



# Public Relations and Communication Strategies in Construction of Large-Scale Cohorts and Biobank: Practice in the Tohoku Medical Megabank Project

Fuji Nagami,<sup>1</sup> Miho Kuriki,<sup>1</sup> Sachie Koreeda,<sup>1</sup> Maiko Kageyama,<sup>1</sup>  
Osamu Shimizu,<sup>1</sup> Soichiro Toda,<sup>1,2</sup> Atsushi Hozawa,<sup>1</sup> Shinichi Kuriyama,<sup>1,3</sup>  
Noriko Osumi<sup>1,4</sup> and Masayuki Yamamoto<sup>1,4</sup>

<sup>1</sup>Tohoku Medical Megabank Organization, Tohoku University, Sendai, Miyagi, Japan

<sup>2</sup>Interfaculty Initiative in Information Studies, The University of Tokyo, Tokyo, Japan

<sup>3</sup>International Research Institute of Disaster Science, Tohoku University, Sendai, Miyagi, Japan

<sup>4</sup>Graduate School of Medicine, Tohoku University, Sendai, Miyagi, Japan

The Tohoku Medical Megabank Project was designed as part of the national reconstruction project for addressing the damage from the 2011 Great East Japan Earthquake. It is an integrated project involving the genome cohort study of 150,000 participants, integrated biobank construction, and multi-omics analyses. Public relations and communication activities emerged to be extremely important in the successful development of this project. To gain insights into the contributions of these activities, we divided the public relations and communication activities for the project into three phases based on the situations surrounding the project. Prior to the start of the cohort study (Phase I), a cooperative relationship was established with a focus on concluding cooperation agreements with local governments. Until the participants reached the target number (Phase II), we actively communicated with the media to publicize the project. During the phase in which use of the constructed biobank is promoted (Phase III), for ensuring the industrial utilization of the biobank, visits from the industry are promoted. Throughout the execution of these activities, we explored the best strategies for building relationships with multiple stakeholders like local government, media and industry. By paying attention to these phases that have been changing according to the project's progress, we were able to adapt the strategies and methods of public relations and communication. The success of these activities has enabled the overall project to progress smoothly. We hope that the process of designing our project's public relations and communication activities will be useful for other similar initiatives.

**Keywords:** biobank; cohort; communications; public relations; Tohoku Medical Megabank Project  
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## Introduction

The Tohoku Medical Megabank (TMM) Project was planned as part of the national reconstruction project that responded to the enormous damage of the Great East Japan Earthquake (GEJE) that occurred in 2011, mainly in the Pacific coast of the Tohoku region (Fuse et al. 2019). The project consists of a cohort study of 150,000 people (Kuriyama et al. 2016), a biobank construction based on this biospecimen and information (Minegishi et al. 2019), a large-scale genome/metabolome analysis (Yasuda et al.

2019; Koshihara et al. 2018), and data sharing with a focus on privacy protection and security control (Takai-Igarashi et al. 2017). The project was planned and proposed by Tohoku University in response to the GEJE, and conducted by Tohoku University and Iwate Medical University. In November 2011, the Japanese government budgeted the project and preparations began at the Universities. The project's details were drafted in 2012, and two cohort studies (Community-based cohort study and Birth and Three Generation cohort study) began in 2013 (Kuriyama et al. 2016). A total of 150,000 participants for the cohort studies

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Correspondence: Fuji Nagami, Tohoku Medical Megabank Organization, Tohoku University, 2-1 Seiryomachi, Aoba-ku, Sendai, Miyagi 980-8573, Japan.

e-mail: f-nagami@med.tohoku.ac.jp

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was the first target of the project, which was realized over 4 years (ending in 2017). In June 2017, as part of the follow-up survey, we encouraged participants to visit the assessment centers for a second-round survey. Notably, Tohoku University was responsible for working with the portion of the cohort in Miyagi Prefecture (about 120,000 people), and Iwate Medical University for that in Iwate Prefecture (about 30,000 people) (Kuriyama et al. 2016). To execute the project, Tohoku University established the Tohoku Medical Megabank Organization (ToMMo) and Iwate Medical University established the Iwate Tohoku Medical Megabank Organization.

Biospecimens and information collected in the cohort study are systematically stored in biobanks (Minegishi et al. 2019); among them, over 1,000 DNA samples underwent whole genome sequencing in 2013 (Nagasaki et al. 2015), and statistical data for approximately 4,700 sequences was made publicly accessible in 2019 (Tadaka et al. 2019). More specifically, the biospecimens and information were made accessible to researchers nationwide by constructing a public distribution system. Biobank storage specimens are analyzed and digitalized in a unified manner, especially in genome and metabolome analyses (Koshiba et al. 2018), contributing to the construction of the integrated biobank that promotes data sharing.

In such a project, public relations and communication activities are extremely important. Internationally, the UK Biobank (Allen et al. 2012), which has gained the participation of 500,000 general residents, and other large-scale projects including patient cohorts, place a great deal of emphasis on public relations activities. Furthermore, although many studies have been published on the general attitudes toward biobanks, as reviewed by Domaradzki and Pawlikowski (2019), not many scientific articles exist about such activities themselves (Gottweis and Petersen 2009). In the cohort study of the TMM project, because more than 120,000 people participated in Miyagi Prefecture—an area with a population of about 2.35 million people—it was necessary to obtain the autonomous participation of as many as 5% of the local population; thus, this study required a wide variety of publicity activities.

We conducted these activities in a short period after the GEJE and also made it known that biospecimens and information obtained from cohort studies may be stored and used as biobanks over a long period of time. Since around the time the cohort study began, we have been seeking consent to perform genome analysis; individual whole genome analysis was not widely conducted in large scale researches (The 1000 Genomes Project Consortium et al. 2012; Telenti et al. 2016). To be sure, the operation of a biobank built by a cohort study must be widely known, especially in the research and industrial communities, in order to maintain and sufficiently utilize the stored biospecimens and information. The feedback to the cohort participants is also important for informing them of that the provided specimens and information are being used well (Lemke et al.

2010). Furthermore, as the project requires a large budget for promotion, which may be granted by the government, there must be communication between governments and policymakers to ensure that the investment in the project is reasonable. The success of the entire project depends on the ability to conduct public relations and communication activities that engage the general public in the region, the research and development personnel of companies and academia nationwide, and policymakers. We divide the public communication activities necessary for the promotion of the TMM Project into several phases based on the situation in the region in which Tohoku University, one of the mother bodies promoting the project, is located.

The public involvement in large-scale cutting-edge science is currently a critical challenge in science communications in various fields. In this study, therefore, we wish to present one of the models for the communication activities in a large-scale biobank study that involves general residents over a long period of time, rather than merely presenting a record of public relations for a large-scale biobank study. Here we would also like to clarify that strategic communication with stakeholders according to the phases of the project progress has contributed significantly to the success of the project.

## Methods

### *SWOT analysis of overall project process*

In the TMM Project, we identified stakeholders based on the purpose of the project, and examined and analyzed the needs for understanding and support from each. After identifying the stakeholders, we listed the strengths, weaknesses, opportunities, and threats, respectively (SWOT analysis) (Turankar et al. 2014). Based on the analysis, we divided each stakeholder and analyzed further. We materialized opportunities for each stakeholder and examined/planned actions to be taken. Depending on the progress phase of the TMM project, the way practical supports should be obtained were estimated. We articulated three progress phases: Phase I, before the start of the cohort study (November 2011 to May 2013); Phase II, until the number of participants reaches the target number (May 2013 to November 2016); and Phase III, biobank use is begun and promoted (November 2016 to Present).

### *Public relations and communication activities using various methods*

We conducted public communication activities using various methods. The typical approaches used were as follows.

### *Direct visiting for local governments*

In Miyagi Prefecture, where Tohoku University is located, there are 35 municipalities in addition to the prefecture. We visited all of these to explain our project. We capitalized preexisting relationships between researchers in ToMMo and the local governments, and the executive

director of ToMMo visited the local governments. For example, Tohoku University has conducted the national survey the Japan Environment and Children's Study (JECS) (Kawamoto et al. 2014). ToMMo includes researchers in charge of JECS, so that we used this route.

Approximately half of the 35 local governments could be contacted by way of the existing relationships. We levered this accomplishment for the negotiation with neighboring local governments and succeeded in gaining the understanding of the mayors. This smoothed our subsequent negotiations with local officers, and finally, all local governments signed the cooperation agreements before the start of the cohort study.

#### *Accepting visitors*

A number of unique facilities such as a supercomputer, next generation sequencers, and huge biobank setups necessary for the project have been established in ToMMo. We accepted many stakeholders to visit ToMMo and help them understand a cutting-edge idea for a biobank and genome cohort through facility tours; we introduced basic concepts of the TMM project as well as future medicine based on personalized medicine and healthcare during the tour. Since the completion of the ToMMo building and facility in March 2014, ToMMo received thousands of visitors as of December 2019. The number of visitors who joined the tour, visiting groups, member lists, and their affiliations have been recorded manually.

#### *Issuing press releases and media coverage*

When the TMM project proceeded to important events, for instance start of the new cohort study and release of new services, or when the TMM project accomplished new and significant results, for instance completion of intractable surveys and publication of core research articles, we issued press releases to the media. Since the inauguration of the organization, the number of press releases covering these issues have surpassed 150, indicating wide coverage of our activity. The issued press releases have been posted on the website of ToMMo ([www.megabank.tohoku.ac.jp/](http://www.megabank.tohoku.ac.jp/)), and thus a record of the press releases can be found on the website.

We have been using press releases and the mass media actively as a means to reach the general population. Similarly, we exploited the mass media to publicize our project; fifteen-second television advertisements were produced and aired at the start and the peak stage of our recruitment, and ToMMo researchers often appeared in many information programs. Seven to eight minute-long radio programs were also created and aired over fifty times, including interviews with researchers and personalities. We also published advertisements calling for cohort study participation in newspapers, inserted flyer advertisements, and serialized research-related articles on regional block papers.

We counted the numbers of coverage by newspapers and televisions using combined methods. The coverage in

major newspapers of Japan and in a large regional newspaper were searched by the database provided by four companies —KIKUZO II by Asahi-Shimbun, Yomidas by Yomiuri-Shimbun, Nikkei Telecon 21 by Nikkei, and Kahoku Shimpō Database by Kahoku Shimpō— using the keywords “Tohoku Medical Megabank” and some of its variations. Coverage by some specialty papers such as Nikkan-Kogyo and Kagaku Shimbun was searched on the newspapers' own websites. Coverage by television media was checked manually; i.e., we recorded and examined all news on televisions programs after the press conferences and interviews with video recording. Articles on the web were searched using Google with the keywords “Tohoku Medical Megabank” and some variations. Articles by only the media sites were counted, and those on viral or reproduction sites were omitted manually.

## Results

### *Stakeholder analysis*

To analyze and understand the situation surrounding the TMM project, a standard SWOT analysis was first performed. We articulate three progress phases for the TMM project. In the proposal stage (Phase I), some of the Japanese science community members and reviewers of the proposal expressed concerns that basic concepts of the TMM project, especially cohort studies, biobanks, and genome analysis, might be too difficult for the general public and potential participants or study candidates to understand properly (Ministry of Education, Culture, Sports, Science and Technology 2012). These concerns were articulated into two major points; one was converged into the risk of leakage or integrity of our security system to protect personal genome information, while the other was the suitability of our project as the reconstruction project or how TMM project directly related to the recovery from the earthquake and tsunami damages in the affected areas (Mitobe 2012).

In the SWOT analysis (Fig. 1), we situate these points as “weakness” and “threats” of harmful internal and external origins, respectively. Discussions related to these criticisms were held within the organization, and the decision to explain the overall project repeatedly with easy to understand language was made, while avoiding explanation of difficult concepts. We also decided to explain the contribution of the TMM project to disaster recovery over the medium- and long-terms; the TMM project was best explained as a project for creating strong basis for future medicine.

We listed the Trust for Tohoku University, proximity to each stakeholder, and flexible organization as “Strength,” and proximity between stakeholders, and momentum for reconstruction after the Great East Japan Earthquake as “Opportunity.” Tohoku University is one of the oldest universities in Japan, and until 2016, was the sole university that educated medical doctors in Miyagi prefecture. A majority of medical practitioners in the prefecture are grad-

	Helpful	Harmful
Internal Origin	<b>Strengths</b> -Trust for Tohoku University -Flexible organization -Proximity to each stakeholder	<b>Weakness</b> -Difficulties for general public to understand the concepts of cohort, biobank, and genome analysis -The organization and the project are not well known -Ethical concerns
External Origin	<b>Opportunities</b> -Proximity between stakeholders -Flexible production and execution system -Momentum for reconstruction after the Great East Japan Earthquake	<b>Threats</b> -Opposition to implementing as a reconstruction project -Low budget constancy

Fig. 1. SWOT analysis of public communication activities of the TMM project. Strengths, weakness opportunities and threats for the public communication activities of TMM project are listed in the first to the fourth quadrants, respectively.

uates of the university, and the trust for the university, especially in medical field, has long been cultivated in the area.

Our organization was founded based on the medical school, but flexibly recruited specialists for each field from all over Japan and appointed faculty members of several other departments in the other schools of the Tohoku University as concurrent posts. These members have been taking advantages of their specialties, and their personal connections have been utilized in the progress of the TMM project. As a result of the attempt to make a flexible and diverse organization, ToMMo has acquired a certain degree of proximity to various stakeholders in the region and this was effectively used to contact each target.

The momentum for reconstruction after the Great East Japan Earthquake was an indispensable point, especially at the early stage of the project. Many residents and stakeholders thought it would be natural for Tohoku University to implement this project, and the proposal of the TMM project has been accepted relatively smoothly with very strong support from various fields.

In particular, our project has also been working to allocate physicians to medical institutions in the severely affected areas to directly support community medicine that has been significantly hindered by the earthquake. The existence of this effort is one of the major factors in the entire community's support for the project.

In addition, the proximity between the stakeholders involved in this project in Miyagi Prefecture cannot be overlooked. Information is exchanged among local governments, medical communities, and the local media, among others. When visiting the heads of local governments,

sometimes people from the local medical institutions attended. The understanding of one of the stakeholders led to gaining understanding from other stakeholders. Overwhelming supports from the local community has been one of the most important factors to promote this project.

#### *Detailed characterization of the stakeholder*

Because the stakeholders of the TMM project are very diverse, we tried to identify further detailed strengths and opportunities of the TMM organization for each issue analyzed (Fig. 2). We listed and analyzed the following as important stakeholders: general public, local government, local medical community, academic community, industry, media, and central government. The former three are local stakeholders, whereas the latter four are nationwide. There may be other stakeholders, but these seven have been influential and important.

Local stakeholders are vitally important in conducting cohort studies and recruiting participations. As a critically helpful point throughout these categories, a trusting relationship has already been established between these local stakeholders and Tohoku University as described above. On the other hand, the TMM Project itself was thought to have suddenly emerged after the disaster and was not well-recognized at the beginning. Only the aspect that it was a large-scale genome-related project was disseminated, and as a result, the aspect of ethical concerns preceded (Matsui and Tashiro 2014). At the time after the earthquake, we found that the local governments were exhausted because of the rush of many surveys all over Japan, and there was a sense of caution about increasing their work. On the other

Categories	Strengths	Weakness	Opportunities	Threats
<b>General residents</b>	Trust for Tohoku University	The organization and project are not well known	Media, approaches through other stakeholders, events, printed materials	Concerns for privacy, Opposition to large-scale reconstruction projects
<b>Local governments</b>	Trust for Tohoku University	The organization and project are not well known, ethical concerns	Direct visits	Repellent response to increased work volume, ethical concerns
<b>Medical communities</b>	Trust and relations with Tohoku University	The organization and project are not well known	Direct visits, approaches through other stakeholders	Repellent reaction to competition and disturbance
<b>Academia</b>	Evaluation for epidemiology researchers, understanding of the need for a large-scale biobank/prospective cohort	Former achievements related to genome analysis	Exhibition at academic events, Accepting visits to organization	Large competitor
<b>Industries</b>	Demand for large-scale public data	Lack of basic knowledge about biobanks	Accepting visits to organization, direct visits	Balancing with ethical constraints
<b>Media</b>	Importance as a large-scale project	Ethical concerns	Briefing session, Accepting visits to organization	Low directness as a reconstruction project
<b>Government</b>	Understanding the need for biobank and cohort studies, Necessity of a reconstruction project	Single-year budget planning	Regular meetings, committees	Pressure to reduce long-term costs

Fig. 2. Analysis of each stakeholder. SWOT analysis was executed for each stakeholder of the TMM project.

hand, there was a misunderstanding among local medical institutions that the TMM project wished to directly cover medical practices, thus raising alarm as a potential competitor. We carefully tried to resolve misunderstandings and instill vigilance, as well as to gain common understanding on the ethical concerns by repeating direct visits and dialogues. Building collaborative relationships with local stakeholders took a lot of time and effort, the analysis of the characteristics and measures for each stakeholder enables us to approach strategically to each stakeholder in the right phase. This has led to the promotion of the cohort studies in a limited period.

As for nationwide stakeholders, the necessity of large-scale biobanks based on prospective genome cohorts focused on ostensibly healthy people who gained a certain level of understanding from the academia (Science Council Japan, Section II Genome Cohort Research System Study Subcommittee 2013). In addition, there was the expectation for constructing research repositories of healthy people's data and samples from the industry. In the central government, there were people who showed interest in constructing modern biobanks. This was helpful for the preparation of the TMM project at that time.

On the other hand, in terms of the harmful aspects as of 2011, we were able to determine a few issues (Fig. 2). Firstly, the concept of a biobank was not so popular or well-established in Japan. Secondly, generally speaking, the budgets for any large-scale projects were regarded as a competing factor with the other regular-size research projects, and thus, not appreciated strongly in the science community. Thirdly, although Tohoku University was expected to host this project, it did not have sufficient experience in conducting large-scale genome cohorts and biobank con-

structions. We have corresponded to these situations to increase the opportunities for direct dialogues. In the promotion of the TMM project, we have created a number of nation scale committees and working groups for discussion on the project details; the opinions of many researchers, industry people, and government officials were reflected through their participation in these discussions.

#### *Targets and initiatives for each phase*

From the results of the SWOT analyses for each stakeholder in Fig. 2, it has emerged that the period for performing the necessary communication varied upon the progress of the project. In fact, it was vitally important to establish close relationships with local stakeholders, especially during the start-up period of the project, in order to smoothly establish and promote the TMM project. Communications with local governments and medical institutions played key roles before the recruitment for the cohort studies began, and those with general residents directly affected the progress of the project, especially after the recruitment began. Relationships with nationwide stakeholders have a different aspect from these. People in the academia became interested in our collected data and biospecimens after certain progress was made in our project, such as releasing the results of the genome analysis. We noticed that the relationships with the industries also gained importance when the TMM project progressed further, because the stored biospecimens and information and the established framework of the cohort studies to collect those samples and information became attractive for the public.

We envisage that the TMM project can be divided into three phases. For each phase, the main public communica-

Phase	Term	Important targets	Major appeal	Major media
<b>Phase I</b>	Nov 2011 to May 2013	Municipalities, medical communities, governments	Importance as reconstruction project, trust for Tohoku University	Direct visits
<b>Phase II</b>	May 2013 to Nov 2016	General residents, municipalities	Benefits as a health survey, trust for Tohoku University	Mass media, exhibitions
<b>Phase III</b>	Nov 2016 to Present	Academia, industries	Usefulness and quality of accumulated biospecimens and information	Briefing sessions, Accepting visits to organization

Fig. 3. Targets at each phase.

The phases of Tohoku Medical Megabank Project were divided into three, and the important targets, major appeals, and major media were listed respectively.

tion target and its purpose were different. The important targets in each phase are summarized in Fig. 3. In Phase I, the main goal was to attract numerous people to become aware about the TMM Project. It was important to obtain acceptance (or consent in extreme cases) from the relevant stakeholders for the implementation of the project. The relevant stakeholders included local governments, medical institutions, and medical organizations in Miyagi Prefecture. In Phase II, our communication focused on gaining an understanding of the general residents who would participate in the cohort. In Phase III, completely different stakeholders emerged. Communications with the industry and national academia became important.

#### *Phase I: Period before the start of the cohort study*

One of the most important targets of the TMM communication prior to the start of the TMM cohort study was to obtain understanding and create a cooperative relationship with the local governments. We realized that upon reaching the residents, help from the local governments was of great impact. Announcements through town or city bulletins were very effective for providing understanding of the project to the public. To this end, we requested the cooperation of mayors, and these processes were made public to encourage the trust of local residents through multiple means.

In September 2012, we concluded a cooperation agreement with Miyagi Prefecture; we have been building a cooperative relationship with the prefectural government since June 2011, when we first proposed the TMM project to the national government. We held the conclusion cere-

mony in the presence of the governor in September 2012, and received significant attendance to the ceremony from each municipality.

We next requested for each local government to accept our visit and meeting with mayors. Our delegation, including the executive director and staff members of ToMMo, has visited all 35 municipalities in the Miyagi prefecture multiple times during this phase. During these visits, the ToMMo staff explained the implementation of the project and the necessity to conclude a cooperation agreement. A sense of trust was nurtured by these activities and help from the prefectural offices. As shown in Fig. 4, the conclusion of the agreement was fulfilled in all municipalities.

#### *Phase II: Period of cohort participant recruitment*

Since the start of the cohort study, we focused on acquiring media advertising space, especially with the aim of expanding public awareness of the cohort study to the general residents of Miyagi Prefecture. Both TV and radio advertisements were prepared, and information was also transmitted to TV program information corners. A number of publicizing activities such as newspaper advertisements and flyer advertisements were made to encourage participation in the cohort study. Fig. 5 shows the number of mass media appearances. The peak was in 2014, the second year of the cohort study recruitments. Public communication activities during this period strongly sought to increase recognition of and participation in the cohort studies. We also participated in various health-related events at the municipal level by means of booth exhibitions and special events at shopping centers and supermarkets.

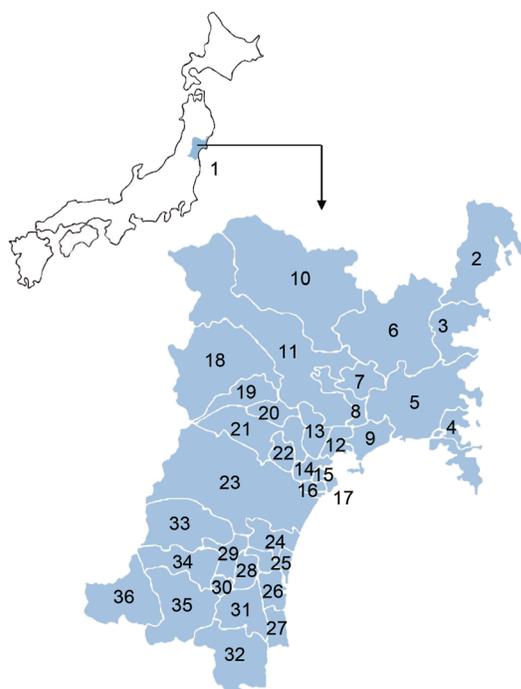


Fig. 4. Cooperation agreements with local governments in Miyagi Prefecture.

The dates of the conclusion for corporation agreements with local governments were listed in the order from the northeast to the southwest. The agreement with Miyagi prefecture was the first case.

No.	Municipalities	Date	No.	Municipalities	Date
1	Miyagi Prefecture	2012/9/18	19	Shikama	2013/10/10
2	Kesenuma	2013/6/17	20	Ohira	2013/9/26
3	Minamisanriku	2013/7/30	21	Taiwa	2013/7/24
4	Onagawa	2013/4/10	22	Tomiya	2014/3/1
5	Ishinomaki	2013/4/10	23	Sendai	2013/10/8
6	Tome	2013/10/1	24	Natori	2013/7/31
7	Wakuya	2013/8/23	25	Iwanuma	2013/2/14
8	Misato	2013/10/1	26	Watari	2013/12/20
9	Higashimatsushima	2013/2/21	27	Yamamoto	2013/4/12
10	Kurihara	2014/1/31	28	Shibata	2013/7/9
11	Osaki	2013/8/26	29	Murata	2013/7/1
12	Matsushima	2013/8/25	30	Ogawara	2013/6/5
13	Osato	2013/10/10	31	Kakuda	2013/7/9
14	Rifu	2013/5/27	32	Marumori	2013/6/24
15	Shiogama	2013/5/16	33	Kawasaki	2013/6/20
16	Tagajo	2013/5/16	34	Zao	2013/6/24
17	Shichigahama	2013/4/12	35	Shiroishi	2013/6/18
18	Kami	2013/9/26	36	Shichikashuku	2013/6/18

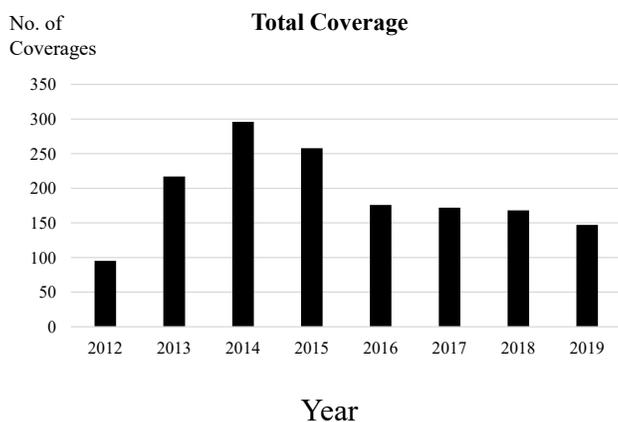


Fig. 5. Appearances on mass media.

The media coverages for the TMM project was counted and the number of coverages for each year were represented.

### Phase III: Period of distribution of biospecimens and information

The idea of a biobank was not well-recognized in Japan when we started the TMM project. In order to promote the use of accumulated biospecimens and information, many explanatory meetings, exhibitions, and efforts for the expansion of external visit were made to actively publicize the value of the integrated biobank.

Our new headquarter building was completed in

March 2014. Since then, we have accepted many visitors from wide variety of backgrounds from researchers, government officials to school children, including members of royal families of Japan. The facility tours have been organized since June 2014, when the interior and facility of the building was completed (Fig. 6). We have counted the numbers of the groups and people who participated the tours that we organized. Since 2016, the number of corporate visitors has increased significantly (Fig. 7). This increase in the number of visitors seems to correlate well with the increase in the use of biospecimens and information, joint research, and proposals.

### Activities throughout all phases: Press releases and media coverages

In order to quickly return the results to the local community without waiting for the publication of research articles, we have been actively issuing press releases regarding the progress of the project. Fig. 8 summarizes the press release issues and media coverage trends. While press releases from research institutions significantly depend on publicizing research results in academic journals, we have been not clinging to this custom and actively disseminated information such as the commencement of the cohort study in each region and conclusions of agreements with local governments. As a result, we believe that we have achieved influential publicity. Accordingly, we argue that these mea-

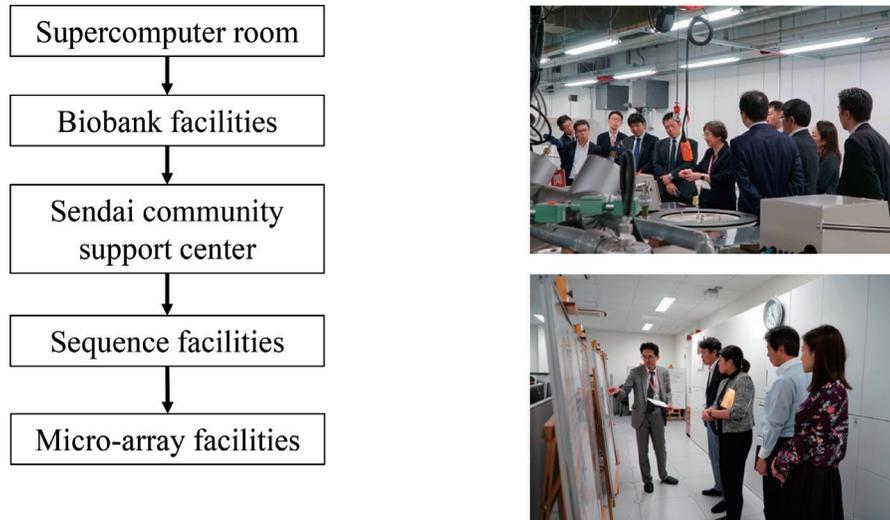


Fig. 6. A typical course of facility tour. (Left) Facility tours were organized according to the visitors' interest and schedule usually including supercomputer room, biobank facilities, Sendai community support center (assessment center for cohort studies), sequence facilities, and micro-array facilities. (Right) Photos taken at the tour. Researchers made explanations on the facilities. The uses of the photographs were permitted by the visitors for research and public communication purposes.

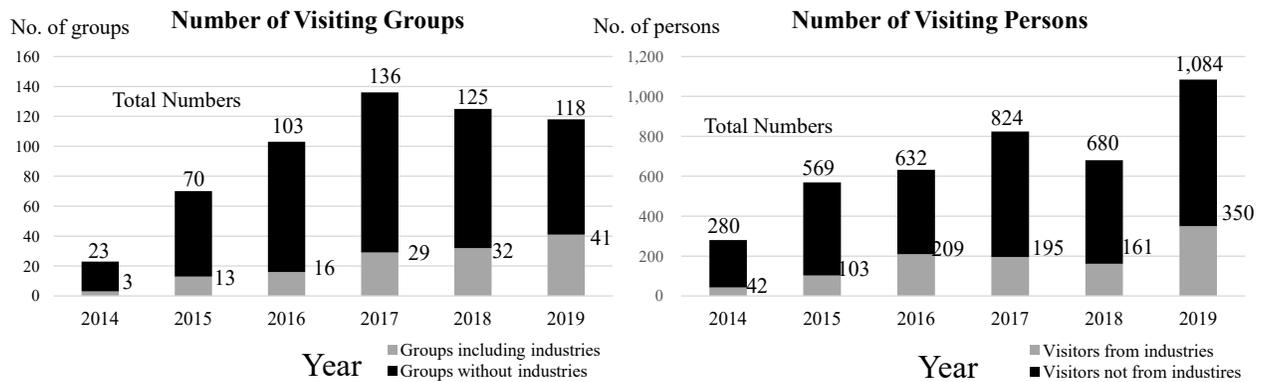


Fig. 7. Increase in the number of visitors from the business community. (Left) Number of groups which visited and toured Tohoku Medical Megabank Organization. The red bars stand for the total numbers of visited groups and the blue bars stand for the numbers of business groups. (Right) Number of people that visited and toured Tohoku Medical Megabank Organization. The red bars stand for the total numbers of people and the blue bars stand for the numbers of business people.

sures supported us in achieving successful recruitment for our cohort.

Recently, the contents of our press releases have changed. The number of press releases in both novel article publications and database releases has been increasing. For instance, after 2016, we have been expanding the dataset for sharing and distribution nearly every year. These expansions have been released to the press each time. The genome reference panel by ToMMo was updated gradually from the first version of 1,070 people whole genome sequencing in 2015, to the second version of 2,049 people in 2016, the third version of 3,554 people in 2017, the modified third version with mitochondria and X chromosome genome added in 2018, and 4,773 people for the fourth version in 2019. These updates have been the major themes for press releases by ToMMo in the recent couple of years.

### Discussion

In this article, we described details regarding the processes of public relations and communication strategies used for the Tohoku Medical Megabank project, which have been flexibly adopting various factors by reviewing the project's progress and phases. In a large-scale project such as the Tohoku Medical Megabank project, it seems natural and reasonable that various phases have been changing and intercrossing along with the progress of the project; the project's relationship with each stakeholder has also changed accordingly. It has been unlikely to apply SWOT analysis to cohort and biobank studies, which is often used in the fields of business management and marketing. However, to our experience, the analysis has been valuable to large-scale sciences with many social contacts and one

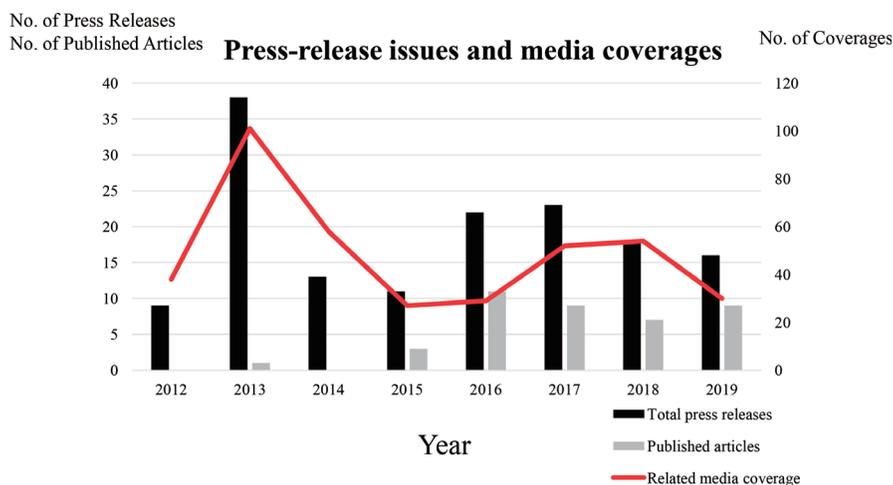


Fig. 8. Press-release issues and media coverages.

Bars represent the number of issuing press releases, blue bars are the total number, and red bars are the releases on the article publication, respectively. Vertical axis of the left side is the scale for the bars. Polygonal line stands for the number of coverages by the media for each year. Vertical axis of the right side is the scale for the line.

example is shown here. It seems to be natural for applying the SWOT analysis to cohort and biobank studies from now on.

It is very important to select the strategies and methods of public relations and communication that are most suitable for such phases according to the analyzed results. Our experience in the Tohoku Medical Megabank project strongly suggests that the success of an individual project is considerably influenced by the selection, flexible management, timely decisions, and the strategies and methods for public relations and communications during various progress phases.

Of the strategies presented here, we feel that the construction of relationships with local governments based on the direct visits are critically important and have produced a notable effect on the progress of the entire project. Cooperation agreements have been made with 35 municipalities in Miyagi Prefecture, and their provisions have covered cooperation in public relations. We needed to grapple with several hurdles before gaining an interview appointment with each mayor and various communications in the processes. For example, before we succeeded in gaining an appointment with a mayor, the officers of the health-related section requested briefings about the project. In a few municipalities, town councils ordered explanations at the full member meetings. Many general residents already trust the local governments and Tohoku University. It gave a noteworthy effect for general residents that we have concluded an agreement with local governments before the commencement of the cohort recruitments. We were able to earn the initial trust of diverse residents (Platt et al. 2014; Sanderson et al. 2017). The project succeeded in being recognized as a public project that contributes to the health promotion of the region, which in turn leads to successful recruitment.

By acquiring support from the other stakeholders, we

were able to approach the community comprising the potential participants of our cohort studies. We learned that in order to gain the trust of local residents, it is important not only to provide sufficient explanation, but also to create a foundation that encourages them to listen to our explanation. Along these lines, reliance on existing trust has had a great impact. As the proximities between stakeholders were extracted as an important factor from the SWOT analysis, the trust fostered with local governments and medical institutions appeared to be positively propagated to the community residents. One of typical examples of successful long-term cohort studies in Japan, the Hisayama study, is known to have built strong relationships with the local government (Ninomiya 2018). It seems to be a key element for the success of the research involving residents in Japan.

One of the aspects not covered in this article is the analysis of the relationship between the recruitment performance and individual activities and strategies of public relations. While the success or failure of the detailed approaches for each subject of the cohort study remain to be closely examined (Ishikuro et al. 2018), we have written this paper as we believe it is important to provide the entire picture of our strategies at this point.

Now, the new phase of the Tohoku Medical Megabank is beginning. We surmise that even more important issues will arise depending on the progress of our project, especially in the follow-up surveys and communications to ensure the long-term sustainability of the cohorts and the integrated biobank. We hope the current descriptions of our project will be useful for other similar initiatives.

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### Conflict of Interest

The authors declare no conflict of interest.

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