

Pandemic of Paradoxes: The Indirect Global Health Impacts of COVID-19

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Abstract

The indirect impact of the COVID-19 pandemic on several public health issues is examined in the context of its impacts on multiple nations around the world. Not all possible health aspects of COVID-19 indirectly related to the disease were examined. The ones addressed included: I. influenza, II. suicide, III. alcohol consumption, IV. fatal automobile accidents and V. birth rates. In each of these cases COVID-19 has had a paradoxical impact. Although COVID-19 is a dangerous respiratory virus, there has not been a synergism with the influenza virus as initially feared by some public health experts. In fact, there has been a global nonappearance of seasonal flu, a good though indirect, paradoxical consequence of COVID-19. But most other contradictory health consequences of COVID-19 have been largely negative, these include an increase in suicide, but unexpectedly, an initial reduction and other changes in suicide patterns in many countries, an increase in alcohol consumption, but paradoxically, a reduction in beer consumption, some evidence of an increase in fatal automobile accidents (at least on a per mile driven basis) and of monumental long term global consequence, a significant decline in births in many major nations.

1. Introduction

The Coronavirus pandemic, hereafter referred to as COVID-19, has had many paradoxical aspects. For example, it has spread rapidly because it is generally mild, and many contagious carriers are unaware they are infected. It is insidious because it mirrors many other common viruses, allergies, and gastro-intestinal complaints. But unlike the common cold, to which it is related, it kills a significant number of those it infects, typically between one and seven percent of visibly ill patients (Onder et al, 2020). For most of the afflicted it is a passing nuisance and even for the truly sick it departs in most cases with no after-effects in a few weeks. But unpredictably and paradoxically for a respiratory virus, for many afflicted it settles into a long-term debilitating illness with many impacts including neurological ones (Raveendran et al., 2021). These are all direct consequences of COVID-19. However, the dramatic public health efforts to contain the virus have produced profound disruptions in the lives of billions of people and cost tens of trillions of dollars (Nivette et al., 2021).

The indirect impact of these “lock-downs” and “social distancing” measures have had a wide range of impacts, paradoxically some are mixed or even good in their results. The indirect health impacts on a global basis of the COVID-19 pandemic are examined in this paper. This includes an

examination of the spatial extent of impacts with paradoxical characteristics. Among these impacts are the lack of a seasonal influenza epidemic in diverse regions in the aftermath of the COVID-19 pandemic. This nonappearance of the flu, ironically, may have prevented almost as many deaths and many earlier deaths than COVID-19 itself.

Another impact of COVID-19 that is less desirable has been an increase in mental health issues such as depression and anxiety and an associated increase in suicide. The paradoxical aspect of this predictable phenomenon is that in some places where suicide is tracked very carefully, suicides declined in the most intense period of COVID-19 related restrictions in the spring season of 2020. However, this paradoxical decline was short lived and an increase in suicides has been observed in many spatially separated and culturally diverse nations in the year since. But because COVID-19 is a transformative event, the nature of the groups most at risk for suicide seems to have changed from elderly men to younger women in some nations. The apparent increase in suicides may be less than the actual increase in suicides, as there are also changes in the pattern and increases in the number of drug overdose deaths. Some of these deaths may be in fact be suicide. This is partly because overwhelmed medical staff and examiners

are less inclined to examine cause of deaths in detail during the COVID-19 crisis. Also there have been changes in patterns of accidental deaths such as fatal automobile accidents that might actually be suicides (CDC, 2020).

A paradoxical and related issue has been the observed changes in consumption patterns of alcohol. In general, alcohol consumption has increased in terms of the total quantity of pure ethyl alcohol equivalent consumed in several major countries. But paradoxically, the volume of alcoholic beverages consumed has declined. The reason for this, is a switch from consumption of beer and malt beverages and flavored wine “coolers” to preferential consumption of hard alcohol. This in turn can be associated with a decline of social drinking in pubs, bars and sporting events, and parties and an increase in solitary drinking. There is some evidence for gender-based changes as well, with increased consumption of wine by women in the USA. In any case, consumption of less concentrated forms of alcohol has declined at the same time harmful binge drinking in a solitary context has increased (Sugerman and Greenfield, 2021).

The increase in alcohol consumption and some evidence of greater use of opiate drugs, may account in part for another paradoxical impact of COVID-19 which is an increase in fatal automobile accidents, when measured on a per mile driven basis. Unquestionably, the lockdowns, closed borders, a huge decline in leisure travel, and a decline in productive economic activity has caused a sharp drop in automobile travel and particularly in the long journeys often associated with fatal accidents due to drowsiness and high speeds. However, fatal automobile accidents have not declined as sharply as total miles traveled. Fatal accidents per mile of travel has actually increased during the COVID-19 pandemic in the USA. It is hard to untangle the threads of why this might be happening. A good explanation is distracted driving. The distractions including anxiety, depression, sleeplessness, intoxication by drugs, and alcohol and one should not discount the possibility of suicide by car (at least in some cultural groups) as this is more religiously acceptable. (NHTSA, 2020).

Finally, there is one change in global health measures that is of monumental demographic importance. Paradoxically, it has nothing directly to do with morbidity or mortality, but to conception and birth of children. Thus, it is tied to birth rather than death. There were pundits who in the spring of 2020, when hundreds of millions of people globally were being locked down, predicted a baby boom in nine months time. This was surmised to be due to a

lack of diversions and enforced close proximity (Lewis, 2021). With one possible exception in the Philippines, the opposite has proven to be the case, with double digit declines in birth rates in diverse spatially scattered nations. COVID-19 has killed an estimated 4.5 million to 15 million people, when the impact in multiple nations are tailed (Johns Hopkins, 2021). The number of years of life lost has likewise totaled into the tens of millions, but those numbers are exceeded by the number of potential years of life lost in children that were not conceived indirectly because of COVID-19. Tens of millions of children were not conceived worldwide and as their average life span is several score of decades in comparison to the typical COVID-19 victim who is elderly and infirm and has less than a decade to live on average. It is not difficult to argue that it is not deaths, but lack of births that will in coming decades be the greatest demographic impact of COVID-19. (Meyerowitz-Katz et al., 2021).

2. The Non-Appearance of Influenza

Seasonal flu is a predictable part of the global health picture. These epidemics are routine but variable in their impact. Most originate in the Asian region, particularly in China and reach a peak in the northern hemisphere during the winter season. In particularly bad years, tens of millions are sickened and several hundred thousand usually die. The elderly or very young are the most common groups afflicted with fatalities. Usually, the flu progresses to pneumonia in severe cases. In many Asian nations, use of masks is common during flu epidemics. However, only during the 1918-1920 *Spanish flu* pandemic was the rigor and impact of public health measures near to approaching the massive global lock down, interruption of international travel and use of social distancing, masks, hand sanitizer, and other measures employed in a fevered effort to stem the first (of many subsequent) waves of COVID-19 (Brown, 2018). Frustratingly, the vigorous public health efforts to contain COVID-19 have to varying degrees failed to stop the spread and later occurrence of multiple waves of the pandemic (CDC, 2021). But paradoxically, the control measures did all but eliminated the seasonal appearance of the influenza virus. It is possible that the variant of flu in circulation in 2020 was not a virulent one and that as COVID-19 vaccines were not then available, that many additional people were vaccinated early for the influenza virus. In any case, there was no flu epidemic in the winter of 2020 in the Southern Hemisphere (i.e., Australia, New Zealand South Africa, or temperate areas of South America). Thus, in Australia there were less than 400 cases of

influenza in contrast to as many as 40,000 in a typical year. (Australian Department of Health, 2021). Then in the fall and winter of 2020-2021 there was a nonappearance of the flu in its usual haunts in the northern hemisphere. In North America there was what was characterized in Scientific American as the “disappearance of influenza” for over a year. (Peek, 2021). This is illustrated in Figure 1. The line for flu cases does

not rise above the X axis for most of the period since the spring of 2020 in three North American countries, the United States, Canada and Bermuda. This contrasts with as many as 30,000 new confirmed flu cases per week in a typical flu season in the United States, with smaller number of cases but sharp peaks in all nations in the winter Northern Hemisphere flu season (Figure 2).

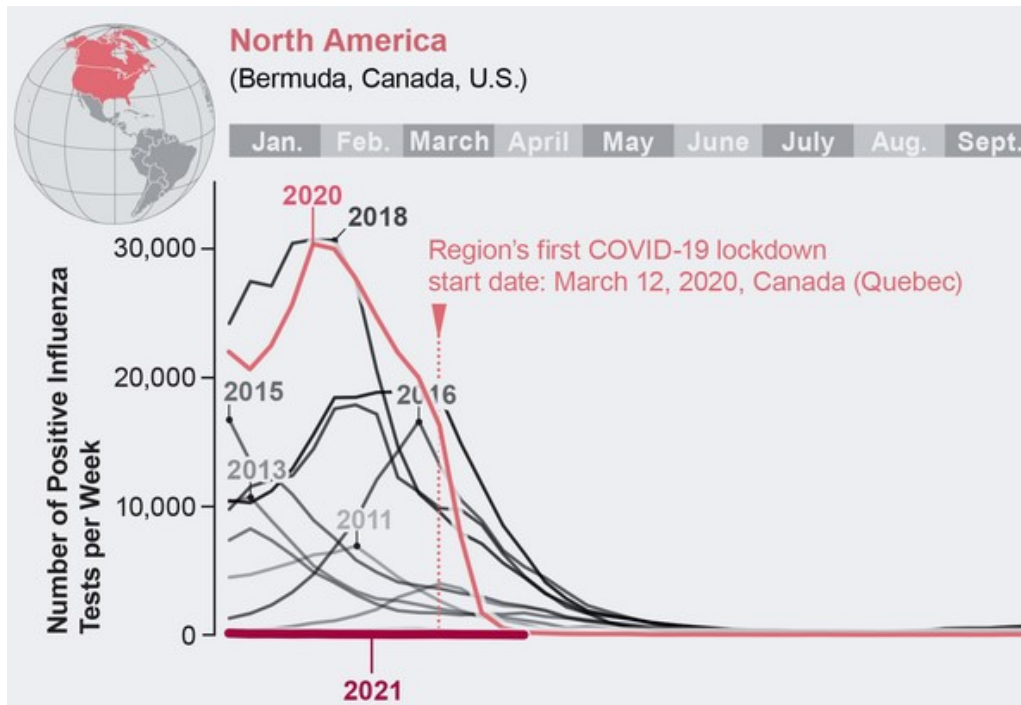


Figure 1: Graph showing the virtual disappearance of influenza in three North American Nations in the spring of 2020 and the non-appearance of influenza in 2021 through the summer

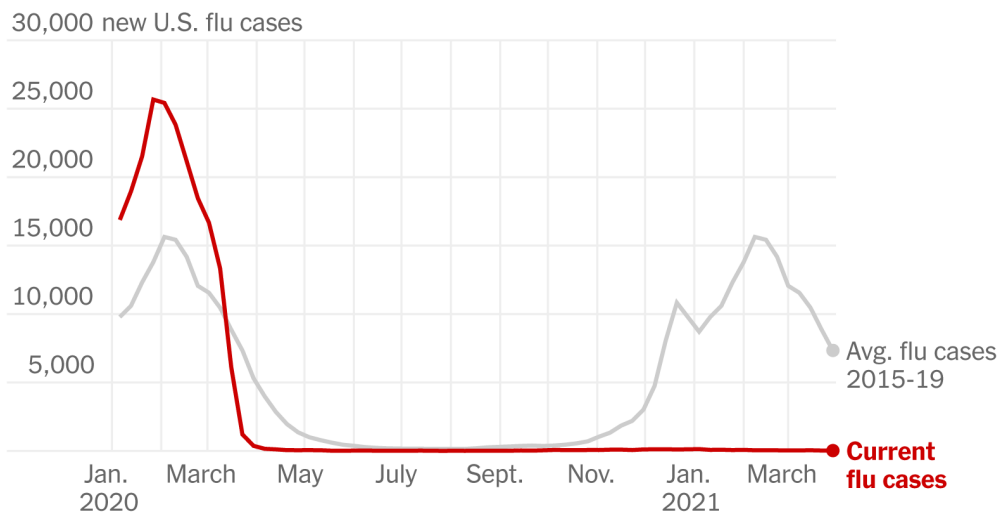


Figure 2: Weekly totals of positive flu tests, from public and clinical laboratories. Source: Centers for Disease Control and Prevention, April 2021

It can be argued that some flu cases might have been missed, but conversely there was a huge amount of testing and awareness for respiratory viruses and probably a higher proportion of flu cases were investigated by medical professionals than in typical years. Many flu tests were conducted to rule out flu infection, which can happen simultaneous with a COVID-19 infection. The bottom line is that precautions against COVID-19, such as wearing masks, social distancing, lockdowns and use of hand sanitizer and other efforts at sanitization and vector control eliminated the influenza virus as a circulating microbe of concern. Unfortunately, the cost of COVID-19 control measures is so high that use of similar strategies to reduce the burden of morbidity and mortality from flu is probably not sustainable.

3. Impact on Suicide

Suicide is a very indirect effect of COVID-19. Unlike a chronic disease like cancer, that might induce a rational person to take their own life to reduce physical misery and cost to loved ones, COVID-19 is an acute syndrome. Of course so called “long COVID” might induce depression, which eventually could lead to suicidal ideation. The reason that COVID-19 seems to be causing more suicides is part of a complex of mental health and larger societal impacts. The personal mental health impacts from loss of employment, loss of social contacts, and increased isolation lead to suicide. Also a sense of dread of infection especially among obsessive and compulsive individuals might play a role. Furthermore, “survivor guilt” and grief over loss of loved ones induced by millions of unexpected deaths is likely a factor. The isolation that was imposed as COVID-19 spread and

produced control measures like lockdowns, was undoubtable an important factor in inducing depression. Likewise, elimination of social interactions like sporting events, travel, and congregation with friends were all factors. Added to this, there has been a huge economic impact from COVID-19 with millions losing jobs and changes in jobs for those still working remotely from home that are generally seen as stressful and unquestionably isolating. Thus, it is predictable that with all this misery and dislocation there would be a concomitant increase in suicide (Bilal et al., 2020) (Figure 3). But this picture paradoxically is complicated by a different factor. That factor is the tendency of people to pull together during a crisis and/or to focus on a greater challenge rather than their own petty concerns. Thus one may see a drop in suicides during disasters. But the comeuppance is after the immediate crisis period is past the dislocation due to the crisis will cause grief which can lead to more suicides. This appears to be happening. There was an apparent decline in suicides during the most intense early months of the pandemic in diverse places that had draconian lockdowns and high death rates such as the state of Massachusetts in the USA. (Sher, 2020). There has also been an observed change in the pattern of suicide, at least in places that have careful monthly collection and release of suicide statistics, like Japan and South Korea (Lee et al., 2021). In these two countries, which have the world’s highest suicide rates, the traditional pattern of suicide prevalence is that suicide is most common among elderly people. Perhaps these citizens feel they are a burden to their families or that they have in some way lost “face” and therefore kill themselves.

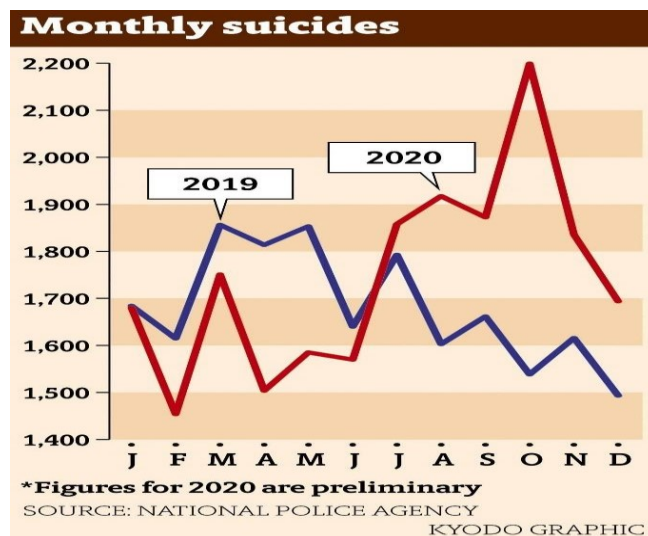


Figure 3: Monthly suicides in Japan, 2019 and 2020 compared. Source National Police Agency, Japan 2020

This means that although there are numerous suicides in such societies, the number of years of potential life lost is less than if younger people were the primary victims. This pattern has changed somewhat during the pandemic with the age of suicide declining and its highest prevalence shifting to another group: young to early middle aged working women. In this group, COVID-19 has had a devastating impact in Japan and Korea through the indirect mechanism of loss of employment, particularly in hospitality related fields. Suicide rates vary considerably around the world; among developed countries, the former Soviet Union Japan and South Korea have the highest rates (Figure 4). Thus, in Japan and South Korea, as a younger and otherwise healthier group succumbs increasingly to suicide, the years of potential life lost soars. This is exacerbated in nations like Japan which has the longest life expectancies for women on the planet. Thus a switch in prevalence from elderly men to younger women is a very socially problematic trend (Sakamoto et al., 2021).

4. Mixed Impact on Alcohol Consumption Patterns

Alcohol consumption is a major public health issue, although it is somewhat less directly a health issue than a societal one. COVID-19 has caused vast disruptions to societies throughout the world. One of the greatest impacts has been the indirect effect of social distancing measures designed to limit the spread of the respiratory virus in a aerosol form

between people in close proximity. There is some evidence that people that are boisterous, singing or talking in an animated fashion are more likely to spread COVID-19. In addition, close proximity and duration of exposure is certainly related to greater chance for infection and the number of persons one has contact with and the range of places those people hail from are all factors. Thus, it is not surprising that public drinking and dining establishments and large crowded sporting events where alcohol is frequently consumed were early targets of attempts to control the spread of COVID-19. Thus, there was an almost total cessation of sporting events and festivals and a curtailment of hours and in some cases closure of bars, taverns, drinking establishments, and restrictions on other social drinking venues. These attempts may have been successful, but paradoxically may have had the unintended consequence of displacing drinking into the isolation of a lonely flat or small dreary home. This in turn might have led to increases in suicide.

In many social drinking situations, the drinks of choice are beer, ale, wine or less concentrated liquors (Mehadevan et al., 2021). But to a lonely person perhaps one with less disposable income and a desire to forget about the devastation happening around them, hard liquor has an undeniable appeal; in sort: *more bang for the buck*. It is difficult to get solid statistics about drinking patterns over short periods of time from sources like records of hospitalization or reports of arrests and even less so from domestic violence reports.

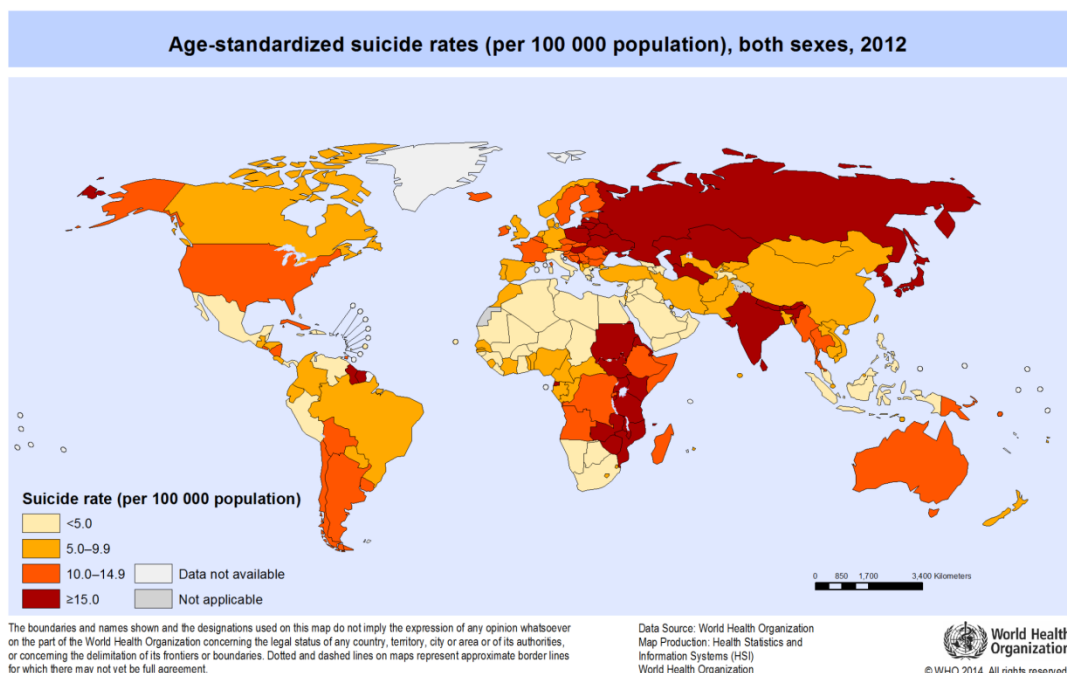


Figure 4: Map of Suicide rates around the world in 2014 from WHO

Thus the best source of information on alcohol consumption in most nations is from aggregated sales information from distillers, brewers, and vintners (Hawthorn, 2020). The numbers from several countries indicate significant increases in sales of hard alcohol and paradoxically declines in sales of beer. This trend is particularly strong in Western Europe where consumption of beer is massive at sporting events and festivals like Oktoberfest (which was cancelled two years in a row). This cause is a probable factor why there might be a decline in beer consumption (German Federal Statistical Office, 2021). The substitution of hard alcohol for beer, cannot be a good portent for public health and carries with it a host of issues including increases in suicide, liver disease, cancer, fatal and injury accidents, as well as domestic violence. One trend that is harder to quantify, but is believable, is the increase in wine consumption among women. The disruption of work routines is perhaps what this trend, seen in younger and professional women, can be attributed to (Sugarman and Greenfield, 2021). The impacts of this are equally bad as with those for men deprived of conviviality in pubs and sporting events who are reduced to consoling themselves alone with a daily bottle of *samogonka*, *Baijiu*, *Lao Theuan* or *Changaa*. Sadly, binge and frequent drinking can become habitual and as the duration of the multiple waves of the pandemic have lasted a long time it is

perhaps long enough to ensure many people become addiction to this dysfunctional pattern.

5. Impact on Fatal Automobile Accidents

Automobile accidents have historically been one of the greatest sources of premature preventable death in many nations (WHO, 2021). After many years of declines in traffic fatalities attributable to improvements in technology such as airbags and anti-lock brakes etc., the number of fatal auto accidents has over the past decade begun a seemingly inexorable though gradual climb, at least in the USA. This trend has been attributable to distracted driving in some part as shown in Figure 5. Although more cars on the road is probably also a factor. Globally, fatal automobile accidents are also on the increase, perhaps partly due to changes in the demographics of drivers, with more drivers in places with dangerous roads or poor enforcement such as India and the Middle East. COVID-19 has undoubtedly impacted traffic safety, as it has many other aspects of life. Almost everywhere there has been less traffic on the roads (Sung and Monschauer, 2021). One would expect an associated drop in fatalities. That has happened in many places, but there has not been as large a percentage decline in fatalities as the percentage decline in miles driven or the percentage decline in number of cars on the road at any given time, at least in the USA in 2020 (NHTSA, 2020).

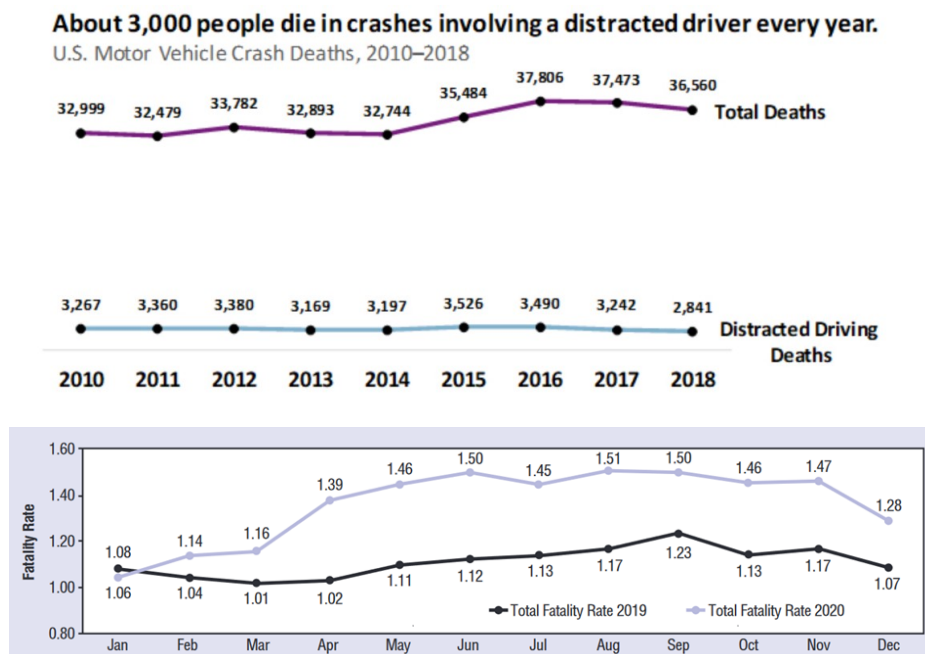


Figure 5: Total fatality rate per 100 million vehicle miles travelled (VMT) and the fatality rate per 100 million VMT by roadway function class, 2019–2020 (National Highway Traffic Safety Administration (NHTSA)'s National Center for Statistics and Analysis, June 2021)

There are several possible explanations for this; one simple one is less traffic allows for higher speeds for the remaining traffic and thus when accidents do happen at these higher speeds there is a higher likelihood of a fatal outcome (National Center for Statistics & Analysis, 2021). But there are several other potential explanations. Another possible factor is that in many places public transportation was closed or restricted during the COVID-19 response, perhaps forcing neophyte drivers unto unfamiliar roads and at unaccustomed times. In any case, public transportation is much safer in terms of accidents on any measurable basis. Changes in alcohol consumption is a possibility, but one might argue that the scenario of the typical drunk driver getting intoxicated after work at a bar and weaving home in the wee hours and driving erratically into a fatal encounter with oncoming traffic or a bridge abutment is unlikely in the post COVID-19 world of early bar closure in Japan, total pub closure in Europe, and restrictions in many other places. Another more plausible reason, is an exacerbation of distracted driving. If texting idly on a cell phone might cause an accident, then intense focus on a cell phone conversation about a sick relative or preoccupation with the likelihood of unemployment would cause worse distraction. One can only hope that in the longer term, the curse of distracted driving produced by mobile phones can be replaced by greater automation of automobiles and a new series of safety improvements related to technology comparable with those engendered by airbags and other automotive design changes. An examination of numbers of all auto accidents, average speeds, causes associated with various types of accidents and a time series analysis of accident rates in various countries in relation to COVID-19 waves and control measures would perhaps help to sort out the somewhat contradictory association between COVID-19 and traffic safety.

6. Impact on Birth Rates

The greatest impact of COVID-19 on the human race in the long term will probably be the impact on conception of new human beings. For a disease that almost never kills infants, COVID-19 has eliminated tens of millions of babies and probably eventually hundreds of millions of person years of life from the earth's teeming mass of inhabitants. Most of this is due to the choice of couples not to procreate. However, social interactions have been vastly reduced and with fewer social interactions there are fewer opportunities for inadvertent or intentional pregnancies. This runs counter to a prediction made by several pundits which might be called the "nine months after the great blackout

phenomenon". This is the case because there have been events in history such as the electrical system failure which blacked out the Eastern seaboard of the USA in 1965, which was followed with an observable increase in deliveries of babies nine months later (New York Times, 1966). It was conjectured that being locked down in the confines of small apartments in urban areas and small houses in rural areas and modest homes in suburban areas etc. would lead the people who were confined with significant others to reproduce out of boredom or without some other option to occupy their time or avoid intimacy.

This prediction has almost uniformly proven false. Nine months and more after the beginning of intense lockdowns in many countries there has been a notable and durable decline in births. Perhaps there have been half a million fewer births in the USA, which is almost as many in the same period as deaths from COVID-19 (Levine and Kearney, 2020). In China there were over one million fewer births in 2020 than in the prior year. This number greatly exceeds official estimates of COVID-19 deaths in China in 2020 (Chen, 2020). Declines in France and elsewhere have been observed in birth rates (Kearney and Levine, 2021). There is one possible exception to this global pattern and that is in the Philippines. The Philippines has had a major increase in births, but it may not last. This is attributable to one impact of COVID-19. Although COVID-19 shut down international travel, it had a particularly large impact on some economic sectors such as cruise ships and on construction activity in the Persian Gulf region. These were areas and vocations where Philippino men were disproportionately employed. Although there was a time lag, ultimately several million expatriate workers returned to enforced stays back in the Philippines. This influx of young men probably can account for the increase in births about nine months later (Los Angeles Times, 2021). There may be other public health and cultural factors such as lack of availability of birth control at work. But the experience of this country and perhaps a few others with returning workers, does not change the total global picture; which is a vast number of children not being conceived. If the active phase of the COVID-19 pandemic lasts more than a few years, this demographic deficit will have a lasting impact on global population. The nation of China was already starting to regret the success of the one child policy, and therefore China is since 2014 is promoting a two-child policy (Yi and Hesketh, 2016). That policy is being extended into a new "three-child policy" which has at least partially been in response to COVID-19. As with any major policy

change in such a populous and powerful nation as China, this change is of huge significance, but it will not offset the much greater impact of COVID-19 deaths in India which is vying with the United States for the most cases and deaths.

7. Conclusion

In this paper, a variety of indirect impacts of the COVID-19 pandemic have been discussed. In addition, there are other well documented impacts on health-related issues from COVID-19 such as an observed increase in heart attacks in the early months of the pandemic and an increase in obesity (ZOE, 2021). These are not as paradoxical as some of the other effects and are also related to stress and the lack of activity associated with lockdowns and changes in routines such as employment in remote workplaces (Dara, 2021). Taken along with the mental health aspects of COVID-19, the disruption of public health and smooth operation of the health care system in many countries, an increase in violent crime in many cities, and the factors discussed in detail in this paper of suicide, automobile accidents, and alcohol consumption all add up to the true toll of COVID-19 being far higher than the direct impact of deaths and disability. This has been seen in higher than predicted mortality in many countries. The counter vailing nonappearance of seasonal flu is a small consolation.

However, if the pattern of lack of conception of children holds true over many more years and the pandemic continues into the foreseeable future with ever more numerous variants and fading immunity from vaccination, then the impact on world population may rank COVID-19 as the largest disruption of the human race since at least the Black Death pandemics of the 14th-16th centuries. Paradoxically, this may not be an unalloyed catastrophe as many environmental thinkers have long predicted that the earth is approaching a point when it will exceed its carrying capacity. Thus COVID-19 might be seen in some ways be a mixed curse.

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