



\$ P N N F O U E

Title:

"Not Taxes, but the Other Thing"

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The most precious asset that any person has on this Earth is the amount of time they have to live. If for any reason their life is cut short, it is a cost for the individual which is beyond

for Covid-19 is now even higher. As of October 21, 2020, there have been 207,882 deaths in the United States involving Covid-19 as defined by the Centers for Disease Control and Prevention. For comparison, the Federal Bureau of Investigation's Uniform Crime Reporting Program identifies a total of 3,047 murder victims from the 9/11 terrorist attacks. The former figure is over 68 times larger than the latter figure. However, I don't think that it is reasonable to claim that the total life lost or the costs of lives lost from Covid-19 is more than 60 times that of 9/11.

Let's start by considering some simpler and cleaner made-up examples. If I am told that "Event A" and "Event B" each caused 10 people to die and asked which one is more costly in terms of lives lost, without any additional information I would say that they are equally costly. But if I were given the additional information that the 10 people who died because of "Event A" were each 9 years old and the 10 people who died because of "Event B" were each 90 years old, I would clearly say that more life was lost (and therefore there were greater costs from lives lost) from "Event A" than from "Event B." This is simply because when people who are not newborns die, they are not losing a full lifetime of life. The expected remaining lifespan for people of different ages is different, and in most cases younger people can expect to have more remaining years of life than older people.

In the United States in 2017 (the most recent year for which projections are available), a 9 year old could expect to live an additional 70.2 years, whereas a 90 year old could expect to live an additional 4.5 years. In expectation, we see that "Event A" results in the loss of 702 years of expected life, while "Event B" results in the loss of 45 years of expected life. Life expectancy at birth in the United States in 2017 was 78.6 years, so in terms of "full lives lost" it is as if "Event A" is equivalent of  $45 \div 78.6 \approx 0.57$  times as costly as "Event B."

Should one view the death of a 9 year old as more tragic and more costly than the death of a 90 year old? Yes. It is horrible if a 90 year old dies prematurely and misses the wedding of her grandchild. But it is much more horrible if a 9 year old dies and misses: the rest of his childhood, his own wedding, the birth of his own children, all the events of his children's childhoods, his children's weddings, the birth of his grandchildren, and finally the wedding of his grandchild.

Is the death of a 9 year old exactly 15.6 times worse or more costly (which is what a simple ratio of 70.2 to 4.5 would suggest) than the death of a 90 year old? I don't know. But to me 15.6 times more costly seems much more likely.

their life cut short. Under this approach, has the Coronavirus Pandemic resulted in more life lost in the United States than the 9/11 terrorist attacks and, if so, how much more life has been lost?

Let's start by looking at the age profiles of people who have died with Coronavirus and from the 9/11 terrorist attacks. The first two columns in Tables 1 and 2 respectively report the number of deaths in the United States within different age ranges related to COVID-19 (through October 21, 2020) and the 9/11 terrorist attacks. We can see that the age profile (and therefore remaining life expectancy) of people who died with COVID-19 differs considerably from the victims of 9/11 by computing "Cumulative Deaths by Age" and "Cumulative Percentage of Deaths by Age" for each group. For example, looking at Table 2 we see that 470 victims of 9/11 were age 29 or younger—which accounts for 15.4% of victims of the terrorist attacks. The median age of 9/11 victims was in the age range of "35 to 39 years." In contrast, from Table 1 we see that the median age of those who died with COVID-19 was somewhere in the range of "75 to 84 years." Comparisons of the "Cumulative Percentage of Deaths by Age" figures in Tables 1 and 2 further reveal that while more than half of the people who have died with COVID-19 were over the age of 74, less than 1% of the victims of 9/11 were in this same age group.

Figure 1 provides a visual depiction of the age profiles of 9/11 victims (blue curve) and people who have died with COVID-19 (red curve), by plotting the figures for "Cumulative Percentage of Deaths by Age" from Tables 1 and 2. The fact that the red curve is so far below the blue curve reinforces that the age profile of 9/11 victims is much younger than that of people who died with COVID-19. The steepness of the blue curve in the middle age ranges (collectively, ages 29 to 59) reveals that the 9/11 attacks killed primarily people in this age demographic. Similarly, increasing steepness of the red curve at the far right of the graph is a consequence of COVID-19 deaths being disproportionately concentrated among the oldest members of society.

As already noted, the amount of total life lost also depends upon the number of people who have their life

Table 1– Covid-19 Deaths in U.S. (as of October 21, 2020)

Age Range	# Covid19 Deaths	Cumulative Deaths by Age	Cumulative Percentage of Deaths byAge	Remaining Life Expectancy (2017 data)	Total Years Lost for Group
0	25	25	0.0120%	78.6	1,965

