

Feasibility of Adopting COVID-19 Quarantine Policy to Combat Global Warming

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ABSTRACT

Since the start of COVID-19, quarantine and social distancing have become a standard social norm in containing the outbreak. During this time period, a significant drop in greenhouse gas emission has been observed and reduced commute appears to be a main contributor to such reduction. Hence, the quarantine is not only effective in maintaining the outbreak but also helped to combat global warming. This paper thoroughly examined both contemporary and previous literature related to the causes of global warming and changes caused by COVID-19 quarantine measures in hope to study the feasibility of employing certain traits from the quarantine lifestyle after the COVID-19 pandemic to combat climate change in the long run. The downside of employing such tactic includes mental health issues, impact on work productivity, potential mass unemployment, and economic depressions. To handle the listed obstacles, companies and state agencies are expected to act in preparation to handle these rising problems to minimize the influence on both the people and the environment. Regardless of certain drawbacks, a prolonged "quarantine" can effectively reduce emission while reducing the risk of potential pandemics, which makes it a valid option to deal with the urgent challenge of escalating global warming.

Keywords: *Global warming, quarantine lifestyle, COVID-19, public policy, infectious disease prevention policy, social problems*

1. INTRODUCTION

As many still struggling to grasp the reality of global warming, the whole situation is on track for a worse and worse ending. Just in July, the Earth witnessed the lowest arctic sea ice level on record [1]. In Siberia, heatwaves caused by global warming led to various environmental risks such as permafrost areas melting [2]. And such a list goes on and on. However, a drastic change in people's lifestyles demonstrated a possible alternation in this pattern could be made. As COVID-19 spreads around the globe, people spend less time moving around and chose to stay at home. And in turn, some environmental changes have been observed, such as the dolphins' return in Venice. Regarding these phenomena, the author aims to analyze if employing a prolonged quarantine-like lifestyle could help combat global warming. And this article also aims to study the hidden obstacles revealed by the COVID-19 pandemic that barricades the prevention of climate change. Along the review, certain problems such as mental health and unemployment are expected after employing the suggested long-term quarantine, and possible counter acts that aim to reduce the negative impacts to the lowest are discussed as well.

2. REDUCING GREENHOUSE GAS EMISSION BY AVOIDING UNNECESSARY TRANSPORTATION

One important cause of global warming is human interference in the environment. And one of the most notorious components is the greenhouse gases, which are largely produced by everyday emissions from factory productions and transportation. As impacted by COVID-19, most of the factory production has been on halt and around 20% decrease in global daily fossil CO₂ emissions was observed [3]. Per EPA, approximately 22% of greenhouse emissions are industry-related, and another even huger portion of emission is from transportation, which is around 28% of the total emission in the US in 2018 [4]. With quarantine being implanted, aviation transportation through commercial airlines has been greatly restricted and resulted in reduced emissions as expected. And a study has shown that a possible drop of 38% of carbon emission through aviation could be expected by the end of 2020 [5]. However, often overlooked, aviation only makes up a very small portion of carbon emission from transportation. In fact, over 70% of transportation-related greenhouse gas emission is

contributed by road-based transportation [6]. As quarantine goes on, daily commute for non-essential workers has been completely avoided and the result is reflected as the total emission appears to have dropped. One important factor that makes stay-at-home feasible as a long-term plan is the forced adaptations that companies made in response to the quarantine. For non-essential workers, although the technology for remote working in certain fields has been practical and feasible for a long time, companies are reluctant in adapting to this new routine due to a lack of infrastructure and traditional work culture. With COVID-19 forcing the companies to change, more and more positions are expected to be more flexible for people who prefer to work from home. Combined with an already emerging trend of transitioning into teleworking in the industry, a future where vast majority of people work from home is more likely than ever [7]. However, such future will probably see the same trend that online ordering and delivery services became more frequent and common as seen during the pandemic [8]. As an expected outcome for the social distance procedure, people would much prefer not to do their own groceries in risk of virus exposure. Despite the surge in the growth of delivery services, the net effect on the environment is still logically expected to be positive. As delivery services charge extra fees for each order, customers would naturally decrease the frequency of their orders and instead increase the quantity of goods per order. And the end result would be more efficient transportation and reduced overall emission compared to more frequent and numerous individual travels to stores prior to the pandemic. Therefore, avoiding unnecessary transportation through the quarantine lifestyle appears to be a highly feasible way of reducing the progress of global warming.

3. REDUCING GREENHOUSE GAS EMISSION BY ENHANCING HYGIENE AWARENESS

Another important aspect to consider when dealing with emissions is, ironically, the healthcare industry. As promising as the healthcare industry sounds to guard human health, it actually accounts for a large portion of the total global greenhouse gas emission [9]. The healthcare industries in the US, Australia, England, and Canada combined would be counted as the 7th highest CO₂ emission "country" [10]. In addition to this, biohazard/medical waste is another potential risk for pollution and possible contribution to carbon emission if incinerated. Both the emission and potential pollution from the healthcare section is closely related to the total population in need of medical attention since the demand for medical supplies and infrastructure usage such as ventilation would increase as the patients increase. Unfortunately, COVID-19 is not the first global pandemic nor will it be the last. Infectious disease

outbreaks appear in cycles and are nowhere near uncommon. The chance of them become a global pandemic might still be small but is still fairly frequent as the last one observed as SARS back in 2003. Even though humans cannot control the mutation of viruses, the experiences help to build a more established protocol for dealing with such outbreaks, and WHO has been working with all countries to reach a unified front in fighting against potential pandemics [11]. Despite the failure of the US in maintaining the COVID-19 spread, most countries appear to have effectively maintained the outbreak according to WHO and local public health guidelines. Social distancing and masks are probably the two most widely practiced prevention procedures globally. In a world where globalization is inevitable, the spread of infectious will only speed up more and more in the future as the transportation of the worldwide population becomes more frequent [12]. The awareness of the threat of infectious disease should become warier in daily life. At the beginning of the COVID-19 pandemic and even now, a portion of the US population refuses to wear masks and practice quarantine, which is a perfect showcase of how a lack of alarmed sense of an on-going pandemic could lead to massive death counts as well as burden the medical system. If the whole population could embrace a better hygiene standard and act everyday life as if there is a pandemic going on, some outbreaks could be avoided and the taxation on the healthcare industry would also be avoided, which in turn lessens emission and pollution that contributes to climate change.

4. EXPECTED PROBLEMS

4.1. Mental health and other issues of teleworking

Regardless of environmental benefits in practicing prolonged quarantine, remote working from home could pose various drawbacks. One of the most prominent side effects is mental health issues caused by remote working and quarantine. A study has shown, social isolation during the COVID-19 quarantine has made people originally prone to mental health issues higher risk while those already struggling with mental health endure more severe conditions [13]. While working from home, some originally possible social contacts such as greeting while passing by others' desks would be missed and people will be working in a more isolated environment. Thus, companies should pay special attention to their employees' mental health while adapting to a virtual working environment and many of them have already employed activities such as virtual chatrooms during break time. Another problem posed by this is the communication between company members as it becomes harder to talk with other members for advice on certain obstacles, which might

end up reducing the overall productivity. Whether teleworking would decrease productivity is often discussed while commonly left without a definitive answer. While it is true that one might be more easily distracted, there are others just dwell on working alone. However, the innate struggle that teleworking bears is the difficulty in monitoring the workers' performance and a statistical analysis usually comes with some biases [7]. And this ambiguity might obstruct the company boards from making the decision of shifting to a remote working environment. Therefore, plans to restructure company's working culture and communication tunnel are the keys of improving the overall productivity as they would help negate such issues.

4.2. Economic depression

Another expected challenge is economic impacts. Massive unemployment has been recorded since the COVID-19 outbreak as a result of the global shut down. One common action linked to unemployment is suicide while each death from suicide is accompanied by 20 suicide attempts [14]. With the expected number of unemployment, the study predicts an increased burden on the medical system due to increased suicide attempts in the close future [14]. Such a problem would not be easily solved. Given that automation is already gradually taking over existing jobs, the ongoing pandemic situation and future protocol would only increase the rate of automation and job loss [15]. In addition, one model predicts that the global impact of COVID-19 could be long-lasting and create a decade of increased poverty rates [16]. Such poverty would also prevent the workforce from converting to a more STEM-focused group through education. Ultimately, the economy might collapse and countries will take all measures to prevent such an outcome, which is why countries are so eager to reopen productions during the COVID-19 pandemic. As though a reduction in CO₂ emission has been observed, a retaliatory "rebound" in emission is highly possible as countries try to rebuild the economy by increasing production [3]. This also in a way shows that one deciding factor in combating climate change is that the economy could not be negatively affected by any proposed plans. Although seeming somewhat inevitable, countries expecting mass upcoming unemployment wave should adopt well-structures support programs to aid the newly unemployed to find other job and to train novel skills needed by the market. On top of that, environmental acts that force factories to limit and reduce emission and pollution should also be enforced in anticipation of such rebound effect, and those acts will keep the damage at a more acceptable level.

5. CONCLUSION

As the ongoing pandemic continues and each country has a differed strategy and recovery state, it is nearly impossible to accurately measure the global impact that COVID-19 had on climate change. There also exist both economic and health drawbacks for a prolonged social distancing practice. At the current stage of global recovery, the exact impact is still ambiguous and might even be malevolence towards the climate in the end. However, the steadily increasing average temperature and decreasing arctic sea ice content suggest something must be wrong with the current model of development and changes must be made to alter the increasingly rapid climate changes. Global warming is a problem predicted in the last century and has only just started to show its destructive potentials in this century. Another challenge faced in this century is the inevitable global pandemics induced by population migrations. This article disclosed some inseparable links between these two challenges. By dealing with the spread of infectious diseases through measures like quarantine, some aspects contributing to global warming can also be alleviated. However, there exists a lack of research on the population's opinion on prolonged social distancing given the fact that it helps to combat climate change. Further, studies in search of a new industry structure that is better suitable for remote workers and automation is in dire need as the current model is clearly not designed for the next generation industrial design such as the implantation of robots. Despite all the uncertainty discussed in this article and as the discussion has shown, quarantine did have a positive impact on climate change and this impact can be logically explained to establish a strong causal effect of its employment in combating global warming.

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REFERENCES

- [1] NSIDC. Arctic Sea Ice News and Analysis. July 16, 2020. <https://nsidc.org/arcticseaicenews/2020/07/>
- [2] S. Kew, S. Philip, G.J. Van Oldenborgh, A. Skålevåg, & P. Lorenz. Prolonged Siberian heat of 2020. 2020, 35.
- [3] C. Le Quéré, R.B. Jackson, M.W. Jones, A.J.P. Smith, S. Abernethy, R.M. Andrew, A.J. De-Gol, D.R. Willis, Y. Shan, J.G. Canadell, P. Friedlingstein, F. Creutzig, & G.P. Peters. Temporary reduction in daily global CO₂

emissions during the COVID-19 forced confinement. *Nature Climate Change*, 2020, 10(7): 647–653. <https://doi.org/10.1038/s41558-020-0797-x>

[4] US EPA, O. Sources of Greenhouse Gas Emissions [Overviews and Factsheets]. US EPA. April 11, 2020. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

[5] A. Quicke, & E. Jones. Grounded | Civil aviation emissions reductions under COVID-19 in Australia and globally and the potential long-term impacts to emissions in the sector. 2020. https://www.tai.org.au/sites/default/files/P894%20Grounded%20-%20Aviation%20Emissions%20during%20Covid-19%20%5BWEB%5D_0.pdf

[6] R. Sims, R. Schaeffer, F. Creutzig, X. Cruz-Núñez, M. D'Agosto, D. Dimitriu, M.J. Figueroa Meza, et al.. Transport. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, et al.] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 2014.

[7] K. Guyot, I.V. Sawhill. Telecommuting will likely continue long after the pandemic. Brookings. April 6, 2020. <https://www.brookings.edu/blog/up-front/2020/04/06/telecommuting-will-likely-continue-long-after-the-pandemic/>

[8] A. Kelley. Delivery services see a surge in business amid coronavirus crisis. TheHill. 2020. <https://thehill.com/changing-america/resilience/smart-cities/488694-despite-grim-economic-news-many-companies-are-hiring>

[9] C. Mercer. How health care contributes to climate change. *CMAJ: Canadian Medical Association Journal = Journal de l'Association Médicale Canadienne*, 2019, 191(14): E403–E404. PubMed. <https://doi.org/10.1503/cmaj.109-5722>

[10] J.D. Sherman, A. MacNeill, & C. Thiel, C. Reducing Pollution From the Health Care Industry. *JAMA*, 2019, 322(11): 1043-1044. <https://doi.org/10.1001/jama.2019.10823>

[11] D.E. Bloom, & D. Cadarette. Infectious Disease Threats in the Twenty-First Century: Strengthening the Global

Response. *Frontiers in Immunology*, 2019, 10: 549–549. PubMed. <https://doi.org/10.3389/fimmu.2019.00549>

[12] J. Frenk, O. Gómez-Dantés, & F.M. Knaul. Globalization and Infectious Diseases. *Infectious Disease Clinics*, 2011, 25(3): 593–599. <https://doi.org/10.1016/j.idc.2011.05.003>

[13] K. Usher, N. Bhullar, & D. Jackson. Life in the pandemic: Social isolation and mental health. *Journal of Clinical Nursing*, 2020, 29(15-16), 2756-2757. <https://doi.org/10.1111/jocn.15290>

[14] W. Kawohl, & C. Nordt. COVID-19, unemployment, and suicide. *The Lancet. Psychiatry*, 2020, 7(5): 389-390. PubMed. [https://doi.org/10.1016/S2215-0366\(20\)30141-3](https://doi.org/10.1016/S2215-0366(20)30141-3)

[15] D. Bloom, & K. Prettnner. The macroeconomic effects of automation and the role of COVID-19 in reinforcing their dynamics. June 25, 2020. VoxEU.Org. <https://voxeu.org/article/covid-19-and-macroeconomic-effects-automation>

[16] M.K. Anser, Z. Yousaf, M.A. Khan, A.A. Nassani, S.M. Alotaibi, M.M. Qazi Abro, X.V. Vo, & K. Zaman. Does communicable diseases (including COVID-19) may increase global poverty risk? A cloud on the horizon. *Environmental Research*, 2020(187): 109668–109668. PubMed. <https://doi.org/10.1016/j.envres.2020.109668>