

Innovation in Preventive Medicine through the Integration of Epidemiological Research and Data Science



Name : **Sho NAKAMURA**

Acquired Degrees : Yamagata University, M.D., Ph.D. (Medicine)

Affiliation : Graduate School of Health Innovation

Research Areas : Epidemiology, Preventive Medicine, Data Science

Keywords : Genetic Epidemiology, DEA, Cohort Studies, Personalized Medicine

Research Activities

1. Innovation in Preventive Medicine through DEA

I focus on applying Operations Research to preventive medicine. I pioneered Data Envelopment Analysis in this field, proving through a randomized controlled trial that health risk assessment using "efficiency scores" outperforms conventional methods. This work was published in BMJ Open^{*1} as a new indicator for health services.

^{*1} Nakamura S, et al. BMJ Open 2023; 13(5): e070187

2. Development and Social Implementation of the ME-BYO Index

With Kanagawa Prefecture, I analyzed data from the ME-BYO Cohort Study^{*2} to refine the "ME-BYO Index" that quantifies the state between health and illness. Demonstration studies across municipalities now promote behavioral change through health visualization.

^{*2} <https://www.me-byo-cohort.jp/>

3. Personalized Prevention through Gene-Environment Interaction

Using nationwide epidemiological research (J-MICC Study) and the Kanagawa ME-BYO Cohort Study, I research how genetic polymorphisms interact with lifestyle factors in disease development.

4. Gut Microbiota Research

Through the ME-BYO Cohort Study, I examine relationships between gut microbiota and health indicators. Our findings on locomotive syndrome and gut environment were published in NPJ Aging^{*3}, while my novel DEA application to gut microbiota analysis appeared in Current Development in Nutrition^{*4}.

^{*3} Matsuki T, Nakamura S, et al. Curr Dev Nutr 2024; 8(11): 104469.

^{*4} Nishiyama M, Nakamura S, et al. 2024; 10(1): 55.

5. Multi-disciplinary Collaboration

I lead over 20 industry-academia-government research projects, including cancer screening quality management with Yokohama Medical Association and partnerships with universities like Keio and Tohoku. I also conduct international research with institutions including the National University of Singapore.

Message

My research theme "Innovation in Primary Prevention" aims to realize data-driven personalized prevention through DEA, machine learning, and effective interventions to make preventive medicine more accessible.

I strive to build preventive medicine that benefits society by connecting clinical knowledge, research, and implementation. Please contact me for collaboration opportunities.