Natural Capital Exploration and Coronavirus Disease Spread in 2020

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Abstract

The potential relationship between nature and Coronavirus disease 2019 (COVID-19) is provided using cross-sectional macro-data collected including 17 countries of major developed and developing nations whose number of cases were greater than 500 in March 15th 2020. We found that the correlation coefficient is −0.46 between fisheries stock average growth rate per capita from 1994 to 2014 and number of COVID-19 cases in 2020. It suggests that the damage of lives under water and cases of COVID-19 might be associated.

Keywords

Natural Capital, COVID-19, Fisheries

1. Introduction

As of January 27, 2022, around 300 million people had been confirmed as being infected with the novel coronavirus according to Worldometer (2022) and WHO (2020). The coronavirus (COVID-19) outbreak originated in 2019 and, within half a year, spread to six continents and over 200 countries and territories, so it is undoubtedly crucial from the public health perspective to develop vaccines (Malik et al., 2020; Machingaidze & Wiysonge, 2021; Corey et al., 2020; Kaur & Gupta, 2020; Soares et al., 2021; Murphy et al., 2021; Dean et al., 2021; Walter et al., 2022; Polack et al., 2020; Abu-Raddad et al., 2021; Krause et al., 2020; Razai et al., 2021; Biasio et al., 2021) and drugs (Kumar & Trivedi, 2021; Galindez et al., 2021; Asai et al., 2020; Muratov et al., 2021; Keshavarzi Arshadi et al., 2020; Khan & Al-Balushi, 2021; Back et al., 2020; Mullard, 2020; Arora & Bist, 2020; Wang & Guan, 2021; Shuman et al., 2020) and to maintain social distancing (Sun & Zhai, 2020; Syam et al., 2020; Baber, 2022; Saxena et al., 2021; Iachini et al., 2021; Romania, 2020; Curşeu et al., 2021; Unger & Meiran, 2020; Zhao et al., 2020; Narayanan et al., 2020; Painter & Qiu, 2020; Piao et al., 2021) while, at the econom-

ic level, helping businesses and the unemployed. With the outbreak not yet under control, it is prudent to understand and respond to it from a broad range of perspectives, especially that of people's dependence on ecological resources.

However, little attention has been paid to the relationship between the outbreak and natural resource management. Matters that are not directly related to controlling the outbreak are often ignored, such as deforestation, air and water pollution, the consumption of wildlife, over-exploitation of energy, and the inappropriate management of natural resources (such as fisheries). Planetary health is closely related to the health of human beings, however, so a return to previous modes of resource management is inconsistent with the healthy, sustainable development of the earth. Thus, an in-depth exposition of the relationship between the outbreak and natural resource management may become a crucial factor in preserving human health in the long run while social distancing, vaccines are currently crucial for disease control.

When the development of vaccines, drugs, and social distance continues investigation in the proceeding literature (Malik et al., 2020; Machingaidze & Wiysonge, 2021; Corey et al., 2020; Kaur & Gupta, 2020; Soares et al., 2021; Murphy et al., 2021; Dean et al., 2021; Keshavarzi Arshadi et al., 2020; Khan & Al-Balushi, 2021; Back et al., 2020; Mullard, 2020; Arora & Bist, 2020; Wang & Guan, 2021; Shuman et al., 2020; Unger & Meiran, 2020; Zhao et al., 2020; Narayanan et al., 2020; Painter & Qiu, 2020), the relationship between the reduction of the natural capital and the pandemic is scarce. This study aims to provide evidence to present this relationship between the reduction of natural capital (e.g., fisheries) and the COVID-19 pandemic. As the outbreak is ongoing, a broad range of perspectives is necessary to understand the pandemic comprehensively. Highlight the importance of natural conservation to enhance the lives living environment.

2. Analysis and Results

A perspective of the correlation between nature (in terms of the natural resource management capability, including sanitary base) and diseases might provide evidence for understanding COVID-19 in a multidisciplinary manner. Previous scholars emphasize the relation between nature and sustainability, warning that economic indicators omitting natural resources and the ecosystem are misleading (Barbier, 2014; Dasgupta et al., 2015; Managi & Kumar, 2018; Polasky et al., 2019; Worldometer, 2022). This background motivated us to investigate the correlation between nature capital and the incidence of COVID-19.

Cross-sectional macro-data of 17 major developed and developing nations where the number of COVID-19 cases was greater than 500 as of March 15, 2020, were used. In the early days, when governments were not strictly involved in pandemic lockdown measures, the data might provide a close picture of the link between natural resources and outbreaks. The data includes the monetary-based average growth rate of natural capital, forests, and fisheries per capita from the United Nations Inclusive Wealth Report for 2018, while the numbers of COVID-

19 patients and deaths as on March 15 were collected (WHO, 2020; Managi & Kumar, 2018). The list of 17 countries includes Austria; Belgium; Japan; Denmark; Netherlands; Sweden; Norway; UK; Switzerland; USA; France; Germany; Spain; S. Korea; Iran; Italy; China.

The descriptive statistics of variables are displayed in Table 1. On average, there was 8805 infected COVID-19 case until 15th March 2020 among 17 major nations, and the average death of patients is 339. Regarding the natural capital growth in the recent decades, on average, the natural capital decreased by 1.05%, and the fisheries are reduced rapidly, reaching 0.9%. The average growth of renewable natural capital is slightly positive, whereas the average growth rate of the forest is negative values. The detailed information is presented in Table A1.

The correlation between the average growth rate of fisheries stock and the number of COVID-19 cases is −0.46 (see Table 2), which suggests that continuous reduction of fishery stock from 1994 to 2014 positively contributes to the number of COVID-19 cases in 2020. As a comparison, the correlation between forest stocks, natural capital, and the number of COVID-19 cases, is −0.07 and 0.12, respectively. When sampled with countries where the number of cases is

Table 1. Descriptive statistics of variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
Total cases	17	8805	19348	655	80824
Total death	17	339	821	1	3199
Growth of Natural Capital	17	−0.0105	0.0157	−0.0440	0.0160
Growth of Renewables	17	−0.0019	0.0074	−0.0140	0.0160
Growth of Forest	16	0.0011	0.0185	−0.0590	0.0210
Growth of Fisheries	15	−0.0090	0.0144	−0.0320	0.0160

Note: the average growth rates are between 1994 to 2014 from Managi & Kumar (2018) and Number of Cases and Death are from Worldometer (2022) in 15th March 2020. The list of 17 countries includes Austria; Belgium; Japan; Denmark; Netherlands; Sweden; Norway; UK; Switzerland; USA; France; Germany; Spain; S. Korea; Iran; Italy; China.

Table 2. Correlation between nature and incidence of COVID-19 (number of Cases > 500).

	Correlation coefficient
(Fisheries stock, Number of Cases)	−0.46
(Forest stock, Number of Cases)	−0.07
(Natural Capital, Number of Cases)	0.12
(Fisheries stock, Number of Deaths)	−0.44
(Forest stock, Number of Deaths)	−0.08
(Natural Capital, Number of Deaths)	0.13

Note: Average growth rate is from 1994 to 2014. Natural capital (17 countries), fisheries (15 countries), forest (16 countries).

greater than 2000, the correlation coefficients of fisheries stock, forest stock, and natural capital become −0.58, −0.53, and −0.48, respectively. This indicates that the relationship between natural capital, forests, and COVID-19 are heterogeneous. Consistent results are obtained by the number of COVID-19 deaths.

The question is how to reshape human behavior to achieve the goal of ecologically sustainable development. Revealing the relationship between individual sustainability/unsustainability and planetary sustainable/unsustainability and further clarifying and valorizing that relationship may inspire viable solutions for modifying individual behavior to achieve planetary sustainability (Malik et al., 2020; Machingaidze & Wiysonge, 2021; Corey et al., 2020; Kaur & Gupta, 2020; Soares et al., 2021; Murphy et al., 2021; Dean et al., 2021; Keshavarzi Arshadi et al., 2020; Khan & Al-Balushi, 2021; Back et al., 2020; Piao, 2021; Mullard, 2020; Arora & Bist, 2020; Wang & Guan, 2021; Shuman et al., 2020; Unger & Meiran, 2020; Zhao et al., 2020; Piao et al., 2020; Narayanan et al., 2020; Painter & Qiu, 2020; Piao et al., 2022; Barbier, 2014; Dasgupta et al., 2015; Managi & Kumar, 2018; Polasky et al., 2019). For example, it is known that coronavirus is associated with the culture of consuming wild animals. Individual involvement in capturing, selling, and consuming wild animals may cause a loss of well-being in terms of health and social capital, and that loss may exceed what is gained from involvement with wild animals. Evaluating that loss may reshape individual behavior to achieve individual sustainability, and, on that principle, it is also possible to change seafood consumption behavior (and other environmentally harmful human behaviors) to achieve the goal of ecologically sustainable development.

The limitations of this study are acknowledged as follows. This study presents the relationship between nature and Coronavirus disease 2019; however, the sample in the analysis is macro-data, and the sample size is relatively small. Changing the sample collection might influence the results of the study. More comprehensive datasets are necessary to investigate the covid-19 pandemic and natural capital in the future.

3. Conclusion

Referring to the world health organization, around 300 million COVID-19 infected cases are confirmed until January 27th, 2022. When the mechanism of vaccines, drugs, or social distancing are well examined, the investigation of the natural environment and COVID-19 is scarce. This study aims to explore the relationship between the natural capital and COVID-19 spread. The natural capital includes the growth of natural capital, growth of renewables, growth of forests, and growth of fisheries during 1994 to 2014. To reveal the association between the initial spread of the covid-19 pandemic and natural exploration, the 17 nations with greater than 500 infected cases until March 15th, 2020, were collected. The 17 nations contain Austria, Belgium, Japan, Denmark, Netherlands, Sweden, Norway, UK, Switzerland, USA, France, Germany, Spain, S. Korea,

Iran, Italy, and China. The Pearson correlation coefficient method is adopted to present the relationship between natural capital and the COVID-19 pandemic.

The nations with a rapid decrease in fishery stock from 1994 to 2014 were associated with the initial spread of the coronavirus disease 2019 disease. Consistent results were confirmed using the number of COVID-19 death cases. On the contrary, for the other category of natural capital, including forest stock and overall natural capital, the correlation between forest stock and overall natural capital and the numbers of infected cases of COVID-19 were moderate. Consistent results were confirmed using the number of COVID-19 death cases. It is thought that human activities are a major contributor to the ongoing natural environment issues (Polasky et al., 2019). Appropriate approaches lead humanities to reshape their behavior toward economic and environmental sustainability. Reducing the consumption amount of underwater lives or wild animals to protect their lives might lead to a better living environment for all lives.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix

Table A1. Average growth rate of nature and number of cases and death.

Country	Total cases	Total death	Growth of Natural Capital	Growth of Renewables	Growth of Forest	Growth of Fisheries
Austria	655	1	−0.001	0.002	0.005	
Belgium	689	4	0.016	0.016	0.015	0.016
Japan	804	22	−0.009	−0.007	0.002	−0.008
Denmark	827	1	−0.033	−0.014	0.012	−0.018
Netherlands	959	12	−0.03	−0.005		−0.008
Sweden	961	2	−0.013	−0.013	−0.014	−0.012
Norway	1109	3	−0.035	0.003	0.009	−0.006
UK	1140	21	−0.044	−0.01	−0.059	−0.023
Switzerland	1375	13	−0.001	−0.001	0.003	
USA	2836	57	−0.006	0.002	0.003	−0.001
France	4469	91	0	0	0.006	−0.014
Germany	4599	9	−0.006	0.003	0.008	0.008
Spain	6391	196	0.002	0.004	0.012	0.013
S. Korea	8162	75	−0.003	−0.001	0.021	−0.014
Iran	12729	611	−0.006	−0.01	−0.009	−0.032
Italy	21157	1441	−0.002	0	0.011	−0.004
China	80824	3199	−0.008	−0.002	−0.008	−0.032

Data sources: the average growth rates are from Managi & Kumar (2018) and Number of Cases and Death are from Worldometer (2022) in 15th March 2020.