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See also: Child Obesity and Health; Child Witness to Violence; Social Gradients and Child Health.

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China, Hong Kong and Taiwan, Health Systems of

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Introduction

There is a Chinese saying that well describes the relationship among China, Hong Kong, and Taiwan – that they all “spring from the same root.” Historically, all three places were one political entity until Hong Kong was ceded to the British from 1842 through 1997, and when Taiwan became a Japanese colony from 1895 until 1945, followed by the establishment of a separate government by the Nationalists (or Kuomintang) retreating from the Communists in 1949.

Given the divergence in political systems from these historical ‘accidents’ but a common geo-historical lineage, the development of the health systems of China, Hong Kong, and Taiwan provide an ideal natural social experiment to study how macro politico-economic forces can

and have shaped the financing, organization, and delivery of health care among similar peoples. Because Hong Kong and Taiwan are not member countries of the World Health Organization, although the former has observer status at the World Health Assembly, their health and health-care statistics are seldom published in international compendia, and comparative examination of the three systems has not been systematically undertaken and disseminated. The present article attempts to fill this gap in the literature.

In the following sections, we first describe how health care has been and is currently financed, organized, and delivered by noting thematic similarities while highlighting important differences between the three populations. We then assess each system's performance on the equity and efficiency axes, in particular drawing on evidence

from standardized health accounts and recent work by the 15-country, pan-Asian Equity in Asia-Pacific Health Systems or EQUITAP consortium. We show how policy-makers are trying or might attempt to rise up to and overcome these key challenges in the medium- to long-term. Finally, we conclude with important lessons and various solution options that these three economies could learn from each other as well as across neighboring countries in East and South-East Asia.

Financing of Health and Health Care

The history of modern health financing arrangements in all three economies began in the 1950s, albeit under very different circumstances but uniformly driven by the local prevailing political economy at the time. **Table 1** contains general descriptive statistics relevant to the different health systems.

China

In the two decades following the establishment of the People's Republic of China in 1949, the bulk of health

spending was financed publicly, through either tax-financed support of nationalized health facilities or contributions to one or other health insurance schemes: the cooperative medical system (CMS) for rural residents, the government insurance scheme (GIS) for civil servants, and the labor insurance scheme (LIS) for workers in state-owned enterprises (SOEs). China's economic liberalization at the end of the 1970s was associated with a sharp drop in government fiscal revenues, and led to financial difficulties for many SOEs and a dismantling of village collective welfare funds (Zhu *et al.*, 1989; Liu *et al.*, 1995; Liu *et al.*, 2001; Liu 2002). The CMS all but collapsed, and GIS and LIS came under increasing financial strain. The government's initial response was to encourage government health facilities to supplement budget allocations with direct charges to patients. Despite increases in government health expenditure (GHE) (approximately 8% per year in real terms since the early 1990s), the public share of overall health spending declined steadily, reaching just 12% in 2003. Over the same period, government subsidies to providers accounted for a steadily declining share of operational expenses.

Starting in the mid-1990s, the government changed tack and introduced a variety of health insurance reforms

Table 1 Health financing overview

	China (2004)	Hong Kong (2004)	Taiwan (2005)
Population (million)	1292 ^a	7 ^b	23 ⁱ
of which			
Urban	530	N/A	16
Rural	762	N/A	7
GDP per capita (constant 2000 US\$)	1162 ^b	28 174 ^b	14902 ^j
Total health spending per capita	60.0 ^d	1504 ^f	954 ^j
of which			
Government	7.3	838	55
Social health insurance	17.0	N/A	523
Private health insurance	2.2	185	108
Out of pocket	33.5	467	239
Total health spending as % of GDP	5.6%	5.3%	6.4% ^j
General government (government + social) spending as % of total government spending	10.8% ^e	15.6% ^g	18.7% ^{i,k}
Pharmaceuticals as share of total health spending	46.2% ^c	7.8% ^h	22.8% ^l

^aChina Statistical Yearbook 2004.

^bWorld Development Indicators 2007.

^c2004 National Health Accounts (data refer to 2003).

^dCalculations based on 2004 National Health Accounts. Government expenditure includes provider subsidies, medical education, administration, and medical assistance programs. Social health insurance includes the basic medical insurance, the government insurance scheme, rural cooperative medical scheme (old and new), as well as various health expenditures by social organizations and village enterprises.

^eGovernment and social health expenditure from 2004 NHA; total government expenditure from China Statistical Yearbook.

^fHong Kong's Domestic Health Accounts 2004.

^gFor government spending, *Hong Kong Annual Digest of Statistics*.

^hEstimate based on IMS data (sale price of health-care providers, pharmacies, and other retail stores).

ⁱ2005 *Monthly Bulletin of Interior Statistics*, Department of Statistics, Taiwan Ministry of the Interior.

^j2005 Taiwan Department of Health National Health Expenditures figures with estimates for private insurance expenditures by R. Lu based on Annual Report of Life Insurance, Republic of China (figures are in \$U.S., \$1 U.S. = 32.85 NTD in 2005).

^kFor government spending, *2007 Taiwan Statistical Data Book* by CEPD.

^lFor pharmaceuticals, 2005 Taiwan Department of Health Statistics/Health and Vital Statistics.

aimed at reducing the system's emphasis on out-of-pocket (OOP) payments (Table 2), which has resulted in both disparities in access to health care and exposure to health-related financial risk (Bloom and Gu, 1997; Wu, 1997; Liu and Mills, 2002). Building on these experiences, a new urban employee health insurance system, the basic medical insurance (BMI), funded by a social coordinated medical fund in combination with personal medical savings accounts, was established in 1998. The scheme covers government agencies, state and collective enterprises, and private companies. Although the BMI aims at broad coverage, dependants of BMI participants, students, and the unemployed are not covered. Moreover, some employers, in particular in the private sector, have also opted to remain outside the scheme.

In rural areas, piloting of a new model of voluntary but heavily subsidized health insurance (the new CMS or NCMS) started in 2003. As with the BMI, local (county) governments have considerable discretion in the design and implementation of the scheme. The government aims for national coverage by 2008. It is also currently rolling out a medical assistance (MA) scheme, which will cover

poor households in both urban and rural areas, and possibly also employees in enterprises that cannot afford to participate in the BMI and households with very high health-care expenditures.

Hong Kong

Of the three populations, Hong Kong was the first to achieve near universal coverage through a system that derives over 55% of its funds from government general revenue (Table 2), albeit sustained by a very narrow tax base (Leung *et al.*, 2006). Direct taxes contribute about one-half of government general revenue. Only 55% of the working population (3.3 million out of a total population of almost 6.9 million) in Hong Kong pay any income tax, and only the richest 1.4% of the working population fall into the top tax bracket (i.e. 16% flat tax), contributing 38.8% of total salaries tax receipts. Personal income tax constitutes one-third and corporate tax makes up one-half of all direct taxes. The remaining direct tax is property tax, which applies to the 60% of the population who live in private housing but not to the 40% that live in

Table 2 Recent trends in financing mix and health insurance coverage

\$US at 2000 price level	THE per capita	Financing mix Government	Financing mix			Health insurance coverage		
			SHI	PHI	OOP	Urban	Rural	Total
China ^a								
1990	14	19.8%	43.4%	0.0%	36.9%	72.7%	15.9%	30.1% ^d
1995	22	12.8%	40.8%	0.0%	46.4%	55.9%	12.7%	23.6% ^e
2003	60	12.1%	28.4%	3.7%	55.9%	55.2%	21.0%	29.7% ^f
Hong Kong ^b								
1991	797	45.6%	N/A	11.5%	41.6%	N/A	N/A	28.5% ^g
1998	1,130	53.7%	N/A	12.8%	32.0%	N/A	N/A	40.2% ^h
2004	1,504	55.7%	N/A	12.3%	31.0%	N/A	N/A	39.6% ⁱ
Taiwan ^c								
1994	472	14.5%	34.7%	3.4%	47.4%	55.8%	62.5%	57.6%
1995	527	12.9%	46.6%	3.2%	37.3%	N/A	N/A	N/A
2005	954	5.7%	54.8%	11.4%	25.0%	98.2%	98.0%	98.2% ^j

THE, total health expenditures; SHI, social health insurance; PHI, private health insurance; OOP, out-of-pocket payments.

^aCalculations based on 2004 National Health Accounts. Government expenditure includes provider subsidies, medical education, administration, and medical assistance programs. Social health insurance includes the basic medical insurance, the government insurance scheme, rural cooperative medical scheme (old and new), as well as various health expenditures by social organizations and village enterprises. Health insurance coverage based on National Health Surveys (1993, 1998, 2003).

^bHong Kong's Domestic Health Accounts; all Hong Kong residents have universal access to public hospitals and clinics for a minimal copayment, where 95% total bed-days and 15–20% ambulatory episodes are provided. Data from Leung GM, *et al.* The ecology of health care in Hong Kong. *Social Science and Medicine* 61(3):577–590.

^cData sources: for THE and Financing mix, based on 2005 National Health Expenditures released by Taiwan Department of Health, with estimates of private health insurance by R. Lu based on *Annual Report of Life Insurance*, Republic of China; for Health insurance coverage, 1994 and 2001 *Health Interview Survey*.

^d1993.

^e1998.

^f2003.

^gEmployer-provided or privately purchased in addition to universal access to public sector care; *General Household Survey Special Topics Report No.8*.

^hEmployer-provided or privately purchased in addition to universal access to public sector care; *General Household Survey Special Topics Report No.24*.

ⁱEmployer-provided or privately purchased in addition to universal access to public sector care; *Thematic Household Survey 2005*.

^j2001 Health Interview Survey.

government-subsidized housing. Because of its colonial background, Hong Kong has reproduced a tax-financed system as per the UK National Health Service as it developed the welfare state since the 1970s. Government general revenue has funded most of hospital care, initially through publicly operated facilities and subvention of hospitals run by charities, and since 1991 these have been consolidated under the single corporatized umbrella of the Hospital Authority. In contrast, most of ambulatory care has always been privately financed and provided where OOP payments are common, amounting to about one-third of total health expenditure, with limited prospective payment arrangements through employer-provided (mostly multinationals or large local firms), and to a much lesser degree self-purchased, medical insurance.

Taiwan

In contrast to the boom-bust trajectory of health insurance coverage (and therefore access to care) on the mainland, Taiwan has used the fruits of socioeconomic development to progressively expand coverage by establishing three major social insurance programs (and seven other smaller public insurance schemes), namely Labor Insurance in 1950, Government Employee Insurance in 1958, and Farmers Insurance in 1989 (for which its predecessor demonstration project started in 1985) (Lu and Hsieh, 2000a; Cheng, 2003). Collectively, this had covered about 57% of the total population by 1995. The 43% uninsured, mostly consisting of the two age extremes with the highest health-care need, were nevertheless deterred from seeking necessary medical services, which predictably resulted in socially patterned access to care, as in China progressively since the 1980s, that was consistent with Tudor Hart's Inverse Care Law (Tudor Hart, 2000).

After nearly a decade of planning, including a 2-year legislative marathon (Cheng, 2003), Taiwan replaced its previous patchwork of ten separate social health insurance funds with a single-payer, National Health Insurance (NHI) scheme in 1995. The government planned its new NHI system to achieve two essential objectives: providing equal access to health care for all citizens, and controlling total health spending within a reasonable level. The NHI provides a comprehensive benefit package that covers preventive and medical services, prescription drugs, dental services, Chinese medicine, and home nurse visits (Lu and Hsiao, 2003). It is financed mainly through premiums (in the form of payroll tax) and supplemented with direct government funding, and it compensates a mixed health-care economy of public and private (dominant) providers predominantly on a fee-for-service basis (Chiang, 1997). Population coverage in the NHI scheme had reached 99% by the end of 2004 (International Symposium on Achievements and Challenges of National Health Systems, 2005). Therefore, both Taiwan and

Hong Kong have now achieved universal coverage through social insurance and tax financing, respectively, which were instituted in tandem with their economic development (the former lags the latter by about 15 years). Table 3 summarizes the current health financing arrangements in the three populations.

Organization and Delivery of Care

China

On the supply side, the widespread nationalization of facilities during the 1950s and 1960s was accompanied by substantial investment in hospitals, public health infrastructure, and the training of health professionals. The delivery of personal health services was organized around a three-tier system, whereas preventive and other public health services were provided by 'anti-epidemic stations' at province, prefecture/city, and county/district levels, the anti-epidemic department of township health centers (THC), and health workers at village/street clinics.

In China (Chan *et al.*, 2002), as in Taiwan (Chi *et al.*, 1996), traditional Chinese medicine is highly popular and accessible and is widely practiced alongside Western allopathy throughout the country. In a recent household survey in three provinces, 74% of individuals claimed that they prefer to see a practitioner that practices both Western and Chinese medicine (Kin, 2002). Every city has a hospital practicing traditional Chinese medicine, and there are plans for expansion so that every county is covered (Hesketh and Zhu, 1997). Practitioners of Western allopathic medicine report a high level of acceptance and belief in traditional methods and medicines (Harmsworth and Lewith, 2001). Although there are dedicated facilities for traditional healing methods, most notably acupuncture and herbal remedies, as hospitals and clinics for Western medicine are organized independently, there is considerable overlap in the concurrent deployment of mixed-treatment modes in both types of care settings. Ninety-five percent of the Western hospitals also have departments of traditional Chinese medicine, and 40% of prescribed medicines are traditional (Zheng and Hiller, 1995). Herbal medicines accounted for 33.1% of the drug market in China (World Health Organization, 2003).

In the 1980s, in addition to the already noted increased emphasis on charging patients, some local governments went further and privatized hospitals, health centers, and, most frequently of all, village clinics. Despite the sharpening of incentives that these reforms implied, they were not accompanied by effective regulation or provider payment reforms to limit overprovision of care. In fact, continued price regulation that set prices of basic services below cost, and those of high-tech services and drugs above cost, created strong incentives for providers to focus their attention on those services on which they

Table 3 Health financing arrangements

	<i>China</i>	<i>Hong Kong</i>	<i>Taiwan</i>
Health insurance coverage	Urban social health insurance (BMI) covers employees in the formal sector. Participation is mandatory but not strictly enforced. Dependents, unemployed, and informal sector workers are excluded. Rural health insurance (NCMS) is voluntary. Geographical coverage remains limited but is being expanded rapidly. In both urban and rural areas, private complementary insurance is available to increase the level of maximum benefit. For those outside formal health insurance schemes, government subsidies to health-care providers provide a form of implicit insurance. However, due to the declining share of these subsidies in overall financing, the implied price subsidy is limited	Through a tax-financed system, all Hong Kong residents are entitled to full, universal access to public hospitals and clinics for a minimal copayment, where 95% of total bed-days and 15–20% of ambulatory episodes are provided. Supplementary private insurance, whether provided by employers or self-purchased, is generally enjoyed by the middle and upper socioeconomic strata, but such coverage is usually inadequate in the case of serious or chronic illnesses, which are predominantly provided for in the public sector	National Health Insurance (NHI), a compulsory social insurance program implemented in 1995, expanded the insurance coverage rate from 57% to 92% by the end of 1995 and 99% in 2004
Risk pool structure/fragmentation	Risk pooling in BMI is at city-level (country or municipality); in NCMS, it is at county level. In neither case is there risk-equalization across risk pools, although there are targeted central government subsidies in the NCMS	The tax-financed public sector covers the entire population where private services are funded by household out-of-pocket payments and mostly employer-provided insurance policies	NHI operates on a common risk pool
Government subsidies to health insurance	In BMI, government pays contributions for government employees, and also allocates some funds to cover deficits and some extra benefits for civil servants. The NCMS is partly financed by central and local government. Some or all of funds from the new medical assistance (MA) scheme may be channeled through existing health insurance schemes	N/A	Government subsidizes 10% of the premium for the labor workers and 100% for the low-income households, veterans, and military service personnel
Health insurance contributions	In BMI, both employers and employees make contributions that are a fixed percentage of income. In many localities, individuals can make voluntary payment for complementary coverage. Part of contributions go into a personal MSA, and the other part to a social pooling account. In NCMS, individual contributions are fixed for all beneficiaries within risk pools, but vary across risk pools (counties). MSA model is used in some counties	Public sector services are funded from government general revenue. Private supplementary schemes such as employer-provided medical benefits for private care typically form part of the remuneration package whereas individually purchased insurance premiums vary a great deal and such policies typically exclude pre-existing medical conditions	Current contribution rate: 4.55% (of wage income); the relative shares borne by employees and employers depend on the category (currently, the insured is classified into 6 major categories) that the insured falls into. For instance, for labor workers, employers, employees, and government pay for 60%, 30%, and 10%, respectively; the self-employed bear 100% of the premium

Benefits package and copayments	<p>BMI covers a certain percentage of eligible expenditures (after deductible), up to a ceiling. In most localities, MSAs are used to finance outpatient care and social pooling account for inpatient care. In other localities, social pooling account is only accessed when personal account is exhausted. Eligible expenditures and benefit caps vary across risk pools. NCMS arrangements are similar. However, due to lower level of financing, the range of eligible services is considerably more limited, and co-insurance rates are often high. As with the BMI, benefits packages varies across risk pools</p>	<p>The public sector provides the full range of health-care services with minimal copayments, amounting to 3–5% of total bed-day costs and about 10–20% of ambulatory episode costs. All pharmaceuticals are included and are not separately billed</p>	<p>NHI provides a comprehensive benefit package that covers preventive and medical services, prescription drugs, dental services, Chinese medicine, and home nurse visits. It also incorporates a copayment of U.S.\$5 for each outpatient visit to clinics, U.S. \$8 for each visit to hospital outpatient clinics. There is a higher copayment for hospital outpatient visits without a referral by a primary care physician. For inpatient services, the coinsurance rate is 10%, but the total payable amount is capped at 6% for each admission and 10% for each year of the average national per capita income. People with catastrophic illness, children under the age of 6, and users of maternal and preventive services, as well as low-income households, are exempted from the copayment requirement</p> <p>The low-income group whose premium is fully subsidized by the government is also exempted from point-of-care copayments</p>
Special arrangements for the poor (exemptions, subsidized insurance, etc.)	<p>The new medical assistance program is intended to provide benefits to the poorest segments of the population, and to those facing ‘very high’ health expenditures. Program details and implementation, including the extent to which the MA scheme is integrated with health insurance schemes, varies considerably across localities. In addition, some localities require hospitals to provide health care to the poor for free or at reduced prices, but this requirement is often not enforced</p>	<p>Free (i.e. the usually minimal copayments are waived) public health-care services for welfare (namely, Comprehensive Social Security Assistance) recipients</p>	

BMI, basic medical insurance; CMS, cooperative medical system; MA, medical assistance; MSAs, medical savings accounts; NCMS, new cooperative medical system; NHI, National Health Insurance.

could make a profit. These trends have continued to the present, resulting in provision of unnecessary care and contributing to the ensuing rapid cost escalation. The new financing arrangements also had an impact on public health institutions, which responded by introducing charges for some services that had previously been free, and by expanding their range of chargeable services. This has negatively affected the delivery of key population health interventions, such as immunization and tuberculosis control (Liu and Mills, 2002). Moreover, the heavy reliance on county financing for public health has resulted in large disparities in local capacity to implement disease prevention and control programs.

In recent years, there has been limited experimentation with new forms of provider payment by health insurers in both urban and rural areas. There have also been efforts to address the adverse incentives that arise from the distorted prices for services, including attempts to better align service charges with costs. Progress has been slow, however, because of a reluctance to increase prices for the uninsured population.

Hong Kong

Postwar developments in health-care delivery in colonial Hong Kong faced the dual challenges of population explosion through births and, more important, immigration from China, as well as the legacy of an understaffed and underfunded institutional infrastructure. The focus of expansion was centered on the number of public and 'subvented' (run by nongovernmental organizations and charities but largely funded from the public purse) hospital beds, almost to the exclusion of developing primary care and integrating with the private sector. This continued on an *ad hoc* path that had failed to meet health needs until the 1980s (Gauld and Gould, 2002).

The mid-1980s to early 1990s saw major reorganization of government and subvented hospitals under a new parastatal corporation, the Hospital Authority (HA). The HA introduced a modern managerialist culture and improved quality, explicitly taking reference from parallel reforms in Britain's NHS; however, without concomitant increase in user fees. Cost recovery has remained at 3–5% for inpatient care and 10–15% for outpatient visits. This predictably attracted away 10–15% of total bed-days from the private sector, further consolidating the already dominant market position of the public sector to 95% inpatient bed-days, whereas private providers have consistently looked after 70–85% of outpatient episodes, in a compartmentalized (between levels of care and at the public–private interface) mixed medical economy (Hsiao and Yip, 1999; Leung *et al.*, 2005). The HA, as a result of the economic downturn from the late 1990s until 2004 and the ever-upward cost spiral associated with technology diffusion, has sustained annual structural deficits

since 2001. At the same time, the government has been handicapped by popular pressure (where most enjoy essentially free health care because of Hong Kong's narrow tax base and HA's universal entitlement policy), bureaucratic inertia, and political paralysis (arising from strained executive-legislative relations resulting from post-repatriation constitutional adjustments) from making any meaningful change to the system despite numerous consultancies and reports that have warned of an unsustainable future (Health and Welfare Bureau 1993, 2001; Hsiao and Yip, 1999).

Taiwan

Taiwan's delivery system reflected its colonial heritage under Japan, although to a much lesser extent than Hong Kong mirrored the British. For example, hospitals run large outpatient departments, the main purpose of which is to maintain a steady supply of inpatients. The Japanese policy of rapidly scaling up the supply of Western-style allopathic physicians and midwives extended into the Kuomintang-led era post-1945 (Hsiao *et al.*, 1990); in contrast, the Japanese suppressed and eventually banned the practice of Chinese medicine, thus resulting in a drastic decrease of licensed Chinese medicine practitioners from 1903 to 24 (1901–1945) (Lin, 2004). Through the aggressive advocating of the Chinese medicine practitioners themselves, the government finally resumed the licensing system for them in 1947. To enhance its scientific attributes and gain market competitiveness, the practice of Chinese medicine has been modernized through establishing medical training programs within the formal medical school education system, which enrolls 270 medical students yearly (people can also obtain a license to practice through completing the Professional and Technical Special Examinations for Doctors of Chinese Medicine and undertaking an 18-month clinical training program) (Lin, 2004). Even though Chinese medicine, which is deeply rooted in culture, has gained in popularity through the expansion of insurance program coverage, neither the supply of medical professionals nor the use rates are on a par with its Western medicine counterpart.

Since 1945, the government has adopted a *laissez-faire* attitude toward the development of the health-care market, which experienced substantial, uninterrupted expansion throughout the 1970s and 1980s (Lu and Hsieh, 2000b).

The centralization of health-care dollars disbursement, namely the NHI, gave it the market power to set a uniform fee schedule, to experiment with various new payment reforms (such as case payment and global budgeting), and to effectively exercise managerial control in constraining provider behavior through its single-payer system (Lu and Hsiao, 2003). Since NHI was implemented in 1995, there has been further sustained capacity

expansion in Taiwan. **Table 4** compares the health-care establishment for the three economies in Greater China, which shows that Taiwan has more than 15% more beds than Hong Kong in three times as many hospitals per 100 000 population, but providing only about half as many inpatient episodes per capita. Most of Taiwan's health providers operate in the private sector, where 86% of hospitals or 66% of all hospital beds, and 97% of clinics (including some with short-stay beds) are privately owned (Chang, 2001, 2003; Department of Health, 2005). Therefore, there has been increasingly fierce competition for and inducement of patient demand. Recent research has shown that competition, mostly through non-price strategies, has intensified since 1995, particularly in the high-margin, competitive market of inpatient care. For instance, many hospitals are quick to adopt and exploit new medical technology to compete for patients (Lu and Hsieh, 2003). By comparison, Taiwan and Hong Kong have

similarly high (benchmarked against Organization for Economic Co-operation and Development (OECD) countries) levels of outpatient utilization, distributed more or less similarly across Western allopathic, Chinese medicine, and emergency care and generated by about the same number of Western allopathic doctors per capita, although the population-standardized ratio of Chinese medicine providers registered in Taiwan is approximately one-sixth of Hong Kong's (**Table 4**). However, like the deep urban-rural divide in China and indeed in many Western countries with expansive land mass and uneven population densities, Taiwan's overcapacity varies unevenly by geography and between specialties (as physicians trade off risk, workload, lifestyle, and reward) (Cheng, 2003).

Table 5 summarizes the different methods China, Hong Kong, and Taiwan are currently using to remunerate health-care providers.

Table 4 Service delivery establishment

	China		Hong Kong (2004)		Taiwan (2005)	
Human resources			<i>a.</i>		<i>e.</i>	
Total					<i>i.</i>	
Western allopathic doctors per 100 000 population	104.4		165.7		149.6	
Chinese doctors per 100 000 population	13.3		119.3		20.2	
Nurses per 100 000 population	101.2		655.0		406.0	
Dental practitioners per 100 000 population	N/A		28.0		44.5	
Hospitals			<i>b.</i>		<i>f.</i>	
Hospitals per 100 000 population	1.4		0.7		2.5	
of which						
Public	0.8		0.6		0.4	
Private	0.7		0.2		2.1	
Hospital beds per 100 000 population	183.0		456.5		570.9	
of which						
Public	139.7		415.4		196.4	
Private	43.3		41.2		374.5	
Primary care providers			<i>c.</i>		<i>g.</i>	
Primary care providers per 100 000 population	20.7		54.9		N/A	
of which						
Public	4.2		N/A		N/A	
Private	16.5		N/A		N/A	
Per capita outpatient visits per year	Urban	Rural	<i>d.</i>		<i>h.</i>	
Total outpatient visits (including western allopathic, Chinese doctor, and emergency room)			Overall		Urban	Rural
Total	0.86	0.92	11.04		10.72	10.76
richest 20%	1.10	0.98	12.28		10.36	10.70
poorest 20%	0.64	0.82	11.81		12.01	10.79
CI	0.11	0.04	0.02		-0.03	-0.01
Western allopathic doctor visits						
Total			8.27		8.53	9.39
richest 20%	N/A	N/A	9.34		8.02	8.51
poorest 20%	N/A	N/A	8.61		9.75	9.44
CI	N/A	N/A	0.02		-0.04	-0.02
Chinese doctor visits						
Total			2.55		2.05	1.25
richest 20%	N/A	N/A	2.82		2.18	2.05
poorest 20%	N/A	N/A	2.82		2.08	1.29
CI	N/A	N/A	0.02		0.01	0.10

Continued

Table 4 Continued

	China		Hong Kong (2004)	Taiwan (2005)	
Emergency room visits per year					
Total			0.22	0.15	0.13
richest 20%	N/A	N/A	0.11	0.16	0.13
poorest 20%	N/A	N/A	0.39	0.17	0.11
CI	N/A	N/A	-0.25	-0.01	0.03
Total inpatient episodes					
Total	0.04	0.03	0.14	0.09	0.13
richest 20%	0.06	0.04	0.13	0.07	0.14
poorest 20%	0.03	0.03	0.21	0.12	0.12
CI	0.12	0.06	-0.10	-0.11	-0.03
Dental visits					
Total			1.14	2.69	1.93
richest 20%	N/A	N/A	1.85	2.87	2.00
poorest 20%	N/A	N/A	0.62	2.77	2.05
CI	N/A	N/A	0.23	0.01	0.03

CI, concentration index.

^aStaffing data from *MOH Health Statistical Digest (2005)*, population data from *China Statistical Yearbook*. The distinction between traditional Chinese medicine (TCM) and western allopathic doctors is based on data from 2002, which indicates that 11.3% of all doctors work in TCM departments. Note that professional classifications in China do not in all cases follow international norms or standards.

^bHospital data from *MOH Health Statistical Digest (2005)*; hospitals include general hospitals, TCM hospitals, minority hospitals, specialized hospitals.

^cIncludes health service center for community, urban, and township health centers, outpatient departments, clinics, MCH centers, and first-aid stations.

^dEstimates of service utilization are based on National Health Survey (2003); estimates by quintile are not available for the population as a whole; the survey-based estimates of utilization are lower than estimates based on administrative data from the *China Health Statistical Digest* (1.6 outpatient visits per capita and 0.047 inpatient episodes per capita in 2004). In part, this discrepancy reflects the fact that the survey-based estimates do not include preventive visits, but other factors may also be important.

^e*Hong Kong Annual Digest of Statistics*; for Chinese doctors, Chinese Medicine Council of Hong Kong (2004 figures).

^fDepartment of Health Annual Report.

^gEstimate based on 2004 Health Manpower Survey of Department of Health.

^hThematic Household Survey 2002.

ⁱ2005 Department of Health, Health Statistics.

^j2001 Health Interview Survey.

Assessment of System Performance

How well do the health systems under consideration fare? Two yardsticks often used are 'equity' and 'efficiency,' with the latter being assessed in terms of how well the system deals with 'market failures' – instances in which a free market would produce socially inefficient outcomes. 'Externalities' and 'public goods' are a key pair of market failures in the health sector; together they provide the economic rationale for public health programs. 'Adverse selection' in insurance is another – some people are more likely to fall sick than others and can conceal this information from a prospective insurer. The final type of market failure is known as 'moral hazard.' Once insured, patients have an incentive to overconsume health care. This tendency will be reinforced if providers have a financial incentive to deliver extra care, and if, as is likely, providers are better informed than both patients and insurers about the patient's medical needs. Demand-side moral hazard will be reinforced by supply-side moral hazard; the effect will be upward pressure on health-care costs.

China

Government spending on health (including social insurance) disproportionately benefits the better-off (O'Donnell *et al.*, 2007b). This results in part because nearly half goes toward supporting urban health insurance schemes, the members of which are disproportionately from the higher income groups, even within urban areas. But it also reflects the heavy concentration of supply-side subsidies in urban hospitals (Ministry of Health, 2004). Furthermore, there are large geographic inequalities in government health spending favoring richer localities, because China's intergovernmental fiscal system does relatively little to break the link between a province's per capita income and the resources it has available for government spending. **Table 6** summarizes observed inequalities across the three economies and shows the rich-poor and urban-rural divide that characterizes the current Chinese health system.

Some think that China's government ought to be doing more on public health. Allowing public health institutions (PHIs) to raise revenues from patients and others, coupled

Table 5 Provider payment methods

	<i>China</i>	<i>Hong Kong</i>	<i>Taiwan</i>
Provider payment methods	Government subsidies to providers typically based on bed or staffing norms, or on historical standards. Government sometimes cofinances capital expenditures of health-care providers. In BMI and NCMS, fee-for-service is predominant, although some localities have experimented with case-based or capitation payment	All public sector providers are salaried whereas private health care is mainly fee-for-service. Private charges are largely market-driven with no uniform fee schedule, except in the case of third-party payers or preferred provider network arrangements	Mainly fee-for-service (FFS) based on a uniform fee schedule; capitation for remote island experimental sites; case payment method (prototype of DRG) for selected 50 treatment procedures; quality-based FFS is experimented on selected disease types; separate global budget for Chinese medicine, dental services, primary care clinics, and hospitals
Role of government in price regulation/fee setting	Government regulates prices paid by self-paying patients, with prices set below cost for 'basic' services and above cost for advanced/high-tech services. Where prospective payment methods have been introduced, the fee schedule has been determined on the basis of local negotiation between insurer and provider	Government, through the statutory Hospital Authority, sets user fees for public health care only. It takes a laissez-faire approach to private provider payment levels and methods	NHI pays providers based on a uniform fee schedule which is not cost-based but rather derived from some gradual modification made to the fee schedule adopted by Labor Insurance (pre-1995), but the prices paid by self-financing patients, and for noncovered services, are unregulated
Pharmaceutical regulation (drug lists, etc.)	The prices of some drugs are regulated. In the past, fixed margin was permitted in retail sale of pharmaceuticals, but recently the government instead introduced guiding prices and promoted competition in the retail market. The use of drug formularies is common, but practices vary considerably across localities	No drug list or price regulation although the Hospital Authority receives substantial discount from oligopolistic bulk purchasing due to its market size	NHI sets drug prices listed in the formulary through various methods, such as pharmaceutical price surveys, negotiation, etc.

BMI, basic medical insurance; FFS, fee-for-service; NCMS, new cooperative medical system; NHI, National Health Insurance.

with fiscal decentralization, appears to have impacted negatively on the coverage of personal public health interventions, such as immunization, and is also believed to have hindered the development of public-good-type programs such as disease surveillance, especially in poor areas.

The obvious policy to reduce the risk of adverse selection – making insurance compulsory – has been adopted by the government in the case of the urban scheme. However, it seems likely that the low rates of coverage reflect high rates of noncompliance by some enterprises, possibly those with a younger and healthier workforce. In the rural scheme, the government has decided not to make enrollment compulsory, worried about being seen to be introducing a new tax or 'fee' at a time when it is trying to reduce the fiscal burden on rural households and to promote 'social harmony.' It is possible that by making insurance so attractive financially, subsidies will reduce or eliminate any adverse selection. Time will tell.

Although the evidence on adverse selection in China's health system is not clear-cut, the evidence points

strongly toward the spread of moral hazard. Health-care costs have risen rapidly in recent years. One study found that 20% of expenditures associated with the treatment of appendicitis and pneumonia were clinically unnecessary (Liu and Mills, 1999). China has one of the highest shares of pharmaceutical expenditures in total health expenditure in the world—46.2% in 2003, compared to an average of around 15% in the OECD, 8.4% in Hong Kong, and 22.8% in Taiwan (Table 1). One study of village clinics found that only 0.06% of drug prescriptions were reasonable (Zhang *et al.*, 2003). In an attempt to curb overuse of services among the urban insured, China introduced demand-side cost-sharing by getting patients to pay a sizeable fraction of the cost of care out of their own pocket, through a complex system of medical savings accounts (MSAs). These may have done more harm than good: their effects on use appear to have been limited (Yip and Hsiao, 1997), but they do seem likely to have caused financial hardship by limiting the amount the scheme will reimburse. More successful, it seems, has been the introduction in a limited number of localities of supply-side

Table 6 Inequality in financing

	China			Hong Kong			Taiwan		
	Urban	Rural	Total ^a	Effective coverage via tax-financed scheme ^d	Supplementary private coverage ^d	Total ^g			
Health insurance coverage									
Total	55.2%	21.0%	29.7%	100%	49.3%	98.2%			
Richest 20%	80.5%	31.9%		100%	80.1%	99.5%			
Poorest 20%	24.0%	20.1%		100%	25.1%	96.5%			
Total			Total ^b	Total ^e		Total ^h			
OOP as % total household consumption									
Total	N/A	N/A	4.1%	2.3%		4.5%			
Richest 20%	N/A	N/A	3.5%	2.7%		3.3%			
Poorest 20%	N/A	N/A	4.6%	1.9%		5.5%			
Households with catastrophic health-care expenses (%) (15% of income/expenditure)			7.0%	3.0%		3.1%			
Benefit incidence of government health spending	Inpatient	Outpatient ^c		Inpatient	Outpatient ^f	Total			
Richest 20%	35.7%	25.3%		6.1%	11.1%	N/A			
Poorest 20%	6.9%	10.9%		38.9%	38.7%	N/A			
Distributional incidence of health-care financing	Concentration index ⁱ	Kakwani index	Weights	Concentration index	Kakwani index	Weights	Concentration index ⁱ	Kakwani index ⁱ	Weights ⁱ
Direct taxes	0.6038	0.1521	0.0242	0.7840	0.3940	0.3755	0.5331	0.2576	0.0331
Indirect taxes	0.4915	0.0398	0.1298	0.5003	0.1102	0.0975	0.2953	0.0198	0.0262
Social insurance	0.6865	0.2348	0.1818	N/A	N/A	N/A	0.2980	0.0225	0.5653
Private insurance	N/A	N/A	N/A	0.4304	0.0403*	0.1489	0.4200	0.1445	0.1173
Direct payments	0.4349	-0.0168*	0.6642	0.4014	0.0113*	0.3781	0.1856	-0.0899	0.2581
Total financing	0.4921	0.0404		0.5590	0.1689		0.2909	0.0155	

^aHealth insurance coverage based on National Health Surveys (2003); estimates for combined rural and urban population by quintile are not available.

^bData from *EQUITAP Working Paper #2*, based on subsamples of China Urban Household Survey and China Rural Household Survey by National Bureau of Statistics.

^cBenefit incidence analysis from *EQUITAP Working Paper #3*, based on National Health Household Interview Survey (MOH); estimate is the simple average of results from two provinces (Gansu and Heilongjiang) and are therefore not representative for China as a whole.

^dAll Hong Kong residents have universal (effective coverage approximates 100%) access to public hospitals and clinics for a minimal copayment, where 95% total bed-days and 15–20% ambulatory episodes are provided (Leung GM, et al. (2005) The ecology of health care in Hong Kong. *Social Science and Medicine* 61(3): 577–590). Supplementary private coverage refers to employer-provided medical benefits and individually purchased health insurance, over and above universal access to public sector care; Thematic Household Survey 2002.

^eHousehold Expenditure Survey 1999/2000.

^fThematic Household Survey 2002.

^g2001 Health Interview Survey.

^hCI (concentration index) and Kakwani index are computed based on data from 2005 DGBAS Survey of Family Income and Expenditure; weights are derived from 2005 Department of Health NHE figures with estimates of private insurance expenditures by R Lu based on Annual Report of Life Insurance, Republic of China.

ⁱInference not undertaken for taxes and total financing indices, since these are computed as weighted averages. The concentration index is an index of the distribution of payments. It is restricted to the range (-1, 1). A negative (positive) value indicates that the poor (rich) contribute a larger share than the rich (poor). A value of zero indicates that everyone pays the same, irrespective of ability to pay. The Kakwani index, the difference between the concentration index and the Gini coefficient of inequality, is used as a summary measure of proportionality. Its value ranges from -2 to 1. A negative number indicates that payments fall as a proportion of ability to pay (ATP) as the latter increases. A positive number indicates that the share of payments made by the rich is greater than their share of total ATP. In the case of proportionality, the index is zero.

^j2005.

*Indicates not significantly different from zero at 5%.

cost-sharing: paying providers a pre-agreed sum per case depending on the diagnosis, rather than letting providers simply bill the insurer for whatever tests and care they decide to provide (Cai *et al.*, 1999; Liu *et al.*, 2001; Yip and Eggleston, 2004). The relative success of supply-side cost-sharing reflects the fact that it addresses some of the perverse incentives caused by China's official price schedule (Liu and Mills, 1999; Liu *et al.*, 2000).

Hong Kong

Hong Kong is an exceptional example of progressive financing arising from reliance on taxation and an ability to shield those on low incomes from OOP payments (O'Donnell *et al.*, 2007a). The territory boasts a highly vertically equitable system in which the rich pay more absolutely and as a proportion of income (Table 6). Nevertheless, it does not fare as well on the dimension of horizontal equity. There is pro-rich inequity in the delivery of general outpatient care (but not specialist care) and very marginally for inpatient care (Leung *et al.*, 2005).

On dealing with externalities, Hong Kong has continued to maintain a sound basic set of public health institutions (PHIs), although it has yet to develop a comprehensive portfolio of modern public health responsibilities – including technology assessment, economic and policy analyses, health target setting, regulatory oversight, and health information management – befitting its stage of development. All this would require new funding commitments, however, beyond the current and stagnated 3% of total health expenditure for disease prevention and health promotion (Leung *et al.*, 2006).

In 1999, Hong Kong legislated for the regulation of the practice of Chinese medicine practitioners and the use, manufacture, and trading of Chinese medicines; and from 2005, the Department of Health has run trials on the development of standards for some commonly used herbs through the dissemination of the Hong Kong Chinese Materia Medica Standards. Government has clearly been trying to bring the previously underregulated sector into the formal care system, from the licensing and oversight of practitioners to the registration and testing of herbs and medicines. However, there remains a large gap at the practice level in terms of integration between traditional therapies and the dominant allopathic sector.

Given its universally accessible public sector, adverse selection is virtually nonexistent. In the private supplementary insurance market, however, coverage is highly patterned according to health and socioeconomic gradients (Table 6). Moral hazard also appears to be relatively limited in Hong Kong. One recent study (Wong *et al.*, 2006) suggested that third-party coverage, be it public entitlement or private insurance, mostly facilitated access that met genuine health need rather than inappropriate overuse of services. A supply-driven public sector and high OOP

co-payments for private services probably explain these observations.

Therefore, Hong Kong's system appears to be functioning well overall. The most pressing question seems to be more one of residents genuinely wanting more spent, but the government being reluctant to use its tax dollars to increase health expenditure. This raises the question of whether the appropriate response is not to reexamine the tax base and to raise the share of the gross domestic product (GDP) going to taxes. After all, it is the government's tax take that is the real issue, not a health system that is broken.

Taiwan

Taiwan's compulsory NHI program has delivered broadly satisfactory results in terms of equity in both the financing and delivery of care (Lu *et al.*, 2007; O'Donnell *et al.*, 2007a). Although social insurance financing is almost always regressive, the extent to which it is so in Taiwan is relatively limited (Wagstaff *et al.*, 1992; O'Donnell *et al.*, 2007a) (Table 6). On the delivery side, the scope of service coverage by NHI largely determines the extent to which the principle of equal treatment for equal need is followed. For comprehensively covered services, such as inpatient and outpatient visits, a pro-poor or proportional pattern emerges, albeit with a clear urban–rural difference accounted for by the uneven geographic supply of providers (Lu *et al.*, 2007). NHI has in recent years used monetary incentives to encourage providers to relocate to underserved areas (Lu and Hsiao, 2003).

There has been increasing investment in addressing public health externalities. Spending on PHIs reached a record high of 4.24% of total health spending in 2004 compared to an average of 3.5% between 2000 and 2003 and 2.5% in the second half of the 1990s (Department of Health, 2005).

With close to 100% coverage, adverse selection is not an issue in post-NHI Taiwan. However, like in Hong Kong, supplementary private insurance, which has grown considerably and now accounts for 9% of total health finance, is largely distributed by social advantage (Table 6).

Where NHI has shielded needy patients from financial barriers to access, moral hazard (that is, the incentive of patients, once insured, to overconsume health care) is also likely to increase. Average inpatient utilization increased by 10% immediately after NHI came into effect, and went up another 10% by 2001 (Lu and Hsiao, 2001). In the outpatient setting, those who were previously uninsured had increased their use to the same level as those who were previously covered (Cheng and Chiang, 1997). Technology diffusion, the main cost driver in any modern health system, also accelerated post-NHI where there was, for example, a pronounced increase in the use of computed tomography (CT) and magnetic resonance

imaging (MRI) (Lu and Hsieh, 2003). Notwithstanding this higher utilization (be it the effect of moral hazard or enhanced accessibility due to NHI), the total increase in national health spending between 1995 and 2000, after controlling for exogenous spending growth drivers, was not more than the amount that Taiwan would have spent without the program. Such cost containment on the macro level was attributable to the single-payer feature of NHI (Lu and Hsiao, 2003).

Rising up to Challenges

In this section, our discussion is not about identifying challenges but about how policymakers in each system are trying or might try to tackle them.

China

China's government has already taken steps to achieve greater equity through better-targeted and additional government spending. NCMS is to be subsidized where central government subsidies are to be targeted toward the country's poorer central and western provinces, and reinforced by subsidies from provinces to counties. The new medical assistance (MA) program is geared toward the poor. Both will help improve equity, but neither is likely to eliminate the pro-rich bias in government health spending. One option would be to reduce the emphasis on programs that disproportionately benefit the better off, such as government support to urban insurance and supply-side subsidies to hospitals, and to increase the share of spending going to pro-poor programs, such as central government spending on the NCMS. Another option is to keep the spending mix the same but reduce the degree to which pro-rich spending items benefit the better off, and increase the degree to which pro-poor items benefit the poor. Through changes to the contribution schedules, some existing government expenditure on urban health insurance could be redirected to making insurance more affordable for the poor. Supply-side subsidies could be targeted increasingly to lower-level facilities used by China's rural poor rather than to city hospitals. Central government support to the new rural insurance scheme could be targeted increasingly to poorer provinces. Many other options are possible.

The government has increased spending and made substantial progress in better tackling externalities and public goods, especially those associated with public health. Recent efforts include rolling out directly observed therapy for tuberculosis across the country and developing a new nationwide computer-based communicable disease surveillance system. Other new programs have been introduced, including the Four Frees and One Care initiative for human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), which includes, for example, free anti-retroviral (ARV) drugs to AIDS

patients who are rural residents or people with financial difficulties living in urban areas. Geographical disparities in local government spending on public health remain an issue. Tighter targeting of resources from central or provincial government would be one option. Less unequal public health expenditures, as well as strengthened coordination and technical guidance, could also be achieved through a centralization of public health responsibilities. This could be accompanied by horizontal integration to overcome some of the duplication and coordination problems that currently plague the public health system.

As far as tackling moral hazard is concerned, the increased use of prospective purchasing by some urban and rural insurers ought to be – given the OECD countries' experience (Docteur and Oxley, 2003) – a positive development. This will be especially true if insurers develop a greater capacity to control quality and act as champions for their members' interests, including the amount they pay OOP. Other measures being piloted – including the separation of prescribing and dispensing drugs – would also seem worth continuing. The benefits of some other measures are perhaps less clear. For example, the government has allowed – and in some provinces positively encouraged – the privatization of health facilities and the development of a for-profit market. In the absence of firmer regulation by government and by medical associations, there is a risk that these developments could encourage further moral hazard. Finding the appropriate incentives and institutions to address moral hazard is arguably one of the biggest of all the problems China's government faces in its health sector.

Although indigenous traditional medicine remains an important part of health care, China's rapid development has placed heavy pressures to modernize, Westernize, and globalize every sector of society; these developments, on the one hand, in turn may inadvertently reduce the highly popular and widespread role of Chinese medicine in the delivery system (Burke *et al.*, 2003). On the other hand, the process of economic reform and modernization may further facilitate the industrialization of Chinese traditional therapies in the form of standardized pills and ampoules that are subjected to western-style drug regulatory processes including randomized, placebo-controlled testing. The challenge will remain sorting out truly efficacious niche roles of Chinese medicine that are truly integrative with Western allopathy. Sadly, such examples, with notable exceptions, such as the anti-malarial artemisin, analgesic properties of acupuncture, and some immunomodulatory herbal compounds, are few and far between (Hesketh and Zhu, 1997).

Hong Kong

Of the three populations, Hong Kong has perhaps the fewest serious diagnosable problems, yet its people are increasingly unhappy with the state of the system. The

(upper) middle classes, overrepresented politically, face a double-financial burden by almost exclusively bearing the direct taxes that fund public care while paying OOP for private services. There is also anecdotal evidence to suggest that more generally Hong Kong people place considerable emphasis on individual responsibility (i.e., there is declining solidarity) for health care, and that attitudes to equity have changed from the 1970s and 1980s when the territory was transitioning through economic development (Fung *et al.*, 1999; Health Welfare and Food Bureau, 2004). On the supply side, the powerful medical lobby has been intensifying its push for restoring the pre-HA (Health Authority) public-private inpatient market share and further shifting outpatient care to the private sector. Thus, the political viability of continuing to rely on tax financing alone has been increasingly questioned.

Mandatory supplementary insurance and medical savings accounts (MSAs) have been suggested as possible options to finance further privatization of care, which seems likely given Hong Kong's otherwise laissez-faire economy and present political pressures (Fung *et al.*, 1999; Health and Medical Development Advisory Committee, 2005). The key challenge with both instruments is to minimize moral hazard. For MSAs in particular, there are also the attendant dangers of cost escalation, which plagued the Singaporean Medisave (Hsiao, 1995) reform, if the funds can be used contemporaneously, or intertemporal economic deadweight loss if the funds can only be expended in old age as government seems to have suggested (Health Welfare and Food Bureau, 2004).

From a macroeconomic efficiency perspective, however, the tax system exists to generate revenue for government programs, and if it is not generating enough for a well-functioning health system, the obvious answer seems to be to focus on fixing the tax system, not putting on the table reform ideas like private insurance and medical savings accounts, which may well undermine existing strengths of the system and lead to other problems not currently evident. Notwithstanding its narrow tax base and low contribution rates, which essentially funds almost all inpatient and some outpatient care, Hong Kong only spends 5.0% of GDP on health overall. Although there is little sensible reason to preset an arbitrary level of health expenditure, and officials are loathe to tinker with the territory's low-tax regime, there should be a reexamination of the relative distribution of the tax dollar among different policy areas such as health, education, and housing.

Taiwan

The single most important challenge confronting Taiwan concerns financial sustainability. NHI's revenue base has not kept pace with GDP growth because contributions are capped at the upper end of income (where the top earning base is only 5.5 times that of the lowest earning base).

Meanwhile, health-care costs have grown and will continue to increase more quickly than national income (Organisation for Economic Co-operation and Development, 2006). Therefore, the contribution rate was raised from 4.25 to 4.55% in 2002 amid a major political storm. Facing a nearly depleted reserve in 2005, NHI quickly promulgated a series of 'multi-facet micro-tuning' programs to expand the revenue base and further contain cost, but it deliberately circumvented further increase in the contribution rate across the board. Specifically, the contribution cap was raised so that the highest earning base became 8.3 times that of the lowest; tobacco tax was doubled; and new budgets were sought to finance high-priority and easily identifiable items such as preventive interventions, infection control, and medical education in the form of teaching cost from relevant government agencies. On cost containment, NHI strengthened primary care gate-keeping by increasing copayments for hospital services without a referral. It also further tightened the claims review process to reduce duplicate testing and fraud. Nonprescription drugs are now no longer reimbursed, and the reimbursement rates for prescription medicine were lowered.

Nevertheless, 'multi-facet micro-tuning' was only a temporary measure to ameliorate the imminent threat of insolvency. In 2006, the government proposed to change the premium contribution from a payroll tax base to a household income base, thereby broadening the risk pool, and to limit (by explicitly capping contributions at a fixed percentage of the total revenue base) the financial exposure of employers and government. Moreover, occupation-based public subsidy would be replaced by a household income assessment mechanism, which should bring about more targeted support to the socially indigent, although it could prove costly administratively in terms of premium assessment and collection.

In dealing with moral hazard, NHI has employed both demand side and supply side strategies, but has placed more emphasis on the latter recently. For instance, Bureau of National Health Insurance announced its plan to phase in diagnosis-related groups (DRGs) for inpatient services in a four-year period starting in 2008. Although this policy is designed and expected to improve cost containment, it may inadvertently encourage 'cream skimming' by providers. In addition, a more insidious ramification of this policy may be a slow creep down the quality gradient by imperceptibly trading patients' quality of life for cost savings imposed by global budgeting instead of trimming back non-core-patient-related activity.

Lessons Learned

This article has provided a brief overview of all three health systems in the Greater China region and the challenges they face in terms of achieving equity and addressing market failures in the health sector. Some interesting

patterns emerge. As regards equity, China faces the biggest challenges, performing worse than both Taiwan and Hong Kong in terms of both inpatient and outpatient utilization and the prevalence of catastrophic health-care expenditures. China has a highly pro-rich distribution of OOP health-care expenditures (i.e. the rich spend more) and OOP spending is less regressive in China than in Taiwan. However, this pattern largely reflects the low levels of utilization among the poor in China.

Achievement in terms of catastrophic health-care expenditures and equity in utilization in Hong Kong and Taiwan relative to China reflect the higher insurance coverage in the former populations. Indeed, both Hong Kong and Taiwan have achieved near universal coverage, although through quite different routes. Whether through implicit insurance through tax-financed health care (Hong Kong) or mandated social health insurance (Taiwan), universal coverage effectively confines adverse selection problems in these health systems to the relatively small private health insurance market. Adverse selection in the insurance market is a more serious concern in China, where the new rural health insurance scheme is based on voluntary participation, and where mandatory participation in the urban scheme is not effectively enforced.

It is harder to reach a conclusive assessment of how successful the respective health systems have been at addressing other market failures in the health sector. Severe acute respiratory syndrome (SARS) and, more recently, avian influenza, have brought home the challenges all three systems face in the area of public health. In all cases, these challenges have been met by increased government financing and attention. Reflecting a high degree of decentralization and a continued reliance on 'own business revenues' to finance public health institutions, China is perhaps unique in the institutional and organizational challenges in public health.

Moral hazard has been a challenge in all the health systems, although to a different degree. Like many tax-financed health systems, Hong Kong has successfully mitigated moral hazard problems through a combination of modest demand-side cost sharing and effective control of provider incentives through public ownership. In recent years, corporatization of the hospital sector and other supply-side reforms have sought to balance the need to control supplier-induced demand, on the one hand, and incentives for efficiency, on the other. Insofar as moral hazard has been a problem in Hong Kong, it has largely been limited to drug prescriptions in ambulatory care. In contrast, provision of unnecessary care and drugs is a well-documented problem in both China and Taiwan. Taiwan has made important strides in addressing this problem, primarily through the introduction of new forms of provider payment and efforts to separate drug prescription and dispensing functions. The recognition of moral hazard

has been growing in China in recent years. Measures to date have included a mix of demand- and supply-side measures, with supply-side cost-sharing apparently being the more effective and popular approach.

Echoing the WHO's Traditional Medicines Strategy 2002–05, all three systems in Greater China have a rich legacy of traditional healing that should undergo further modernization reforms in terms of a coherent policy framework, safety, efficacy and quality regulation, effective access, and promotion of rational use in an integrative framework with Western allopathy (Bodeker and Kronenberg, 2002).

See also: East Asia and Pacific States, Health Systems of; Health System Organization Models (Including Targets and Goals for Health Systems); Japan, Health System of; South Asia, Health Systems of; Urban Health Systems: Overview; World Bank; World Health Organization.

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