

It could happen again: reducing comorbidity as a tactic for long term preparation for novel viruses

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INTRODUCTION

Cardiovascular disease, diabetes, obesity, chronic respiratory disease, hypertension, and cancer all correlate to higher mortality rates from COVID-19. The UK has also added pregnancy, neurologic diseases, and kidney and liver conditions and asserts that those with organ transplants, blood cancers, and kidney disease requiring dialysis are at even higher risk.¹ Initiatives to improve health outcomes during future pandemics must include a long-term plan to reduce preventable diseases that are likely to contribute to death and severity of future novel respiratory viruses. Policies that promote or fail to reduce widespread health challenges in the US should be changed in response to the current pandemic. While better preparation, access to test kits, quarantining, contact tracing, vaccines, and new anti-viral medicines are all understandable immediate priorities, a healthier population would fare better. It is the government's ethical duty to support health initiatives that address the social determinants of health. Such initiatives include paid sick leave, ending subsidies for unhealthy foods, and implementation of federal workplace requirements that ensure workers have breaks, stress relief tools, and wages sufficient to purchase healthy foods, safe housing, and health insurance. Government policy can alleviate stress by expanding healthcare coverage for those living paycheck to paycheck and by taking measures to alleviate poverty.

ANALYSIS

Early mortality data from China presented by the World Health Organization from February 2020 indicate the devastation of preexisting conditions. Below are data for preexisting conditions followed by death rate for confirmed cases and death rate for all cases:

- Cardiovascular disease / 13.2% / 10.5%
- Diabetes / 9.2% / 7.3%

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- Chronic respiratory disease / 8.0% / 6.3%
- Hypertension / 8.4% / 6.0%
- Cancer / 7.6% / 5.6%
- *no pre-existing conditions* 0.9%

*Death Rate = (number of deaths / number of cases) = probability of dying if infected by the virus (%). The percentages do not have to add up to 100%, as they do NOT represent share of deaths by condition.²

- Currently, all countries collecting COVID-19 data are reporting higher death rates for those with preexisting conditions. One hospital in New Jersey expressed surprise that younger patients are coming in with severe cases. “Dr. Adam Jarrett, the center's chief medical officer, told NBC News on Monday, adding he was surprised patients' ages skewed younger than he'd expected. All but one had underlying health conditions, such as heart or lung disease, diabetes and obesity.” Jarrett specifically noted the impact of obesity on lung capacity.³ Data from Italy implies that obesity is a major risk factor.⁴

According to the American Heart Association, approximately 168.1 million people (71.1 percent of the US population) are obese or overweight.⁵ The CDC estimates 42 percent of people are obese. 9.2 percent of adults are severely obese.⁶ The CDC estimates one in every four people with diabetes does not know they have it. 100 million people have either diabetes or prediabetes, while 9.8 percent of the population have confirmed cases of diabetes.⁷ In a study evaluating an array of respiratory viruses including influenza and coronavirus, researchers concluded the obese and morbidly obese have more hospital stays and more severe illness.⁸ The UK is warning that those with body mass index >40 are most at risk.⁹ Obesity causes both cardiovascular disease and high blood pressure, increasing the odds of one person having several preexisting conditions when a novel virus appears. Solving the obesity crisis would also reduce the incidence of heart disease, hypertension, some cancers, and some liver and kidney problems.

High blood pressure is prevalent in the US population. 116.4 million people have it¹⁰ and the stress of the pandemic itself may cause more cases. In addition to high blood pressure, some blood pressure medications such as angiotensin-converting enzyme (ACE) inhibitors may contribute to the severity of Italy's coronavirus cases.¹¹ In China, almost a quarter of the population has hypertension and an additional forty percent show signs of early stage hypertension.¹² Whether the underlying condition or the medications are the source of the more severe cases, decreasing the incidence of high blood pressure could decrease the impact of future novel viruses.

The World Health Organization in its Social Determinants of Health recommend policies, habits, and conditions that promote good health. WHO advocates proven ways to prevent or reduce obesity, stress related diseases, and cardiovascular problems.¹³ In the short term, the experts might be right to identify the comorbidity without attempting to remedy it. For now, scarce resources are devoted to urgent cases of the coronavirus. People at risk should use extra caution, practice social distancing and isolation, and follow suggested guidelines for hand hygiene. In the long term, the US must investigate the habits that create the comorbidity. The next big pandemic may have the same characteristics. SARS and MERS were both respiratory coronaviruses with characteristics similar to COVID-19. People with obesity, high blood pressure, and heart disease would likely do worse than those without preexisting conditions regardless of the specifics of a future pandemic.

CONCLUSION

If COVID-19 continues to spread and remains devoid of reliable treatments, there is no evidence that it is too late to cure a preexisting condition even within a few months. The influenza of 1918 had a virulent second wave.¹⁴ If COVID-19 mutates or persists longer than expected, improving people's basic health wherever possible should be a priority. Weight loss and gradual exercise improvements can stave off diabetes, decrease blood pressure, and prevent strokes and heart disease. Those on the verge of diabetes or cardiovascular issues may improve their outcome by changing habits now with the support of public policy. With comorbidity prevention in mind as well as socially-conscious strategies to address the next novel virus, public policy will lessen the severity and mortality of future novel viruses.

¹ Sharma, Sonia. "From pregnant to obese - List of those most at risk from coronavirus." *Chronicle Live UK*. March 17, 2020. <https://www.chroniclive.co.uk/news/north-east-news/coronavirus-most-at-risk-pregnant-17936541>

² <https://www.worldometers.info/coronavirus/coronavirus-age-sex-demographics/> based on both: The *Report of the WHO-China Joint Mission* published on Feb. 28 by WHO, which is based on 55,924 laboratory confirmed cases. The report notes that "The Joint Mission acknowledges the known challenges and biases of reporting crude CFR early in an epidemic" (see also a paper by the Chinese CCDC released on Feb. 17, which is based on 72,314 confirmed, suspected, and asymptomatic cases of COVID-19 in China as of Feb. 11, and was published in the Chinese Journal of Epidemiology.)

³ Edwards, Erika. "Not just older people: Younger adults are also getting the coronavirus. Simply looking at the age ranges of the infected, however, doesn't provide any insights into the severity of the illness." *NBC News*. March 17, 2020. <https://www.nbcnews.com/health/health-news/not-just-older-people-younger-adults-are-also-getting-coronavirus-n1160416>

⁴ O'Regan, Eilish. "From risks due to obesity to how children are affected: coronavirus lessons from front-line medics." *Independent.ie*. March 18, 2020. <https://www.independent.ie/world-news/coronavirus/from-risks-due-to-obesity-to-how-children-are-affected-coronavirus-lessons-from-front-line-medics-39054089.html>

⁵ American Heart Association. <https://www.ahajournals.org/doi/10.1161/CIR.0000000000000757>

⁶ Hales CM, Carroll MD, Fryar CD, Ogden CL. Prevalence of obesity and severe obesity among adults: United States, 2017–2018. NCHS Data Brief, no 360. Hyattsville, MD: National Center for Health Statistics. 2020 <https://www.cdc.gov/nchs/products/databriefs/db360.htm>

⁷ <https://www.cdc.gov/media/releases/2017/p0718-diabetes-report.html>

⁸ Moser JS, Galindo-Fraga A, Ortiz-Hernández AA, et al. Underweight, overweight, and obesity as independent risk factors for hospitalization in adults and children from influenza and other respiratory viruses. *Influenza Other Respir Viruses*. 2019;13(1):3–9. doi:10.1111/irv.12618 finding "In adults with coronavirus, metapneumovirus, parainfluenza, and rhinovirus, participants that were underweight (OR: 4.07) and morbidly obese (OR: 2.78) were more likely to be hospitalized as compared to normal-weight adults."

⁹ <https://www.mirror.co.uk/news/uk-news/coronavirus-severely-obese-warned-among-21704686>

¹⁰ American Heart Association. <https://www.ahajournals.org/doi/10.1161/CIR.0000000000000757>

¹¹ Fang, Lei, George Karakiulakis, and Michael Roth, "Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection?" *The Lancet* March 11, 2020 DOI:[https://doi.org/10.1016/S2213-2600\(20\)30116-8](https://doi.org/10.1016/S2213-2600(20)30116-8) [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30116-8/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30116-8/fulltext)

¹² Minter, Adam, "To Treat Pandemics, Start by Treating Hypertension: Controlling common ailments is the first step for low- and middle-income countries looking ahead to what comes after the coronavirus crisis." *Bloomberg News*. March 19, 2020. <https://www.bloomberg.com/opinion/articles/2020-03-19/high-blood-pressure-is-risk-for-countries-after-coronavirus-ends>

¹³ Wilkinson, Richard and Michael Marmot, World Health Organization, Social Determinants of Health, The Solid Facts. (2003). Updated and explained by Marmot in "The Social Determinants of Health Inequities" World Health Organization, *The Lancet* Vol 365 March 19, 2005, and Marmot M, Allen J. Social determinants of health equity. *Am J Public Health*. 2014;104 Suppl 4: S517–S519. doi:10.2105/AJPH.2014.302200

¹⁴ Institute of Medicine (US) Forum on Microbial Threats; Knobler SL, Mack A, Mahmoud A, et al., editors. The Threat of Pandemic Influenza: Are We Ready? Workshop Summary. Washington (DC): National Academies Press (US); 2005. 1, The Story of Influenza. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK22148/>