

CHALLENGES IN UTILIZING BIOBANKS AND EFFORTS TO SOLVE THEM IN JAPAN

M. Morita¹, Y. Inoue², M. Iwane¹, K. Kamikawa¹, M. Kurata³, A. Kohara⁴, Y. Sumita¹, T. Takeuchi⁵, H. Nishihara⁶, A. Hinomura³, T. Morisaki², S. Imoto², K. Matsuda², M. Hirata^{2,7}, H. Yokota⁸, K. Suzuki⁹, K. Ohneda⁹, F. Nagami⁹, S. Nagaie⁹, Y. Miyamoto⁹, K. Hattori¹⁰, T. Tomita⁹, E. Noiri¹¹, R. Matsumura¹⁰, R. Miyahara¹², K. Kitajima¹², K. Shiraishi⁷, S. Kawano¹³, H. Nakae¹⁴, M. Yoshida¹⁵, H. Terui-Kohbata¹⁵, M. Muto¹⁶, S. Matsumoto¹⁶, J. Inazawa¹⁵, T. Tanaka¹⁵, A. Takemoto¹⁵, H. Nishiyama⁵, T. Takagi¹³, Y. Murakami², Y. Goto¹⁰, S. Ogishima⁸

1. Okayama University, Okayama, Japan, 2. The University of Tokyo, Tokyo, Japan, 3. Shiga University of Medical Science, Shiga, Japan, 4. National Institutes of Biomedical Innovation, Health and Nutrition (NIBIOHN), Osaka, Japan, 5. University of Tsukuba, Ibaraki, Japan, 6. Keio University, Tokyo, Japan, 7. National Cancer Center (NCC), Tokyo, Japan, 8. Tohoku Medical Megabank Organization (ToMMo), Tohoku University, Miyagi, Japan, 9. National Cerebral and Cardiovascular Center (NCVC), Osaka, Japan, 10. National Center of Neurology and Psychiatry (NCNP), Tokyo, Japan, 11. National Center Biobank Network (NCBN), Tokyo, Japan, 12. National Center for Global Health and Medicine (NCGM), Tokyo, Japan, 13. Toyama University of International Studies, Toyama, Japan, 14. Council for Industrial use of Biological and Environmental Repositories (CIber), Tokyo, Japan, 15. Tokyo Medical and Dental University, Tokyo, Japan, 16. Kyoto University, Kyoto, Japan



INTRODUCTION

There are about 60 known academic biobanks in Japan (as listed by AMED, Japan's funding agency, on its website). It is thought that the samples and information stored in these biobanks has not been utilized as much as expected. This leads to issues such as the quantity of research results in relation to the cost invested in building and maintaining these biobanks, accountability to research participants and the public, and sustainability of biobanks. Therefore, there is a need for initiatives to promote the use of biobanks.

AIM

1. Questionnaire Survey

The aim of this study was to clarify why the use of biobanks has not progressed and to identify specific approaches that should be taken to promote its use.

2. Biobank Network and Cross-Search Service

The aim of this study was to determine the policy for improvement of the network and cross-search of major biobanks in Japan, which has been in operation since 2019.

RESULTS

1. Questionnaire Survey

Of the 44 valid responses, 36 belonged to the private sector, such as pharmaceutical companies. The answers to the question of how to make more use of biobanks (Table 1) suggest that there is a high need for a cross-search service and the ability to use multiple biobanks with a common procedure.

On the other hand, as for what they knew about biobanks (Fig 1), only 30% of the respondents knew that a biobank cross-search service is currently available in Japan (*), while about 80% of the respondents knew that academic biobanks require ethical review (†) and that some biobanks provide samples and information to private companies (‡).

2. Biobank Network and Cross-Search Service

About 700 users in academia and industry have registered for the biobank cross-search service.

We are currently developing a web system for users to apply for use of 12 biobanks with a common procedure, and establishing a central IRB. Users search for the specimens and information on the biobank cross-search service, and then apply for use them in commonized flow through this system. Although the application must go through the IRB in all biobanks when the specimens and information will be from multiple biobanks, the central IRB can be used to obtain approval in a single review.

Part of questionnaire survey results

Fig 1. Q. Do you know the following things about biobanks?

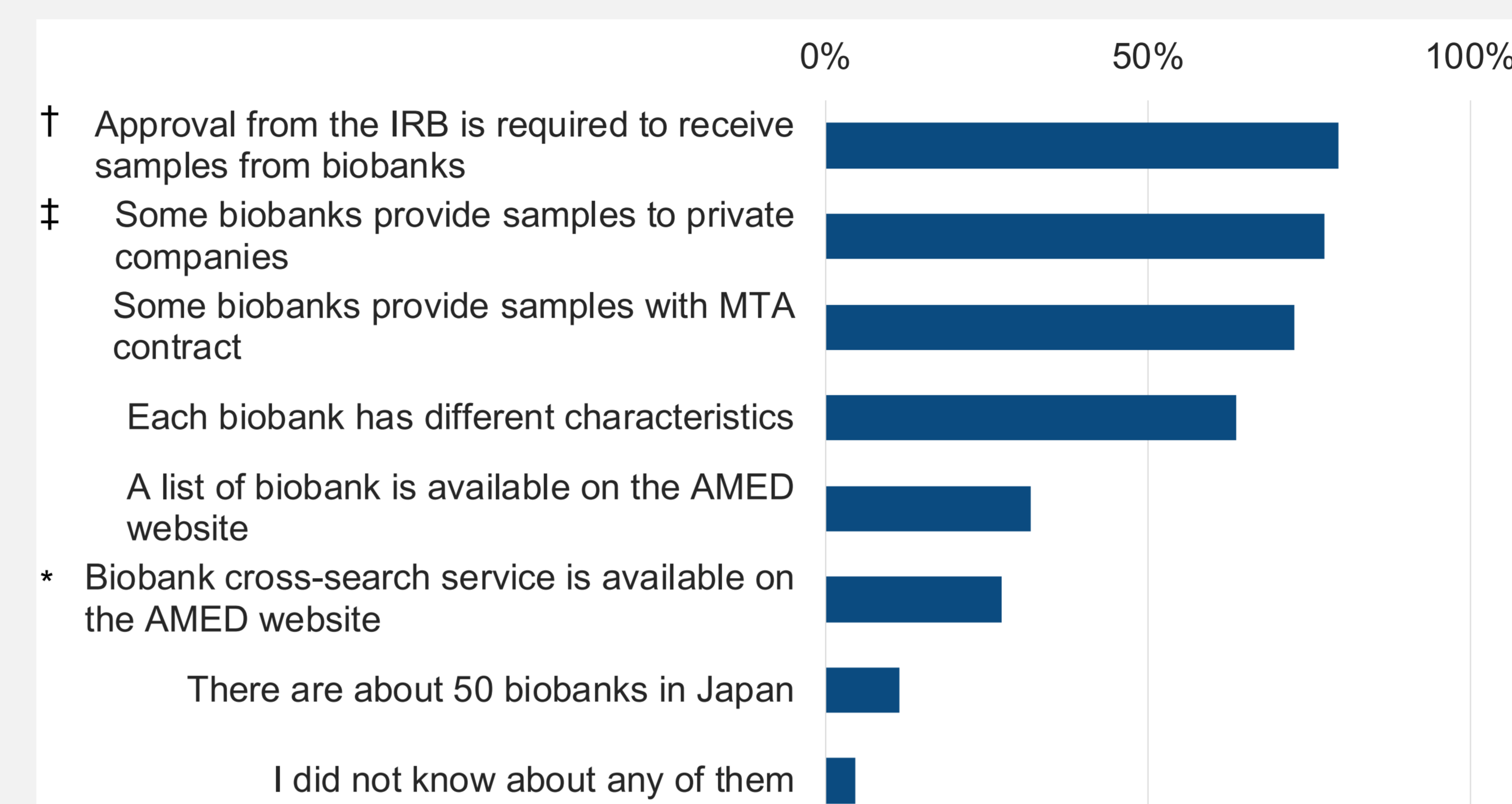


Table 1. Q. Ideas for how to make biobanks more useful (free text)

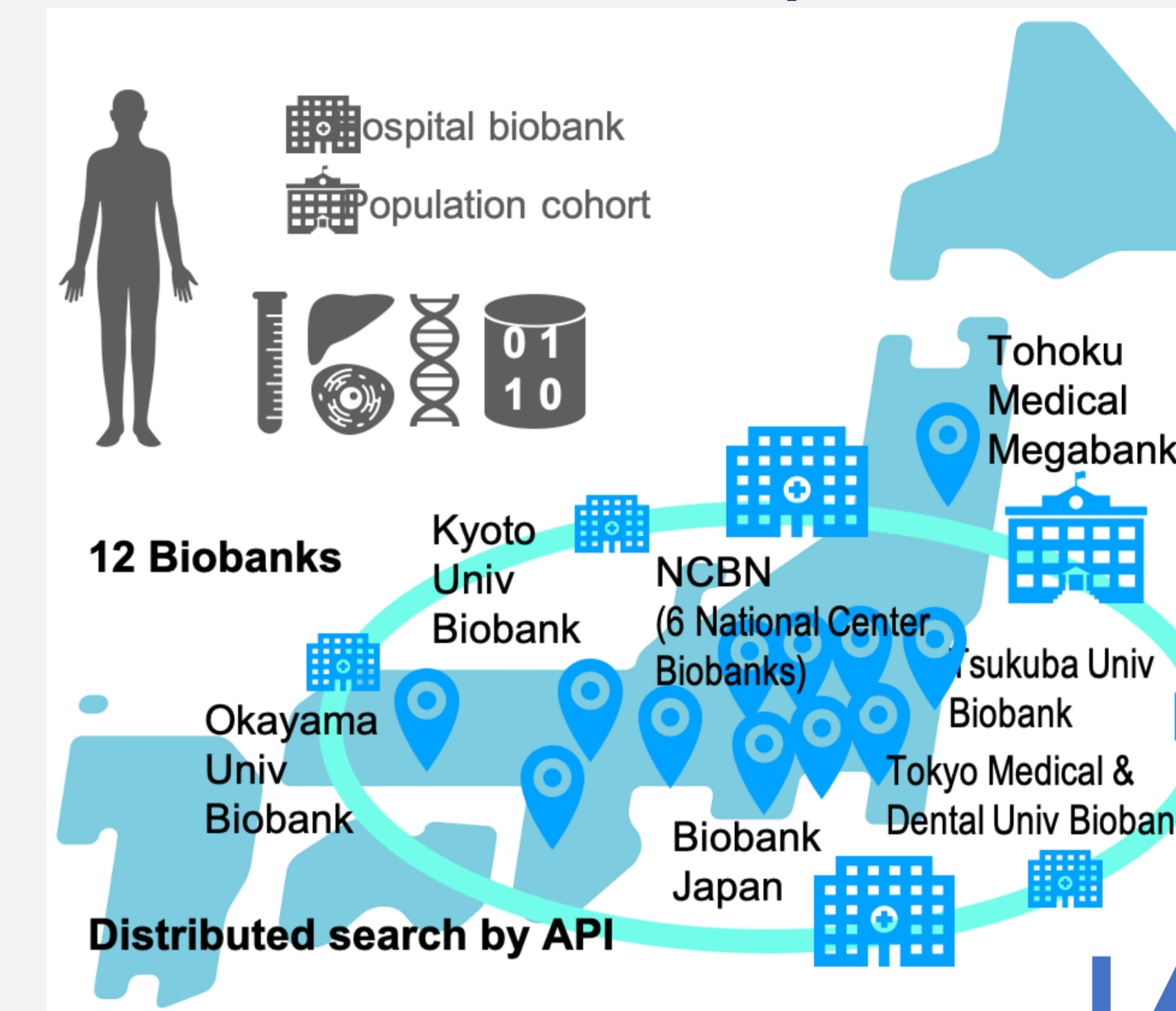
It would be more accessible if we could easily search which biobanks have what samples and in what quantities.

Although there are some barriers due to laws and regulations, it would be good if there is a system that allows easy sharing of specimens through a **biobank's web search**. It would also be good if the biobank contact point could be centralized.

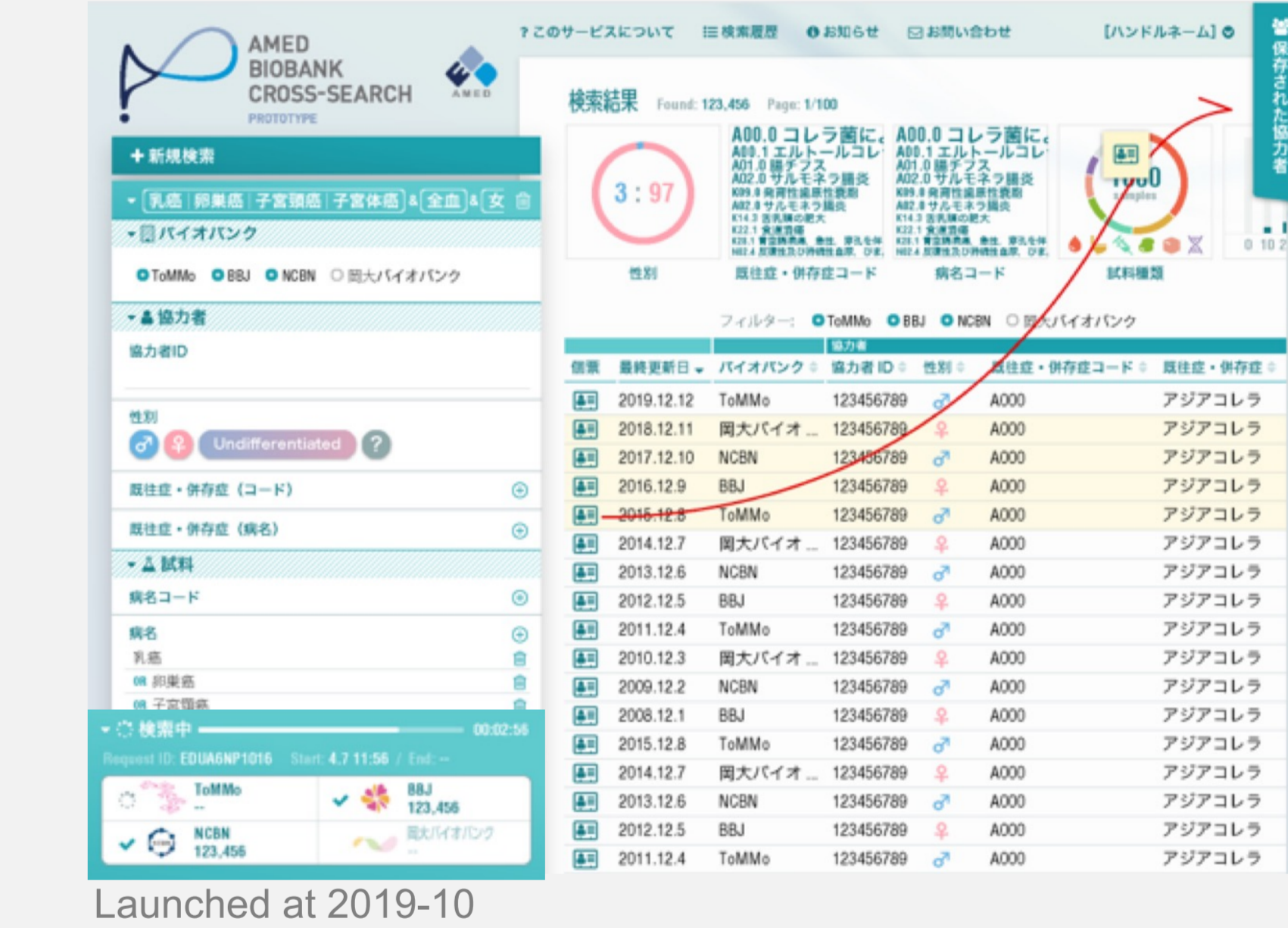
Expedite contract and IRB. Provision by MTA contract. Comprehensive search results through a **cross-search system**.

I thought it would be a good idea to have a **cross-sectional search system**, which would give us an opportunity to know what kind of samples are available in the world.

Biobank Network in Japan



Biobank Cross-Search Service



METHOD

1. Questionnaire Survey

- We conducted a small-scale questionnaire survey in March 2021 for those who use biological samples in their research and development in order to identify challenges in biobank utilization.
- It was focused on researchers who have used biobanks and human biological materials in the past.

2. Biobank Network and Cross-Search Service

- We established a biobank network of 12 major biobanks in 2019¹⁻⁶, and started a cross-search service of 859,130 samples and 203,900 data from 424,480 donors.
- As publicity activities, we have been promoting biobanks and the cross-search service through seminars, exhibition booths at academic conferences and exhibitions, and search-linked advertisements.

CONCLUSIONS

We have been developing a network of major biobanks in Japan and the cross-search service based on this network since 2018. We are now conducting research to find concrete actions that should be taken to promote the utilization of biobanks.

What the results of the survey in 2020 revealed was the importance of public relations strategies. While researchers had needed the cross-search service, few were aware that such a service actually existed. In addition, the fact that the procedures differ from one biobank to another was found to be a major barrier to its use.

We have designed a specimen acquisition flow using the biobank cross-search and are currently developing an additional system that will improve the convenience of users by allowing them to use multiple biobanks in a commonized flow.

We now plan to examine whether these efforts have actually led to the promotion of utilization of biobanks.

REFERENCES

- <http://biobank-network.jp>
- Ogishima S et al. Research and Development of Biobank Network and Operational Support for Promotion of Utilization of Biobank toward Realization of Genomic Medicine. *ISBER 2019 Annual Meeting and Exhibits*
- Ogishima S et al. Biobank Network for Promotion of Utilization of Biobank toward Realization of Genomic Medicine in Japan. *ISBER 2020 Virtual Symposium*
- Nagaie S et al. Minimum Common Data Elements of Cancer-specific Clinical Information and Consent Information for the Biobank Network in Japan. *ISBER 2020 Virtual Symposium*
- Morita M et al. Minimum Common Data Elements of Biospecimen Quality Information for Biobank Network in Japan. *ISBER 2020 Virtual Symposium*
- Ogishima S et al. Update of Biobank Network for Promotion of Utilization of Biobank toward Realization of Genomic Medicine in Japan. *ISBER 2021 Annual Meeting*

ACKNOWLEDGEMENTS

This research is supported by the Japan Agency for Medical Research and Development (AMED) under Grant Number JP21km0405401 and JP21kk0305016.

CONTACT INFORMATION

1. Questionnaire survey

MORITA Mizuki <mizuki@okayama-u.ac.jp>
Okayama University, Japan

2. Biobank Network and Cross-Search Service

OGISHIMA Soichi <ogishima@megabank.tohoku.ac.jp>
Tohoku Medical Megabank Organization (ToMMo), Japan