

# **The Economic Cost of Long COVID: An Update**

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In a 2020 JAMA Viewpoint, Lawrence Summers and I guessed at the possible economic costs of long COVID.<sup>1</sup> At the time, we thought the cost might be \$2.6 trillion. With more data, that estimate can be updated. I do so here.

## **Background**

Many survivors of SARS-CoV-2 infection suffer “long COVID,” formally termed Post-Acute Sequelae of SARS-CoV-2 infection (PASC). Data suggest that 22-38% of people with COVID will have at least one symptom 12 weeks after initial onset, and 12-17% will have three or more symptoms. With 80.5 million confirmed COVID cases in the United States, this implies at least 9.6 million people with three or more symptoms of long COVID. The most common symptom of long COVID is fatigue, but every organ system has been implicated.

## **Three Economic Costs**

Three economic costs of long COVID were estimated. The first is the lost quality of life. Economists value lost quality of life by estimating the reduction in quality adjusted years of life due to long COVID (QALY) and multiplying that by the value of a year of good health. To estimate the QALY disutility of long COVID, I assume that cases with three or more symptoms experience the same disutility as people with myalgic encephalomyelitis (ME)/chronic fatigue syndrome

(CFS), which has been estimated at -0.29.<sup>2</sup> Cases with one or two symptoms were assumed to have a disutility of -0.1.<sup>3</sup> I assume that long COVID lasts 5 years on average, consistent with the slow rate of recovery observed to date.<sup>4</sup> I assume a year in good health is worth \$100,000. The first row of the table shows the resulting implied cost of reduced health, estimated to be \$2.2 trillion.

The second economic cost is lost earnings. Based the prevalence rates above, there are an estimated 8.4 million adults with three or more symptoms of long COVID. The labor force participation rate for adults is about 60 percent, which I assume applies to this population. I assume no labor supply consequences for people with <3 symptoms. Surveys of people with long COVID suggest that the reduction in labor supply for those with significant impairment is about 70 percent.<sup>5</sup> I assume this persists for five years and that people out of work lose the average amount earned, roughly \$1,100 per person. The net loss in income, shown in the second row of the table, is \$1 trillion.

The third economic cost is higher spending on medical care. I again use ME/CFS as a guide. Costs for these conditions range between \$3,712 to \$13,750.<sup>6</sup> I assume the midpoint of \$8,731 for people with three or more symptoms and one-third that amount for cases with <3 symptoms, consistent with the roughly two-thirds reduction in quality of life. The additional medical spending totals \$528 billion, shown in the last row of the table.

Adding across the three areas, Table 1 shows the total cost of long COVID is \$3.7 trillion. 59% of the cost is lost quality of life; the remainder is reduced earnings and greater medical spending. The total amount is roughly \$11,000 per person, or about 17% of pre-COVID US GDP. By another metric, the cost of long COVID rivals in aggregate the cost of the Great Recession.<sup>1</sup>

## Discussion

Relative to my earlier estimate with Lawrence Summers of the cost of long COVID of \$2.6 trillion, the higher number here is higher: \$3.7 trillion in total. The higher estimate is largely a result of the greater prevalence of long COVID than we had guessed at the time. There are about 10 times the number of people with long COVID as have died of COVID.

Because long COVID is so new, there is uncertainty about all of the numbers involved in the calculations. Still, the costs here are conservative, based on only cases to date.

The enormity of these costs implies that policy to address long COVID are urgently needed. With costs this high, virtually any amount spent on long COVID detection, treatment, and control would result in benefits far above what it costs.

**Table 1: The Economic Cost of Long COVID**

<b>Impact</b>	<b>Value (\$ billion)</b>
Reduced quality of life	\$2,195
Reduced earnings	\$997
Increased medical spending	\$528
Total cost	\$3,719
Cost per capita	\$11,189
Percent of 2019 GDP	17%

## References

- <sup>1</sup> Cutler DM, Summers LH. The COVID-19 Pandemic and the \$16 Trillion Virus. *JAMA*. 2020;324(15):1495–1496. doi:10.1001/jama.2020.19759.
- <sup>2</sup> Falk Hvidberg M, Brinth LS, Olesen AV, Petersen KD, Ehlers L. The Health-Related Quality of Life for Patients with Myalgic Encephalomyelitis / Chronic Fatigue Syndrome (ME/CFS). *PLoS One*. 2015 Jul 6;10(7):e0132421.
- <sup>3</sup> Martin C, Luteijn M, Letton W, Robertson J, McDonald S. A model framework for projecting the prevalence and impact of Long-COVID in the UK. *PLoS One*. 2021;16(12):e0260843. Published 2021 Dec 2. doi:10.1371/journal.pone.0260843
- <sup>4</sup> Davis, H, et al., Characterizing Long COVID in an International Cohort: 7 Months of Symptoms and Their Impact, medRxiv 2020.12.24.20248802;
- <sup>5</sup> COVID-19 Longhailer Advocacy Project, An Open Letter to President Biden, Cabinet and Congressional Leadership, and Key Governmental Agencies, January 10, 2022.
- <sup>6</sup> Jason LA, Mirin, AA. Updating the National Academy of Medicine ME/CFS prevalence and economic impact figures to account for population growth and inflation, *Fatigue: Biomedicine, Health & Behavior*, 2021; DOI: 10.1080/21641846.2021.1878716