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**Report on Joint Research with Keio University Nakajima Research Laboratory
at the 2023 Japanese Economic Association Spring Meeting**

Japan System Techniques Co., Ltd. (JAST) is announcing the report concerning results obtained at this stage of the joint research project with Keio University for increasing the use of generic drugs. The details are as per attached.

The earnings forecast to be announced on May 12, 2023 incorporates the effect of this matter on the results of operations for the fiscal year ending March 2024. An announcement will be made promptly if there is any additional information that should be disclosed.

June 27, 2023

Japan System Techniques Co., Ltd.

Report on Joint Research with Keio University Nakajima Research Laboratory at the 2023 Japanese Economic Association Spring Meeting

Interim results of the joint research project of Japan System Techniques Co., Ltd. (JAST) and the Nakajima Research Laboratory of Keio University for increasing the use of generic drugs were announced at the 2023 spring meeting of the Japanese Economic Association (JEA).

■ Summary of the Research Project

In July 2022, JAST and Keio University began a joint research project about increasing the use of generic drugs. The objective is to devise effective methods for helping to raise the use of generic drugs (note 1) to more than 80% of all prescription drug use in every prefecture of Japan by the end of March 2024. This is the goal of the Japanese Ministry of Health, Labour and Welfare.

(Refer to <https://www.jast.jp/news/14800/>)

At the 2023 spring JEA meeting, which took place on May 27 and 28, results achieved as of the current stage of the research project were announced.

■ Presentation

Heterogeneous Adoption and Supply Constraints in Generic Pharmaceuticals

■ Details

By using health insurance invoice data (note 2), this research project is examining the relationship between authorized generics (AG, note 3) prescribed for patients and the utilization rates of generic drugs. Analysis of health insurance invoice data for prescriptions resulted in data demonstrating that, for AG antibiotics, prescribing AGs at pharmacies raised the generic drug utilization rate by 28.5 percentage points. Furthermore, this analysis revealed that whether or not individual pharmacies used AG antibiotics is linked to factors involving pharmacies and patients.

In Japan, some generic drugs, which are called AG, are manufactured and sold by brand-name drug companies that also produce branded prescription drugs. The prices are the same as for other generic drugs. Previous research showed that people prefer AG because they believe the reliability is the same as for the equivalent brand-name drug (note 4). However, there is uncertainty about the relationship between AG use and the utilization rate of all generic drugs. As a result, this research project is focusing on antibiotics in Japan and examining how much the use of AG at pharmacies is influencing the utilization rate of generic drugs.

This research project differs from previous studies by using the new approach of examining simultaneously the roles of patients and pharmacies regarding the use of generic drugs. Although people prefer AG, pharmacies do not always provide the AG drugs that people want. Consequently, in order to determine the effect of AG on generic drug utilization rates, this research did not solely look at the preference of people for AG. There was also a need to take into consideration the activities of pharmacies that provide AG. By performing an economic analysis of the behavior of patients and pharmacies, this research demonstrated how much AG use affects the generic drug utilization rate.

The analysis showed that the use of AG antibiotics by pharmacies raised the generic drug utilization rate by an average of 28.5 percentage points. Furthermore, the size of this increase varies from prefecture to prefecture. These differences are attributable to the characteristics of the patients who receive AG and the pharmacies that provide prescription drugs. For

pharmacies, the differences are largely related to the size of pharmacies (note 5) and whether or not large pharmacy chains are used (note 6). The results of this analysis demonstrate that the use of AG by pharmacies depends greatly on the cost of AG and the supply chain. This provides valuable information for devising effective ways to further increase the use of generic drugs in Japan.

■ Upcoming Activities

The results of this research project are the result of the unique business practice in Japan of selling AG and other generic drugs at the same prices. Research in two areas will be performed to further raise the generic drug utilization rate. First is factors involving pharmacy and patient AG use to learn more about the causes and effects. Second is the relationship between government drug price policies and the policy for additional payments to pharmacies for using generic drugs.

Furthermore, due to the fact that the use of AG significantly affects how pharmacies are managed in all areas of Japan, this research project will seek ideas that are beneficial for insurance organizations and activities nationwide that help people remain in good health.

■ The Future Co-Creation Laboratory of JAST

The Future Co-Creation Laboratory of JAST is a medical big data business with the mission of using the digital transformation of health care backed by medical big data (invoice data, health check-up data and other data) to solve issues at healthcare facilities and insurance companies and organizations. This laboratory will continue to analyze information obtained from research activities in order to raise the value of JAST's data and create more ways to solve the issues of customers.

Operations of The Future Co-Creation Laboratory also contribute to accomplishing Sustainable Development Goals number three, good health and well-being, and nine, industry, innovation and infrastructure. These activities include the use of medical big data to enable people to stay healthy and the use of alliances with the academic sector for joint research and the development of products.



■ Profile of Ryo Nakajima

Ryo Nakajima (Contact for more information *Redirected to an external website: <https://sites.google.com/view/ryo-nakajima-lab/supervisor/>)

Professor, Department of Economics, Keio University

Background:

1994: Graduated from Department of Economics of Agriculture and Forestry, Faculty of Agriculture, Kyoto University

2004: Completed the doctoral course in Department of Economics, New York University (Ph.D. in Economics)

Professor Ryo Nakajima specializes in applied econometrics and was awarded the Ishikawa Prize of the Japan Economic Association in 2018. His research focuses on empirical analysis of social interactions, examining with data the mechanisms by which people influence each other through channels beyond the market and the external economies that emerge from these interactions.

■ The Japanese Economic Association website

<https://www.jeaweb.org/C00>

Note 1: Generic drugs are prescription drugs produced and sold after the patent of a prescription drug (brand name drug) has expired. Generic drugs have the same amount of effective ingredients and the same efficacy as those of the brand name drug (Source: Ministry of Health, Labour and Welfare).

Note 2: Health insurance invoice data

When an individual receives a medical treatment covered by insurance, the healthcare institution sends an invoice listing the procedures and amounts due to the insurance company or organization. For medical and dental care, an invoice listing the procedures and amounts due is sent. For pharmacies, an invoice listing the drugs supplied and amounts due is sent. For nurses visiting individuals at home, an invoice listing home nursing care services and amounts due is sent. One invoice for each patient and individual healthcare institution is prepared every month. Invoices contain information about the reasons that individuals received medical care, the cost of the care and other items. JAST converts this information into a database for subsequent utilization.

Note 3: Authorized generics are generic drugs produced with the permission of the original manufacturer by using the same ingredients and production method as those used for the original prescription drug.

Note 4: Aljoscha Janssen, Generic and Branded Pharmaceutical Pricing: Competition Under Switching Costs*, The Economic Journal, Volume 133, Issue 653, July 2023, Pages 1937–1967, <https://doi.org/10.1093/ej/uead021>

Note 5: Defined as the total number of prescriptions at each pharmacy.

Note 6: Group pharmacies in Basic Dispensing Fee 3 are defined as pharmacy chains.

Inquiries

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Contact for more information (redirected to an external website): <https://www.jastlab.jast.jp/contact/>

Website of The Future Co-Creation Laboratory: <https://www.jastlab.jast.jp/>