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The interplay between COVID 19 and non-communicable diseases

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Since the coronavirus designated as COVID-19 emerged as a global pathogen in late 2019, there has been rapid spread across the globe. After originating in China, several high-income countries such as Italy, Spain, United States, and the United Kingdom have had high case prevalence and high levels of mortality.

In this issue, Azarpazhooh and colleagues analyze the impact of COVID-19 on different countries in terms of their global burden of disability and life expectancy.¹ Higher income countries had higher non-communicable disease disability adjusted life years (DALYs) and deaths, compared to low and middle-income countries. In addition, high income countries had 15 years higher life expectancy in 2017 compared to low income countries.

When the authors looked at COVID-19 case numbers, they found that life expectancy, healthy life expectancy (HALE), non-communicable disease DALY's, and ischemic heart disease had a significant correlation with COVID diagnosis. These factors, along with ischemic stroke, were linked with COVID-19 deaths. However, mixed model analyses showed only a positive association between HALE and the number of COVID-19 cases and tourist numbers and COVID-19 mortality.

The results raise several challenges for clinicians and policy makers. First, it is somewhat paradoxical that high income countries with better hospital infrastructure are nevertheless having high rates of COVID-19 mortality. This is undoubtedly related to life expectancy and public health strategies. As the authors indicate, since high income countries have longer life expectancy, this creates a larger group of elderly individuals who are vulnerable to COVID-19. Despite better hospital

infrastructure in high income nations, some localities have been overwhelmed due to the sheer number of seriously affected patients, both elderly and non-elderly.

A second noteworthy observation from the study is the link between ischemic heart disease and stroke and COVID-19 deaths. Patients with prior vascular disease are more vulnerable to severe COVID-19 infection. Some of the countries that have had high fatality rates are also known to have high rates of heart disease and stroke. The COVID-19 pandemic may also be inflicting collateral damage on patients with heart disease and stroke. Admissions for both myocardial infarction and stroke have been noted to decline during the pandemic, along with imaging for acute stroke.² Avoidance of the hospital can thereby cause delay in medical care for patients with heart disease and stroke and potentially a higher rate of complications.

An ecological study of this type has potential limitations. For example, it may not be well-suited to address certain race-ethnic disparity questions. Blacks in the US have higher infant and adult mortality rates than white persons for most leading causes of death.³ Disparities in COVID-19 death rates for members of the black and Latin X communities have been noted in the US despite coronavirus testing availability for some.^{4,5} These realities have led to important questions as to why these disparities exist. Systemic inequalities in health-care, implicit bias, working under stressful and high-risk conditions as 'essential' workers, residential segregation and other social determinants of health, and racism are being discussed as possible underlying factors for poorer COVID-19 outcomes in traditionally underrepresented groups.³ This informative ecological study explores the surface landscape associated with COVID-19 outcomes and begs us to look much deeper. Other limitations of the study may include variation in test methods, rates of testing and availability of resources for testing by country, and a need for a reassessment at the policy level of what may or may not work during the pandemic as evidenced by relatively low COVID-19 death rates in some high-income countries (e.g., Denmark, Norway, Germany, New Zealand) but not others.

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The COVID-19 pandemic has altered both the global and local landscape. Going forward we may be faced with viral attacks in waves over a protracted time period. Thus, there is an urgent need for a vaccine to combat the virus, and for us to benefit from lessons learned in the initial wave of COVID-19. Importantly, hospitals will need to balance bed availability for patients with both COVID-19 and traditional non-communicable diseases. The authors provide a stark reminder that balancing the competing needs of communicable and non-communicable disease will be a persistent challenge.

Disclosures

Dr. Chaturvedi is an Associate Editor for *Stroke* and is on the editorial board of *Journal of Stroke & Cerebrovascular Diseases* and *Neurology*. Dr. Gorelick has no relevant disclosures.

References

1. M. Reza Azarpazhooh MR, Morovatdar N, Avan A, et al. Covid-19 pandemic and burden of non-communicable diseases: An ecological study on data of 185 countries. *J Stroke Cerebrovasc Dis* 2020;29:105089.
2. Uchino K, Kolikonda MK, Brown D, et al. Decline in stroke presentations during COVID-19 surge. *Stroke* 2020. <https://doi.org/10.1161/STROKEAHA.120.030331>.
3. Williams DB, Cooper LA. COVID-19 and health equity—a new kind of “herd immunity”. *JAMA* 2020;323(24):2478-2480.
4. Wadhera RK, Wadhera P, Gaba P, et al. Variation in COVID-19 hospitalizations and deaths across New York City boroughs. *JAMA* 2020;323(21):2192-2195.
5. Yancy CW. COVID-19 and African Americans. *JAMA* 2020;323(19):1891-1892.