

ABSTRACT

Three Essays on Economic Analysis of Health Care: Focusing on Efficiency, Equity, and Effectiveness

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Health care is one of the major research fields in health economics. This thesis analyzes health care activities from an economic perspective, focusing on the efficiency of health care delivery, income-related inequalities in health care consumption, and the causal impacts of health checkups on health care. The first chapter evaluates the efficiency and productivity of surgical treatments across surgical specialties in a high-volume Japanese teaching hospital. The second chapter examines income-related inequalities in health care utilization and spending under universal coverage in a long-term perspective for the case of the Republic of Korea. The third chapter investigates the causal relationship between participation in health checkups and health care expenses and use under the Japanese healthcare system.

Chapter one evaluates the efficiency and productivity of surgical treatments across surgical specialties in a high-volume Japanese university hospital. Japan's healthcare expenditures, which are largely publicly funded, have been growing dramatically due to the rapid aging of the population as well as the innovation and diffusion of new medical technologies. The efficiency and productivity of healthcare providers is a critical issue to maintain or improve the existing quality of health care under the constraint of tight government financial resources. In particular, a large amount of hospital resources are utilized in surgical procedures in the inpatient care setting; annual costs for surgical treatments are estimated to be approximately USD 20 billion. Using unique longitudinal clinical data at the individual surgeon level, this chapter aims to estimate the technical efficiency of surgical treatments across surgical specialties in a high-volume Japanese teaching hospital by employing stochastic frontier analysis (SFA) with production frontier models. We simultaneously examine the impacts of potential determinants that are likely to affect inefficiency in operating rooms. Our empirical results show a relatively high average technical efficiency of surgical production, with modest disparity across surgical specialties. However,

there is room to reorganize and improve resource utilization in the operating rooms of surgical specialties that show lower technical efficiency. We also demonstrate that an increase in the number of operations performed by a surgeon significantly reduces operating room inefficiency, whereas the revision of the fee-for-service schedule for surgical treatments does not have a significant impact on inefficiency. In addition, we find higher technical efficiency among surgeons who perform multiple daily surgeries than those who perform a single operation in a day. We suggest that it is important for hospital management to retain efficient surgeons and physicians and provide efficient healthcare services given the competitive Japanese healthcare market.

Chapter two considers income-related inequality in health care under universal coverage from a long-run perspective in the case of the Republic of Korea. Many countries have sought to promote well-being for their entire populations through the implementation of universal health coverage (UHC). To identify the extent to which UHC has been attained, it is necessary to evaluate equity of access to use of needed care and the cost burden of health services for the country's entire population. Exploiting longitudinal data from a nationally representative health survey from 2008 to 2018, this chapter investigates how income-related inequalities in health care use and spending in Korea have varied over time and examines the extent to which need and non-need factors contribute those inequalities, using an in-depth decomposition analysis, allowing for heterogeneous responses across income groups. The empirical results show that overall health care utilization is disproportionately concentrated among the poor over both the short and long run. Income-group differences and household characteristics, such as marital status, make larger pro-poor contributions to inequality in inpatient care use, while chronic disease prevalence greatly pushes outpatient care utilization in a pro-poor direction. These considerations suggest that it is important for health care policy in Korea to focus on improvements in the health status and well-being of low-income groups, as poor people are likely to be in poorer health. The results regarding inpatient care expenses indicate a similar pattern of pro-poor bias, implying that higher spending on inpatient care may be a heavier financial burden for low-income people. Long-run inequality favors the better-off in terms of outpatient care expenses, where the contribution of income-group differences has the largest impact. People in high-income groups may spend most on costly services in outpatient care, including uninsured services, with the help of additional private health insurance.

Chapter three investigates the causal relationship between participation in health checkups and health care under the Japanese healthcare system. There exists a globally growing concern regarding the prevention and control of non-communicable diseases (NCDs), and Japan is no exception wherein lifestyle-related NCDs have a significant impact on public health. To prevent the prevalence of metabolic syndrome and control the rising healthcare costs, the Japanese government initiated a novel annual health checkup initiative, known as the Specific Health Checkups (SHC) and Specific Health Guidance (SHG), which targets individuals aged 40-74 years in April 2008. Utilizing distinctive longitudinal administrative data at the individual enrollee level for the periods between fiscal year (FY) 2011 and FY 2016, graciously provided by a local municipality in Japan, this chapter examines the causal impacts of taking the SHC on their health care expenditures and utilization for inpatient and outpatient care services. We employ an instrumental variable (IV) estimation that relies on regional variation in peer effects as a determinant in the individual's decision, allowing for a deeper investigation into the heterogeneous impacts with specific demographic groups. Our IV estimation for the entire sample demonstrates little significant effects of the SHC participation on health care expenses and use in both the same and the subsequent FYs at the intensive margin, given that it proves to be a sufficiently strong instrument. We only find that it may have a small possibility of reducing inpatient care utilization in the following FY. However, our stratification analysis uncovers distinct patterns. Individuals under the age of 65 years may decrease their inpatient care utilization in the subsequent FY, while the elderly over 65 years of age are inclined to raise their annual expenses for physician visits in the year following the SHC participation. Additionally, males tend to increase their annual expenditures for hospital admission soon after participating in the SHC. Conversely, females are more likely to reduce their use of hospitalization through the SHC participation. These findings emphasize the necessity of providing the SHC participants with tailor-made follow-up care, beyond the SHG, considering the heterogeneous causal effects within different demographic groups.

ACKNOWLEDGMENTS

First and foremost, I would like to express my deepest gratitude to my supervisor, Professor Haruko Noguchi, for her continuous support and encouragement. My doctoral work at the Graduate School of Economics, Waseda University has always been behind the expected schedule. My research and this dissertation would not have been accomplished without her persistent help and encouragement. I would also like to extend my thanks to Professor Toshihide Arimura (Waseda University) and Dr. Rei Goto (Keio University) in my doctoral committee for their insightful comments and questions. Their comments and suggestions have helped improve my dissertation.

For the research described in chapter one, we would like to sincerely thank to Teikyo University Hospital, which allowed us to utilize the valuable data on surgical records. We also gratefully acknowledge the financial support from Waseda Institute of Social& Human Capital Studies (WISH) for travel expenses to present this paper at an international academic conference, and appreciate the Waseda Institute of Political Economy (WINPEC) for its financial support. Our special thanks go to Dr. Akira Kawamura (Waseda University) for providing valuable comments, and Dr. Hiroyuki Kawaguchi (Seijo University) for discussing our paper at the 13th Annual Conference of the Japan Health Economics Association (JHEA). Further, we would like to extend appreciation to those who participated in the 5th European Health Economics Association (EuHEA) PhD Student-Supervisor and Early Career Researcher Conference for their helpful comments and suggestions. This work was supported by the Japan Society for the Promotion of Science (JSPS) KAKENHI Grant Number 17K09247 to Dr. Yoshinori Nakata (Teikyo University).

For the study described in chapter two, I am sincerely grateful to Korea Institute for Health and Social Affairs, which provided me with valuable data on the Korea Health Panel Survey. I also express my gratitude to Dr. Toshiaki Aizawa (Hokkaido University) for discussing my paper at the 17th Annual Conference of the JHEA. Further, I would like to extend appreciation to Dr. Owen O'Donnell (Erasmus University Rotterdam) and Dr. Tom Van Ourti (Erasmus University Rotterdam) for providing valuable comments and suggestions at the Tinbergen Institute Summer School on Inequalities in Health and Healthcare. My special thanks go to Dr. Haruko Noguchi (Waseda University), Dr. Narimasa Kumagai (Seinan Gakuin University) and those who

participated in the 15th International Health Economics Association (IHEA) World Congress for their helpful comments. This work was supported by the JSPS Grant-in-Aid for Early-Career Scientists (Grant Number 18K17341).

For the research presented in chapter three, we would like to sincerely express our appreciation to Mr. Nobuyuki Izumida (National Institute of Population and Social Security Research), who provided us with valuable data on the administrative records of a municipality in Japan as well as useful information on data characteristics and institutional background. We also extend our special thanks to those who participated in the 13th IHEA World Congress for their helpful comments. This work was supported by the JSPS KAKENHI Grant Numbers 15H03365 and 20K02230 to Mr. Nobuyuki Izumida.

Lastly, I am deeply thankful to my parents and brother for their long-standing support and care with affection.