2020. Using a combination of basic command

Abbreviations: BMI, body mass index; COVID-19, coronavirus disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.



line tools and a spreadsheet, a data file was generated. Three more columns were added: one for death rates, one for test rates and one for BMI. The World Health Organization's Global Status Report on noncommunicable diseases 2014 contains both 2010 and 2014 BMI data, which show increases of up to 2% over a period of 4 years, hovering around 1% for most countries. Given that COVID-19 struck 6 years later, and that adult BMI has and is seeing a linear increase worldwide (37), our analysis underestimates the effect of BMI on mortality. Regarding causality, reverse causation is for temporality reasons not possible. Common causative factors—if any is present—would call for a proper quantification of their individual impact.

Out of 214 countries, 31 had no BMI data, thus allowing analysis of 183 countries in total. All data files are available as [Supplemental material](#).

Results

Plotting each country's COVID-19 death rate vs. its mean BMI gave us some elementary clues (Figure 1B). After over 2 years into the pandemic, countries with a BMI <25 reached a maximum of

1,535 deaths (Namibia), as opposed to those exceeding 25, where death rates soared, up to 6,280 (Peru, see [Supplemental material](#)). Correlation with cigarette smoking was much weaker, as shown in Figure 1C. The effect of climate is shown in Figure 1D, where both precipitations and higher average temperatures confirmed to result into a somewhat lower mortality.

COVID-19 reported death rates for year 2020, virtually free from the effects of vaccination, are shown in Figure 2. Mean mortality in normal mean BMI countries was 4.8 (1755/369, Worldometer) and 13.7 (685/50, OWID) times smaller than that found in high mean BMI countries.

A view at the recognized major risk factor for death due to COVID-19, age, can be observed in Figure 3. Countries with longer life expectancies at birth were, as expected, hit the hardest. However, countries with a mean BMI <25 consistently showed a reduced mortality, which remained particularly low even among the few countries with the highest life expectancies.

The number of countries with a mean BMI <25 amounts to 27 (20.1% of the total of the 134 considered). The overall distribution of mortality in this group scales down to less than one fourth of that seen for BMI ≥25. The odds ratio between the odds of a lower mortality rate in presence of a BMI <25 and the odds of

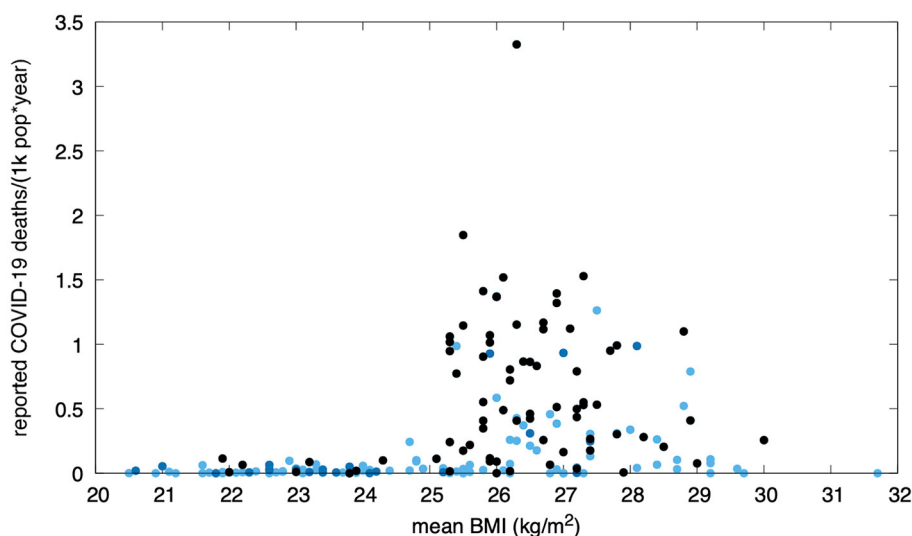


FIGURE 2
Pre-vaccination annual reported COVID-19 mortality in 183 countries (Our World in Data, year 2020) vs. mean BMI. Black dots correspond to countries who performed more than 50 tests per thousand people per year. Dark blue dots indicate countries who did not reach such a rate. Countries for which testing data was not available within this dataset are shown in light blue. The lower mortality rates among countries with a normal mean BMI can not be explained by undertesting alone (a few extensively-testing countries can be seen in this range).

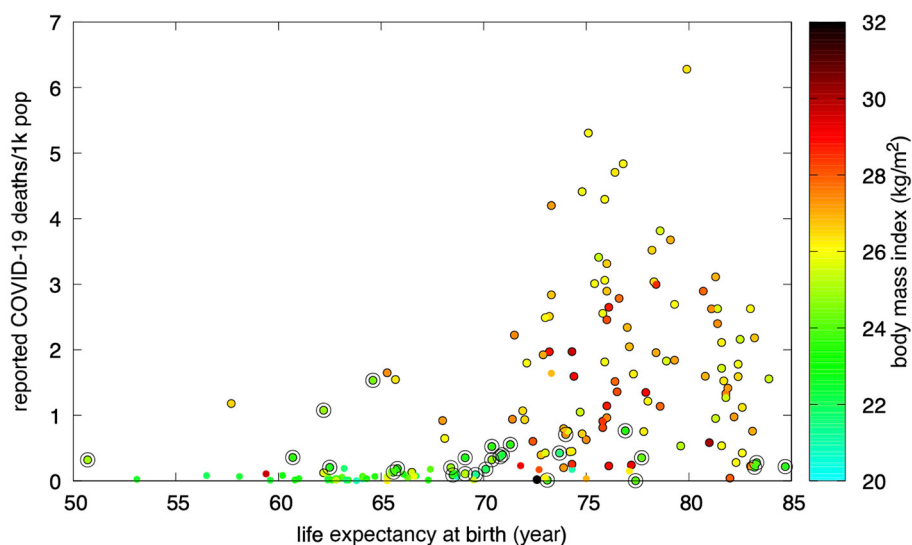


FIGURE 3
Countries with a normal mean BMI (circled) reported a lower COVID-19 mortality. Purportedly under-reporting countries are shown with edgeless dots.

a lower mortality rate in the absence of a BMI <25 is identically equal to 1.0 (24:24) when a reference value of 720 deaths per 1,000,000 population is taken. Defining “high reported mortality” as the mortality exceeding such a value, only 3 countries had high mortality in the presence of a BMI <25, against 83 countries with high mortality in the absence of a BMI <25. The resulting odds ratio was therefore 0.036 (3:83).

According to worldwide reported deaths due to COVID-19, high reported mortality in the presence of a mean BMI <25 was rare. Countries with a mean BMI <25 where

the extent of testing was deemed representative showed less than one fourth the mortality observed in countries with a BMI ≥25.

Discussion

Two major limitations of this study are the uncertainties on undertesting and underreporting of deaths. Lower income countries typically tested less extensively and were less likely

to report deaths from COVID-19 with the needed accuracy. Actual mortality was higher than reported mortality in every part of the world, but the ratio between the two was correlated with income. Developing countries—the majority of which also have a lower mean BMI—had a much higher actual mortality compared to reported counts. This effect was, expectedly, less prominent in higher income countries. Although such a difference could have in principle represented a bias toward an overestimation of the effect of BMI on mortality, the absence of extensively-testing (high-income), normal-BMI countries reporting high mortalities remains.

Another limitation came from differential testing policy, which was not considered. However, although local and temporally delimited differences in country-specific decisions on testing symptomatic individuals only vs. everyone existed, governmental directions changed over time in most countries, making annual statistics less sensitive to this type of inequality.

As a simple anecdote, we would like to draw the reader's attention to the fact that a naked man walking in the rain in the winter is not unlikely to catch a cold. Although colds are often caused by a virus, we do not usually point the finger at the infective agent. We agree instead that the cause of his cold was his behavior, since he—aware of the risk—exposed himself to the elements. Indeed the use of face masks, social distancing and mass vaccinations, all offer protection against infection. However, limiting vulnerability to the new threats that day after day nature manages to assemble behind the scenes would not be inadvisable.

One potentially successful strategy, and a suggestion for an open medical ethics debate, would be that of entitling those who treat their body with more respect (such as normal-weight, non-smokers individuals) to small deductions on the contribution that in many countries patients owe for the cost of medical tests and treatments. An action of this kind has the potential to mitigate the obesity and smoking prevalence. It would simultaneously provide positive feedback to those who already look after their body, and would gradually awake the interest of those who struggle making an effort to change their attitude towards smoking and/or food. A rewarding scheme recognizing body respect would invert the current global trend of increasing obesity rates, simultaneously resulting in a significant reduction in public health expenditure.

Conclusion

A higher mortality from COVID-19—up to fourfold and over—was observed in many countries where the mean BMI exceeded the value of 25, while such increase was not seen in the few extensively-testing, normal-mean-BMI countries.

Caution should nevertheless be exercised in the interpretation of the reported correlations when attempting a causal analysis. Although both a coincidence and reverse causation can be excluded due to the correlation being statistically significant and temporally unidirectional, mean values do not contain information about distribution. A country with a bimodal distribution of

BMI (for example were many people are underweight and obese) could have a similar mean BMI of a country where most people have a normal BMI. Finally, a high BMI does not represent neither a necessary nor a sufficient condition for death due to COVID-19. Common causation can not be ruled out.

As with any morphometric index, BMI comes with issues. International variations are well known, such as a reduced upper normal value for Asians (38). A more promising index seems to be the dimensionless waist-to-height ratio, in short WHtR, for which at the time of this writing a global report is still missing.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Author contributions

RG wrote the manuscript, retrieved the data, and prepared the figures. NMP revised the manuscript, analyzed data comparability criteria, encouraged discussions, and elaborated on correlates. All authors contributed to the article and approved the submitted version.

Funding

RG and NMP are supported by MIUR, PRIN 2017, grant number 20177TT3PS.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpubh.2023.1106313/full#supplementary-material>

References

- Haththotuwa RN, Wijeyaratne CN, Senarath U. *Chapter 1—Worldwide Epidemic of Obesity, Obesity and Obstetrics (Second Edition)*. Amsterdam, Netherlands: Elsevier (2020). p. 3–8. doi: 10.1016/B978-0-12-817921-5.00001-1
- Kopelman PG. Obesity as a medical problem. *Nature*. (2000) 404:635–43. doi: 10.1038/35007508
- Bray GA. Medical consequences of obesity. *J Clin Endocrinol Metab*. (2004) 89:2583–9. doi: 10.1210/jc.2004-0535
- Ogden CL, Yanovski SZ, Carroll MD, Flegal KM. The epidemiology of obesity. *Gastroenterology*. (2007) 132:2087–102. doi: 10.1053/j.gastro.2007.03.052
- Dietz W, Santos-Burgoa C. Obesity and its Implications for COVID-19 Mortality. *Obesity*. (2020) 28:1005–5. doi: 10.1002/oby.22818
- Popkin BM, Du S, Green WD, Beck MA, Algaith T, Herbst CH, et al. Individuals with obesity and COVID-19: A global perspective on the epidemiology and biological relationships. *Obesity Rev*. (2020) 21:e13128. doi: 10.1111/obr.13128
- Peters SAE, MacMahon S, Woodward M. Obesity as a risk factor for COVID-19 mortality in women and men in the UK biobank: Comparisons with influenza/pneumonia and coronary heart disease. *Diabetes Obes Metab*. (2021) 23:258–62. doi: 10.1111/dom.14199
- Jung CY, Park H, Kim DW, Lim H et al. Association between body mass index and risk of coronavirus disease (COVID-19): A nationwide case-control study in South Korea. *Clin Infect Dis*. (2021) 73:e1855–62. doi: 10.1093/cid/ciaa1257
- Freuer D, Linseisen J, Meisinger C. Impact of body composition on COVID-19 susceptibility and severity: A two-sample multivariable Mendelian randomization study. *Metabolism*. (2021) 118:154732. doi: 10.1016/j.metabol.2021.154732
- Hamer M, Gale CR, Kivimäki M, Batty GD. Overweight, obesity, and risk of hospitalisation for COVID-19: A community-based cohort study of adults in the United Kingdom. *PNAS*. (2020) 117:21011–3. doi: 10.1073/pnas.2011086117
- Murillo-Zamora E, Mendoza-Cano O, Delgado-Enciso I, Hernandez-Suarez CM. Predictors of severe symptomatic laboratory-confirmed SARS-CoV-2 reinfection. *Public Health*. (2021) 193:113–5. doi: 10.1016/j.puhe.2021.01.021
- Stefan N. Metabolic disorders, COVID-19 and vaccine-breakthrough infections. *Nat Rev Endocrinol*. (2021) 18:75–6. doi: 10.1038/s41574-021-00608-9
- Gao M, Piernas C, Astbury NM, Hippisley-Cox J, O'Rahilly S, Aveyard P, et al. Associations between body-mass index and COVID-19 severity in 6.9 million people in England: a prospective, community-based, cohort study. *Lancet Diabetes Endocrinol*. (2021) 9:350–9. doi: 10.1016/S2213-8587(21)00089-9
- Alberca RW, Oliveira LM, Branco ACCC, Pereira NZ, Sato MN. Obesity as a risk factor for COVID-19: an overview. *Crit Rev Food Sci Nutr*. (2021) 61:2262–76. doi: 10.1080/10408398.2020.1775546
- Albashir AAD. The potential impacts of obesity on COVID-19. *Clin Med*. (2020) 20:e109–13. doi: 10.7861/clinmed.2020-0239
- Busetto L, Bettini S, Fabris R, Serra R, Dal Pra C, Maffei P, et al. Obesity and COVID-19: An Italian Snapshot. *Obesity*. (2020) 28:1600–05. doi: 10.1002/oby.22918
- Watanabe M, Balena A, Tuccinardi D, Tozzi R, Risi R, Masi D, et al. Central obesity, smoking habit and hypertension are associated with lower antibody titres in response to COVID-19 mRNA vaccine. *Diabetes Metab Res Rev*. (2022) 38:e3465. doi: 10.1002/dmrr.3465
- Hadadi A, Pirzadeh M, Kazemian S, Ashraf H et al. COVID-19 in Iran: clinical presentations and outcomes in three different surges of COVID-19 infection. *Virology*. (2022) 19:123. doi: 10.1186/s12985-022-01846-7
- Frasca D, Reidy L, Romero M, Diaz A, Cray C, Kahl K, et al. The majority of SARS-CoV-2-specific antibodies in COVID-19 patients with obesity are autoimmune and not neutralizing. *Int J Obes*. (2022) 46:427–32. doi: 10.1038/s41366-021-01016-9
- Edwards DA, Ausiello D, Salzman J, Devlin T, Langer R, Beddingfield BJ, Fears AC, Doyle-Meyers LA, Redmann RK, Killeen SZ, Maness NJ, Roy CJ. Exhaled aerosol increases with COVID-19 infection, age, and obesity. *PNAS*. (2021) 118:e2021830118. doi: 10.1073/pnas.2021830118
- Recalde M, Pistillo A, Fernandez-Bertolin S, Roel E. et al. Body mass index and risk of COVID-19 diagnosis, hospitalization, and death: a cohort study of 2 524 926 Catalans. *J Clin Endocrinol Metab*. (2021) 106:e5030–42. doi: 10.1210/clinem/dgab546
- Kim TS, Roslin M, Wang JJ, Kane J, Hirsch JS, Kim EJ. BMI as a Risk Factor for Clinical Outcomes in Patients Hospitalized with COVID-19 in New York. *Obesity*. (2021) 29:279–84 doi: 10.1002/oby.23076
- Kananen L, Religa D, Eriksson M, Hägg S, Julhävä J, Cederholm T. Body mass index and Mini Nutritional Assessment-Short Form as predictors of in-geriatric hospital mortality in older adults with COVID-19. *Clin Nutr*. 41:2973–9. doi: 10.1016/j.clnu.2021.07.025
- Paravidino VB, Leite TH, Mediano MFF, Sichieri R, Silva GAE, Cravo V, et al. Association between obesity and COVID-19 mortality and length of stay in intensive care unit patients in Brazil: a retrospective cohort study. *Sci Rep*. (2022) 12:13737. doi: 10.1038/s41598-022-17197-w
- Bouziotis J, Arvanitakis M, Preiser JC. Association of body mass index with COVID-19 related in-hospital death. *Clin Nutr*. (2022) 41:2924–6. doi: 10.1016/j.clnu.2022.01.017
- Cheng WA, Turner L, Ruiz CJM, Tanaka ML, Congrave-Wilson Z, Lee Y, et al. Clinical manifestations of COVID-19 differ by age and obesity status. *Influenza Other Respi*. (2021) 16:255–64. doi: 10.1111/irv.12918
- Simonsen L, Viboud C. A comprehensive look at the COVID-19 pandemic death toll. *Elife*. (2021) 10:e71974. doi: 10.7554/eLife.71974
- Singh D, Mathioudakis A, Higham A. Chronic obstructive pulmonary disease and COVID-19: interrelationships. *Curr Opin Pulmonary Med*. (2022) 28:76–83. doi: 10.1097/MCP.0000000000000834
- Chen S, Prettnner K, Kuhn M, Geldsetzer P, Wang C, Bärnighausen T, et al. Climate and the spread of COVID-19. *Sci Rep*. (2021) 11:9042. doi: 10.1038/s41598-021-87692-z
- Chan KH, Peiris JSM, Lam SY, Poon LLM, Yuen KY, Seto WH. The effects of temperature and relative humidity on the viability of the SARS coronavirus. *Adv Virol*. (2011) 2011:734690. doi: 10.1155/2011/734690
- World Health Organization. *Global Status Report on Noncommunicable Diseases 2014*. WHO Library Cataloguing-in-Publication Data (2014).
- Worldometers.info. Dover, Delaware, USA. Available online at: www.worldometers.info.
- Hasell J, Mathieu E, Beltekian D, et al. A cross-country database of COVID-19 testing. *Sci Data*. (2020) 7, 345. doi: 10.1038/s41597-020-00688-8
- Drope J, Hamill S, Chaloupka F, Guerrero C, Lee HM, Mirza M, et al. *The Tobacco Atlas*. New York: Vital Strategies and Tobacco Economics (2022).
- The World Bank. Food and Agriculture Organization, Electronic Files and Web Site. Available online at: <https://data.worldbank.org/indicator/AG.LND.PRCP.MM> (2019) (The file contains data up to and including year 2019).
- Climatic Research Unit. University of East Anglia (from Wikipedia) (accessed March 25, 2022).
- NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. *Lancet*. (2017) 390:2627–42. doi: 10.1016/S0140-6736(17)32129-3
- Jih J, Mukherjee A, Vittinghoff E, Nguyen TT, Tsoh JY, Fukuoka Y, et al. Using appropriate body mass index cut points for overweight and obesity among Asian Americans. *Prev Med*. (2014) 65:1–6. doi: 10.1016/j.ypmed.2014.04.010

Country	BMI	COVIDdeathsp1M	cigspyp	WHOlifeexpb	COVIDtestsp1M	COVIDcasesp1M	precip	temp
Afghanistan	21.6	189	311.6	63.2	21160	3925	327	12.6
Albania	26.1	1215	2491.6	78.0	569929	71662	1485	11.4
Algeria	26.2	152	1046.7	77.1	5119	4773	89	22.5
Andorra	27.5	1975	6398.3	-	3225381	271957	-	7.6
Angola	24.1	55	340.2	63.1	40024	1923	1010	21.55
Antigua and Barbuda	28.1	1359	89.2	76.5	190517	42354	1030	26.0
Argentina	27.7	2783	1176.1	76.6	708534	117785	591	14.8
Armenia	26.7	2895	1985.7	76.0	917563	115785	562	7.15
Australia	27.2	225	917.0	83.0	2346981	9994	534	21.65
Austria	25.4	1717	1927.0	81.6	15602507	138074	1110	6.35
Azerbaijan	27.4	939	1525.6	71.4	597967	59465	447	11.95
Bahamas	28.8	1969	438.6	73.2	524011	57960	1292	24.85
Bahrain	28.2	813	1101.5	75.8	4876138	155808	83	27.15
Bangladesh	21.0	174	744.1	74.3	74327	9465	2666	25.0
Barbados	28.7	1142	277.5	76.0	1858859	94543	1422	26.0
Belarus	26.6	717	2911.3	74.8	1237917	72664	618	6.15
Belgium	25.5	2626	2440.9	81.4	2569422	172944	847	9.55
Belize	28.9	1595	168.6	74.4	1115913	76662	1705	25.3
Benin	23.4	13	204.0	63.4	47871	1979	1039	27.55
Bhutan	23.8	11	-	73.1	1851402	3390	2200	7.4
Bolivia	25.9	1798	291.6	72.1	222502	47587	1146	21.55
Bosnia and Herzegovina	26.1	4838	1767.2	76.8	498187	87892	1028	9.85
Botswana	24.7	1076	433.5	62.2	835311	84546	416	21.5
Brazil	25.9	3060	333.5	75.9	296709	103437	1761	24.95
Brunei	26.2	450	9.7	74.3	1585481	34755	2722	26.85
Bulgaria	26.0	5307	1757.3	75.1	1229280	105767	608	10.6
Burkina Faso	22.1	17	408.1	62.7	11168	767	748	28.29
Burundi	20.9	3	239.4	63.8	27773	1824	1274	19.8
Cambodia	21.9	178	726.2	70.1	163817	7060	1904	26.8
Cameroon	24.4	70	171.0	62.4	63498	3926	1604	24.6
Canada	27.2	975	1021.3	82.2	1469709	49610	537	-5.35
Cape Verde	24.7	708	397.1	74.0	707957	98767	228	23.30
Central African Republic	22.4	23	213.2	53.1	16382	2415	1343	23.3
Chad	22.3	11	279.3	59.6	11145	333	322	26.55
Chile	27.8	2894	769.3	80.7	1539120	92669	1522	8.45
China	23.9	3	2043.0	77.4	111163	70	645	6.95
Colombia	25.9	2693	351.4	79.3	620628	98862	3240	24.5
Comoros	24.1	177	585.4	67.4	-	5216	900	25.55
Congo	23.3	67	195.2	64.7	59474	3355	1646	-
Costa Rica	26.9	1597	411.4	80.8	627792	110132	2926	24.8
Croatia	25.5	3815	1578.9	78.6	1039918	166793	1113	10.9
Cuba	26.2	752	233.5	77.8	1118993	85207	1335	25.2
Cyprus	27.0	758	1961.4	83.1	7760297	119644	498	18.45
Czech Republic	26.9	3676	2427.9	79.1	4663361	224958	677	7.55
Denmark	25.3	951	1298.0	81.3	20508953	109996	703	7.5
Djibouti	23.3	187	785.5	65.8	270682	13416	220	28.0
Dominica	27.0	871	147.4	-	2023593	88999	2083	22.35

Dominican Republic	26.7	396	218.9	72.8	267506	37419	1410	24.55
DR Congo	22.2	14	128.0	62.4	9022	719	1543	24.0
East Timor	21.2	95	-	69.6	166690	14634	1500	25.3
Ecuador	27.0	1956	93.5	78.4	133147	29776	2274	21.85
Egypt	29.2	231	1449.4	71.8	35048	3578	18	22.1
El Salvador	27.4	629	206.7	75.0	248275	18599	1784	24.45
Equatorial Guinea	25.6	123	328.2	62.2	185304	9261	2156	24.55
Eritrea	20.5	28	132.3	64.1	6538	2150	384	25.5
Estonia	25.5	1829	1759.9	78.9	2128255	175749	626	5.1
Ethiopia	20.6	62	115.3	68.7	36347	3165	848	22.2
Fiji	27.2	919	491.1	68.0	541537	58115	2592	24.4
Finland	25.9	537	1098.8	81.6	1691974	39848	536	1.7
France	25.3	2159	1089.9	82.5	3412167	131952	867	10.7
Gabon	25.5	131	451.2	66.5	666252	16429	1831	25.05
Gambia	24.0	144	249.1	65.5	53734	3995	836	27.5
Georgia	27.2	4200	1917.7	73.3	3634650	229702	1026	5.8
Germany	26.3	1525	1599.5	81.7	1064309	81282	700	8.4
Ghana	24.2	45	40.5	66.3	69642	4131	1187	27.2
Greece	27.3	2624	2078.6	81.1	5495137	100283	652	15.4
Grenada	27.0	1922	158.2	72.9	1109400	52256	2350	26.65
Guatemala	26.5	934	111.8	72.0	194466	33900	1996	23.45
Guinea	22.7	32	316.0	61.0	42544	2257	1651	25.7
Guinea-Bissau	23.1	83	25.3	60.2	58079	3171	1577	26.75
Guyana	26.3	1546	359.1	65.7	639475	49097	2387	26.0
Haiti	24.1	71	143.0	64.1	11394	2234	1440	24.9
Honduras	26.4	1068	469.8	71.9	117195	37378	1976	23.5
Hungary	26.3	4706	2060.3	76.4	1046742	127841	589	9.75
Iceland	25.9	281	848.1	82.3	4602998	61583	1940	1.75
India	21.9	368	89.3	70.8	520185	24825	1083	23.65
Indonesia	22.9	555	1675.5	71.3	257683	15340	2702	25.85
Iran	26.2	1630	936.5	77.3	521584	72173	228	17.25
Iraq	28.0	602	1184.4	72.4	417698	50336	216	21.4
Ireland	27.5	1330	976.5	81.8	2153667	131786	1118	9.3
Israel	26.3	1121	1280.7	82.6	4436346	145558	435	19.2
Italy	26.0	2627	1493.3	83.0	2820779	89595	832	13.45
Ivory Coast	23.6	29	352.7	62.9	49511	2274	1348	26.35
Jamaica	27.4	963	312.5	76.0	264941	30901	2051	24.95
Japan	22.6	218	1583.2	84.7	265266	13741	1668	11.15
Jordan	28.9	1349	2306.1	77.9	1412700	100490	111	18.3
Kazakhstan	27.4	713	1800.9	74.0	605034	51484	250	6.4
Kenya	23.0	101	264.4	66.1	57883	4769	630	24.8
Kiribati	29.6	106	1396.0	59.4	-	24974	-	28.2
Kuwait	30.0	583	1412.7	81.0	1575162	94926	121	25.35
Kyrgyzstan	26.2	445	519.6	74.2	284910	27577	533	1.55
Laos	22.6	88	814.6	68.5	129279	13529	1834	22.8
Latvia	25.8	3010	1189.1	75.4	3287714	144675	667	5.6
Lebanon	27.8	1516	2037.5	76.4	707607	103494	661	16.4
Lesotho	24.9	321	448.0	50.7	173523	11817	788	11.85

Liberia	24.0	56	154.4	64.1	26658	1131	2391	25.3
Libya	28.4	910	327.2	75.8	315837	54633	56	21.8
Lithuania	26.6	3314	1292.0	76.0	2718294	189169	656	6.2
Luxembourg	26.5	1590	6330.9	82.4	6180878	151394	934	8.65
Madagascar	21.1	48	404.2	65.3	12862	1646	1513	22.65
Malawi	22.8	131	241.1	65.6	26513	3285	1181	21.9
Malaysia	25.3	1048	441.2	74.7	1349827	82536	2875	25.4
Maldives	25.1	533	560.9	79.6	3700009	169626	1972	27.65
Mali	22.8	34	316.9	62.8	28102	918	282	28.25
Malta	27.2	1414	1527.9	81.9	2732197	95858	560	19.2
Mauritania	24.8	202	30.3	68.4	141307	8310	92	27.65
Mauritius	25.6	759	542.5	74.1	281291	18025	2041	22.4
Mexico	28.1	2456	327.1	76.0	107342	30050	758	21.0
Moldova	26.7	2838	1747.2	73.3	663403	92639	450	9.45
Mongolia	26.0	646	1982.5	68.1	1198853	115433	241	-0.7
Montenegro	26.0	4295	1100.8	75.9	1772960	256497	-	10.55
Morocco	25.6	426	682.3	73.0	298848	25376	346	17.1
Mozambique	22.3	67	501.9	58.1	37484	4931	1032	23.8
Myanmar	22.6	353	226.5	69.1	115400	9617	2091	13.05
Namibia	24.3	1533	298.4	64.6	352116	53489	285	19.95
Nepal	22.2	398	511.6	70.9	174195	27628	1500	8.1
Netherlands	25.4	1270	1459.9	81.8	1227550	174600	778	9.25
New Zealand	27.9	40	685.1	82.0	1206227	2705	1732	10.55
Nicaragua	26.9	33	327.8	75.0	-	2580	2280	24.9
Niger	21.7	12	118.8	63.3	8501	283	151	27.15
Nigeria	23.4	15	162.5	62.6	18935	1054	1150	26.8
North Korea	21.8	-	993.3	72.6	-	-	1054	5.7
North Macedonia	25.8	4412	2784.9	74.8	856865	106282	619	9.8
Norway	26.0	426	552.8	82.6	1795150	64643	1414	1.5
Oman	26.9	797	271.1	73.9	4706868	57562	125	25.6
Pakistan	23.8	133	363.2	65.6	109895	5686	494	20.2
Palau	29.4	329	-	-	21828100	218550	-	27.6
Panama	27.1	1841	219.3	79.3	1172489	109561	2928	25.4
Papua New Guinea	25.3	69	1689.3	65.3	27039	3916	3142	25.25
Paraguay	25.8	2555	384.5	75.8	322281	64000	1130	23.55
Peru	26.3	6280	97.7	79.9	750321	67356	1738	19.6
Philippines	23.2	525	1132.2	70.4	243702	25400	2348	25.85
Poland	26.4	3037	1363.1	78.3	805369	105390	600	7.85
Portugal	26.2	2110	1133.4	81.6	3291624	120934	854	15.15
Qatar	29.2	241	1020.3	77.2	1176549	87932	74	27.15
Romania	25.3	3411	1204.3	75.6	1001131	94463	637	8.8
Russia	26.5	2510	2295.0	73.2	1695504	70314	460	-5.1
Rwanda	22.0	108	94.0	69.1	334003	7591	1212	17.85
Saint Kitts and Nevis	29.7	780	-	-	1210957	52241	1427	24.5
Saint Lucia	29.6	1972	553.9	74.3	684875	71282	2301	25.5
São Tomé and Príncipe	24.8	323	-	70.4	128718	16591	3200	23.75
Saudi Arabia	28.5	253	1341.0	74.3	1057674	15480	59	24.65
Senegal	23.0	112	359.4	68.6	56095	4267	686	27.85

Serbia	25.8	1813	1898.6	75.9	933053	147770	-	10.55
Seychelles	26.8	1640	543.6	73.3	-	242312	2330	27.15
Sierra Leone	22.8	15	468.6	60.8	31576	792	2526	26.05
Singapore	23.7	207	851.2	83.2	3825919	46656	2497	26.45
Slovakia	26.5	3519	1500.9	78.2	1020852	148443	824	6.8
Slovenia	26.9	3111	2236.5	81.3	1190453	216751	824	8.9
Somalia	21.9	81	198.5	56.5	24136	1401	282	27.05
South Africa	27.3	1649	509.6	65.3	367863	54906	495	17.75
South Korea	23.9	278	1667.4	83.3	307838	-	1274	11.5
South Sudan	25.2	12	383.7	62.8	28102	1196	900	-
Spain	26.7	2181	1499.0	83.2	1415329	118321	636	13.3
Sri Lanka	23.0	763	254.6	76.9	281331	26930	1712	26.95
Sudan	25.2	107	339.9	69.1	12382	1012	250	26.9
Suriname	27.4	2223	511.7	71.5	360514	86509	2331	25.7
Swaziland	26.5	1180	91.7	57.7	387237	-	788	21.4
Sweden	25.8	1779	716.2	82.4	1619172	123981	624	2.1
Switzerland	25.3	1557	1489.8	83.9	1906925	137014	1537	5.5
Syria	28.1	172	2291.7	72.7	8050	2748	252	17.75
Taiwan	-	36	-	-	438321	705	-	-
Tajikistan	25.4	13	361.1	69.5	-	1735	691	2.0
Tanzania	23.1	12	181.8	67.3	-	426	1071	22.35
Thailand	24.1	352	837.4	77.7	246456	31353	1622	26.3
Togo	23.2	32	147.3	64.3	77241	3123	1168	27.15
Tonga	31.9	19	986.9	72.6	1136750	42103	-	25.25
Trinidad and Tobago	28.7	2648	682.5	76.1	395921	61070	2200	25.75
Tunisia	26.8	2341	1580.0	77.0	333503	60092	207	19.2
Turkey	27.8	1136	1770.7	78.6	1525812	107271	593	9.9
Turkmenistan	26.4	-	962.1	69.7	-	-	161	15.1
Uganda	22.0	75	195.7	66.7	48859	2710	1180	22.8
Ukraine	26.0	2490	1849.4	73.0	416578	83434	565	8.3
United Arab Emirates	29.0	228	748.5	76.1	12371211	74003	78	27.0
United Kingdom	27.3	2398	827.7	81.4	6567768	167421	1220	8.45
United States	28.5	2998	1016.6	78.4	2689323	155937	715	8.55
Uruguay	26.8	2045	899.4	77.1	1489570	115948	1300	17.55
Uzbekistan	26.1	48	495.9	73.0	40249	5775	206	12.05
Vanuatu	26.2	3	1069.2	65.3	72222	19	2000	23.95
Venezuela	27.2	201	396.2	73.9	118657	15606	2044	25.35
Vietnam	21.6	426	1049.6	73.7	781673	15937	1821	24.45
Yemen	25.8	69	423.8	66.6	8595	328	167	23.85
Zambia	22.6	206	145.4	62.5	165628	11445	1020	21.4
Zimbabwe	23.4	357	122.9	60.7	130395	12851	657	21.0

Our World In Data + BMI

country	start_date	deaths	tests	life_expectancy	population	death_rate	test_rate	BMI
Afghanistan	2020-02-24	2189.0	-	64.83	41128772.0	0.062464	-	21.6
Albania	2020-02-25	1181.0	247526.0	78.57	2842318.0	0.489225	102.537	26.1
Algeria	2020-02-25	2756.0	-	76.88	44903228.0	0.072266	-	26.2
Andorra	2020-03-02	84.0	-	83.73	79843.0	1.263170	-	27.5
Angola	2020-03-20	405.0	-	61.15	35588996.0	0.014523	-	24.1
Anguilla	2020-03-28	0.0	-	81.88	15877.0	0.000000	-	-
Antigua and Barbuda	2020-03-13	5.0	-	77.02	93772.0	0.066424	-	28.4
Argentina	2020-01-01	43245.0	5126379.0	76.67	45510324.0	0.950224	112.642	27.7
Armenia	2020-02-03	2823.0	595876.0	75.09	2780472.0	1.116213	235.609	26.7
Aruba	2020-03-13	49.0	-	76.29	106459.0	0.573375	-	-
Australia	2020-01-26	909.0	11260636.0	83.44	26177410.0	0.037278	461.796	27.2
Austria	2020-02-25	7486.0	-	81.54	8939617.0	0.985966	-	25.4
Azerbaijan	2020-03-01	2641.0	-	73.0	10358078.0	0.305128	-	27.4
Bahamas	2020-03-16	170.0	-	73.92	409989.0	0.521881	-	28.8
Bahrain	2020-02-24	352.0	2355313.0	77.29	1472237.0	0.280606	1877.601	28.2
Bangladesh	2020-03-08	7559.0	3228434.0	72.59	171186368.0	0.054084	23.099	21.0
Barbados	2020-03-17	7.0	-	79.19	281646.0	0.031390	-	28.7
Belarus	2020-02-28	1424.0	-	74.79	9534956.0	0.177560	-	26.6
Belgium	2020-02-04	19528.0	6966831.0	81.63	11655923.0	1.847464	659.103	25.5
Belize	2020-03-23	248.0	-	74.62	405285.0	0.789219	-	28.9
Benin	2020-03-16	44.0	-	61.77	13352864.0	0.004147	-	23.4
Bermuda	2020-03-19	10.0	-	82.59	64207.0	0.198075	-	-
Bhutan	2020-03-06	0.0	281699.0	71.78	782457.0	0.000000	438.023	23.8
Bolivia	2020-03-11	9165.0	413924.0	71.51	12224114.0	0.927654	41.896	25.9
Bonaire Sint Eustatius and Saba	2020-04-02	3.0	-	77.79	27052.0	0.148270	-	-
Bosnia and Herzegovina	2020-03-05	4050.0	514380.0	77.4	3233530.0	1.518814	192.901	26.1
Botswana	2020-03-30	42.0	-	69.59	2630300.0	0.021117	-	24.7
Brazil	2020-02-26	195072.0	29244757.0	75.88	215313504.0	1.070183	160.439	25.9
British Virgin Islands	2020-03-28	1.0	-	79.07	31332.0	0.041904	-	-
Brunei	2020-03-09	3.0	-	75.86	449002.0	0.008211	-	26.2
Bulgaria	2020-03-08	7576.0	1149545.0	75.05	6781955.0	1.368238	207.610	26.0
Burkina Faso	2020-03-10	85.0	-	61.58	22673764.0	0.004623	-	22.1
Burundi	2020-03-31	2.0	-	61.58	12889583.0	0.000206	-	20.9
Cambodia	2020-01-27	0.0	-	69.82	16767851.0	0.000000	-	21.9
Cameroon	2020-03-06	448.0	-	59.29	27914542.0	0.019526	-	24.4
Canada	2020-01-23	15736.0	17965095.0	82.43	38454328.0	0.435460	497.145	27.2
Cape Verde	2020-03-20	113.0	-	72.98	593162.0	0.243126	-	24.7
Cayman Islands	2020-03-13	2.0	-	83.92	68722.0	0.036254	-	-
Central African Republic	2020-03-15	63.0	-	53.28	5579148.0	0.014164	-	22.4
Chad	2020-03-19	104.0	-	54.24	17723312.0	0.007463	-	22.3
Chile	2020-02-23	16608.0	6443459.0	80.18	19603736.0	0.991098	384.520	27.8
China	2020-01-22	4733.0	-	76.91	1425887360.0	0.003522	-	23.9
Colombia	2020-03-06	43213.0	8104617.0	77.29	51874028.0	1.013529	190.088	25.9
Comoros	2020-04-30	10.0	-	64.32	836783.0	0.017804	-	24.1
Congo	2020-03-15	108.0	-	64.57	5970430.0	0.022689	-	23.3
Costa Rica	2020-03-06	2185.0	427761.0	80.28	5180836.0	0.513125	100.455	26.9
Cote d'Ivoire	2020-03-11	137.0	258506.0	57.78	28160548.0	0.006019	11.358	23.6

Croatia	2020-02-25	3920.0	1019109.0	78.49	4030361.0	1.145179	297.720	25.5
Cuba	2020-03-12	146.0	1490767.0	78.8	11212198.0	0.016166	165.069	26.2
Curacao	2020-03-14	14.0	-	78.88	191173.0	0.091540	-	-
Cyprus	2020-03-08	120.0	1037630.0	80.98	896007.0	0.164039	1418.429	27.0
Czechia	2020-03-01	11580.0	4224539.0	79.38	10493990.0	1.320569	481.761	26.9
Democratic Republic of Congo	2020-03-11	591.0	-	60.68	99010216.0	0.007385	-	22.2
Denmark	2020-02-02	1298.0	10540209.0	80.9	5882259.0	0.241868	1964.055	25.3
Djibouti	2020-03-18	61.0	-	67.11	1120851.0	0.068974	-	23.3
Dominica	2020-03-22	0.0	-	75.0	72758.0	0.000000	-	27.0
Dominican Republic	2020-03-01	2414.0	876244.0	74.08	11228821.0	0.257274	93.386	26.7
Ecuador	2020-03-01	14034.0	704513.0	77.01	18001002.0	0.932992	46.837	27.0
Egypt	2020-02-14	7631.0	-	71.99	110990096.0	0.078178	-	29.2
El Salvador	2020-03-19	1327.0	621580.0	73.32	6336393.0	0.266342	124.757	27.4
Equatorial Guinea	2020-03-15	86.0	-	58.74	1674916.0	0.064403	-	25.6
Eritrea	2020-03-21	3.0	-	66.32	3684041.0	0.001043	-	20.5
Estonia	2020-01-06	229.0	640612.0	78.74	1326064.0	0.175090	489.802	25.5
Eswatini	2020-03-14	205.0	-	60.19	1201680.0	0.213243	-	26.5
Ethiopia	2020-03-13	1923.0	1800236.0	66.6	123379928.0	0.019416	18.176	20.6
Faeroe Islands	2020-03-04	0.0	-	80.67	53117.0	0.000000	-	-
Falkland Islands	2020-04-04	0.0	-	81.44	3801.0	0.000000	-	-
Fiji	2020-01-30	2.0	21365.0	67.44	929769.0	0.002337	24.962	27.2
Finland	2020-01-29	592.0	2505181.0	81.91	5540745.0	0.115722	489.704	25.9
France	2020-01-24	64644.0	35881338.0	82.66	67813000.0	1.017377	564.706	25.3
French Polynesia	2020-03-13	114.0	-	77.66	306292.0	0.463654	-	-
Gabon	2020-03-14	64.0	-	66.47	2388997.0	0.033487	-	25.5
Gambia	2020-03-17	124.0	-	62.05	2705995.0	0.057875	-	24.0
Georgia	2020-02-26	2505.0	371383.0	73.77	3744385.0	0.790245	117.159	27.2
Germany	2020-01-27	33071.0	-	81.33	83369840.0	0.427102	-	26.3
Ghana	2020-03-14	335.0	672364.0	64.07	33475870.0	0.012509	25.106	24.2
Gibraltar	2020-03-04	7.0	-	79.93	32677.0	0.258906	-	-
Greece	2020-02-26	4838.0	3382488.0	82.24	10384972.0	0.550294	384.738	27.3
Greenland	2020-03-16	0.0	-	71.7	56494.0	0.000000	-	-
Grenada	2020-03-22	0.0	-	72.4	125459.0	0.000000	-	27.0
Guam	2020-03-12	0.0	81134.0	80.07	171783.0	0.000000	586.365	-
Guatemala	2020-02-17	4813.0	609672.0	74.3	17843914.0	0.309593	39.217	26.5
Guinea	2020-03-13	81.0	-	61.6	13859349.0	0.007281	-	22.7
Guinea-Bissau	2020-03-25	45.0	-	58.32	2105580.0	0.027761	-	23.1
Guyana	2020-03-12	164.0	-	69.91	808727.0	0.251760	-	26.3
Haiti	2020-03-20	236.0	-	64.0	11585003.0	0.025998	-	24.1
Honduras	2020-03-11	3130.0	-	75.27	10432858.0	0.371203	-	26.4
Hong Kong	2020-01-23	148.0	5809821.0	84.86	7488863.0	0.021030	825.554	-
Hungary	2020-03-03	9537.0	2227027.0	76.88	9967304.0	1.152615	269.152	26.3
Iceland	2020-02-28	29.0	241454.0	82.99	372903.0	0.092461	769.827	25.9
India	2020-01-30	148994.0	172049274.0	69.66	1417173120.0	0.114209	131.881	21.9
Indonesia	2020-03-02	22138.0	-	71.72	275501344.0	0.096479	-	22.9
Iran	2020-02-19	55223.0	7620667.0	76.68	88550568.0	0.720335	99.405	26.2
Iraq	2020-02-24	12813.0	-	70.6	44496124.0	0.337957	-	28.0
Ireland	2020-02-29	2237.0	2375010.0	82.3	5023108.0	0.531208	563.981	27.5
Isle of Man	2020-03-20	25.0	-	81.4	84534.0	0.377429	-	-

Israel	2020-02-20	3325.0	7889431.0	82.97	9449000.0	0.407744	967.480	26.3
Italy	2020-01-31	74159.0	26598607.0	83.51	59037472.0	1.368624	490.884	26.0
Jamaica	2020-03-11	302.0	-	74.47	2827382.0	0.132158	-	27.4
Japan	2020-01-22	3492.0	4486717.0	84.63	123951696.0	0.029892	38.407	22.6
Jordan	2020-03-03	3834.0	3175555.0	74.53	11285875.0	0.409230	338.949	28.9
Kazakhstan	2020-03-13	2749.0	5539512.0	73.6	19397998.0	0.176540	355.746	27.4
Kenya	2020-03-06	1670.0	-	66.7	54027484.0	0.037607	-	23.0
Kuwait	2020-02-24	934.0	1254832.0	75.49	4268886.0	0.256782	344.988	30.0
Kyrgyzstan	2020-03-18	1355.0	-	71.45	6630621.0	0.258991	-	26.2
Laos	2020-03-24	0.0	-	67.92	7529477.0	0.000000	-	22.6
Latvia	2020-01-06	635.0	877015.0	75.29	1850654.0	0.347888	480.477	25.8
Lebanon	2020-02-21	1468.0	-	78.93	5489744.0	0.310840	-	27.8
Lesotho	2020-05-13	51.0	-	54.33	2305826.0	0.034798	-	24.9
Liberia	2020-03-17	83.0	-	64.1	5302690.0	0.019769	-	24.0
Libya	2020-03-04	1478.0	-	72.91	6812344.0	0.262219	-	28.4
Liechtenstein	2020-03-04	44.0	20939.0	82.49	39355.0	1.351259	643.046	-
Lithuania	2020-03-19	1800.0	1641368.0	75.93	2750058.0	0.832418	759.058	26.6
Luxembourg	2020-02-12	495.0	1651658.0	82.25	647601.0	0.863750	2882.060	26.5
Macao	2020-01-22	0.0	-	84.24	695180.0	0.000000	-	-
Madagascar	2020-03-20	261.0	-	67.04	29611718.0	0.011249	-	21.1
Malawi	2020-03-29	189.0	-	64.26	20405318.0	0.012205	-	22.8
Malaysia	2020-01-24	471.0	4317441.0	76.16	33938216.0	0.014811	135.770	25.3
Maldives	2020-03-08	48.0	306372.0	78.92	523798.0	0.112242	716.410	25.1
Mali	2020-03-25	269.0	-	59.31	22593598.0	0.015465	-	22.8
Malta	2020-03-05	219.0	514757.0	82.53	533293.0	0.497972	1170.477	27.2
Marshall Islands	2020-05-07	0.0	-	73.7	41593.0	0.000000	-	29.2
Mauritania	2020-03-14	347.0	-	64.92	4736146.0	0.091583	-	24.8
Mauritius	2020-03-18	10.0	-	74.99	1299478.0	0.009753	-	25.6
Mexico	2020-01-01	125807.0	3460436.0	75.05	127504120.0	0.986690	27.140	28.1
Moldova	2020-03-08	2985.0	-	71.9	3272993.0	1.117058	-	26.7
Monaco	2020-02-29	3.0	-	86.75	36491.0	0.098063	-	-
Mongolia	2020-03-10	1.0	600984.0	69.87	3398373.0	0.000363	218.069	26.0
Montenegro	2020-03-17	682.0	-	76.88	627082.0	1.373583	-	26.0
Montserrat	2020-03-18	1.0	-	74.16	4413.0	0.287188	-	-
Morocco	2020-02-07	7388.0	4457349.0	76.68	37457976.0	0.219483	132.419	25.6
Mozambique	2020-03-22	166.0	271947.0	60.85	32969520.0	0.006471	10.601	22.3
Myanmar	2020-03-27	2682.0	1818260.0	67.13	54179312.0	0.064761	43.905	22.6
Namibia	2020-03-14	205.0	209155.0	63.71	2567024.0	0.099824	101.847	24.3
Nepal	2020-01-25	1856.0	1932477.0	70.78	30547586.0	0.065034	67.714	22.2
Netherlands	2020-02-27	11459.0	6230581.0	82.28	17564020.0	0.773152	420.385	25.4
New Caledonia	2020-03-19	0.0	-	77.55	289959.0	0.000000	-	-
New Zealand	2020-02-28	26.0	1405854.0	82.29	5185289.0	0.005961	322.346	27.9
Nicaragua	2020-03-19	165.0	-	74.48	6948395.0	0.030200	-	26.9
Niger	2020-03-20	104.0	-	62.42	26207982.0	0.005064	-	21.7
Nigeria	2020-02-28	1289.0	948048.0	54.69	218541216.0	0.007013	5.158	23.4
North Korea	2020-04-02	0.0	26244.0	72.27	26069416.0	0.000000	1.346	21.8
North Macedonia	2020-02-26	2503.0	402103.0	75.8	2093606.0	1.412213	226.870	25.8
Northern Mariana Islands	2020-04-04	0.0	27096.0	76.74	49574.0	0.000000	736.164	-
Norway	2020-02-12	436.0	2737139.0	82.4	5434324.0	0.090663	569.170	26.0

Oman	2020-02-24	1499.0	-	77.86	4576300.0	0.384432	-	26.9
Pakistan	2020-02-25	10176.0	6696068.0	67.27	235824864.0	0.050806	33.432	23.8
Palestine	2020-03-05	1400.0	-	74.05	5250076.0	0.323362	-	-
Panama	2020-03-09	4022.0	1302483.0	78.51	4408582.0	1.121191	363.086	27.1
Papua New Guinea	2020-03-20	9.0	-	64.5	10142625.0	0.001132	-	25.3
Paraguay	2020-03-07	2262.0	560389.0	74.25	6780745.0	0.407227	100.887	25.8
Peru	2020-03-06	93070.0	5522513.0	76.74	34049588.0	3.325596	197.332	26.3
Philippines	2020-01-30	9244.0	6408076.0	71.23	115559008.0	0.086898	60.239	23.2
Poland	2020-03-04	28554.0	7604343.0	78.73	39857144.0	0.865858	230.591	26.4
Portugal	2020-03-01	6906.0	5681817.0	82.05	10270857.0	0.804661	662.024	26.2
Puerto Rico	2020-03-01	0.0	363762.0	80.1	3252412.0	0.000000	133.846	-
Qatar	2020-02-29	245.0	-	80.23	2695131.0	0.108432	-	29.2
Romania	2020-02-26	15767.0	4479391.0	76.05	19659270.0	0.947362	269.145	25.3
Russia	2020-01-31	56271.0	91123132.0	72.58	144713312.0	0.423667	686.070	26.5
Rwanda	2020-03-14	92.0	725804.0	69.02	13776702.0	0.008347	65.854	22.0
Saint Helena	2020-09-07	0.0	-	80.56	5401.0	0.000000	-	-
Saint Kitts and Nevis	2020-03-25	0.0	-	76.23	47681.0	0.000000	-	29.7
Saint Lucia	2020-03-14	5.0	-	76.2	179872.0	0.034747	-	29.6
Saint Pierre and Miquelon	2020-04-05	0.0	-	81.07	5885.0	0.000000	-	-
Saint Vincent and the Grenadines	2020-03-14	0.0	-	72.53	103959.0	0.000000	-	27.3
Samoa	2020-11-18	0.0	-	73.32	222390.0	0.000000	-	31.7
San Marino	2020-02-29	59.0	-	84.97	33690.0	2.088923	-	-
Sao Tome and Principe	2020-04-06	17.0	-	70.39	227393.0	0.101441	-	24.8
Saudi Arabia	2020-03-02	6223.0	11046767.0	75.13	36408824.0	0.205217	364.290	28.5
Senegal	2020-02-28	410.0	277749.0	67.94	17316452.0	0.028150	19.070	23.0
Serbia	2020-02-26	3211.0	2296303.0	76.0	6871547.0	0.551976	394.738	25.8
Seychelles	2020-03-15	0.0	-	73.4	107135.0	0.000000	-	26.8
Sierra Leone	2020-03-31	76.0	-	54.7	8605723.0	0.011722	-	22.8
Singapore	2020-01-23	29.0	-	83.62	5637022.0	0.005475	-	23.7
Slovakia	2020-03-06	2138.0	3244664.0	77.54	5643455.0	0.460929	699.514	26.5
Slovenia	2020-02-02	2697.0	678496.0	81.32	2119843.0	1.394524	350.826	26.9
Solomon Islands	2020-10-12	0.0	-	73.0	724272.0	0.000000	-	25.5
Somalia	2020-03-16	130.0	-	57.4	17597508.0	0.009298	-	21.9
South Africa	2020-02-07	28469.0	6609208.0	64.13	59893884.0	0.528943	122.796	27.3
South Korea	2020-01-22	917.0	4809285.0	83.03	51815808.0	0.018778	98.481	23.9
South Sudan	2020-04-05	63.0	76232.0	57.85	10913172.0	0.007804	9.443	25.2
Spain	2020-02-01	50837.0	22859368.0	83.56	47558632.0	1.168146	525.268	26.7
Sri Lanka	2020-01-27	204.0	1250417.0	76.98	21832150.0	0.010061	61.667	23.0
Sudan	2020-03-13	1468.0	-	65.31	46874200.0	0.039014	-	25.2
Suriname	2020-03-14	122.0	10118.0	71.68	618046.0	0.246745	20.464	27.4
Sweden	2020-02-01	8727.0	4179271.0	82.8	10549349.0	0.904036	432.934	25.8
Switzerland	2020-02-25	7873.0	3288431.0	83.78	8740471.0	1.060563	442.981	25.3
Syria	2020-03-22	711.0	-	72.7	22125242.0	0.041301	-	28.1
Taiwan	2020-01-16	7.0	126987.0	80.46	23893396.0	0.000306	5.543	-
Tajikistan	2020-05-01	90.0	-	71.1	9952789.0	0.013527	-	25.4
Tanzania	2020-03-16	21.0	-	65.46	65497752.0	0.000404	-	23.1
Thailand	2020-01-04	61.0	1634168.0	77.15	71697024.0	0.000858	22.982	24.1
Timor	2020-03-22	0.0	-	69.5	1341298.0	0.000000	-	21.2
Togo	2020-03-04	68.0	179607.0	61.04	8848700.0	0.009288	24.532	23.2

Trinidad and Tobago	2020-03-14	127.0	-	73.51	1531043.0	0.103687	-	28.7
Tunisia	2020-03-04	4676.0	-	76.7	12356116.0	0.457381	-	26.8
Turkey	2020-03-11	20881.0	24464277.0	77.69	85341248.0	0.302735	354.686	27.8
Turks and Caicos Islands	2020-03-28	6.0	-	80.22	45726.0	0.172280	-	-
Uganda	2020-03-21	251.0	750583.0	63.37	47249588.0	0.006803	20.345	22.0
Ukraine	2020-03-03	19281.0	-	72.06	39701744.0	0.585019	-	26.0
United Arab Emirates	2020-01-29	669.0	20890341.0	77.97	9441138.0	0.076748	2396.537	29.0
United Kingdom	2020-01-30	94998.0	49127610.0	81.32	67508936.0	1.528646	790.529	27.3
United States	2020-01-22	350555.0	257894445.0	78.86	338289856.0	1.099516	808.886	28.8
United States Virgin Islands	2020-03-24	0.0	31459.0	80.58	99479.0	0.000000	409.315	-
Uruguay	2020-03-13	181.0	639198.0	77.91	3422796.0	0.065875	232.637	26.8
Uzbekistan	2020-03-15	614.0	-	71.72	34627648.0	0.022241	-	26.1
Vanuatu	2020-11-10	0.0	-	70.47	326744.0	0.000000	-	26.2
Vatican	2020-03-06	0.0	-	75.12	808.0	0.000000	-	-
Venezuela	2020-03-14	1028.0	-	72.06	28301700.0	0.045404	-	27.2
Vietnam	2020-01-23	35.0	-	75.4	98186856.0	0.000379	-	21.6
Wallis and Futuna	2020-10-19	0.0	-	79.94	11596.0	0.000000	-	-
Yemen	2020-04-10	610.0	-	66.12	33696612.0	0.024934	-	25.8
Zambia	2020-03-18	388.0	601003.0	63.89	20017670.0	0.024565	38.051	22.6
Zimbabwe	2020-03-20	363.0	216254.0	61.49	16320539.0	0.028386	16.911	23.4