

approach will adjust to further changes in employment patterns, including an increased number of pensioners working. Additionally, the co-payment rate should be lowered for all households with low income—not only elderly people—to improve inequities in access. Where to set the line to exempt people from contributing premiums and making co-payments should be considered in the context of public assistance reform (panel 4).⁴³

Consolidation within prefectures does not mean that the national government would abdicate its responsibility. On the contrary, the government should continue to play a major part in deciding the services to be covered and their prices in the fee schedule, in setting national standards of quality and professional qualifications, and in subsidising prefectures with low average incomes, a higher proportion of elderly people, and so forth. However, key decisions about investment in and restructuring the delivery system would be made by prefectural governments. This devolution of authority and fiscal responsibility would be in line with the ongoing trend in the public sector in Japan.

Global lessons

Japan's major accomplishment with social health insurance, from a global perspective, has been its successful pursuit of the normative goals of expansion of coverage and containment of costs while improving equity in the health system over time. Japan offers several lessons for other countries.

The first is that attainment of universal coverage on the one hand and achievement of equity in benefit packages and rates of co-payments and contributions on the other, are different goals and need different long-range strategies.⁴⁴ Before universal health coverage was achieved in 1961, community-based plans adopted the fee schedule of employee-based plans in 1959. The co-payment rate became uniform, except for elderly people and children, only in 2003. However, contribution rates still differ by more than three times between the social health insurance plans. Reform is a continuous process that will never be completed.

The second is the importance of political driving forces to move countries forward on the path to universal coverage. For Japan, the political forces for expansion of social health insurance coverage were the goals of achieving a wartime state in the 1930s and 1940s, and a welfare state in the 1950s to 1970s. For the welfare state, Japan's post-war democracy had a crucial role, providing both popular support and political party competition that motivated efforts to decrease inequities in the different rates of co-payment between social health insurance plans. Successful egalitarian reforms have been undertaken in South Korea and Taiwan after the election of democratic governments.⁴⁵

The third is the inherent weakness of a social health insurance system that is fragmented by employment and residential status as in Japan. Because each plan

will differ in risk profile and income level, economic and political incentives against policy change are created.⁴⁶ This difficulty will be exacerbated if local governments are allowed to choose their own method of setting contribution rates. Countries that might consider adopting Japan's model of social health insurance should plan in advance to address its weaknesses before opposition to structural reform becomes deeply entrenched.

Contributors

B-KY, HH, MM, AB, and RW contributed to the data analysis. B-KY, HH, MM, AB, HO, KS, B-MY, and MRR commented on the report, and MRR revised the report. All authors contributed to the discussion and have seen the final version of the report.

Conflicts of interest

We declare that we have no conflicts of interest.

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lower than in other high-income countries.⁵ Given poor measures on quality of care, further reduction in mortality may require that Japan revamp its health-care system. Economic stagnation and rising income inequality could also be part of the explanation of recent trends.

What lessons can be drawn from the experience of Japan? Drawing from Ikeda and colleagues' analysis, I make four observations. First, strong government action at relatively low national income per capita (Japan in the 1950s) in a comparatively educated population can result in implementation of effective infectious disease control programmes. The critical necessity for high levels of educational attainment⁶ should not be underestimated. Second, the main effects of the health-care system in explaining accelerated mortality decline were probably through public health action and primary care management of key risks such as blood pressure. These make up a small fraction of health expenditure in any nation. Low health expenditure as a fraction of GDP in Japan associated with excellent health outcomes could be because most health expenditure in other nations contributes little to improved population health outcomes. Third, Japan has benefited enormously from favourable risk factors for ischaemic heart disease and some cancers. Japan already had lower death rates from ischaemic heart disease than the other eight nations in the 1950s. Favourable risk factor endowment must be taken into consideration when undertaking any type of assessment of health system performance. Fourth, in an era of economic stagnation, political turmoil, ageing

populations, and inadequate tobacco control, Japan does not seem to be effective in addressing its new set of health challenges. It will take more than universal access to a low-spending, high-volume health system to tackle these challenges. Without concerted action, Japan, like the USA⁷ is likely to continue dropping in the global mortality league tables. Although the relative decline will not be as severe as we are witnessing in the USA, it is a cautionary tale that success in the past does not guarantee top performance in the future.

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Development of a disaster cardiovascular prevention network

The magnitude 9.0 Great East Japan Earthquake that hit Tohoku in the northeast region of the main island, Honshu, on March 11, 2011, was followed by a devastating tsunami that has killed 15 538 people to date and left 7060 missing. Japan's Disaster Medical Assistance Team, which was developed on the experience of the 1995 Great Hanshin-Awaji (Kobe) Earthquake, went into action immediately. However, the unique nature of the 2011 disaster made it more challenging than its predecessors, as witnessed by the fact that the process of recovery has been far from satisfactory and is expected to be extensive.^{1,2} The experience of similar events in the past suggests that survivors will have

acute injuries and infections and will be at an increased risk of chronic illness, such as cardiovascular disease or mental ill health.³

Major cardiovascular events, such as stroke and myocardial infarction, occur more frequently in survivors of disasters and the effect can last months after the event. An increased incidence of cardiac events (myocardial infarction and sudden death within 24 h of onset) and stroke was reported in communities around the epicentre of the Great Hanshin-Awaji Earthquake in the 3 months after the event.^{4,5} Moreover, the frequency of cardiovascular disease in every community was positively correlated with the magnitude of

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earthquake-induced damage.^{4,5} A disaster can trigger cardiovascular events through sympathetic nervous activation and potentiation of acute risk factors.^{6,7} In particular, blood pressure increases during and in the aftermath of a disaster, probably because of sympathetic activation by fear and increased salt sensitivity from insomnia and a disrupted circadian rhythm.⁷

The tsunami-hit areas in Tohoku have some of the most rapidly ageing populations in Japan with a high prevalence of hypertension and diabetes; residents in these areas have little access to high-quality facility-based services.⁸ Because of the unprecedented scale of the 2011 disaster (earthquake, tsunami, and nuclear crisis) pre-existing disorders such as hypertension and diabetes might be aggravated in survivors, leading to increased risk of cardiovascular disease.^{9,10} Despite such concerns, no rapid or systematic assessment of the health status of survivors had occurred 2 months after the earthquake, partly because of the logistical difficulties involved, but mainly because of the absence of preparedness and coordination between Japanese central and local government, medical communities, and non-governmental organisations and voluntary groups.⁸ Uncoordinated small-scale surveys that have been undertaken in affected areas have provoked much controversy and debate about the ethical implications of doing research into populations of survivors.¹¹

To better assess and reduce risks for disaster-associated cardiovascular events, we developed the web-based Disaster Cardiovascular Prevention (DCAP) network

on the basis of previous studies,^{4-7,12} and have begun to implement it in the survivors of the 2011 disaster. The DCAP system entails calculation of a risk score to identify survivors at high risk of cardiovascular events and promote preventive behaviours. Our initial DCAP assessment aimed at prevention of excess morbidity and mortality in 386 survivors living in shelters in the towns of Minamisanriku, Ishinomaki, and Kesenuma in May, 2011. We used a real-time feedback survey and after completion of a DCAP risk score sheet asked individuals to undertake behavioural components on a score sheet of prevention measures.

We noted that individuals had lowest ratings on the preventive score component for diet, sleep quality, blood pressure control, and bodyweight. Analysis of blood and urine suggested that high salt intake was widespread in survivors, as was hypercoagulability and increased blood glucose concentration. Our survey highlights the potentially urgent need to introduce a system to monitor the health status of survivors in other locations affected by this disaster. We intend to follow up individuals who were assessed and have DCAP scores to assess the validity and reliability of the scores in terms of prediction of cardiovascular events.

In the difficult circumstances after the Great East Japan Earthquake, the DCAP network provided monitoring devices to assess cardiovascular risks in survivors, allowing preventive interventions to be made by participating health facilities and supporting blood pressure control by public health nurses on the basis of DCAP scores. This system can be extended to other health conditions and will aid the integration of traditional facility-based care with multidisciplinary and community-based primary care in the areas affected by tsunamis. A network of health-care provision will also promote empowerment and connectedness in survivors who can otherwise become isolated.

We hope that the DCAP network will be integrated into the community reconstruction plan in Japan in the coming months. Tohoku should not be regarded as an isolated and powerless region but as a pilot for the future Japanese health system, in which innovative technology-driven primary care can connect patients, service providers, and the community and help to integrate health services and research and development. We believe that this unique network will contribute to more effective cardiovascular protection in survivors and

also provide a model for primary care in other settings around the world with restricted access to services and health care.

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Japan: Universal Health Care at 50 years 3

Cost containment and quality of care in Japan: is there a trade-off?

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This is the third in a Series of six papers about Japan's universal health care at 50 years

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Japan's health indices such as life expectancy at birth are among the best in the world. However, at 8·5% the proportion of gross domestic product spent on health is 20th among Organisation for Economic Co-operation and Development countries in 2008 and half as much as that in the USA. Costs have been contained by the nationally uniform fee schedule, in which the global revision rate is set first and item-by-item revisions are then made. Although the structural and process dimensions of quality seem to be poor, the characteristics of the health-care system are primarily attributable to how physicians and hospitals have developed in the country, and not to the cost-containment policy. However, outcomes such as postsurgical mortality rates are as good as those reported for other developed countries. Japan's basic policy has been a combination of tight control of the conditions of payment, but a laissez-faire approach to how services are delivered; this combination has led to a scarcity of professional governance and accountability. In view of the structural problems facing the health-care system, the balance should be shifted towards increased freedom of payment conditions by simplification of reimbursement rules, but tightened control of service delivery by strengthening of regional health planning, both of which should be supported through public monitoring of providers' performance. Japan's experience of good health and low cost suggests that the priority in health policy should initially be improvement of access and prevention of impoverishment from health care, after which efficiency and quality of services should then be pursued.

Introduction

A common concern about universal insurance coverage is how to control health expenditure while maintaining service quality.¹ On this issue, Japan seems to do well. Global health indices such as life expectancy at birth are

among the best in the world, while its health expenditure is fairly low—only about 8·5% of the nation's gross domestic product (GDP) is spent on health, ranking 20th among Organisation for Economic Co-operation and Development (OECD) countries in 2008 and half as much as that in the USA.²

What mechanisms did Japan use to contain costs? Has Japan made major trade-offs in quality control to keep costs down? Is the system sustainable, especially in the face of rising expectations, advances in technology, and the ageing society? In the first section of this report, we explore how Japan has controlled costs by using a nationally uniform fee schedule. In the second section, we assess the quality of care according to structure, process, and outcome, and explain why quality is at its present level. In the third section, we present the challenges that Japan is facing and our proposals for reform. Finally, we suggest global lessons from Japan's experiences in seeking to control costs and maintain quality.

How has Japan contained costs?

During the past three decades, Japan's health-care system has effectively managed to contain costs despite many factors that are typically associated with high costs: a private-sector dominated delivery system, payment by fee-for-service, and no gatekeeper function by family doctors.³ By comparison with other OECD countries, Japan has more frequent physician consultation, more in-hospital days per head, and longer length of stay in hospitals (table 1). Moreover, the proportion of the population aged 65 years and older

Search strategy and selection criteria

We searched PubMed, Medline, JSTOR, and Google Scholar and examined government reports and unpublished literature from domestic sources. The first section of this report, on cost containment, is based on an overview of the historical background of Japan's health-care delivery system and policy. Previous studies by the co-lead author, other domestic and international policy research papers, including working papers from the World Bank and other international institutes, were synthesised. We also compared Japan's health-care system with those of other countries by benchmarking its health-care use and resources using Organisation for Economic Co-operation and Development health data and other available cross-country data. For the section on quality of care, our search looked at issues related to structural, process, and outcome dimensions of care quality, including patient satisfaction. For the structural determinants, we focused on hospital-standardised surgical mortality rates by originally undertaking an analysis with nationally representative micro data derived from patient surveys. For the process determinants, we focused on the extent of medical supervision of chronic illnesses such as hypertension and hypercholesterolaemia using the national health and nutrition survey. For the outcome determinants, we undertook an extensive review of published articles and documents about outcomes in acute inpatient care, specifically about postsurgical mortality rates, by searching Japanese studies with standardised data collection on a nationwide scale. Additionally, we focused on changes in surgical mortality rates after the volume criteria were amended for accreditation of residency programmes in cardiovascular surgery by referring to data provided by the Japanese Society of Thoracic Surgery. For data for patient safety, we referred to the annual report from the Japan Council for Quality Health Care.

has more than doubled from 9% in 1980 to 23% by 2010.⁴⁵ How has Japan achieved cost containment under these conditions?

The first explanation is the greater use of outpatient services compared with inpatient care. Japan has the highest per-head number of physician visits of all OECD countries. Although the per-head number of beds is also high, because the bed turnover rate (14·8 per bed per year vs the OECD average of 43·6 per bed per year) and the number of physicians and nurses per bed (27·2 and 117·3 per 100 beds, respectively vs OECD average of 99·8 and 248·9 per 100 beds, respectively) are quite low in Japan, the use of inpatient services is not as high as it seems. The reason why this situation exists is historical: almost all hospitals were established as an extension of physicians' clinics.⁶⁻⁸ The large share of outpatient care even in tertiary hospitals, which resulted from an absence of functional differentiation and effective referral between hospitals and clinics, has restricted the amount of time that hospital physicians can devote to inpatient care. This situation, together with patients' cultural preference for less invasive care, could account for the low use of surgical procedures. The per-head number of surgical operations with general anaesthesia was about half that of the USA in 2008: 18 surgeries per 1000 population per year in Japan compared with 39 per 1000 in the USA.^{9,10}

The second explanation for Japan's cost containment can primarily be attributed to its payment system: supply-side cost control is provided by the nationally uniform fee schedule for reimbursement, which is revised at both the global and the item-by-item level.¹¹ The fee schedule controls the money flowing from all insurance plans to almost all providers. Thus, although Japan has multiple payers (ie, about 3500 insurers),¹² it has only one payment system that is applied across the board. This structure improves equity, since the benefit package is essentially the same for all social health insurance plans, and increases efficiency, since administrative costs are reduced.

Adherence to regulations for billing set by the fee schedule is inspected by peer review of claims filed, which result in a denial of payment for 1·4% of the amount billed.¹³ Additionally, on-site audits of medical records are made, with the frequency determined by the provider's past record of compliance. If systematic non-compliance is revealed in the audit, providers have to retrospectively pay back the amount that they had inappropriately billed for the past 6–12 months. Although the primary purpose of the claims review and audits is cost containment, they also serve to control quality by standardising physicians' practice in line with the regulations. An additional measure to contain costs is the restriction of extra billing (billing of services or drugs that are not listed in the fee schedule) to mainly extra-charge rooms and new technology that is still being assessed for efficacy, and the prohibition of balance billing (charging more than the prescribed price).

Key messages

- Japan's health status is among the best in the world, but the percentage gross national product spent on health (ie, 8·5%) is 20th among Organisation for Economic Co-operation and Development (OECD) countries. This situation exists despite the private-sector dominated delivery system and the fee-for-service payment, showing how Japan has achieved good health at fairly low cost.
- Costs have been contained because reimbursement has been tightly controlled by the nationally uniform fee schedule, and because the government was able to reduce prices when the economy stagnated.
- When assessed on the basis of the structural dimensions of quality of care, the number of physicians and nurses per bed is the lowest among OECD countries. Subspecialty accreditations have remained underdeveloped, and general practice has yet to be recognised as a specialty. The government's initiative for assessment and improvement of quality has been focused on the staffing level of nurses in inpatient care.
- The process dimensions of quality seem to be low in inpatient care, with little standardisation, and in outpatient care, with effective coverage of hypertension and hypercholesterolaemia that is below that in the USA. However, when measured by outcome, postsurgical mortality rates are as low as those reported in other countries, and are likely to be especially low in large hospitals.
- Japan's policy of tight control of health-care cost and a laissez-faire approach to service delivery, with inadequate governance of provider organisations, created a mismatch between need and supply of health-care resources and impeded accountability for care quality. To address these structural problems, increased flexibility should be allowed for the conditions of payment by simplification of the reimbursement rules in inpatient care, and tightened control should be imposed on service delivery by strengthening regional health planning and by public monitoring of providers' performance with education reform to establish primary care.
- Japan's experience suggests that the priority should initially be placed on expansion of access and prevention of impoverishment from health care, after which efficiency and quality of services should then be pursued.

Revisions are made through the following process.³ First, the Cabinet decides on the global revision rate of all services and drug prices based on the prime minister's evaluation of the nation's political and economic situation. During this process, the Ministry of Finance demands a decrease, the provider groups lobby for an increase, and the Ministry of Health, Labour and Welfare plays a key part by providing technical expertise. This revision is made every 2 years. In the 2008 revision, the rate was decreased by 0·82%; in the 2010 revision, it was increased by 0·19%. Setting this global rate effectively determines the next fiscal year's health expenditure because the volume of all services and drugs at the aggregated level will remain essentially the same.

Next, the prices of drug, devices, and services are revised on an item-by-item basis so that their net effect becomes equal to the global rate. The effect of making each revision is calculated from its volume, which is estimated from the national claims data survey. These item-by-item decisions are officially made by the Central Social Insurance Medical Council, which is composed of members from payers, providers, and people to represent public interest, appointed by the Minister of Health,

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Labour and Welfare. However, since the process of deciding on price of each item is both technical and complicated, the actual negotiations are made between the provider groups concerned and the physician officials of the Ministry of Health, Labour and Welfare.

For drugs and devices, the price is revised mainly according to the results of a market price survey. The price of each drug is individually revised to reflect its volume-weighted average price paid by the provider, which is usually lower than the fee schedule price. The prices of new drugs are set by comparison of their efficacy and innovativeness with existing ones; cost-effectiveness, however, is not taken into consideration. Additionally, if the sale of a new drug is larger than estimated by the manufacturer, then its price is unilaterally lowered by the Ministry of Health, Labour and Welfare. For services and procedures, the reimbursement price is lowered if there are sudden large increases in volume (to contain costs) or if the item is perceived to have its capital costs reduced. For example, in the 2002 tariff revision, the tariff for a head MRI was reduced by 30%, whereas the global rate was decreased by only 2.7%. Conversely, fees for services that the government would like to expand, such as physician home visits, have been increased to provide an incentive. Hence, revisions of the fee schedule system are based more on policy decisions, rather than objective evidence.

As shown in figure 1, revisions of the fee schedule global rate are directly reflected in the level of national medical expenditure. In the 1980s, when the economy was expanding, national medical expenditure increased at about the same rate as the economy so that its proportion of GDP remained constant. But in the 1990s, although national medical expenditure increased at the same pace, GDP growth was stagnant or even negative, so the proportion of national medical expenditure to GDP increased. As a result of decreases in revenue from taxes and premiums, financing of health care by the government became increasingly difficult. To address

this situation, the government decreased the fee schedule global rate in four consecutive revisions from 2002.

Two key questions arise with respect to Japan's strict cost-containment policy. First, how have physicians reacted to the item-by-item decreases in reimbursement prices? Second, how has cost containment affected quality of care? During the 1970s, the Japanese Government did not successfully contain medical costs: the global rate was raised under pressure from the powerful Japan Medical Association (JMA).¹⁴ The economy had been growing so that the government was more concerned about expanding services to meet the increased demand for health care than about controlling costs.^{8,15} The situation changed in the 1980s when the government started to implement its fiscal and administrative reforms, and the power of the JMA started to wane. However, even when cost containment became the policy goal, physicians based in clinics, who formed the core members of the JMA, were largely protected, in part because the JMA was the biggest donor to the ruling Liberal Democratic Party. By contrast, specialists and hospitals were not well organised or politically influential. Although the proportion of clinic-based physicians fell from more than half in the 1970s to a third in the 1990s, specialists and hospitals did not become more prominent until 2009, when there was a change of government.^{6,15}

Quality of care

How has cost containment affected quality of care in Japan? We assess quality of care in Japan using Donabedian's framework of structure, process, and outcomes, including patient satisfaction.¹⁶ The structural dimension of quality typically refers to inputs to the health-care system—ie, the number and standards of health-care facilities and staff. In this dimension, Japan has a high per-head number of hospitals and hospital beds compared with the OECD average (table 1), mainly because nearly half the non-psychiatric hospitals have

	Japan	Canada	Finland	France	Germany	Korea	Mexico	UK	USA
Proportion of population aged 65 years and older (%)	22.1%	13.6%	16.6%	16.5%	20.2%	10.3%	5.6%	15.7%	12.7%
Total expenditure on health (% of GDP)	8.5%	10.3%	8.4%	11.1%	10.7%	6.5%	5.8%	8.8%	16.4%
Physician consultations (number per head per year)	13.2	5.5	4.3	6.9	7.7	13.0	2.8	5.9	3.9
Inpatient acute care, average length of stay (days)	18.8	7.7	5.5	5.2	7.6	NA	3.9	6.9	5.5
Acute care beds per 1000 total population	8.1	1.8	1.9	3.5	5.7	5.4	1.6	2.7	2.7
Turnover of cases per available bed per year	14.8	35.8	NA	51.8	36.6	NA	62.5	49.0	44.2
MRI units, per million population	43.1	8.0	16.2	6.1	NA	17.6	1.7	5.6	25.9
Practising physicians, per 1000 population†	2.2	2.3	2.7	3.3	3.6	1.9	2.0	2.6	2.4
Practising nurses, per 1000 population‡	9.5	9.2	9.6	7.9	10.7	4.4	2.4	9.5	10.8
Physicians per acute care beds	0.3	1.3	1.4	0.9	0.6	0.4	1.3	1.0	0.9
Nurses per acute care beds	1.2	5.1	5.1	2.3	1.9	0.8	1.5	3.5	4.0

Data are from reference 2. OECD=Organisation for Economic Co-operation and Development. GDP=gross domestic product. NA=not available. *Available data for the nearest year to 2008. †Professionally active physicians in Canada and France. ‡Professionally active nurses in France and the USA.

Table 1: Health-care use, expenditure, and resources in Japan compared with selected OECD member countries, 2008*

one or more units composed of chronic care beds. Even in beds that are classified as acute care, 34% of patients were admitted to hospital for longer than 30 days.¹⁷ Thus, comparison of the number of hospital beds and their staffing levels is difficult, even when the measure is restricted to acute care beds.

So far, the Japanese Government's monitoring of quality has focused on the number of physicians and nurses per beds. If the hospital does not meet basic standards, it faces sanctions through reduced reimbursement rates. Conversely, the higher the nurse staffing level is, the higher the reimbursement rate will be. This emphasis on nurse staffing arose from the fact that nursing care in hospitals was traditionally provided by families until reforms were made by the occupying forces after defeat in World War 2. The reliance on the family continued until care by privately hired aides (ostensibly to substitute for care by the family) was formally prohibited in 1997.¹⁸

To assess the relation between structure and outcome, we used patient-level data from the government's patient survey to calculate the hospital's standardised mortality ratios, and linked this information with staffing data from the hospital survey (table 2, see technical note in webappendix). In patients in acute care with length of stay less than 30 days, after adjustment for patient and hospital characteristics, hospital-standardised mortality ratios were significantly lower in hospitals with a high number of full-time-equivalent physicians and pharmacists, but not nurses. Hospitals also had low mortality ratios if they had a greater number of subspecialty departments, intensive care beds, general anaesthesia procedures, and a greater ratio of inpatient to outpatient service volume. This analysis suggests that patient outcomes for acute care seem to be best in large hospitals with the greatest number of physicians, pharmacists, and physical facilities and that are weighted towards inpatient care.

Little attention has been paid to the quality of physicians and nurses beyond their licensing. OECD data do not show the breakdown of specialists and generalists for Japan because the two are not officially differentiated. Physicians and hospitals can proclaim any subspecialty service at their discretion. Although two-thirds of physicians have been accredited with at least one subspecialty, since formal procedures for accreditation had started only in the 1980s for most subspecialties, those who received their training before this time were accredited based on their experience without having to undergo formal training.¹⁹ Moreover, specialist organisations vary in the rigour of the accreditation process. Very few have a formal recertification process or a designated quota of training positions. As a result, the per-head number of some subspecialists, such as neurosurgeons, is much greater than in the USA (figure 2).

Traditionally, university clinical departments trained young physicians to become subspecialists.^{6,21} Once they

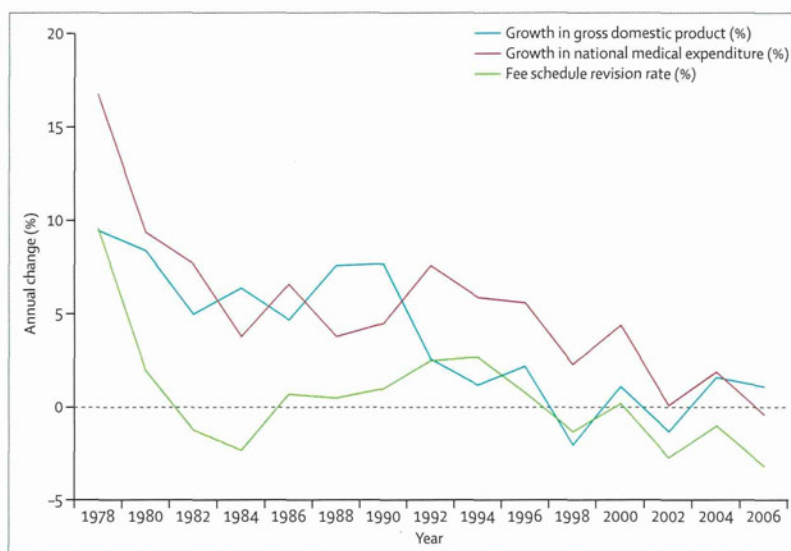


Figure 1: Annual changes in gross domestic product, national medical expenditure, and global revision rate of the fee schedule in Japan, 1978-2006

	Regression coefficient, unstandardised	p>Z
Staffing (in full-time equivalent)		
Number of physicians	-0.300	<0.0001
Number of nurses	-0.022	0.4169
Number of pharmacists	-0.252	<0.0001
Structural input of hospital		
Number of subspecialty programmes	-0.149	<0.0001
Number of acute care beds	-0.120	0.0084
Number of beds in intensive care unit	-0.315	<0.0001
Other hospital characteristics		
Annual number of general anaesthesia procedures	-0.153	<0.0001
University main hospital	-0.018	0.8339
Presence of emergency service unit	-0.401	<0.0001
Proportion of acute care beds to total beds	-0.041	0.4471
Ratio of inpatient to outpatient service volume	-0.188	<0.0001

Data are pooled for 14 309 hospitals. Analysis was limited to patients with length of hospital stay less than 30 days and was adjusted for hospital ownership and year dummy variables in addition to variables listed in the table. Data are from patient survey and hospital surveys, 1999, 2002, 2005, and 2008 (Ministry of Health, Labour and Welfare; see webappendix for details).

Table 2: Determinants of hospital-standardised mortality ratio (observed/estimated) of acute inpatient care in Japanese hospitals, 1999-2008

completed their training, only a few continue to practise as a subspecialist and the rest leave the large hospitals to practise in community hospitals or to open clinics, without any formal retraining outside their subspecialty or training as family doctors. General practice has not yet been recognised as a specialty by the Japan Specialist Accreditation Organisation.²² Almost all physicians who work in clinics had previously worked as specialists in hospitals (panel).²² This review of the structural dimension shows that issues in quality are mainly due to historical legacy rather than cost containment. Professional

See Online for webappendix

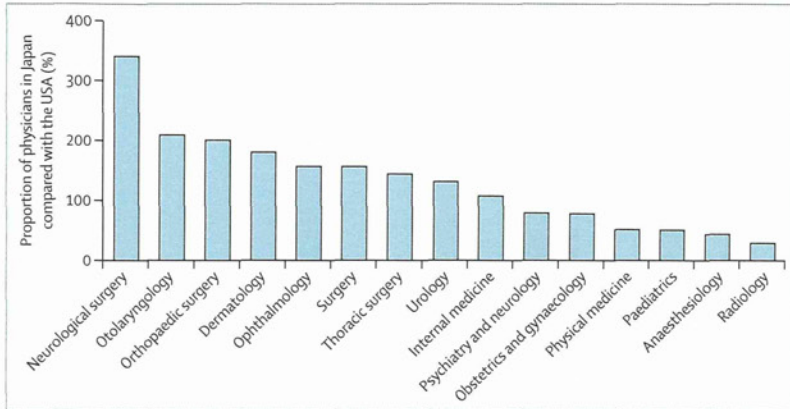


Figure 2: Proportion of the per-head number of subspecialty physicians in Japan compared with the USA (per 100 000 population)

Data derived from the Commission on Physician Supply, Ministry of Health, Labour and Welfare, 2005.²⁰

accountability is lacking in the training and accreditation of subspecialists, which has resulted in a mismatch between supply and societal need.^{21,22}

The quality of the process of care depends on standardisation of care processes.²³ One of the main obstacles to standardisation of specialist practice has been the trend for physicians to identify with their university clinical department rather than with a subspecialty board or hospital. Physicians' practice patterns tend to be idiosyncratically set by the chair and professor of the university clinical department. Very few hospitals have designated staff to monitor quality. However, there have been some efforts to monitor quality. A non-profit organisation for hospital accreditation was founded in 1995,²⁴ and as of 2010, about 30% of the hospitals have been certified. About 300 hospitals have joined research-based benchmarking projects to publish clinical process indicators, such as the use of aspirin in acute myocardial infarction.²⁵

For outpatient services, easy access by patients allowed widespread use of antihypertensive drugs, which has contributed to reductions in stroke mortality.²⁶ However, our analysis using the 2007 National Health and Nutrition Survey showed that only half of patients currently receiving drugs to control high blood pressure and hypercholesterolaemia achieved targeted levels of outcomes. Moreover, the proportion of undiagnosed and untreated patients in the community was greater than the estimated numbers from the 2007 US National Health and Nutrition Examination Survey²⁷ (diabetic care could not be compared because different criteria for HbA_{1c} were used; figure 3).²⁸ Our results support those of an accompanying paper in this Series²⁶ showing that hypertension is the second greatest cause of death from non-communicable diseases in Japan, after tobacco. Although mortality attributed to hypercholesterolaemia is low at present, the consequence of the equally poor level of control for hypercholesterolaemia remains to be investigated since this risk

Panel: Happy Mrs Tanaka

Mrs Tanaka, a 48-year-old bank receptionist, underwent an annual health check-up at her workplace and, for the first time, her score was poor. She was diagnosed as having hypercholesterolaemia with serum LDL cholesterol of 4.66 mmol/L (or 180 mg/dL). 2 weeks after she received the report, a public health nurse at the workplace health centre called her office to arrange an appointment for counselling. After Mrs Tanaka had been interviewed, the nurse recommended that she visit a clinic for her LDL cholesterol, since she had a family history of hypercholesterolaemia and ischaemic heart disease. There is a solo-practice clinic within a 5-min walk from her home, which listed the physician's specialties as internal medicine and surgery.

At the first visit to the clinic, Mrs Tanaka had to wait for only 5 min. The physician, who had practised gastroenterological surgery in a nearby university hospital, ordered a serum test again after looking at her report and confirmed that her LDL cholesterol concentration was high. He then promptly prescribed pravastatin without discussing diet with her or other non-medical management, and asked her to come again after 2 weeks. Mrs Tanaka took the medicine from that day. However, she began to feel muscle ache in her calves a week later. She looked at the information form that came with the drug from her local pharmacist and found that her symptom might be due to a side-effect of pravastatin, rhabdomyolysis. She decided to stop taking the drug, and went to a university outpatient clinic 30 min from her home. She could make the visit without any appointment and was seen by the physician of her choice after waiting an hour.

The university physician, whose subspecialty was endocrinology and diabetes, told her after a 10-min interview that she should stop taking the drug, and instead reduce her LDL cholesterol with a careful diet and exercise for the next 3 months. After 3 months, her score improved. Mrs Tanaka thought that the hour's wait was well worth it.

Note, this panel shows a fictional case study to emphasise issues in the health-care system and is not meant to be representative.

factor is fairly new in Japan.²⁹ These indicators of poor quality in care of chronic diseases could be attributed to the absence of standard guidelines and training in general practice, and the division between preventative and curative services in Japan. The situation might have improved since the introduction of screening for metabolic syndrome in 2008.³⁰

When the quality of care by outcome is measured, the standard of inpatient acute care seems to be fairly high. Studies have consistently reported low postsurgical mortality in Japan by comparison with other developed countries.³¹⁻³⁶ A recent cross-country comparison of cancer survival showed that Japan's survival rates for colorectal and breast cancer were similar to those in other OECD countries.³⁷ This similarity might be attributable