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International promotion of Japanese aging-related health services and products: Perspective of an international agency

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Abstract: Asia is at a critical juncture of health development. The population is aging and shrinking. At the same time, the economy is developing rapidly. These two factors, which necessitate a new paradigm of health development: departing from dependence on Official Development Assistance (ODA) and transitioning towards a model with more involvement of industries (private sector), academia, and health care providers, the so-called public-private partnership (PPP) model. The Economic Research Institute for ASEAN and East Asia (ERIA) is studying the potential for broader application of the new concept for collaboration between Asian countries and Japan. In this article, the authors attempt to introduce the complete picture of a new health ecosystem advocated by Japan. We first look at the impacts of population aging and shrinking, followed by introducing two new approaches; regional and country-specific, with the involvement of ERIA. Then, the outcomes of the projects and Japanese technology, services and products relevant to the older population are introduced. Finally, based on the various projects and products, we focus more closely on the new health development model, the PPP model. We start from the theory and move to examine a tool for implementation, which is the formulation of a dialogue forum named the MEX (Medical Excellence X, where X can be substituted by the acronym of any participating country) project. The experience of these projects and case studies will benefit all ASEAN member countries and beyond. ERIA finds that the facilitation works of the Institute catalyze the progress. ERIA will remain committed to helping the endeavors initiated by Japan for the benefit of all.

***Keywords*:** aging-related health services and product, Economic Research Institute for ASEAN and East Asia (ERIA), international collaboration, health ecosystem, public-private partnership (PPP)

Introduction

Asia is at a critical juncture of health development. The population is aging and shrinking. At the same time, the economy is developing rapidly. These two factors bring a new paradigm of health development: departing from dependence on Official Development Assistance (ODA) and transitioning towards a model with more involvement of industries (private sector), academia, and health care providers, the so-called public-private partnership (PPP) model. The Economic Research Institute for ASEAN and East Asia (ERIA) is studying the potential for broader application of the new concept for collaboration between Asian countries and Japan.

In this article, the authors attempt to introduce the complete picture of a new health ecosystem advocated by Japan. We first look at population aging and shrinking as the dominant force driving mortality and morbidity changes, followed by introducing the new approaches initiated in Japan with the involvement of ERIA and the outcomes of the projects. Then, we focus more closely on the new health development model; the PPP model, together with the tool for implementation, which is a dialogue forum named the MEX (Medical Excellence X; where X can be substituted by the acronym of any participating country) project.

Population aging and shrinking: Lessons from Japan

The Asian population is aging and shrinking, a phenomenon that first started in Japan (*1*). However, this trend is spreading worldwide if one examines the most recent World Population Prospects (WPP) published by the Department of Economic and Social Affairs Population Division, United Nations (*2*). As shown in Figure 1, the total population in Asia is projected to peak at 5.306 billion in 2055 (for reference, global population is projected to peak at 10.431 billion in 2086), to be followed by a negative population growth thereafter; in other words, population shrinking starts. The percentage

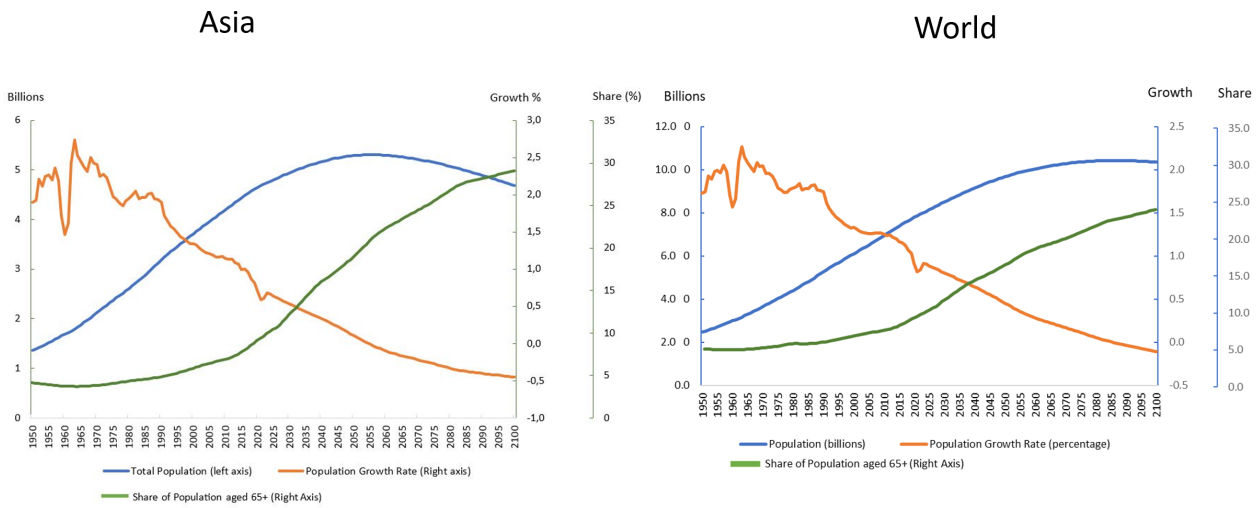

Figure 1. Total population, growth rates and share of population aged 65+ in Asia and the world. Data source: *i*) Percentage of 65+: Population Percentage by Select Age Groups Both Sexes. WPP 2022 File POP/06-1: Percentage of total population by select age group, region, subregion and country, annually for 1950-2100. Estimates, 1950–2021. *https://population.un.org/wpp/Download/Standard/Population/*; *ii*) Total population, growth rates: Demographic indicators. Compact (most used; estimates and medium projections) WPP 2022 File GEN/01/REV1: Demographic indicators by region, subregion and country, annually for 1950-2100. Estimates, 1950–2021. *https://population.un.org/wpp/Download/Standard/MostUsed/*

of the population aged over 65 in Asia is projected to reach 19.0% in 2050 and 29.2% in 2100 (global figures are 16.5% and 24.0%, respectively). Aging in Asia appears to be moderate in the above WPP report. This is because Asia in the report consists of five subregions: Central Asia, Eastern Asia, Southern Asian, South-East Asia, and West Asia. Japan, China, and the Republic of Korea belong to Eastern Asia, and the projected percentage of over 65 in this subregion is 30.8% in 2050 and 40.5% in 2100, compared with the figures of 13.7% and 27.0%, respectively, in the Southern Asia subregion comprising the population giants including Bangladesh, India and Pakistan. Furthermore, there are vast differences among countries in the South East Asia subregion. Among the ASEAN (Association of Southeast Asian Nations) members, for example, aging is already advancing significantly in Thailand and Vietnam, but not so much in Indonesia and the Philippines, as shown in Figure 2. The trends of aging in three countries in the Eastern Asia subregion – Japan, China, and the Republic of Korea – are also depicted in Figure 2, together with the major measures implemented in Japan to address the aging population.

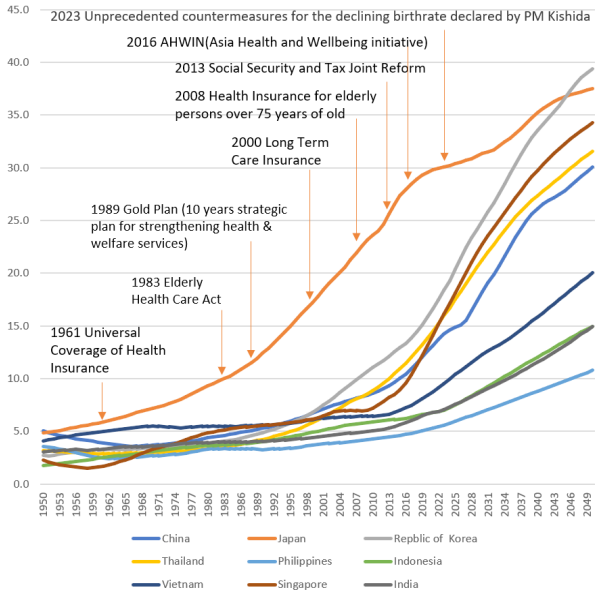

Figure 2. Population ageing in selected countries in Asia (1950–2050) and major Japanese policies. Data source: Percentage of 65+: Population Percentage by Select Age Groups Both Sexes. WPP 2022 File POP/06-1: Percentage of total population by select age group, region, subregion and country, annually for 1950-2100. Estimates, 1950–2021. *https://population.un.org/wpp/Download/Standard/Population/*

Japan achieved universal health insurance coverage in 1961 and enjoyed the bonus of population growth (*3*) until the 1980s when Japan recognized the impact of population aging and started to prepare for the forthcoming aged and super-aging Society (*4*). The measures include the enactment of the Elderly Health Care Act in 1983 that mandated annual health checkups for early detection and prevention of chronic conditions, and strengthening of the financial basis to cover increasing healthcare costs for the older population. In 1989, the Gold Plan started ten-year investments in health and welfare service infrastructure for senior citizens to prepare for the launching of universal coverage of long-term care insurance in 2000. Despite such efforts, healthcare financing has been a major challenge, especially with the increase of senior citizens aged over 75. A subprogram for persons over 75 within the universal insurance coverage scheme was started in 2008 (*5*) to sustain financial stability. In 2013, a whole-government review of social security (health and welfare) and taxation initiated by late Prime Minister

Abe concluded a coordinated approach to sustain appropriately coordinated services for everyone in need in the super-aging society after 2025, when all baby boomers will be over 75. Another grand agenda of the Abe cabinet was to revitalize the Japanese economy. The cabinet office saw population aging as both challenges and opportunities. Indeed, many innovative products and services for senior citizens have been invented and developed in the last decade. These are perceived as business opportunities for Japan, and at the same time valuable for countries that follow a similar path of population aging as Japan. With this in mind, Asia Health and Wellbeing Initiative (AHWIN) was launched in 2016 (*6*). While attention was given to aging, birth rate decline has continued in Japan and the fertility rate dropped to a record low of 1.26% in 2022. At the Parliamentary session in the beginning of 2023, Prime Minister Kishida declared, "unprecedented measures to address declining birth rate" (*7*).

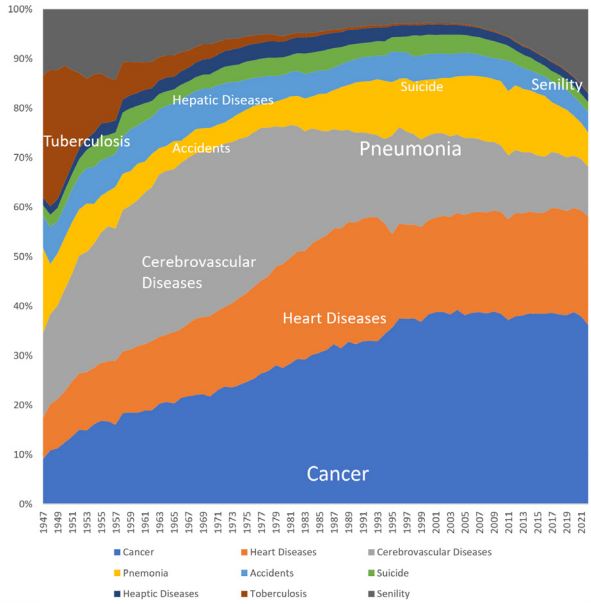

Figure 3: Trends of major causes of death (per 100,000 Japanese Population): 1947-2022. Data Source: Ministry of Health. Labour and Welfare: Vital Statistics 2022. *https://www.mhlw.go.jp/toukei/saikin/hw/jinkou/geppo/nengai22/index.html*

The demographic changes are both consequences and contributing factors of changes in mortality pattern, as shown in Figure 3. After World War II, tuberculosis and pneumonia declined, and typical lifestyle-related diseases of the middle-aged and senior population including cerebrovascular diseases, heart diseases, and cancer dominated. Then, the last two decades saw a return of pneumonia and senility as killers of senior citizens as the population ages. Naturally, these changes in mortality demanded changes in health care provision. Also, the decrease in cerebrovascular diseases is noteworthy as a favorable outcome of public health interventions (*8*). The Japanese experience is summarized in Table 1, which may be a helpful reference for other countries to predict the looming policy agenda to prepare for the forthcoming era of aging and shrinking population. There are no solid definitions for different grades of aging and aged society. However, the number of years taken for the over 65 population to increase from 7% to 14% is used as the doubling time. Therefore, in Table 1, we choose the years when the proportion of over 65 population in Japan reached 7%, 14%, 21%, and 28% (doubling, tripling, and quadrupling time, respectively) as milestones, and list the significant agendas for each period.

Approaches of Japan and Involvement of ERIA

As described above, Japan sees population aging as both challenges and opportunities, and believes that international collaboration is helpful for both Japan and the collaborating countries. ERIA is an organization

Table 1. Summary of Japanese experience

	Aging Phase	Aged Phase	Super Aging Phase	Super Aged Phase	Population Aging and Shrinking Phase
% 65+	7%	14%	21%	28%	depending on country: Japan 30.1 (2023 by WPP 2022)
in Japan	1969	1994	2006	2017	2023
Major Agenda	Mortality/Morbidity Pattern Changes, Necessary changes of health and public health services	Preparation of Long term Care Insurance and strengthening service capacities	Financing seniors among elderly population (75+) for financial sustainability of health insurance	Integration of health and welfare services at community level and ensure sustainable financing by insurances and support from taxation	Multisectoral interventions such as better work-life balance and wedge increase of younger generation, expanding child care facilities, with wider considaration of mitigating impact of shrinkage of population such as maintining social functions and keeping workforce.
Health focus	Prevention and Care of Major chronic diseasaes	Provision of care of aging associated conditions	Continuing care at community level	Dementia and other mental issues	Life course approach

with the mission to deepen the economic integration, narrow the developing gaps, and achieve sustainable developments in Association of Southeast Asian Nations (ASEAN) and East Asian countries through conducting a variety of projects and studies as part of its efforts to promote collaboration and community building throughout the region (*9*). The Institute examines various topics including trade, investment, energy, IT, health, and the environment. Within such wide mandates, ERIA perceives the benefits for member countries to work with Japan in the health field, especially in the aging-related area. The role of ERIA is to facilitate relevant works and initiatives jointly developed by the governments of the respective ERIA member states and Japan. The health-related works of ERIA can be categorized into regional infrastructure building and facilitation of country-specific cooperation by building public-private-academic platforms (*10*). Examples are illustrated below.

Regional approaches

As in Japan, the morbidity and mortality patterns of ASEAN countries are changing, creating a need for much-awaited new health policies and products. Development of such healthcare technologies and products require generation of robust evidence to apply for approval from regulatory bodies to ensure safety and effectiveness of the products, so that they are truly useful for the end users. Concerning evidence generation, conducting high-quality and large-scale clinical trials through international and well-coordinated projects such as multiregional clinical trials (MRCT) is ideal. MRCTs may facilitate health product-specific marketing approvals in participating nations *via* due regulatory processes. Moreover, MRCTs can provide regional and national data for evidence-based health policy recommendations. To strengthen MRCT and its networking, the Ministry of Health, Labour and Welfare of Japan has been supporting an international research team by launching the Department of International Trials (DIT) in the National Center for Global Health and Medicine (NCGM) in Tokyo (*11*). The DIT is the first team in Japan to be staffed by both Japanese and non-Japanese healthcare professionals. Non-Japanese staff includes health care professionals from Indonesia, the Philippines, Thailand, Vietnam, and the Democratic Republic of the Congo. The team is intimately involved in project planning in Tokyo, followed by local implementation in the countries of origin. Thus, DIT can cross multiple borders to manage MRCTs with less cumbersome efforts and financing than conventional methods such as contract research organizations. Recently, DIT has collaborated with the Ministry of Foreign Affairs of Japan, Osaka University, and other stakeholders to conduct MRCTs during the COVID-19 pandemic. After that, a region-wide clinical trial network called the Academic Research Organization Alliance for Southeast and East Asia (ARISE) was developed (*12*) (Figure 4). The early member institutions of ARISE included DIT in Tokyo, Bach Mai Hospital (*13*) in Hanoi, the Indonesian Medical Education and Research Institute (IMERI) (*14*) of the University of Indonesia in Jakarta, the National Clinical Trials and Translation Center (NCTTC) (*15*) of the University of the Philippines in Manila, as well as Siriraj Institute of Clinical Research (SICRES) (*16*) of Mahidol University in Bangkok, and was later joined by the Clinical Research Malaysia (*17*).

The initial phase of team building at the ARISE during the COVID-19 pandemic attracted due attention and hence resources. The initial efforts have focused on clinical trials of products related to infectious diseases, which later expanded to include non-communicable diseases and now global health in the framework of universal health coverage (UHC), including aging. The information generated through ARISE should help avoid prolonged regulatory approval processes in each nation through harmonization of the regulatory process advocated by the Pharmaceutical and Medical Devices Agency (PMDA) of Japan (*18*). ERIA has had a long relationship with NCGM, particularly with its Bureau of International Health Cooperation (BIHC). Now that BIHC, DIT, and ARISE are based in NCGM, partnership with ERIA, particularly its Healthcare Unit (*19*), has been strengthened. ERIA is thus facilitating the development of joint initiatives for the entire ASEAN community through the ASEAN Secretariat (*20*) and ministries of health of ASEAN member states, as well as for the global and regional community through World Health Organization (WHO) and Organization for Economic Cooperation and Development (OECD). These efforts are now paving the way for developing

Figure 4. Membership of Academic Research Organization Alliance for Southeast and East Asia (ARISE). Collaborations of ARISE with the Economic Research Institute for ASEAN and East Asian (ERIA) effectively expands ARISE membership from 5 Southeast Asian countries (red broken lines and red solid line) to 16 ERIA member countries, including 10 ASEAN member countries, 3 East Asian countries such as Japan, and 3 neighboring countries.

and marketing innovative healthcare products and services by collaborating with Japan and like-minded member countries. For example, ERIA supports ASEAN countries in the assessment of coverage by public health system of health services to be included in the WHO Essential Diagnostics List (EDL) in support of UHC (*21*). This initiative may increase regional awareness toward narrowing of national EDL gaps and development of policy recommendations to implement provisions for basic diagnostics in urban poor and rural communities, including disabled- and elderly-friendly access to devices. Participation by member countries would ensure a region-wide market-friendly health ecosystem with global standards of excellence.

Another regional approach is AHWIN. In July 2016, Japan announced AHWIN as one of its contributions to achieving UHC in the Asian region. This initiative was initially intended to offer Japanese experience and ongoing efforts in developing a comprehensive community-based long-term care system for Asia (particularly in Southeast Asia), where the aging society was expected to develop. The initiative called for mutually beneficial cooperation and economic growth in Asia (especially in the Southeast Asian region) through achieving a healthy society and economic development from comprehensive community care with the spirit of UHC (*22*). AHWIN was subsequently revised in 2018 to expand the scope of works to broader areas including disease prevention and nutrition. The principles of the revised AHWIN are to achieve a virtuous cycle of healthcare services in Asia as a whole by strengthening the provision of services, the development of data and research infrastructure, and the flow of human resources; not only in the field of aging but also in disease prevention and nutrition (*23*). Such concepts are illustrated by the shape of Mount Fuji as illustrated in Figure 5. The top hierarchy is the provision of health care, but it would only be meaningful if we have a broad infrastructure of services and products that are useful for healthy living.

Since ERIA is committed to maximizing the virtuous cycle of health and development, it works with Japan in the capacity of an international organization. One typical example is advocacy. ERIA is working with the Japan Center for International Exchange (JCIE) on the Healthy Aging Prize for Asian Innovation (HAPI) since 2020, under the auspices of AHWIN (*24*). HAPI is an award program to recognize and amplify innovative policies, programs, services, and products that address the challenges of aging societies, highlighting innovations that people throughout the region can emulate or access. To date, three rounds of awards have been held, with 237 applications from 12 countries and regions. The winning organizations came from China, Indonesia, Japan, Malaysia, Singapore, South Korea, Taiwan, Thailand, and Vietnam. HAPI is unique not only in the diverse background of the applicants but also in the wide range of the award winning organizations. Awards have been presented to elderly care businesses, technology companies, local governments, academic programs, civil society organizations, and multisectional initiatives. As such, HAPI offers a unique and valuable asset of assembling a collection of innovations and addressing a broad spectrum of activities for promoting healthy aging. Approximately one-half of the 237 applications received were from Japan, which could be taken as an implication of the leading-edge research and innovations the country has undertaken in tackling population aging. One example of an awardee in technology was a QR code company called "NailQ" located in a suburb of the Metropolitan Tokyo area. The company developed an innovative personalized QR code to address the issue of wandering by people with dementia. According to the 2022 statistics of the Tokyo Metropolitan Police Department, the number of reported cases of missing due to wandering that year was over 18,000, and the figure has been increasing steadily over the past decade (*25*). The company produces QR code stickers for applying to

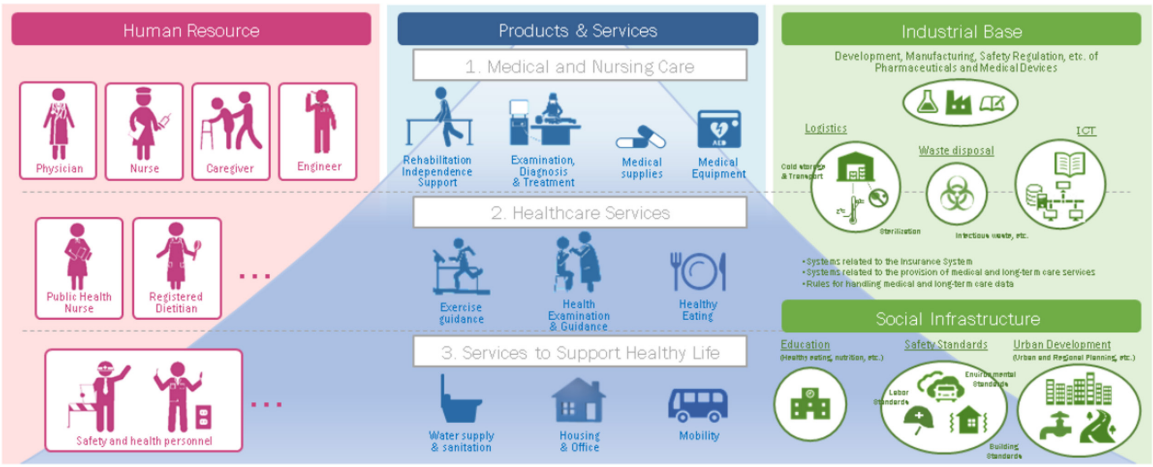

Figure 5. Concept of the Asia Health and Wellbeing initiative (AHWIN). Source:*https://www.kantei.go.jp/jp/singi/kenkouiryou/en/torikumi/index.html*

fingernails, which facilitate verification of the identity of persons with dementia and ensure their safety even if they wander off (*26*). The technology itself is simple, but implementation on a large scale requires cooperation from local stakeholders. The enterprise has collaborated with the local government, railway company, and police office. To date, the innovation has been widely used to support people with dementia and their families. NailQ has also started to be recognized internationally, receiving inquiries from Australia, Singapore, Hong Kong, and Taiwan. While HAPI is an international scheme that encourages applications not only from Japan but across Asia, the inquiries and feedback to this program prove that there is great interest in the knowledge and experience accumulated in Japan over the decades since the country became an aged society in 1994, ahead of other Asian countries. Given the uniqueness of HAPI in taking into consideration the diverse nature of the Asian region, it is an asset in assembling and showcasing a collection of innovations that can potentially be expanded further according to the context and economic development of individual countries.

Facilitation of country cooperation

According to the data of Institute of Health Matrix and Evaluation (IHME), the shares of development assistance for health in Southeast Asia, East Asia, and Oceania in 2000, 2010, and 2019 were 7.76%, 5.09% and 4.28%, respectively (*27*). With the shrinking public investment for health, private sector investment gains weight in Asia. Reflecting this trend, Japan launched a general incorporated association named Medical Excellence JAPAN (MEJ) in 2011. The priority objective of MEJ is to serve as a central hub and platform to promote international healthcare business jointly with the Japan government, medical communities, academic organizations, and healthcare industries (*28*). This approach seemed to work, but a study group of the Ministry of Economy, Trade and Industry (METI) identified three major areas requiring further strengthening: *i*) Twenty-four collaboration sites were established but these lacked robust expandability and profitability, hence sustainability; *ii*) There was insufficient focus in terms of geographic area and scope of products; and *iii*) Participating business partners were limited, and further involvement of new partners was essential (*29,30*).

With this background, more sustainable arrangements and participating partners were sought. Dr. Tatsuya Kondo, late CEO of MEJ, proposed the concept of MEX in his presentation at the International Deployment of Healthcare Service and Products Council organized by the Office of Healthcare Policy, Cabinet Secretariat on October 1, 2020 (*31*). He underscored that a government-endorsed international network with a coordination mechanism among industry, academia, and health service providers was critical to realize rational patient-centered health care and to support the progress of health care and development of health industries. He advocated that like-minded countries should have their own MEJ-like organizations (MEX, where X can be substituted with the acronym of any participating country), and all MEXs, including MEJ, would interact and collaborate through a network. Also, each participating organization, including MEJ, can utilize this project as an opportunity to promote internal collaboration to generate and develop potential business opportunities. In this concept, the core agency is MEJ. However, since such networks will help develop healthcare industries in member countries and serve as a new model of collaboration for the emerging economy where ODA is not applicable, ERIA has been engaged to facilitate collaboration between Japan and like-minded countries since 2021. The first country that came forward was Vietnam. Already, Medical Excellence Vietnam (MEV) was established. MEJ, MEV, and ERIA jointly organized three "MEV-MEJ Forum" meetings and identified possible area(s) for further collaboration. The outcome was presented at the Joint Coordination Committee of Japan and Vietnam on November 28, 2023 (*32*).

Potential assets, evolving new technologies, services, and products in Japan

The policy initiatives adopted need some time to produce tangible outcomes, and this is particularly true for the regional approaches such as ARISE and AHWIN. However, some encouraging results have been achieved. Significant progress has been made in Japan as a result of the AHWIN initiatives. With the continuous population aging and shrinking in Japan, there is an increase in demand for assistive devices due to the physical and mental characteristics of older people as well as the needs of caregivers. The industries have been urged to develop assertive technologies that meet various user needs under public funding of the Long-term Care Insurance (LTCI) scheme (*33*). As of FY2020, approximately 14,000 types of assistive devices and about 800 companies were listed in the Technical Aids Information System for assistive devices (*34*). The domestic market of all the assistive products was anticipated to be 1,521 billion yen in FY2021 and growing, according to the Japan Assistive Products Association (JASPA) (*35*). Personal care items such as diapers, communication devices such as hearing aids, and mobility devices such as canes and wheelchairs account for two-thirds of the market.

Rapidly growing areas are services and digital applications to manage nursing care facilities. An example is an application that visualizes the care needs of residents of elderly care facilities and the contents of services provided, and anticipates the changes in users' conditions. This tool allows constant update of well-structured care provided in Japan to the residents with a

minimum additional burden to professional caregivers. Another example is services for older individuals with relatively good physical conditions who are not eligible for coverage by the LTCI scheme. Such services include housekeeping services, outing support, and remote monitoring systems for older people living alone. These products and services have been developed out of the real needs of seniors and family caregivers, taking advantage of the changes in lifestyle and public attitudes toward care and support for older people, and are potentially acceptable by the Asian market (*36*). A Japanese assistive device manufacturer established a subsidiary company in Thailand and invited other Japanese companies to form a consortium of Japanese companies to expand their business in Thailand (*37*). The aim of this venture is to adapt Japanese-made services and products to the needs of older people in Thailand.

In addition to the services and products, the MEX initiative urges the Japanese stakeholders to review the strengths and weaknesses of their own healthcare industries. An analysis by METI (*38*) has concluded that Japanese healthcare industries have strength in diagnostics such as endoscopies and ultrasound imaging, but not in the treatment area. Also, the Japanese conventional manufacturing technology (hardware) is insufficient to engage in product development that benefits from digital (software) integration through AI analysis. New approaches for health care industries in the context of industrial structural changes, innovation, and international collaboration are thus required. Concerning country cooperation, Vietnam has progressed well. MEV was established, and MEV, MEJ, and ERIA jointly organized three focused forum meetings on cancer, non-communicable diseases, and aging. After the forum meetings, MEV and MEJ held follow-up discussions to identify specific collaboration projections.

Introducing a new approach with industry-government-academia-medicine collaboration mechanism

Rationale for introducing the industry-government-academia-medicine collaboration approach in place of ODA approach

In above sections, we introduced various regional approaches and mechanisms to facilitate inter-country collaboration. These approaches and mechanisms are dependent on each other. Regional approaches create a cross-country cooperation framework through smooth R&D and health product development to support the country's participation in a new collaboration ecosystem. This section will discuss the broader concept and practice based on the previous sections, using the MEX project as an example. ERIA supports the creation of an ecosystem of collaboration among industry, government, academia, and medicine in Asian countries. This initiative also supports the development of a platform to promote dialogue between key stakeholders in industry, government, and academia in Asia and their counterparts in Japan and other developed countries. Such a new cooperation model will contribute to advance the health ecosystem in each participating country. There are four reasons why ERIA has begun to explore the possibility of promoting such a model of international cooperation.

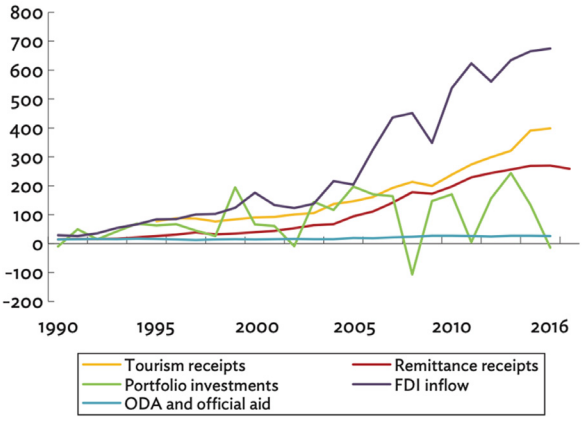

Figure 6. Financial inflow to Asia by type (US$ billion). FDI = foreign direct investment, ODA = official development assistance. Source: Asian Development Bank. Remittances and Tourism Receipts, Asia Economic Integration Report 2017. *https://aric.adb.org/pdf/aeir/AEIR2017_5_remittances-and-tourism-receipts.pdf*

First, an approach that relies too heavily on ODA from developed countries is unsustainable anymore (*39,40*). Figure 6 shows the evolution of financial inflow in the Asian region (*41*). Portfolio investment inflows have fluctuated significantly in response to changes in the global financial and economic environment, while foreign direct investment, balance of payments in services, and overseas remittances have been increasing constantly in recent years. On the other hand, the amount of ODA has remained stable at a low level for more than two decades, and the share of ODA in total financial inflow from outside the region has decreased markedly. This is because the income levels of Asian countries have risen accompanying rapid economic growth, and as a result they are not in a position to benefit from ODA in the same way as in the past. Therefore, Asian countries must consider promoting the so-called PPP or projects based on unsolicited private proposals, to replace ODA or the public-works type development of healthcare infrastructure.

Second, when Asian countries attempt to attract cooperation and investment from businesses outside the region, multinational companies (MNCs) often encounter barriers entering the medical and health market in Asian countries. Collaboration and harmonization among domestic and foreign stakeholders are required to facilitate market entry by MNCs. Figure 7 shows the four distinct strategies of industry globalization applied to the integration-responsiveness framework

(*42*). This figure indicates that global responsiveness and local adaptability are indispensable for MNCs. Still, an appropriate balance is required depending on the product/service and business domain. The first domain is where the pressure to respond globally and the pressure to adapt locally are both weak (bottom left quadrant of Figure 7). The representative businesses in this domain include civil engineering and repair services. The second domain is where the pressure to respond globally is intense but the need to adapt locally is weak (top left quadrant). Representative businesses include passenger aircraft, natural resources and materials, and finance. The third domain is where the demand to respond globally is not necessarily strong but the need to adapt locally is high (bottom right quadrant). Contents creation services affected by language and culture, as well as products and services supported or regulated by national policy would belong to this domain. The fourth domain is where the pressure to respond globally and the need to adapt locally are both intense (upper right quadrant). Representative businesses would include automobiles and consumer goods. MNCs must develop international business strategies for each quadrant when considering market entry (*43*). Healthcare business is most fitted to the third domain (bottom right quadrant of Figure 7). Therefore, MNCs should select a "multi-domestic strategy" for their international business development. In other words, they need to transfer significant authority to local operations, while the head office focuses on overall business management. Thus, when developing overseas business, it is difficult for MNCs to enter the medical and health care market of Asian countries without focusing considerably on local applications in these countries, while maintaining their technology and services at global standards. These imply that it is difficult for Asian countries to attract and promote the entry of MNCs without helping them to achieve cooperation and harmony with local industry, government, and academia. Therefore, setting up a platform for key stakeholders in industry, government, and academia both domestically and internationally is imperative to promote dialogue.

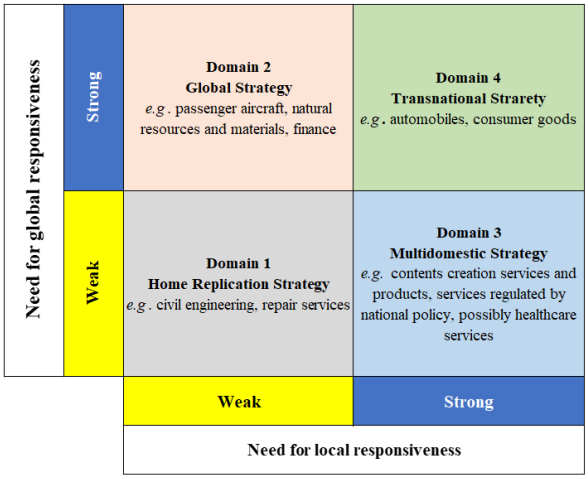

Figure 7. Strategies of industry globalization based on the integration-responsiveness framework. Source: modified from Reference 42 (Cavusgil ST, Knight G, Riesenberger J. *International Business: The New Realities, Second Ed.* Pearson Education, Inc. 2012, Chapter 12.).

Third, the experience of the efforts made in Japan in establishing collaboration among the industry-government-academia-medical communities (IGAMC) deserves close examination. Figure 2 also shows the evolution of policies in the medical and health fields in Japan. The evolution was initially based on

Table 2. Mapping of broadening international health care products and business at various stages of pharmaceutical research and development

	Basic Research	Applied Research/ Clinical Trial	Approval by Regulatory Agency	IP Protection	Business Plan and Price Setting	Production	Procurement
Role	Exploring Seeds	Verification	Legal Procedure	Protection of IP	Business Plan	Production Capability	Provision of Services and Goods
Main Providers	Researchers, Companies and Institutions		Regulatory Agency	Company	Company + Consultants	Company Grants/Investments	Service Beneficiaries and Gov.
Health Approach by MHLW	AMED	Strengthening Clinical Trials by MHLW	Strengthening PMDA and Harmonization of Regulations				Insurance Coverage
Development Approach by MoFA/JICA		Private Sector Coordination Project and Technical Cooperation by JICA				Loan to Companies by JBIC	Contribution to International Organizations (GAVi, GF, UNTAID) Grants/Loan/Technical Assistance
Industry Approach by METI	Next Generation Health Care Project/ outbound service providers and their	Hub Creation Initiative	JIH/Certified Medical Visitor Supports Encouragement of Inbound/ infrastructure building				Government-Government Dialogue
Approach by MEJ		Secretariats Function		Business Model of MEJ/Mexx (One-stop Shop)			

Source: Nakatani H, *et al,* Approach of Medical Excellence JAPAN to create platforms of collaboration in Asia. Glob Health Med. 2021; 3:401-405.

the changes in disease burden and demographics in Japan. However, it was gradually recognized that the challenges of population aging could not be addressed sufficiently without forming multi-sectorial alliances or cooperations. The first policy of applying such a concept was the Gold Plan launched in 1990. The plan offered the vision and predictability of government-committed service demand based on the ability of IGAMC to make investment plans. These plans are based on expected service needs, service volume, and quality, considering technical, operational, and financial prospects to serve the community. In such task-driven studies, stakeholders in IGAMC need to work together, fulfill their respective roles and responsibilities, and sometimes accept the division of labor. This Japanese experience may serve as a reference to other Asian countries.

Lastly, a characteristic of the value chain, or a series of consecutive steps with increase in value that go into the creation of a finished product from its initial design to its arrival at customers, in the healthcare field is that the process from upstream to downstream involves a variety of stakeholders, including industry, government, academia, and healthcare providers. This implies that if coordination and cooperation do not proceed well along this process, there is a possibility that the products and services provided may not be appropriate to patients and users. Since each player has a unique and solid culture, coordination/cooperation among them is very challenging. The difficulties of the linkage between each of research, development, commercialization, and marketing process of pharmaceutical products, *i.e.*, "death valleys", are well acknowledged and documented, as shown in Table 2 (*28*). In other words, discovery of seeds through primary research, verification of safety and efficacy, approval procedures for commercialization, protection and management of intellectual property, formulation of business strategies including pricing according to market demand, and production and sales based on these strategies are all part of the process. This linear process shows the critical role of each step participated in by different stakeholders to avoid bottlenecks during the process. In addition, this process is at risk of disruption if coordination among each step is insufficient. With such rationale, forming a PPP involving IGAMC has been advocated to ensure smooth progress from research, production, accreditation, and delivery to the target community and people. Such need of IGAMC involvement is painfully recognized in COVID-19 vaccine development and deployment. Those countries in which all actors collaborated were successful in developing novel vaccines for their populations and beyond. However, forming a PPP per se cannot provide solutions. A hub or coordinator may be needed to encourage all the actors to fulfill their duties with a spirit of cooperation.

Thus, PPPs and collaboration among industry, government, academia, and the medical communities are extremely important in the medical and health fields. It is particularly so for Asian countries in which the traditional ODA is rapidly shrinking, thanks to their own economic success. This also means that ODA-driven government-proposed (solicited) approaches are insufficient to solve the population's increasingly diverse and complex medical and health needs. Building an "ecosystem" where industry, government, academia, and the medical community work closely together domestically and internationally is necessary in such an environment.

With the above background, a PPP model in which the MEX concept is integrated is evolving, as illustrated in Table 3. Although the steps of operation of the PPP model appear similar to the ODA model, there is a fundamental difference between the two models: the ODA model has a top-down approach led by the government, while the PPP model has the IGAMC approach right from the beginning of the market survey phase.

In the ODA model, the recipient government initiates the process sequence by first conducting a market survey to identify the issue that the government wishes to address, followed by proof of value (POV) and proof of concept (POC) of the initiative to be pursued, and finally assigns the task to a local implementation agency to operate the initiative (*44*). Regarding supportive policy measures/tools, they are provided mainly by ODA loans. The ownership and funding source of this model are relatively simple, since recipient and donor governments are the vital actors. However, the process lacks the involvement of national/international industry, academia, and healthcare providers, which may generate risks regarding the relevance of the initiative to the actual community needs, since industry, academia, and healthcare providers are closer to the patients they serve. In addition to this potential weakness of this model, the AESAN countries lost eligibility for ODA loans due to their recent economic development. These two forces necessitated an alternative model, taking advantage of the growing healthcare industries. Hence, the PPP model was proposed.

The PPP model involves all stakeholders including the recipient government, national institutions, and international players in the whole process, and creates a forum for national and international dialogue. In other words, the government, industry, academia, and healthcare providers of a country form a partnership, and partnerships from different countries engage in dialogue *via* the forum. The first step of the process is a market survey to identify the missing piece in the health ecosystem, which potentially generates business opportunities to ensure the initiative's sustainability. Regarding the supportive policy measures/tools, the top-down approach of the ODA model was not capable of continuously procuring funds, and had difficulties encouraging the implementing agency to be autonomous and make the project economically viable

Table 3. Comparison of ODA model and PPP model, and role of MEX

		Market Survey	Project Ideation (1) POV	Project Ideation (2) POC	Project Development (1) Pre FS	Project Development (2) FS	Procurement	Construction	Finance	Operation
ODA Model	**Public Works (Solicited Project)**	Identifying Policy Challengs	Policy Impact Projection	Feasibility (technical/business model) Analysis	Project Planning through Feasibility (economics/financial) Analysis	Detailed Project Planning for ODA Specification and Government Approval	ICB with emphasis on economic saving and efficiency on basic specification and transperancy	EPC Works	Public Financing (ODA)	Management by Local Implementing Agancy, which tend to rely on government and/or Development Agency for operational improvement and renovation
	Stakeholder	Receipient Govenrnmet ODA Task Force	Recipent Government, Local Implementing Agency, Development Agency and hired experts							Local Implementing Agency
	Policy Measures/Tools	Support for Development Policy Formulation	Assistance for Project Formulation		ODA Loan					(Monitoring)
					Support for Feasibility Study		(Support for tender management, followed by disursement, completion of construction work, determination of loan receivable amount, repayment)			
PPP Model	**PPP Works (Unsolicited Project)**	Identifying Business Opportunity (finding missing piece in health ecosystem)	Anaysis of competivness and value proposition being offered	Feasibility (technical/business model) Analysis to judge "Feasibility"	Project Planning through Feasibility (economic/financial) Analysis to judge "Bankability"	Detailed Project and Business Planning including market strategy with FEED, decision of DE Ratio, FID and Government Approval, if any	Negotiated Lump Sum Contract with emphasis on sharp specifications for securing merchantability and timely market-in	EPC Works	self-funded investment, short-term loan (domestic) long-term loan (international) comfort letter/performance guarantee (governmnet)	Managemnt by initiator (Joint Venture), which manages, operates and renovates from commercial perspective
	stakeholder	Receipient Government, Local Institution, International Players and PPP Players plus local/international industry-government-academia-healthcare provider framework (MEX)			PPP Players plus local/international industry-government-academia-healthcare provider framework (MEX)		PPP Players and EPC Contractors plus local/international industry-government-academia-healthcare provider framework (MEX)		PPP Players and financial stakeholders plus local/international industry-government-academia-healthcare provider framework (MEX)	
	policy measures/tools	Research works supported or subsidized by METI	-	Demonstaration project supported or subsidized by METI	Subsidy-Based FS Project for Overseas Expansion on High-Quality Infrastructure, PPP projects by METI		-	-	Private-Sector Investmenet Finance by JICA Loan and investment banking by JBIC	-
	Additional Policy Measure: Scope of MEX	Bridging the gaps of "dealth valleys" and link to cooperative PPP formulation between identified countries and Japan for making use cases applicable for ASEAN countries with healthcare market and policy impact					→	→	→	→

POV = Proof of Value, POC = Proof of Concept, Pre FS = Preliminary Feasibility Study, ODA = Official Development Assistance, ICB = International Competitive Bidding, EPC = Engineering, Procurement and Consutruction, PPP = Public Private Partnership, FEED = Front End Engineering Design, DE Ratio = Debt Equity Ratio, FID = Final Investment Dicision, JICA = Japan International Cooperarton Agency, JBIC = Japan Bank for International Cooperation, METI = Ministry of Economy, Trade and Industry, MEX = Medical Excellence Initiative.

and sustainable. Here, Japan proposed to narrow the gaps by offering coordination and support through the MEX project at the market survey, POV, POC, and feasibility study phases, so that the project can demonstrate itself to be "bankable" and "sustainable". It must be emphasized that such initiatives should be more relevant to the communities they serve, since a platform of dialogue between all stakeholders is in place, which cannot be expected from the top-down approach often seen in the ODA model.

Lessons learned from ongoing initiatives

Japan and Vietnam signed a memorandum of cooperation on healthcare in July 2019 to strengthen collaboration between the two governments. The MEV Project was launched in 2021. This project aims to solve problems in the medical and health care fields, improve the healthcare ecosystem, and foster the development of the healthcare industry in both countries by developing MEV, a partnership that involves all relevant stakeholders including the industry, government, academia, and healthcare providers in Vietnam. It was hoped that the MEV and its counterpart partnership in Japan; *i.e*. MEJ, would have continuous dialogue and develop the practical implementation of collaborative projects (*45*). In other words, this approach emphasizes dialogue and discussion between the partnerships of the two countries. As a platform for dialogue, discussion, and matching, the "MEV-MEJ Forum" was organized (*46*). The Forum meetings are designed to serve as the driving force for advancing this initiative. The inception of the MEV-MEJ Forum was traced back to the High-Level Meeting on Japan-Vietnam Medical Deployment held in October 2021. At that meeting, Mr. Son, Deputy Minister of the Vietnamese Ministry of Health, and Ms. Chau, Deputy Director-General of the International Cooperation Department, expressed their priorities for cooperation with Japan, followed by expert presentations and discussions on collaboration between industry, government, academia, and healthcare providers. Cancer, non-communicable diseases, and aging were identified as areas for further discussion. To address each challenge, three MEV-MEJ Forum meetings were organized under the tripartite memorandum of understanding (*47*) among Hanoi Medical University Hospital, MEJ, and ERIA, which was endorsed by the two governments in July 2022. Therefore, it is understood that both the Japanese and Vietnamese governments recognize the MEV-MEJ Forum as a mechanism to materialize the Japan-Vietnam Memorandum of Cooperation in Healthcare.

During the preparation for the forum, it was felt necessary to have a central hub to organize symposia (MEV-MEJ Forum meetings) and generate specific Japan-Vietnam collaborative projects based on the discussions. This idea was materialized with the establishment of the Joint Strategic Council (JSC) in December 2022. The core membership has a unique composition, consisting mainly of non-governmental organizations from Vietnam (including representatives from national hospitals and the National University of Medicine and Pharmacy) and from Japan (centered on MEJ member companies), with the goal to foster and expand collaboration between the Japanese and Vietnamese healthcare industries.

Under the leadership of the JSC, three forum meetings were jointly organized by MEV, MEJ, and ERIA in 2023, focusing on cancer, other non-communicable diseases, and aging. Participants discussed challenges in Vietnam, introduced Japanese strategies, and explored potential collaborative project ideas. The common themes identified in the wrap-up of each meeting are as follows:

i) In addition to strengthening primary and secondary prevention through the introduction of health checkups, screenings, and coordinated treatment, primordial prevention is crucial for improving national health and reducing inequalities.

ii) It is necessary to build a consensus across society to support the health and aging of the population.

iii) The setting of policy visions and the allocation of budgets by the government are essential (*e.g*., exploring the creation of healthcare and long-term care insurance systems funded by premiums or systems financed or subsidized by taxes). There is a need for a reinforced recognition that investing in the healthcare sector is not a wasted resource for economic growth.

iv) It may be effective to place responsibility for providing healthcare and long-term care services at the municipal level, with the actual service provision carried out by the private sector. Regarding human resources, various measures can be considered, such as introducing qualification tests for care workers and using IT technologies to supplement human resources. In this context, the possibility of collaboration with Japan in developing relevant private sector and human resources needs further exploration.

v) Recognizing that the direct adoption of the Japanese model may not be feasible for Vietnam, it might be advisable to consider a unique Vietnamese model for each challenge, such as nationwide deployment, starting from a small-scale model. Collaborative efforts involving various organizations including the private sector, government, hospitals, and universities from Japan and Vietnam are desirable.

Specific achievements resulting from these activities are worth noting. First, a unique project generation mechanism has been established. After each MEV-MEJ Forum meeting, the Vietnamese side submitted over 20 project ideas for the Japan-Vietnam collaboration. Several projects in line with mutual interests received attention from Japanese private companies and are moving toward concrete outcomes in 2023 and beyond. The process of formulating project ideas, further

exploration, and matching stakeholders' interests in both countries, along with feasibility studies was carried out through the Japan-Vietnam dialogue. This inclusive approach involving stakeholders from the industry, government, academia and health providers from the upstream phase of project creation facilitated the engagement of private companies.

In addition, while ODA has traditionally been the mainstream of Japan-Vietnam cooperation, the nature of the MEV Project allows exploration of alternative funding avenues. Recognizing the need for non-ODA-dependent collaboration, the Forum set criteria of project adoption focusing on social impact, business effectiveness, and sustainability. This encourages members from companies, hospitals, and universities to contribute to addressing the challenges within their organizations as well as the future healthcare and development of healthcare industries in Vietnam.

To advance the MEV Project, further efforts are needed to: *i*) utilize diverse funding options from domestic/international and public private sources without interruption throughout the process of each project, *ii*) strengthen and sustain the governance of the overall MEV-MEJ Forum, and *iii*) maintain the momentum of dialogue and collaboration after the initial and good outcomes gained in 2023.

Ways forward

ERIA has been involved in developing various initiatives, starting from clinical trials and moving on to a more prominent framework of AHWIN. ERIA actively works to broaden the concept of MEX and build a platform to facilitate dialogue among national/international partnerships, each consisting of industry, government, academia, and healthcare providers. The first-line collaborating countries are Vietnam and India, but more countries are expected to be added. The experience and case studies gained from these projects will benefit all member countries of ASEAN. ERIA will remain committed to helping and facilitating the endeavors initiated by Japan for the benefit of all.

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