News Release

Title

Influence of COVID-19 on the 10-year carbon footprint of the Nagoya University Hospital and medical research centre

Key Points

・The greenhouse gas emissions from a large healthcare facility which should be close to the actual emissions were presented over a 10-year period based on multiple factors.

・The aging of the population and COVID-19 pandemic could explain why there was a trend of increasing greenhouse gas emissions per hospitalization.

・It is highly important to promote public health measures such as vaccination in order to reduce the healthcare burden possibly caused by the aging society.

Summary

A research group led by Takanori Yamamoto, a lecturer and Hikaru Morooka, a former clinical fellow at the department of emergency and ciritical care medicine of Nagoya University Graduate School of Medicine, (currently Norwegian University of Science and Technology), and Professor Shoichi Maruyama at the department of nephrology of Nagoya University Graduate School of Medicine reported the carbon emissions of a large medical institution (Nagoya University Hospital and Graduate School of Medicine (NUH)) over a ten-year period based on multiple factors. They reported on several factors and applicable local emission factors and evaluated how the emissions have changed over the last 10 years including COVID-19 pandemic time. Previously, the greenhouse gas emissions at a medical setting have been mainly reported in operation rooms, a dialysis center, and army hospital with short periods of time.

The results showed that the carbon emissions at NUH resulting from electricity and gas have decreased over the years due to energy conservation and the use of renewable energy in Aichi. However, the overall carbon emissions at NUH have increased due to the rising consumption of pharmaceuticals and medical materials associated with the aging society.

There was a possible influence by COVID-19 from April 2020. That is, not only did the infectious medical waste increase, but the consumption of the pharmaceuticals and medical materials rised due to the increasing severity of patients, resulting in an increase in carbon footprint per hospitalization compared with other years. Nonetheless, because the total number of patients decreased at NUH in 2020, leading to an overall decrease in carbon

emissions compared with those in 2018 and 2019.

The Paris Agreement and COP 26 call for reducing the greenhouse gas emissions in order to prohibit the global average temperature from increasing more than 2.0°C compared to pre-industrial times. The Japanese government declared to achieve carbon neutrality by 2050. On the other hand, the medical industry has been reported to produce 5-10% of the society's total carbon emissions.

Based on this study, the amount of the carbon emissions from the clinical setting may increase in the future, because the world is facing the aging society. It is more and more important to promote public health measures such as vaccinations and preventative medicine, because the carbon footprint can increase due to the aging society in the world.

There are two higfly important lessons from the research. First, it is urgent for the medical society to evaluate the reality of medical carbon emissions, because the medicine cannot sacrifice the future generations using an excuse to save only the present patients. Second, it is important to promote the public health measures to reduce the future medical demands. It can be highly crucial to acknowledge the importance of the vaccination and preventative medicine from a sustainable perspective.

Research Background

Climate crisis is a matter of concern that affects all the humankind, and it is highly urgent to reduce the carbon emissions. Based on the economic analyses, the carbon emissions from the healthcare industry are reported to ocuupy 5~10% of the entire emissions. Thus, it is mandatory for the humankind to deal with this climate crisis, including the medical society.

Research Results

The carbon emissions over the last 10-year at the Nagoya University Hospital and Graduate School of Medicine was studied. The research found out that the carbon emission at the Nagoya University Hospital has been increasing about 25% over the last 10 years. While the carbon emissions from the gas and electricity use have been decreasing due to energy conservation and the use of renewable energy, the greenhouse gas emissions from the use of pharmaceuticals and medical materials have increased, probably due to the aging society and COVID-19 pandemic.

Research Summary and Future Perspective

The research shows both the importance and reality of accurately measuring and evaluating the carbon emissions at the medical facilities around the world. Moreover, the COVID-19 impact highlighted the increasing medical demand in the Naogya University Hospital. In the future, further studies are required to investigate on how the medical sectors emit the carbon

footprint in a larger picture. Furthermore, the importance of the publich health measures is noted more than ever in regards of protecting the health of the people but also the health of the future generation.

Publication

Journal: Globalization and Health
Title: Influence of COVID-19 on the 10-year carbon footprint of the Nagoya University Hospital and medical research centre
Author: Hikaru Morooka[1,2], Takanori Yamamoto[2], Akihito Tanaka[3],
Kazuhiro Furuhashi[3] ,Yasuhiro Miyagawa[4] ,Shoichi Maruyama[5]
Affiliation:
1.Department of Public Health and Nursing Norwegian University of Science and Technology N-7491 Trondheim Norway
2.Department of Emergency and Critical Care Medicine Nagoya University Graduate School of Medicine Tsurumai-cho, 65, Showa Ward 466-8560 Nagoya Aichi Japan
3.Department of Nephrology Nagoya University Hospital Tsurumai-cho, 65, Showa Ward 466-8560 Nagoya Aichi Japan
4.Department of Hospital Pharmacy Nagoya University School of Medicine Tsurumai-cho, 65, Showa Ward 466-8560 Nagoya Aichi Japan
5.Division of Nephrology Nagoya University Graduate School of Medicine Tsurumai-cho, 65, Showa Ward 466-8560 Nagoya Aichi Japan

DOI: 10.1186/s12992-022-00883-9

Japanese ver.

https://www.med.nagoya-u.ac.jp/medical_J/research/pdf/Glo_221124.pdf