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Improving Population Health in the Era of Superaging: Japan's Challenges and Opportunities

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EXECUTIVE SUMMARY

This essay examines the changing characteristics of the burden of disease in Japan and provides recommendations for national and local policymakers to improve public health in a rapidly aging population.

MAIN ARGUMENT

Japan established universal health coverage in 1961. Since then, it has achieved excellent population health at a relatively low cost, while offering universal access to healthcare across regions. Today, Japan is at the forefront of research and policymaking on population aging, confounded by a slowdown in the progress in improving population health, an increase in the burden of age-related morbidity, and growing health inequalities across prefectures. The development of Japan's policies on aging can add perspective to debates that many countries are currently having or are likely to conduct. Now is an opportune time to take steps to ensure the sustainability and equity of Japan's health accomplishments over the past 50 years.

POLICY IMPLICATIONS

- Further progress in improving public health in Japan primarily depends on the prevention of major modifiable risk factors for noncommunicable diseases, such as tobacco smoking, dietary risks, and metabolic risks.
- Promoting local and regional stewardship for integrated healthcare services will help more efficiently allocate resources and ensure that funding is sustainable in different local contexts.
- Enhancing the performance of health systems by using health information and communications technology can help identify current and potential bottlenecks and thereby improve the delivery of services and promote the efficient use of resources.

Japan established universal health coverage in 1961, which has been instrumental in providing the latest breakthroughs in medicine and treatment to the population. Its premier accomplishment in the past 50 years has been the achievement of excellent population health at a low cost and increased equity between different socioeconomic groups.[1] Through a rapid reduction in the mortality rates of communicable diseases among children in the early 1960s, Japan's life expectancy has become world-leading (83.7 years in 2015).[2] Simultaneously, coupled with a low fertility rate (1.4 births per woman in 2016), Japan is at the forefront of the debate over "superaging." The number of individuals aged 65 and over has nearly quadrupled in the last 40 years, rising to 27% in 2016 as a percentage of the total population. This figure is expected to grow to 40% by 2060.[3]

Japan is therefore well-positioned to take the lead in exploring the implications of population aging. Its experience can add perspective to the policy debates that are currently underway in many countries confronted with an aging population. As our recent research in the *Lancet* has shown, while Japan has been successful overall in reducing the rates of mortality and disability from most major diseases, progress has slowed and variations in public health between prefectures are growing.[4] However, substantial opportunities exist to craft more robust policies to support a healthier population in Japan.

This essay examines the changing characteristics of the burden of disease in Japan and provides recommendations for national and local policymakers to improve the health of the country's rapidly aging population. The essay begins by analyzing the key challenges regarding disease burden in Japan. The next section provides an overview of the major policy options the government has developed to address some of these issues. The third section then highlights three specific recommendations that will help guide policy agendas to address Japan's healthcare challenges in an efficient and sustainable manner. The essay concludes with a brief summary of the findings and implications.

The Disease Burden Profile of Japan: Key Issues and Challenges

Japan can claim great success in introducing universal health coverage, which has led to excellent population health for all socioeconomic groups at a low cost. In the era of superaging, however, the country now faces significant challenges that must be addressed in order to ensure the sustainability and equity of Japan's health accomplishments of the past 50-plus years.[5]

First, the progress in population health has slowed down. This is largely a result of the leveling off of mortality reduction since around 2005 (see **Table 1**), primarily from cardiovascular disease

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1 Nayu Ikeda et al., "What Has Made the Population of Japan Healthy?" *Lancet* 378, no. 9796 (2011): 1094–105.

2 World Health Organization (WHO), *World Health Statistics 2017: Monitoring Health for the SDGs* (Geneva: WHO, 2017), http://apps.who.int/iris/bitstream/10665/255336/1/9789241565486-eng.pdf.

3 Ministry of Health, Labour and Welfare (Japan), "Jinkoudoutaitoukei no gaikyou" [Overview of Vital Statistics in 2015], 2016, http://www.mhlw.go.jp/toukei/saikin/hw/jinkou/kakutei15/index.html; Ministry of Internal Affairs and Communications (Japan), Statistics Bureau, "Population Estimates by Age (5-Year Age Group) and Sex," 2016, http://www.stat.go.jp/english/data/jinsui/tsuki/index.htm; and Ministry of Internal Affairs and Communications (Japan), Statistics Bureau, "Population and Households," in *Japan Statistical Yearbook 2017* (Tokyo, 2017), chap. 2, http://www.stat.go.jp/english/data/nenkan/66nenkan/1431-02.htm.

4 Shuhei Nomura et al., "Population Health and Regional Variations of Disease Burden in Japan, 1990–2015: A Systematic Subnational Analysis for the Global Burden of Disease Study 2015," *Lancet* 390, no. 10101 (2017): 1521–38.

5 Ibid.

TABLE 1 Five-year reduction rates of age-standardized mortality (%, measured in five-year periods)

Year	Both sexes	Male	Female
1995	6.9	4.5	9.4
2000	9.7	8.3	11.6
2005	7.1	7.3	7.7
2010	6.2	7.7	5.4
2015	3.1	5.4	1.0

SOURCE: Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2015," 2016.

and cancer. The increasing burden from degenerative disorders such as Alzheimer's disease also hampers Japan's progress in improving population health (as will be further elaborated below).[6]

Second, as a consequence of the growing phenomenon of survivorship, the Japanese population suffers from more chronic and age-related morbidity. **Table 2** shows the 2015 ranking of causes of disability-adjusted life years (DALYs)—an indicator that combines mortality and morbidity. Alzheimer's disease (including other forms of dementia) was a distinctive cause of DALYs, increasing almost 50% from 2005 to 2015. Another key metric for monitoring the shift of the burden of disease is age-standardized DALYs, which assess the impact of a disease by comparing populations with different age structures to minimize over- or under-representation of the impact of certain diseases on different age groups. While the age-standardized rates of DALYs from many leading causes have declined since 2005, the rates due to musculoskeletal disorders (e.g., lower back and neck pain) and sense organ diseases (e.g., hearing loss and vision loss) have remained static. More importantly, Alzheimer's disease was the only one of the ten leading causes that increased age-standardized DALY rates significantly over the same period (by 3.3%). The increasing burden from Alzheimer's disease may lead to higher demand for long-term and special care, putting constraints on healthcare expenditure and resource utilization and thus threatening the sustainability of the Japanese health system.[7]

Third, Japan is experiencing rising prefectural variations in the burden of disease.[8] For example, our study from 2017 found that Shiga Prefecture, located in the western region of Japan's main island of Honshu, had the highest number of diseases with mortality and DALY rates that are significantly lower than the national mean (sixteen for mortality and twelve for DALYs out of the

[6] Nomura et al., "Population Health and Regional Variations of Disease Burden in Japan."

[7] Naoki Ikegami et al., "Japanese Universal Health Coverage: Evolution, Achievements, and Challenges," *Lancet* 378, no. 9796 (2011): 1106–15.

[8] Nomura et al., "Population Health and Regional Variations of Disease Burden in Japan"; and Yoshiharu Fukuda, Hiroyuki Nakao, Yuichiro Yahata, and Hirohisa Imai, "Are Health Inequalities Increasing in Japan? The Trends of 1955 to 2000," *BioScience Trends* 1, no. 1 (2007): 38–42.

TABLE 2 Top ten causes of DALYs in Japan

Rank in 2015	Cause	Type of cause	Change in number of DALYs from 2005 (%)	Change in age-standardized DALY rate from 2005 (%)
1	Ischemic heart disease	Chronic disease	7.6	-14.5
2	Lower back and neck pain	Chronic disease	6.7	-0.1
3	Sense organ diseases	Chronic disease	22.7	0.8
4	Cerebrovascular disease	Chronic disease	-0.7	-21.4
5	Alzheimer's disease	Chronic disease	49.6	3.3
6	Lower respiratory infections	Infectious disease	22.4	-10.8
7	Lung cancer	Chronic disease	8	-11.1
8	Self-harm (mostly suicide)	Injury	-8.8	-5.3
9	Stomach cancer	Chronic disease	-4.5	-20.6
10	Colorectal cancer	Chronic disease	11.4	-6.4

SOURCE: Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2015."

NOTE: DALYs represent disability-adjusted life years; ranking is based on the number of DALYs from each cause.

twenty leading causes).[9] Hence, Shiga had the highest life expectancy at birth in 2015 (84.7 years). By contrast, Aomori Prefecture in the northernmost part of Honshu recorded the lowest life expectancy at birth in 2015 (81.6 years) and had the highest number of diseases. At the same time, Aomori had mortality and DALY rates that were significantly higher than the national mean (thirteen for mortality and eleven for DALYs out of the twenty leading causes).

The reason for the health inequalities across prefectures is still little understood. In our article for the *Lancet*, we found no significant correlations between the age-standardized mortality or DALY rate in 2015 and health expenditure per capita in 2015 and health workforce density in 2014.[10] Known risk factors (behavioral, metabolic, and environmental and occupational risks) were also homogeneously distributed across prefectures. However, variations in lifestyle, socioeconomic status, and poverty trends in each prefecture have not been fully analyzed. Here, health system performance, which varies across the country, is often a greater contributor than other factors in addressing health inequalities.[11]

[9] Nomura et al., "Population Health and Regional Variations of Disease Burden in Japan."

[10] Ibid.

[11] The WHO defines a health system to include all the activities whose primary purpose is to promote, restore, or maintain health. The assessment goals of health system performance should be expressed in terms of outputs (readiness/quality of program activities), outcomes (program results), and impacts (program effects), which will likely relate to health status, rather than inputs and processes (program infrastructure). See WHO, *World Health Report 2020—Health Systems: Improving Performance* (Geneva: WHO, 2000).

Visions for Japan's Healthcare Policy

Efforts to reform Japan's health system are guided by several underlying values and principles. Yasuhisa Shiozaki, the former minister of health, labour and welfare, established the Health Care 2035 Advisory Panel in June 2015, which brought together young leaders on health policy from within and outside the ministry to develop a long-term strategy for the next twenty years.

Their report—*The Japan Vision: Health Care 2035*—proposes a paradigm shift that would transform Japan's current health system into a multidisciplinary system in the era of superaging.[12] The core principles would shift from the provision of identical services uniformly across whole populations toward services that target individual needs and continuously value equality and solidarity. The focus of this new system would shift from hospital-centered care toward patient-centered long-term care within communities as well as proactive interventions to improve patients' lifestyles and behavior, workplace environment, and housing conditions, among other factors. The report also recommends that the principles of Japan's health system shift from curative care toward care that improves quality of life, including mental and social well-being, especially for those living with long-term or chronic illness.[13] The pillars of this vision include healthcare professionals, information sharing, and sustainable financing.

Healthcare professionals. In the next twenty years, Japan will likely face healthcare workforce shortages. In an aging society, people are expected to experience more chronic diseases and multimorbidity, which often require care by professionals from both the healthcare and social care sectors. Thus, Japan must promote educating and training its workforce to be capable of performing multiple functions in both service sectors. Other endeavors include shifting and sharing tasks among health workers, which increases service delivery capacity by delegating some tasks from higher-level to less-specialized workers. These will concurrently support the growth of an integrated community care system (ICCS).

Information sharing. With regard to healthcare governance at lower levels, it is necessary to help prefectures better use comparative health data to analyze and understand population needs and appropriately allocate resources through cutting-edge information and communications technology (ICT). These efforts will lead to improved quality of healthcare and support further reorganization of the healthcare system through adjustments to key elements, including hospital functions and the number of inpatient beds.

Sustainable financing. Progressive population aging also could put the future of the Japanese healthcare system in a dire financial situation. It is therefore critical that Japan adopt measures to make the system financially sustainable. To ensure the sustainability of public funding, various strategies should be considered, including increasing existing taxes and imposing new taxes on products that are known to adversely affect health, such as tobacco, alcohol, and sugar. Implementing policies that tax pollution and other actions that are harmful to the environment could also play a positive role.

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[12] Ministry of Health, Labour and Welfare (Japan), *The Japan Vision: Health Care 2035* (Tokyo, 2015). See also Hiroaki Miyata et al., "Japan's Vision for Health Care in 2035," *Lancet* 385, no. 9987 (2015): 2549–50; and Michael R. Reich and Kenji Shibuya, "The Future of Japan's Health System—Sustaining Good Health with Equity at Low Cost," *New England Journal of Medicine* 373, no. 19 (2015): 1793–97.

[13] Miyata et al., "Japan's Vision for Health Care in 2035."

Recommendations

Despite the challenges discussed above (e.g., morbidity expansion due to health transitions and growing health variations between prefectures), Japan—a front runner in the era of superaging—has great potential to improve the health of its population. We propose the following three major recommendations to help guide policy agendas, including *The Japan Vision: Health Care 2035*, and prioritize policies for promoting population health in Japan in a sustainable manner.

Strengthen the Prevention of Risk Factors

Further progress in improving public health primarily depends on the prevention of major risk factors for noncommunicable diseases, such as smoking, dietary risks, and metabolic risks—the leading risks of death and DALYs in the Japanese population in 2015 (see **Table 3**). A comprehensive package of preventative measures should be encouraged in order to lower the effect of risk factors of metabolic syndrome, including by improving unhealthy lifestyles and diet (mostly due to high sodium levels) and increasing the coverage of antihypertensive drugs. This package would be

TABLE 3 Top five risk factors for deaths and DALYs in Japan with proportion of total deaths/DALYs attributable to each risk factor

	Rank in 2015	Risk factor for deaths (%)	Risk factor for DALYs	Type of risk factor
Men	1	Smoking (18.9)	Dietary risks (13.8)	Behavioral
	2	Dietary risks (18.8)	Smoking (12.5)	Behavioral
	3	High systolic blood pressure (15.0)	High systolic blood pressure (10.1)	Metabolic
	4	High fasting plasma glucose (7.1)	High fasting plasma glucose (6.7)	Metabolic
	5	Alcohol and drug use (5.5)	Alcohol and drug use (6.1)	Behavioral
Women	1	Dietary risks (18.0)	Dietary risks (9.5)	Behavioral
	2	High systolic blood pressure (17.4)	High systolic blood pressure (7.9)	Metabolic
	3	High fasting plasma glucose (7.6)	High fasting plasma glucose (5.5)	Metabolic
	4	High total cholesterol (6.6)	Impaired kidney function (3.2)	Metabolic
	5	Impaired kidney function (5.8)	Smoking (2.8)	Behavioral

SOURCE: Institute for Health Metrics and Evaluation, "Global Burden of Disease Study 2015."

NOTE: DALYs represents disability-adjusted life years; ranking is based on the proportion of total deaths or DALYs attributable to each risk factor.

particularly relevant given evidence suggesting that Japanese might be genetically susceptible to being overweight or to developing diabetes mellitus.[14] In April 2008 the government commenced a screening and intervention program specifically targeting metabolic syndrome. People aged 40–74 years are eligible to have an annual health checkup and a health education intervention, although the program's effectiveness is not yet well-evaluated.[15]

Importantly, tobacco smoking has a striking effect on population health. Despite its well-known harmful effects, smoking is still commonplace in Japan, where 30% of men and 10% of women smoke today.[16] The country should adopt more drastic measures to discourage the consumption of tobacco products. In 2017 the Ministry of Health, Labour and Welfare attempted to introduce its strictest smoking policy to date. The law would have banned smoking on the premises of public facilities, such as restaurants and bars, hospitals, and municipal offices, with the long-term goal of making the 2020 Tokyo Olympics smoke-free. The policy was strongly supported by the general public, patient groups, researchers, and practicing health professionals, including the Japan Medical Association.[17] However, it was fiercely opposed by pro-tobacco policymakers, the tobacco industry (led by Japan Tobacco Inc.), and bar and restaurant owners concerned about the effect the ban would have on revenue.[18]

One of the prevailing arguments in opposition to a ban is the assertion that prohibiting smoking in public places may harm restaurants and other businesses. However, this assertion has been disproved by a number of studies. In New York City, for example, one year after the 2003 Smoke Free Air Act banning smoking in all workplaces went into effect, restaurant and bar tax receipts increased by 8.7%, and employment subsequently grew by 10,600 jobs.[19] In response to the Ministry of Health, Labour and Welfare's proposed smoking ban, pro-tobacco lawmakers suggested that Japan should instead focus on policies that segregate smoking and nonsmoking areas in public places (i.e., the creation of designated smoking rooms).[20] However, such an unrestrictive ban is likely to be ineffective in preventing "passive smoking" among children and nonsmoking adults through the inhalation of secondhand smoke.

Promote Local Governments' Stewardship of Integrated Services

As an aging society, Japan experiences higher rates of chronic disease and multimorbidity. To allocate healthcare resources more efficiently and ensure that funding is sustainable in different

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14 Naoki Sakane et al., "Beta 3-Adrenergic-Receptor Polymorphism: A Genetic Marker for Visceral Fat Obesity and the Insulin Resistance Syndrome," *Diabetologia* 40, no. 2 (1997): 200–204; and Toshihide Yoshida et al., "Mutation of Beta 3-Adrenergic-Receptor Gene and Response to Treatment of Obesity," *Lancet* 346, no. 8987 (1995): 1433–34.

15 Ministry of Health, Labour and Welfare (Japan), "Tokuteikenshin Tokuteihokenshidou ni tsuite" [Standard Health Examination and Guidance Program], 2008, http://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000161103.html.

16 Japan Tobacco Inc., "Kitsuensharitsu" [Smoking Rates], 2016, https://www.jti.co.jp/corporate/enterprise/tobacco/data/smokers/index.html.

17 Yusuke Tsugawa, Ken Hashimoto, Takahiro Tabuchi, and Kenji Shibuya, "What Can Japan Learn from Tobacco Control in the UK?" *Lancet* 390, no. 10098 (2017): 933–34; and Japan Medical Association, "Jyudoukitsuen wo kyouka jitsugen surutameno shomeikatsudou shuuryou no gohoukoku to orei" [Petition to Support a Policy That Prevents Secondhand Smoke], 2017, http://www.med.or.jp/people/info/people_info/005096.html.

18 Justin McCurry, "Japan Urged to Go Smoke-Free by 2020 Tokyo Olympics," *Guardian*, January 31, 2017, https://www.theguardian.com/world/2017/jan/31/japan-urged-to-go-smoke-free-by-2020-tokyo-olympics; and Marissa Payne, "'How Would I Live If Smoking Is Banned?' Japanese Politicians Decry Calls for Smoke-Free Olympics," *Washington Post*, May 2, 2017, https://www.washingtonpost.com/news/early-lead/wp/2017/05/02/how-would-i-live-if-smoking-is-banned-japanese-politicians-decry-calls-for-smoke-free-olympics.

19 "The State of Smoke-Free New York City: A One-Year Review," New York City, 2004, https://www.tobaccofreekids.org/assets/content/pressoffice/NYCReport.pdf.

20 "Japan's Tobacco Lobby Fires Up as Government Pushes Ahead with Tougher Smoking Laws," *Japan Times*, March 13, 2017, http://www.japantimes.co.jp/news/2017/03/13/national/social-issues/japans-tobacco-lobby-fires-government-pushes-ahead-tougher-smoking-laws/#.WQbzgVOGPUI.

local contexts, the authority and responsibility of local governments in creating and implementing health policy should be clearly defined and strengthened.

As proposed in *The Japan Vision: Health Care 2035*, Japan is striving to establish an ICCS by 2025.[21] This would be a comprehensive system that provides communities with appropriate living arrangements, healthcare, and social services, such as daily life support that supplements end-of-life care in long-term-care settings. The system would be funded through the long-term-care insurance system.[22]

Nurses would play an important role in the ICCS by working on a team alongside social workers and care managers, as well as community volunteers working under the supervision of nurses. The establishment of an ICCS will require strong stewardship by local governments, given that the contexts for healthcare and other social care are locally differentiated. For example, each prefectural government is required under the Medical Service Act (amended in 2014) to develop its own community health vision. Local leaders are expected to present models for ideal healthcare service for their communities.[23] In doing so, the data and information needed to implement this vision will be gathered, analyzed, and shared; healthcare demand will be estimated; and interested bodies and stakeholders in the prefecture will discuss healthcare service provisions.

Because the evaluation of these reforms to establish an ICCS is still in the early stages, more attention and caution should be paid to measuring performance. Also, in order to ensure the successful performance of the ICCS, Japan needs to empower local planning entities that can expand regional autonomy. This should facilitate dialogue and decision-making among groups that have not previously collaborated, including local governments, local medical associations, private industries, and civil society groups.

Enhance Health System Performance and Assessment

Prefectural governments face the challenge of improving the performance of their health systems amid aging demographics, increasing multimorbidity, and growing concerns about financial stability. One of the key measures required to improve health system performance is insurance reform, such as the consolidation of social health insurance plans at the prefectural level.[24] This would not only improve the fairness of premium contributions and copayment settings but also boost the authority of the prefectural governments.[25] They would then have a mandate to exert tighter supervision and control over the provision of healthcare to more efficiently allocate resources in the prefecture.

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21 Ministry of Health, Labour and Welfare (Japan), "Chiikihoukatsu kea sisutemu" [Integrated Community Care System], http://www.mhlw.go.jp/stf/seisakunitsuite/bunya/hukushi_kaigo/kaigo_koureisha/chiiki-houkatsu.

22 The long-term-care insurance system was introduced in 2000 to meet the challenges of Japan's aging society and to contain health expenditures. Its beneficiaries are those requiring long-term care or support services, including nursing care and day service. The insured must be certified as being in the condition requiring such services due to having dementia or being bedridden. This system is primarily funded through compulsory contributions by those over 40, general taxation, and copayments by the insured of 10% of the cost of services. The managing entities (insurers) of the long-term-care insurance system are the municipalities.

23 Yohsuke Takasaki et al., "Health Care Reform through Demographic Transition—The Case of Japan: Integrated Community Care System for Sustainable UHC and Society," Japan Center for International Exchange, 2016.

24 Kenji Shibuya et al., "Future of Japan's System of Good Health at Low Cost with Equity: Beyond Universal Coverage," *Lancet* 378, no. 9798 (2011): 1265–73. In addition to long-term-care insurance, there are three main types of health insurance in Japan: employee's health insurance (EHI), national health insurance (NHI), and late elders' health insurance (LEHI). EHI is provided to employed workers (company employees) and their dependents and is insured by several insurers, mostly depending on the size of the company. Meanwhile, NHI is designed for people who are not employed and are under 75, and it is insured by municipal governments. The people who are not eligible for either EHI or NHI, including self-employed persons over 75, are enrolled in LEHI, which is insured by prefectures.

25 Ikegami et al., "Japanese Universal Health Coverage."

This option recently became more realistic after the Ministry of Health, Labour and Welfare announced its intention to consolidate citizens' health insurance (for the unemployed, self-employed, and retirees) within all prefectures. Under this reform, prefectural governments will assume fiscal responsibility from municipal governments for citizens' health insurance by 2018 in order to stabilize management and equalize services and premium contributions among different municipalities within a prefecture.[26]

The performance of the health system must be monitored and assessed to ensure accountability and to enhance quality through peer competition. As emphasized in *The Japan Vision: Health Care 2035*, national and prefectural governments should invest in health ICT to exploit the potential for big data to assist in identifying the bottlenecks of the current health system, improve the delivery of health services, and promote efficient use of health resources. For example, a new platform called the Person-centered Open PLatform for wellbeing (PeOPLe) is an endeavor to make the best use of data on population health and health system performance. This initiative was proposed by the Ministry of Health, Labour and Welfare in October 2016 and is expected to be implemented by 2020.[27] This is an open-data platform that integrates personal data from electronic medical records, including on insurance claims, immunizations, and checkups.

Conclusion

Japan is at the forefront of developing policy solutions to deal with the challenges of population aging. The country faces an increase in the burden of age-related morbidity and growing health inequalities across prefectures, among other public health issues. Moving forward, it will be important for Japanese policymakers to strengthen the prevention of key risk factors, promote local and regional stewardship for integrated services, and enhance health system performance and assessment in order to further improve population health and reduce inequity. Given the position of Japan as a global leader that has previously achieved excellent population health at a relatively low cost, its development of policies on population aging will likely add perspective to debates in other countries. With these factors in mind, now is an opportune time for Japan to work to ensure the sustainability of its public health achievements over the past 50-plus years.

[26] Takasaki et al., "Health Care Reform through Demographic Transition."

[27] Ministry of Health, Labour and Welfare (Japan), "ICT wo katsuyou shita jisedaigata hokeniryou sisutemu no kouchiku ni mukete" [Toward the Construction of a Next Generation Health Care System Utilizing ICT], 2016.