

Public Expenditure and Resource Allocation in the Health Sector in China

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Summary

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I. INTRODUCTION

This report discusses the role of public expenditure in financing the Chinese health system. After more than two decades of market reform and decentralization, China faces many severe problems in its health care delivery system – rapid cost escalation, supplier-induced demand, an inefficient service mix, questionable quality of care, a high degree of duplication, and inadequate provision of essential activities such as basic curative care, public health programs, outreach, and support and supervision. Many of these can be traced to the system of financing and its implications for equity and resource allocation.

The first section draws on the National Health Accounts to provide information on the level, financing, and composition of government health expenditures. Section two assesses these trends and explains these outcomes through an examination of China's fiscal system and budgeting practices over the past two decades, focusing especially on the decay of the intergovernmental system. Section three describes some general lessons from other countries that have sought to reform their systems of health finance, focusing specifically on the role of government expenditure in relation to how financial risks are pooled in health care. Finally, section four draws some conclusions and describes options for policy makers in China.

II. CHINA'S HEALTH EXPENDITURES

The National Health Accounts (NHA) are the authoritative dataset that underpins basic research on health policy. This section draws on the NHA to provide information on the level, financing, and composition of government health expenditures and their changes over time; and assesses these trends and their outcomes. A fuller presentation is given in the summary of NHA (Ministry of Health 2004).

a) Estimates of China Total Expenditure on Health (CTEH)

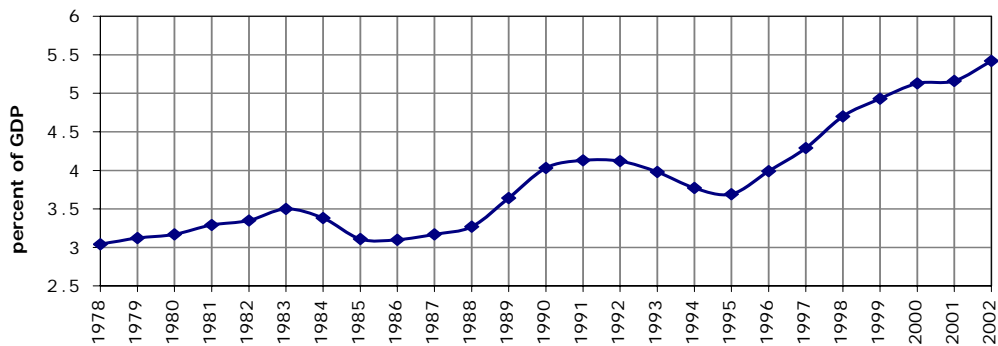
In 2002, China's total expenditure on health were RMB 568.46 billion yuan, up from RMB 11.02 billion yuan in 1978. Total expenditure on health per capita rose from RMB 11.45 yuan to 442.5 yuan during 1978-2002. Total expenditure on health per capita in 2002 was 38 times the level in 1978. In US dollars terms, China's total expenditure on health were 68.68 billion dollars in 2002, up from 9.39 billion dollars in 1981, total expenditure on health per capita rose from 9.38 dollars to 53.47 dollars during 1981-2002. Over the period 1978 to 2002 CTEH increased from 3.04% to 5.42% of GDP (Table 1).

Table 1: China's Total Expenditure on Health (CTEH) by Source

Year	CTEH		CTEH as % of GDP	Per capita CTEH	
	RMB 100million	Dollar 100million	%	RMB (yuan)	Dollar
1978	110.21		3.04	11.45	
1979	126.19		3.12	12.94	
1980	143.23		3.17	14.51	
1981	160.12	93.91	3.29	16.00	9.38
1982	177.53	93.81	3.35	17.46	9.23
1983	207.42	104.99	3.50	20.14	10.19
1984	242.07	104.03	3.38	23.20	9.97
1985	279.00	95.01	3.11	26.36	8.98
1986	315.90	91.49	3.10	29.38	8.51
1987	379.58	101.98	3.17	34.73	9.33
1988	488.04	131.12	3.27	43.96	11.81
1989	615.50	163.48	3.64	54.61	14.50
1990	747.39	156.25	4.03	65.37	13.67
1991	893.49	164.09	4.13	77.14	14.49
1992	1096.86	198.90	4.12	93.61	16.98
1993	1377.78	239.11	3.98	116.25	20.18
1994	1761.24	204.35	3.77	146.95	17.05
1995	2155.13	258.07	3.69	177.93	21.31
1996	2709.42	325.88	3.99	221.38	26.63
1997	3196.71	385.62	4.29	258.58	31.19
1998	3678.72	444.34	4.70	294.86	35.62
1999	4047.50	488.93	4.93	321.78	38.87
2000	4586.63	554.05	5.13	361.88	43.71
2001	5025.93	607.22	5.16	393.80	47.58
2002	5684.63	686.80	5.42	442.55	53.47

Health expenditures have grown rapidly in both absolute terms and as a share of GDP. Figure 1 shows the upward trend in CTEH as a share of GDP, rising to 5.42% in 2002. The share of CTEH to GDP increased 1% every 10 years. Compared to other countries, at 5.4 percent of GDP, China's level of health spending is fast catching up to some European countries with much higher levels of per capita income (see Section III).

Figure 1: China's Total Expenditures on Health as Share of GDP



Source: Ministry of Health (2004).

b) Composition of CTEH by Source

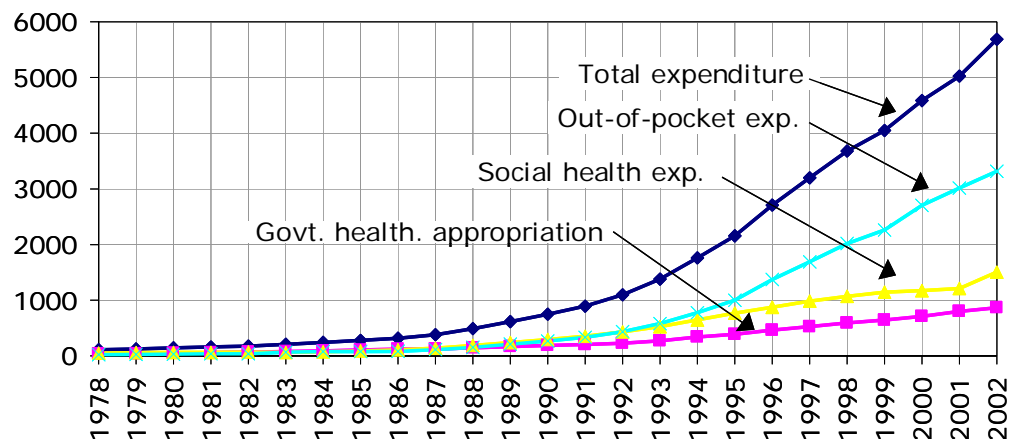
Table 2 disaggregates total health expenditure into three parts: government appropriation, social health expenditure (social insurance and others), and out-of-pocket expenditure. Government appropriation accounted for 15.21% in 2002, down from 32.16% in 1978. Social insurance and others accounted for 26.45% in 2002, down from 47.41% in 1978. Out-of-pocket health expenditure accounted for 58.34% in 2002, up from 20.43% in 1978.

In 2002 Government appropriation was RMB 86.45 billion yuan (15% of total), social insurance and others RMB 150.36 billion yuan (26%), and out-of-pocket expenditures RMB 331.65 billion yuan (58%). Figure 2 shows that from 1990 to 2002, every part of CTEH increased rapidly, but out-of-pocket expenditures increased especially fast, and were the main growth factor of CTEH.

Table 2: Composition of CTEH by Source

Year	CTEH by source		Government health appropriation as % of CTEH	Social health expenditure as % of CTEH	Out-of-pocket health expenditure as % of CTEH
	RMB 100million	Dollar 100million			
1978	110.21		32.16	47.41	20.43
1979	126.19		32.21	47.45	20.34
1980	143.23		36.24	42.57	21.19
1981	160.12	93.91	37.27	38.99	23.74
1982	177.53	93.81	38.86	39.49	21.65
1983	207.42	104.99	37.43	31.12	31.45
1984	242.07	104.03	36.96	30.41	32.64
1985	279.00	95.01	38.58	32.96	28.46
1986	315.90	91.49	38.69	34.93	26.37
1987	379.58	101.98	33.53	36.16	30.31
1988	488.04	131.12	29.79	38.93	31.28
1989	615.50	163.48	27.27	38.64	34.09
1990	747.39	156.25	25.06	39.22	35.73
1991	893.49	164.09	22.84	39.67	37.50
1992	1096.86	198.90	20.84	39.34	39.81
1993	1377.78	239.11	19.75	38.09	42.17
1994	1761.24	204.35	19.43	36.62	43.95
1995	2155.13	258.07	17.97	35.63	46.40
1996	2709.42	325.88	17.04	32.32	50.64
1997	3196.71	385.62	16.38	30.78	52.84
1998	3678.72	444.34	16.04	29.11	54.85
1999	4047.50	488.93	15.84	28.31	55.85
2000	4586.63	554.05	15.47	25.55	58.98
2001	5025.93	607.22	15.93	24.10	59.97
2002	5684.63	686.80	15.21	26.45	58.34

Figure 2: China total expenditure on health by source



Source: Ministry of Health (2004)

c) Government Health Appropriation

In 2002, government health appropriation was RMB 86.45 billion yuan. This was nearly 24 times the 1978 appropriation of RMB 3.54 billion yuan. In US dollar terms, government health appropriation roughly tripled, from \$3.50 billion to 10.45 billion during 1981-2002. However, the share of CTEH financed by Government appropriations fell from 32.2% in 1978 to 15.2% of in 2002. In terms of total government expenditure, it fell from 6.11% of to 3.9% during the period; and in GDP terms it fell from 1.0% to 0.8% (Table 3).

Table 3: Government Health Appropriation

Year	Government health appropriation		As % of CTEH	As % of GDP	As % of total government expenditure
	RMB 100million	Dollar 100million	%	%	%
1978	35.44		32.16	0.98	3.16
1979	40.64		32.21	1.01	3.17
1980	51.91		36.24	1.15	4.22
1981	59.67	35.00	37.27	1.23	5.24
1982	68.99	36.45	38.86	1.30	5.61
1983	77.63	39.29	37.43	1.31	5.51
1984	89.46	38.44	36.96	1.25	5.26
1985	107.65	36.66	38.58	1.20	5.37
1986	122.23	35.40	38.69	1.20	5.54
1987	127.28	34.20	33.53	1.06	5.63
1988	145.39	39.06	29.79	0.97	5.84
1989	167.83	44.58	27.27	0.99	5.94
1990	187.28	39.15	25.06	1.01	6.07
1991	204.05	38.33	22.84	0.94	6.03
1992	228.61	41.46	20.84	0.86	6.11
1993	272.06	47.22	19.75	0.79	5.86
1994	342.28	39.71	19.43	0.73	5.91
1995	387.34	46.38	17.97	0.66	5.68
1996	461.61	55.52	17.04	0.68	5.82
1997	523.56	63.16	16.38	0.70	5.67
1998	590.06	71.27	16.04	0.75	5.46
1999	640.96	77.43	15.84	0.78	4.86
2000	709.52	85.71	15.47	0.79	4.47
2001	800.61	96.72	15.93	0.82	4.24
2002	864.49	104.45	15.21	0.82	3.92

d) WHO estimates of China's Total Expenditure on Health

The World Health Organization divides total health expenditure into public and private expenditures. Public expenditures on health include social security funded health expenditure, government tax funded health expenditure and external assistance on health.

Private expenditures on health include expenditures from private insurance, non-profit institutions, privately owned enterprises, initial investments of private practitioners, out-of-pocket, rural collective economy and others (World Health Organization 2002).

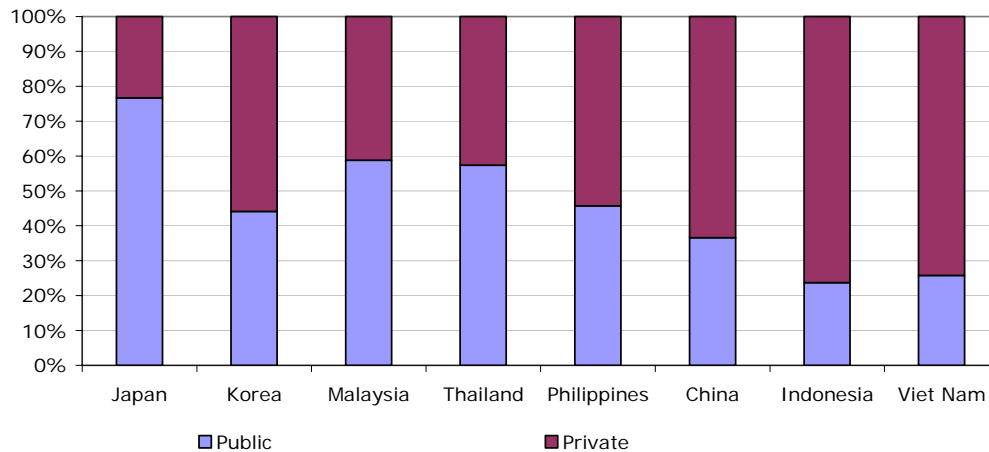
According to this classification, during 1990-2002, China public expenditures on health increased from RMB 44.61 billion to 185.18 billion yuan while its share of CTEH fell from 59.6% to 32.6%. Private expenditures on health increased from RMB 30.19 billion to 383.28 billion yuan, rising from 40.4% to 67.4% of CTEH (Table 4). In 2002, Social security funded health expenditure accounted for 61.1% of public expenditures, down from 65.7% in 1990. Out-of-pocket expenditures accounted for 90% of private expenditure.

Table 4: China's Total Expenditure on Health by WHO System

Year	Public expenditure on health			Private expenditure on health		
	RMB 100million	Dollar 100million	As % of CTEH	RMB 100million	Dollar 100million	As % of CTEH
1990	446.11	93.27	59.64	301.86	63.11	40.36
1991	518.56	97.41	57.58	381.97	71.75	42.42
1992	603.57	109.45	55.01	493.65	89.52	44.99
1993	736.32	127.79	53.07	651.12	113.00	46.93
1994	900.45	104.48	51.12	861.06	99.91	48.88
1995	1045.11	125.15	48.44	1112.64	133.23	51.56
1996	1196.65	143.93	44.11	1516.51	182.40	55.89
1997	1324.58	159.78	41.36	1877.63	226.50	58.64
1998	1432.89	173.07	38.87	2253.88	272.24	61.13
1999	1527.99	184.58	37.72	2522.64	304.73	62.28
2000	1609.77	194.45	35.10	2976.86	359.59	64.90
2001	1626.79	196.54	32.37	3399.14	410.67	67.63
2002	1851.84	223.73	32.58	3832.79	463.06	67.42

Thus despite growing at 7.7% per annum over the period 1980 -2000, government health spending has fallen as a share of health expenditures. In 2002, the government appropriations of RMB 86.5 billion yuan accounted for only 15.2 percent of CTEH, very low by international standards. Even using the WHO classification of including social security in the public share of health expenditures, China's 32.6 percent is relatively low (Figure 3). The Figure also illustrates the general tendency towards higher national public spending as income levels increase.

Figure 3: Health expenditure by source in selected Asian Countries (2000)



Source: WHO (2002 Annex 5).

e) Composition of CTEH by Health Care Providers

Based on OECD classifications, providers in the Chinese health services system are divided into seven categories: hospitals, nursing care facilities, ambulatory health care facilities, retail sale and other providers of medical goods, public health facilities, health administration, and others.

During 1990-2002, the expenditure share of city hospitals in CTEH showed a steady upward trend, rising from 56.1% to 67.7%. The share of other hospitals showed a definite downward trend in CTEH, of which county hospitals fell from 10.8% to 8.7%. Ambulatory health care facilities expenditures fell sharply, from 20.9% in 1990 to 13.4% in 2002. The share of retail sales and other providers of medical goods rose from 2.23% to 7.85%. Public health services expenditures stayed at about 6% of CTEH. (Table 5)

Table 5: China's Total Expenditure on Health by Providers

Unit: %	1990	1995	1998	1999	2000	2001	2002
CTEH by providers (RMB100million)	860.6	2395.5	3805.3	4331.6	4870.4	5254.8	5872.8
As % of total							
1. Hospitals	56.07	61.94	61.95	63.16	64.90	62.50	67.68
1.1 City hospitals	32.76	41.72	44.05	45.33	47.16	47.96	50.52
1.2 County hospitals	10.81	8.60	8.19	8.60	8.74	6.04	8.70
1.3 City health centers for community	0.00	0.00	0.00	0.00	0.00	0.00	0.45
1.4 Township health centers	10.62	10.16	9.12	7.87	7.63	6.61	7.26
1.5 Other hospitals	1.00	0.81	0.60	0.46	0.45	1.03	0.11
2. Nursing care facilities	0.89	0.64	0.45	0.92	0.92	0.87	0.63
3. Providers of ambulatory health care	20.93	16.65	14.14	13.69	13.61	14.52	13.44
4. Retail sale providers of medical goods	2.23	4.53	5.78	6.92	6.37	6.60	7.85
5. Public health facilities	6.54	5.50	5.88	5.16	5.07	5.21	6.29
6. Health administration	0.34	0.37	0.45	0.53	0.55	0.63	0.76
7. Others	13.89	11.01	11.35	10.54	9.51	10.53	3.97

f) Composition of CTEH by Function

CTEH by function includes seven parts, curative care, rehabilitative care, ancillary services, medicines dispensed to outpatients, prevention and public health services, health administration, and capital formation of health care provider institutions.

Curative care and drugs accounted for the bulk of CTEH by function. From 1990 to 2002, curative care rose from 39.0% to 50.7%. During this time, inpatient care expenditures rose from 25.91% to 33.60% of CTEH. Outpatient curative care rose from 14% to 17.1%, but medicines dispensed to outpatients fell from 35.6% to 31.7% of CTEH. Prevention and public health services rose from 8.0% in 1990 to 10.9% of CTEH in 2002 (Table 6).

Table 6: China's Total Expenditure on Health by Function

(% unless otherwise noted)	1990	1995	1998	2000	2001	2002
CTEH by function (RMB100million)	860.6	2395.5	3805.3	4870.4	5254.8	5872.8
As % of total						
1. Services of curative care	39.89	44.91	42.98	49.24	48.82	50.7
1.1 Inpatient curative care	25.91	30.66	29.23	32.57	31.99	33.6
1.2 Outpatient curative care	13.98	14.25	13.76	16.67	16.83	17.1
2. Services of rehabilitative care	0.89	0.64	0.45	0.92	0.87	0.6
3. Ancillary services to health care	1.41	1.92	1.99	0.00	0.00	2.0
4. Medicines dispensed to outpatients	35.60	33.47	32.59	31.01	30.13	31.1
5. Prevention and public health services	7.97	7.67	10.18	8.77	9.02	10.9
6. Health administration	2.84	1.46	1.40	1.47	1.49	1.6
7. Capital formation of health provider	11.40	9.92	10.40	8.59	9.67	3.2

g) China's Total Medical Expenditure

Estimates for the national medical expenditure, and breakdowns of CTEH by providers, outpatient expenditure and inpatient expenditure are based on national household health services surveys in 1993, 1998, and 2003. According to the populations of urban and rural sectors, urban medical expenditure and rural medical expenditure could be separately estimated. These are shown in Table 7 and Table 8.

Table 7: National Total Medical Expenditure

	1992	1997	2002	2002/1992	2002/1997
Total medical expenditure (RMB100million yuan)	955.41	2588.0	5225.5	5.47	2.02
Outpatient expenditure	570.74	1436.4	2556.7	4.48	1.78
Inpatient expenditure	351.96	962.28	2197.8	6.24	2.28
Retail sale expenditure on drugs	32.71	189.27	460.94	14.09	2.44
Per capita medical expenditure (yuan)	80.65	207.58	406.78	5.04	1.96
Per capita outpatient expenditure	48.16	115.14	199.81	4.15	1.74
Per capita inpatient expenditure	29.70	77.13	171.10	5.76	2.22
Per capita retail sale expenditure on drugs	2.79	15.31	35.87	12.86	2.34

In 2002, urban medical expenditure was RMB 282.67 billion yuan and rural medical expenditure was RMB 193.79 billion yuan. Urban medical expenditure for 502 million residents were more than that of rural for 782 million residents. In 2002, per capita medical expenditure were RMB 563.32 in urban, and 247.86 in rural sectors. The gap between urban and rural medical expenditure appears to be growing: the ratio of urban to rural per capital medical expenditure was 2.27 in 2002, up from 1.82 in 1992 and 1.84 in 1997.

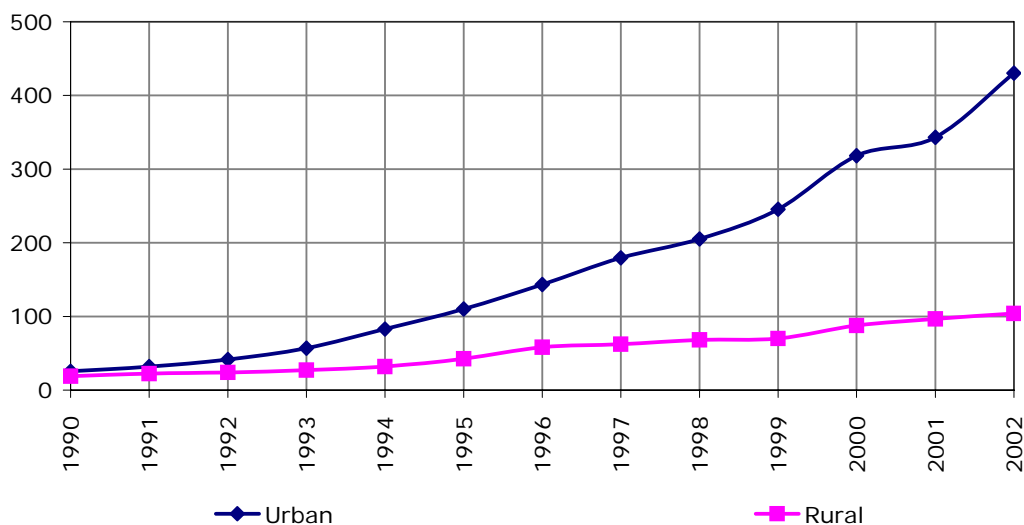
Table 8: China Urban and Rural Medical Expenditure

	1992	1997	2002	2002/1992	2002/1997
Urban medical expenditure (RMB100million)	382.62	1148.71	2826.62	7.39	2.46
Outpatient expenditure	213.48	593.56	1364.68	8.07	2.30
Inpatient expenditure	169.14	555.15	1461.94	8.64	2.63
Per capita medical expenditure (yuan)	115.34	276.08	563.32	4.88	2.04
Per capital outpatient expenditure	64.35	142.66	271.78	4.22	1.91
Per capital inpatient expenditure	50.99	133.42	291.54	5.71	2.19
Rural medical expenditure (RMB100million)	540.08	1250.01	1937.86	3.59	1.55
Outpatient expenditure	357.26	842.88	1201.99	3.36	1.43
Inpatient expenditure	182.82	407.13	735.87	4.03	1.81
Per capita medical expenditure (yuan)	63.28	150.32	247.86	3.91	1.65
Per capital outpatient expenditure	41.86	101.36	153.63	3.67	1.52
Per capital inpatient expenditure	21.42	48.96	94.05	4.39	1.92
Per capita urban medical expenditure / that of rural	1.82	1.84	2.27		

Note: Total medical expenditure in this table doesn't include expenditure on retail sale medical goods.

h) Urban/rural variations

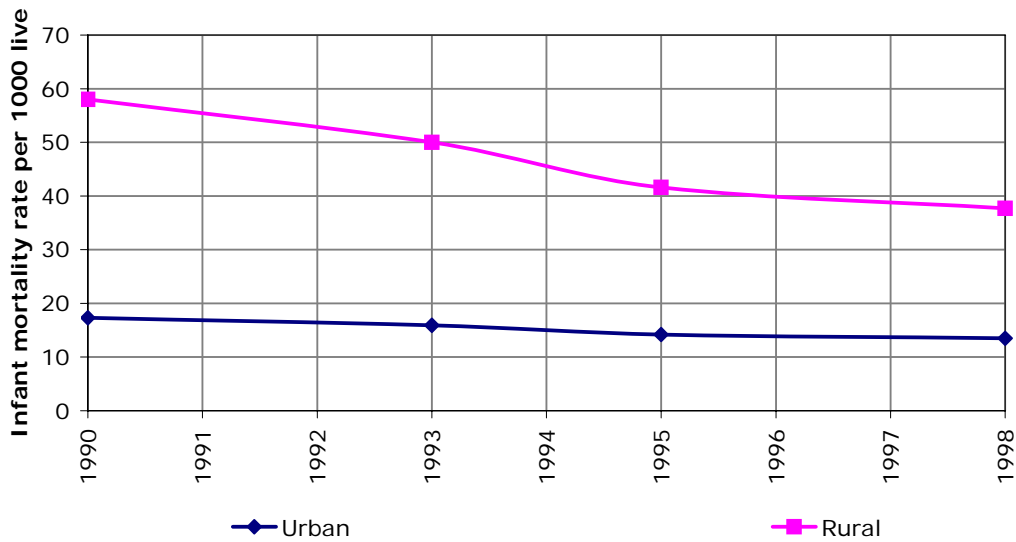
The differences in health expenditures are large and growing across sectors and regions. Figure 4 shows the growing divergence between urban and rural health spending.

Figure 4: Per capita medical care expenditure

Source: Ministry of Health (2004)

These different levels of spending are associated with big differences in outcomes. Despite significant improvement since 1990, Figure 5 shows rural infant mortality rates to be nearly three times that in urban areas.

Figure 5: Infant mortality rate per 1,000 live



Source: China Statistics Yearbook, various years

Table 9 shows the per capita medical expenditures by province for rural residents. The summary statistics at the bottom show the ratio of spending in the richest province (Guangdong in 1985, Zhejiang in later years) to the poorest (Guizhou) growing from 2.9 in 1985 to 8.2 in 2001 and 2002. The dispersion of per capita expenditures across provinces also grew over time – the coefficient of variation grew from 0.22 to 0.44 from 1985 to 2001, before moderating somewhat, to 0.41 in 2002.

Table 9: Per Capita Medical Expenditure of Rural Residents by Region (yuan)

	1985	1990	1995	2000	2001	2002
Hebei	8.34	19.13	40.93	78.28	81.33	99.14
Shanxi	7.37	20.14	31.09	60.35	59.15	64.44
Inner Mongolia	8.59	19.27	48.49	104.46	113.20	116.82
Liaoning	8.29	24.84	48.57	109.51	100.55	115.80
Jilin	11.07	27.47	57.83	102.65	120.51	132.13
Heilongjiang	10.03	28.71	74.84	117.20	126.55	120.22
Jiangsu	7.82	22.68	49.07	129.52	146.98	142.50
Zhejiang	9.25	28.41	103.20	200.06	252.03	266.52
Anhui	6.48	14.67	34.07	58.05	68.88	72.99
Fujian	8.95	20.08	44.39	87.38	101.64	118.71
Jiangxi	6.99	16.13	39.48	63.48	72.42	80.86
Shandong	6.70	17.13	40.25	118.69	114.94	127.59
Henan	8.06	18.02	34.43	63.55	68.10	73.80
Hubei	8.00	17.56	34.90	69.67	87.60	90.51
Hunan	7.49	18.29	35.78	82.23	95.71	102.81
Guangdong	11.91	34.13	67.51	100.31	118.68	116.90
Guangxi	6.58	12.52	29.04	52.38	60.95	66.19
Hainan		19.70	24.58	44.15	39.10	62.27
Sichuan	6.31	14.27	29.35	72.84	82.45	78.30
Guizhou	4.09	7.87	16.28	27.68	30.86	32.36
Yunnan	5.58	13.74	32.04	64.31	69.04	69.02
Shaanxi	7.52	18.18	41.30	91.40	86.02	103.09
Gansu	6.40	13.85	29.18	70.60	75.72	82.68
Qinghai	6.32	18.49	34.70	78.20	85.62	118.01
Ningxia	8.12	17.18	41.50	88.53	98.21	123.32
Xinjiang	7.84	16.43	47.96	73.67	86.60	99.81
maximum	11.9	34.1	103.2	200.1	252.0	266.5
minimum	4.1	7.9	16.3	27.7	30.9	32.4
max-min ratio	2.9	4.3	6.3	7.2	8.2	8.2
mean	7.8	19.2	42.7	85.0	94.0	103.0
std dev	1.68	5.73	17.71	33.76	41.78	42.70
coeff. Variation	0.22	0.30	0.41	0.40	0.44	0.41

Source: China Rural Households Survey Yearbook, 2003.

Note: The four municipalities with provincial status have been removed to avoid comparing suburban health care with rural health care in other provinces. Tibet has been removed as an outlier.

i) Concluding comments

These trends pose troubling questions for China's policymakers. First, in spite of increased budgetary spending, the government's role in the health sector is diminishing. More importantly, interventions by government appear increasingly ineffective in combating market failures and inequities in health provision. If we consider the critical functions of government to include: 1) protecting access to health care for the poor and vulnerable groups, 2) containing costs, 3) effecting some equalization of opportunities for health care, and 4) safeguarding the

quality of health care by protecting consumers from the abuse of informational asymmetries by health care providers; the public sector performance has been weak.

The rising disparities in health spending between sectors and regions, combined with the preponderance of out-of-pocket payments, imply large inequalities in access to health care between urban and rural residents, and among residents of rich vs. poor provinces – a fact noted by other chapters in this study, as well as by the 2000 World Health Report.¹ Indeed, survey data indicate that out-of-pocket payments have risen steeply since the mid-1990s as a share of household expenditures in both the urban and rural sectors, accounting for an average of 5-6 percent of household disposable income in recent years. When disaggregated across income groups, it implies that medical expenditures are large enough to impose an onerous burden on lower income households. Indeed, survey reports confirm that the poor are increasingly foregoing recommended treatments due to cost considerations, and that health risks are a growing factor in the impoverishment of families (Lindelov 2004). While the rapid growth in total health expenditures is partly attributable to China’s health transition, where improved standards of living and sanitation have led to a shift in disease patterns and greater demand for more and better health care, it is also showing signs of cost containment problems. In the hospital sector, for example, the costs of an inpatient day and an outpatient visit have both grown at annual rates of 16% during the 1990s (Lindelov 2004).

When we examine more narrowly the allocation of government health expenditures, we find that they are not well linked to policy priorities. The portion of public spending going to the government insurance scheme that benefits only civil servants and some public employees had risen from 13 percent in 1980 to 30 percent by the late 1990s. The portion going to public health institutions (centers for disease control, maternal child health centers) fell from 6.5 percent of the total in 1990 to a low of 5.1 percent in 2001 (before recovering to 6.3 percent in 2002) (Table 5). More starkly, when we look at the proportion of total funding at the level of the public health institutions, budgetary support is only 40 percent for CDCs, and less than 30 percent for MCHs – these institutions have to seek user charges and other incomes to make up the rest (Table 10).

Table 10: Government Subsidies in Medical Institutions by Type (2002)

	Hospitals	THCs	EPS/CDC	MCH Center
Total Expenditure (billions yuan)	191.39	38.66	12.99	5.49
Government Subsidy (billions yuan)	16.04	5.10	5.41	1.50
% of Gov. Subsidy in expenditure	8.38	13.20	41.65	27.34

Source: Ministry of Health (2004).

Finally, many studies show low efficiencies in public spending: low and declining bed-occupancy rates and patient caseloads in public health institutions show pervasive underutilization of capacity, fragmentation and duplication of facilities, along with rapid cost escalation (see separate AAA report on service delivery).

In sum, after two decades of market transition and incremental reform, public expenditures and resource allocation in the health sector appear to have lagged behind the needs of China’s rapidly changing economy. While it seems clear that more public spending will be

¹ The *World Health Report 2000* ranked China 144th for the overall performance of the health system out of 191 countries, but 188th in terms of fairness in financial contribution (World Health Organization 2000).

required for government to effectively carry out its critical role in protecting public health and access to health care for all, it is also clear that some fundamental changes are also required to improve the efficacy of public spending. To understand the diminished and increasingly ineffective role of government over the past two decades requires understanding the evolution of China's fiscal system and intergovernmental relations through the transition period, as well as the lagging efforts to modernize public expenditure management.

III. HOW PUBLIC EXPENDITURES ARE ORGANIZED IN CHINA

This section discusses public expenditure on health care in the context of broader developments in Chinese public finance over the last two decades.

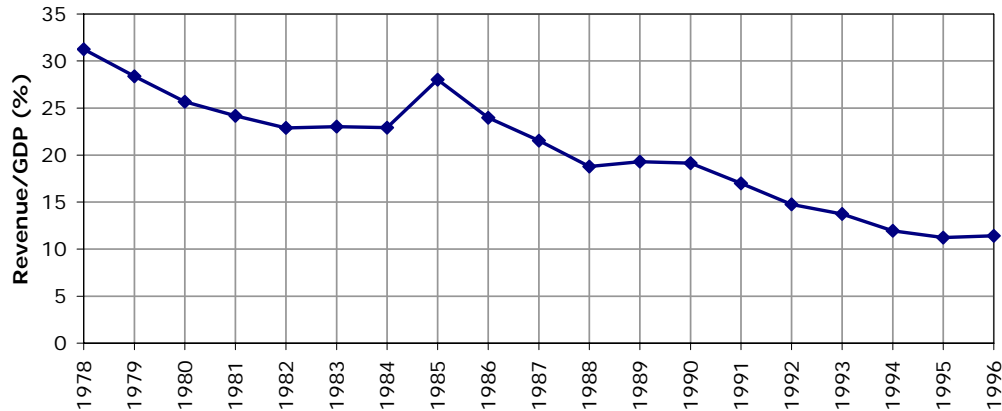
a) The shrinking resource envelope and decentralized finance: the 1980s and 1990s

The main outline of the macroeconomic environment in the 1980s and 1990s is as follows: at the outset of market reform in 1978, China's fiscal system was modeled on that of the Soviet Union and designed to work in a centrally planned economy. The revenue mechanism was built on three pillars: state ownership of industry, prices that were set administratively and rigged to favor industry, and compulsory trade among producers in accordance with directives set in the plan. Under central planning, by transferring all surpluses to the industrial sector and scooping up profits from state-owned enterprises, this system produced robust revenues that funded government as well as savings and investment.

With market reforms quickly eroding the pillars of this revenue mechanism – state ownership of industry and planned trades declined, and prices were freed to market determination – state owned enterprise profits collapsed, and with them, government revenues (see Figure 6). Central revenues were especially hard-hit as local governments in rich regions protected their own resource base by shielding local enterprises from taxation to avoid sharing revenues with central government.²

² For example, under the planned economy Shanghai remitted more than 80 percent of its revenues to the central government. This high “tax” on Shanghai revenues created incentives for collusion between the municipal government and its subordinate enterprises and the potential for informally sharing the “saved revenues” within Shanghai. For analyses of this period, see (Oksenberg and Tong 1991; Wong 1991; Wong 1992).

Figure 6: The Long Fiscal Decline



This fiscal decline forced across-the-board budgetary cutbacks and a devolution of expenditure responsibilities to lower level governments.

Today China is among the most decentralized countries in the world by the conventional measure of expenditure shares – the central government accounts for only 30 percent of budgetary expenditures. The other 70 percent are distributed among the four levels of subnational government: provinces, prefectures/municipalities, counties and townships.³

Two aspects of China’s decentralized fiscal system are especially important for understanding health finance:⁴ first, the system assigns unusually heavy expenditure responsibilities to lower levels of government (Table 11). Among the “heavy” expenditure responsibilities, social welfare stands out. Since welfare and pension payments are cyclical, they are usually deemed unsuitable for local governments. Education and health are also costly and important services whose responsibilities are rarely assigned solely to local governments, since they often exceed the financial and management capacities of lower level governments. In China, social welfare (including pensions) is the responsibility of municipalities and counties, and education is primarily the responsibility of municipal, county and township governments (see Figure 9 for the administrative structure and size of governments in China). In the health sector, the vast majority of public health institutions for epidemic and disease prevention are run by the lowest tiers of government – municipalities, counties and townships. The same is true for maternal child health centers.

The second important aspect of China’s decentralized system is that since the late 1980s, the responsibilities for financing and provision have been joined in the same unit of government. In many countries, local governments are assigned the responsibilities for *providing* education, health and social welfare services, but the *financing* is provided by higher level governments in

³ This compares to subnational expenditure shares averaging 14 percent for developing countries, 26 percent in transition countries, and 32 percent for OECD countries (Bahl 2000).

⁴ China’s decentralized fiscal system and its effects on the delivery of social services are analyzed in World Bank, China: *National Development and Subnational Finance – a review of provincial expenditures*, 2002 (The World Bank 2002).

whole or in part (Table 11). In China, in contrast, there is no system of transfers designed to ensure that local governments can finance a minimum level of services assigned as their responsibilities (Figure 7). As a result, the quantity and quality of services vary tremendously across localities, depending on the status of local budgets. Since the mid-1990s, these differences have grown (The World Bank 2002).

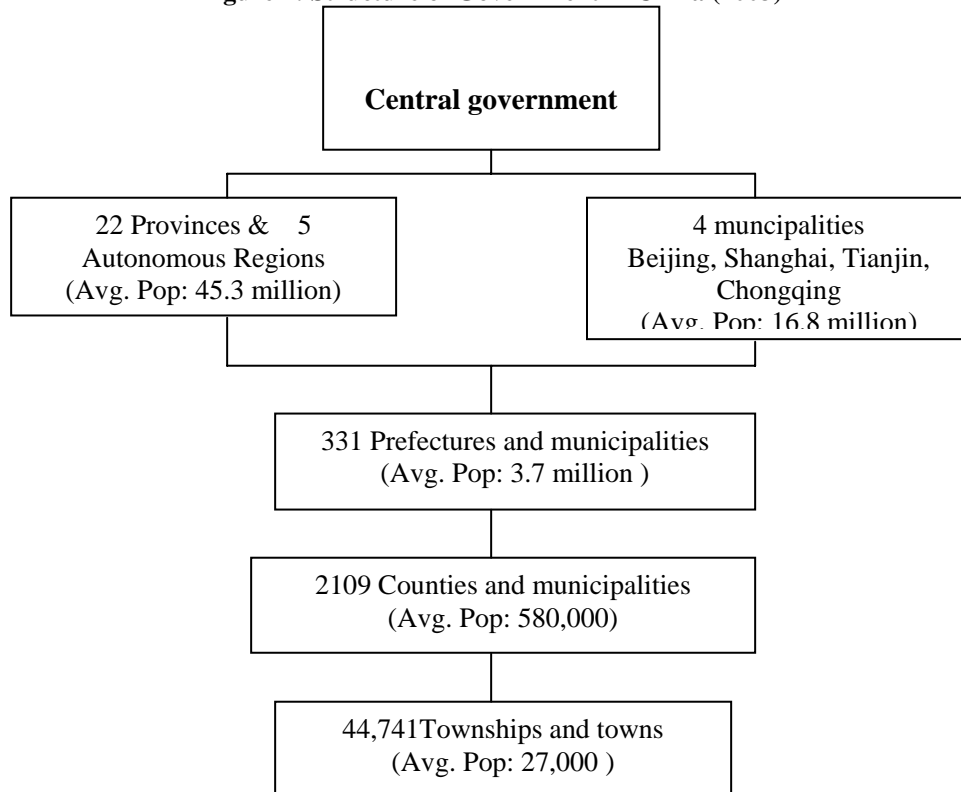
Table 11: Expenditure Assignments in Comparative Perspective

	Unemployed Insurance	Air Rail	Industry Agriculture	Education	Health	Social Welfare	Police	High- ways
China (1), (2)	L	F	F,S,L	L	L	L	L	F,S,L
Brazil: (1)	F	F	F,S	F	F,S	F,S	F,S	F
(2)	F	F	F,S	F,S,L	F,S,L	F,S	F,S	F,S
India: (1)	F,S	F	F,S	F,S	S	F,S	S	F
(2)	F,S	F	F,S	F,S,L	S,L	F,S	S	F
Japan: (1)			L	F,L	F,L	F,L	L	
(2)				L	F,L	F,L	F,L	L
Canada	F	F,S	C	S	S(F)	F,S	F,S	S
United States	F,S	F,S	S	S,F	S(F)		F,S	F,S
Switzerland	C	F,C	F,S	C,F,S	S,C	F,C	S	FS
Australia	C	F,S	S,C	F,S	F,S	C	S,F	F,S
Germany	C	F,C	C	C,S	C,F,S	C	C,S	C
Austria	F	F	F	F,S	C,F,S	C	F,S	F,S

Source: Anwar Shah,, Perspectives on the Design of Intergovernmental Fiscal Relations, Policy Research Working Paper Series, No. 726, July 1991; Dherpinger, Distribution of Powers and Functions in Federal Systems, Ottawa, 1991, Appendix B.

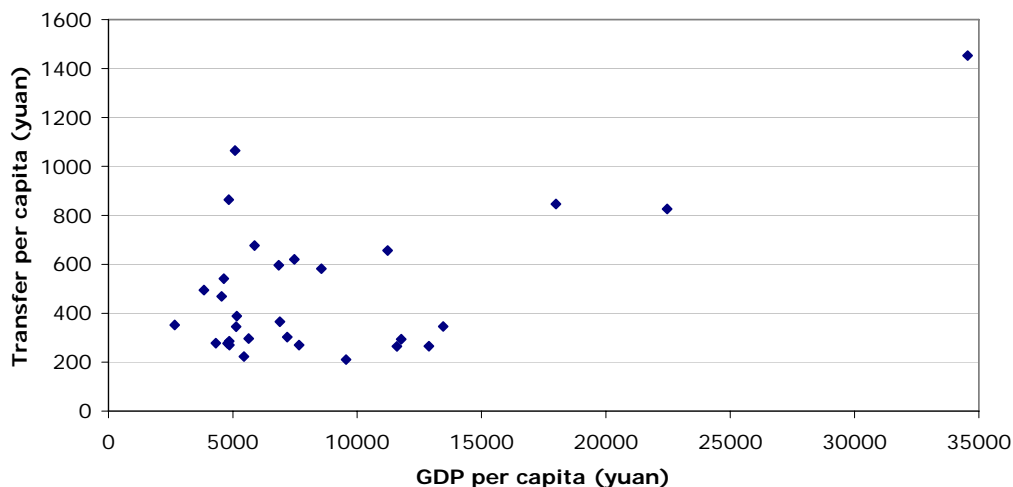
Notes: (1) policy and financing (2) provision. For federal countries, C = concurrent.

Figure 7: Structure of Government in China (2003)



Since the mid-1990s, central transfers to provinces have also grown rapidly, and currently finance nearly half of all spending at the subnational levels. However, nearly half of the transfers are rebates of the VAT and excise taxes, which are calculated by formula to return a proportion of the two taxes to the provinces by derivation -- and are thus not equalizing, since those collecting more receive more in rebates. Of the rest of the transfers, two types of earmarked subsidies dominate: those designed to bail out local governments unable to meet payments for pensions and unemployment stipends, and subsidies to compensate local governments and raising civil service pay. Neither of these subsidies is targeted for the poor, but instead go predominately to more industrialized provinces. Only the “general” transfers are designed to be pro-poor, but they were until 2002 a miniscule portion of the total (less than 5 percent). This leaves subnational governments in China are self-financed, with heavy responsibilities for delivering social services (The World Bank 2002; Wong 2004).

Figure 8: Central transfers by province (2000)



b) Budgeting for health

Under this fiscal system, the financing of health care is by “subsidiarity” – each level of government finances largely its own facilities, so that provincial governments support referral hospitals in the provincial capital and the institutions that supervise preventive programs. Prefectural/municipal governments support municipal health institutions, and so on down the administrative hierarchy, with township health centers receiving most of their very low levels of financial support from township governments.

As noted in the 2002 World Bank study, few resources are transferred from higher levels of government to facilities at the lower levels to support recurrent costs, although there are some earmarked grants for specific objectives and activities. For example, vaccines are provided free of charge to township health centers. Very small amounts of money are sometimes transferred to village health services – some counties pay village doctors a monthly fee to carry out immunization programs, and other areas subsidize cooperative medical insurance schemes. This arrangement means that the quality of health services in each locality is highly dependent on the financial health of the local budget. As expected, this gives wide variation to per capita expenditures across localities (see Table 12).

Table 12: Trend in Health Expenditures Across Regions

	1995	1996	1997
Health Exp. Per Capita	Yuan		
High income regions	686.3	812.6	996.0
Middle income regions	267.4	332.6	368.7
Lower income regions	154.1	190.1	210.5
Poor regions	117.0	141.6	155.8
Maximum/minimum	5.9	5.7	6.4
% of Health Exp. In GDP			
High income regions	5.18	5.24	5.67
Middle income regions	3.18	3.39	3.39
Lower income regions	3.66	3.76	3.72
Poor regions	6.43	6.65	6.6

Note: High income regions: Beijing, Shanghai, Tianjing

Middle income regions (9 provinces): Zhejiang, Guangdong, Jiangsu, Liaoning, Qinghai, Xinjiang, Hainan, Fujian, Hebei

Lower Income Regions (9 provinces): Heilongjiang, Yunnan, Ningxia, Jilin, Shandong, Shanxi, Hebei, Hunan, Inner Mongolia

Poor regions (9 provinces): Sichuan, Guangxi, Tibet, Shannxi, Gansu, Jiangxi, Anhui, Henan, Guizhou

Source: World Bank (2002), Table 7.6.

Because of the differential financing capacities of different tiers of government, the level of subsidy tends to diminish down the administrative hierarchy. For example, in the World Bank 2002 study, it was found in a county in Gansu province that while the budget appropriated 70% of personnel salaries for the county hospital (including for the 20% of personnel in excess of what was officially approved), the county budget covered only a minor portion of salary costs for township health centers: 50% of the basic wage for staff who were classified as “state employees”, and none for those who were “collective employees”. A portion of salaries and all other running costs had to be raised by the institutions themselves. In some of the poorer townships, there were reportedly no budgetary inputs to the health sector at all (The World Bank 2002, chapter 7).

c) The modality of budgeting support

Compounding the problems of declining budgetary support to health institutions is the unreformed modality under which budgeting support was provided to the health sector, which became increasingly unsuited to China’s increasingly diversified economy. Under the planned economy, budgetary support for the health sector was channelled mainly through supply-side subsidies that went to building state-owned institutions and providing budgetary support to their salary costs. Consumers were subsidized implicitly through the low-prices of services provided by public health institutions. Even in the 1950s, user charging was applied to consumables such as medicine, on which a 15 percent profit margin was permitted (Lindelov 2004).

Through the 1980s and 1990s, when budgetary support was gradually reduced, health institutions were allowed to levy user charges to raise revenues to support operations. In an attempt to impose a rational structure to these budgetary cutbacks and protect high priority areas, a tripartite system was introduced in the mid-1980s that divided health institutions into three

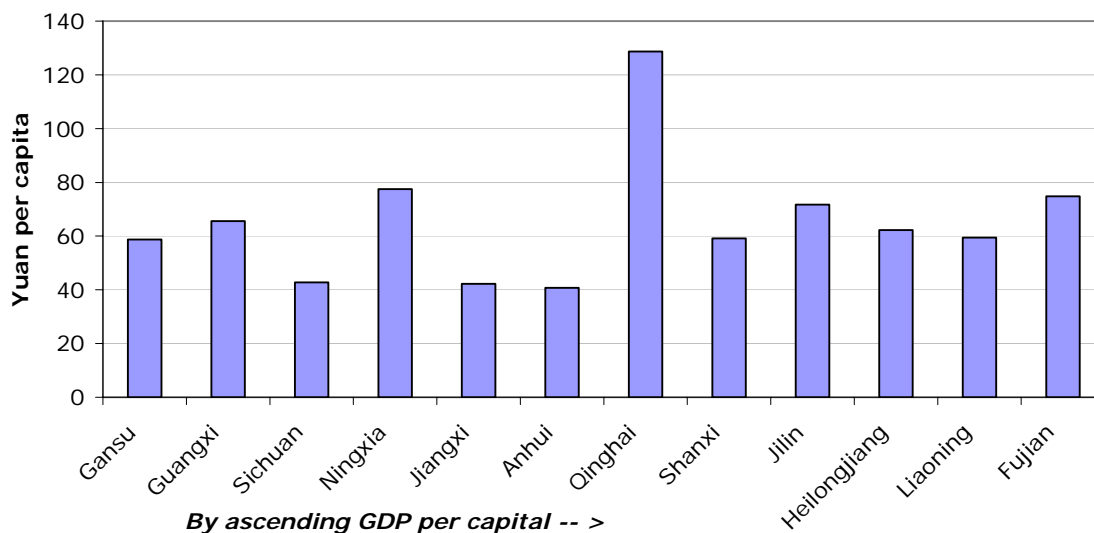
types: “fully funded”, “partially funded”, and mostly “self-funded”. At the policymaking level, these divisions were defined by the degree of “public benefit”, which corresponded broadly to the notions of public goods, externalities and protection of vulnerable groups. For example, public health functions such as epidemic prevention immunizations were placed in the category to receive full budgetary funding, along with maternal child health, and health care for minority regions. Rural township health centers were placed in the “partially funded” category, while general hospitals were mostly self-funded.

But this tripartite division was diluted by problems of the intergovernment fiscal system, especially in poor regions. Since more than 90 percent of health institutions are at the subnational levels, local fiscal problems led to under-funding of services across-the-board. As a result, all service delivery units were pushed to raise operating revenues through user charges including maternal and child health centers and epidemic prevention stations (later renamed centers of disease control), which received only 30-40 percent of their revenues from the budget in spite of being “fully funded” units (Table 10 earlier). By the late 1990s, since the amount of subsidy available depended on local fiscal health, the outcomes of these supply-side subsidies became increasingly regressive: in rich localities residents enjoyed a higher level of subsidization than in poor localities – a fact that cut across regions and sectors (urban vs. rural).

More importantly, as health institutions were permitted to “top up” staff salaries with bonuses and supplementary pay from own revenues, this created market-like incentives that proved irresistible to health care providers and significantly distorted the pattern of health care provided. The appropriation of budget support by inputs such as personnel or bed numbers, and by institutions until the past 2-3 years also contributed to inefficiencies such as the creation of excess capacity in beds and staffing. All of these exacerbated the difficulty of cost-containment and a persistent mismatch between supply and demand.

Figure 9 shows no clear relationship between health subsidies and per capita GDP for 12 provinces (Ministry of Health 2004). In sum, the logic of budgetary subsidization of the health system created under the planned economy no longer works. A new modality for public subsidies is needed.

Figure 9: Per capita government spending on healthcare, by province



Source: MOH (2004)

IV. INTERNATIONAL EXPERIENCE

This section discusses international experiences with public finance of health care. The intention is to indicate the various ways in which government revenues interact with other types of health care financing within the health system. The next section gives some examples of how health care financing is organized in different types of health system. We then discuss the specific role of government in *integrating* a system of fragmented risk pools. The final section discusses practical associated with transition.

a) Introduction

Most health systems are organized into a system of financial *risk pools*, which usually act as both insurers and collective purchasers of health care for a defined population (Smith and Witter 2001). The extent to which members of a risk pool are protected from routine or catastrophic health care expenditures differ markedly between systems, depending on the package of care covered, and the extent to which patients must share some of the costs of care in the form of out-of-pocket payments. However, the essence of the pooling arrangement is that – to some extent – the financial risks associated with health care are transferred (a) from the poor to the rich (b) from the sick to the healthy and (c) from the young to the old. The nature and magnitude of these transfers is a fundamental policy choice.

The most important imperatives for risk pooling are to establish appropriate and reliable systems of governance, to assure the collection and stewardship of finances, and to ensure that providers are reimbursed appropriately by the risk pools. These basic requirements are fundamental, and local conditions may seriously circumscribe realistic policy choices. They imply the need for a minimum degree of long-term trust in the institutions of health care, a

rudimentary flow of adequate information, and the reliable enforcement of contracts, whether implicit or explicit. Without these desiderata, it is difficult to envisage any system of risk pooling and collective purchasing of health care being feasible.

Once these basic institutional requirements are satisfied, numerous fundamental choices must be made about the type of risk pooling employed within a system of health care, including:

- the institutional basis for risk pools (geography, employment sector, employment status, and so on);
- the criteria for membership of a risk pool;
- the size of risk pools;
- whether or not the risk pools are competitive;
- whether or not contributions are mandatory;
- whether financial contributions are community rated or risk rated;
- the extent to which health care users retain some expenditure risk (in the form of user charges);
- the extent to which there are financial transfers between risk pools;
- the extent to which the risk pools are protected from unpredicted variations in expenditure needs by some higher level pooling;
- the freedom given to risk pools to choose variations in packages of care, membership entitlement and financial contributions.

A full discussion of all of these issues is infeasible, although some of the more important are touched on in the following sections. The choice will frequently be heavily dependent on the administrative structures already in place, the nature of governance structures, managerial and informational capacity, and societal preferences.

Almost all health systems, to a greater or lesser extent, deploy public expenditures as a major source of financing health care, in the form of public subsidies to the risk pools. However, there exist enormous variations in the level of public expenditure, and the way that public finance is allocated. Examples include,

- A low income country model, based predominantly on out-of-pocket payments;
- A transition country model, with government subsidies to providers and substantial informal user charges;
- A market model with extensive use of private insurance, as in the US;
- A social insurance system, as in much of central Europe;
- A centralized national health system, financed and administered by the national government, as in the United Kingdom;
- A local government system, as found in much of Scandinavia.

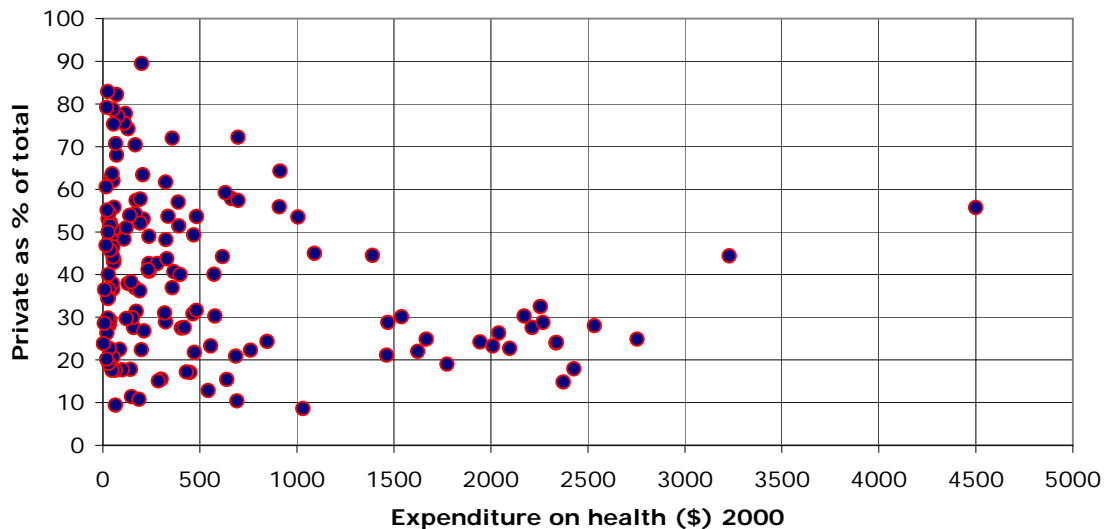
In practice, most health systems comprise mixes of these arrangements, and none operates purely according to these crude caricatures. For example, the social insurance systems in Austria and Belgium are supplemented by considerable subsidy to the sickness funds from national taxation. The UK national public system and the German and Dutch social insurance systems include substantial elements of private health insurance. Almost all systems rely to some significant extent on an element of user charges. And the US system comprises a uniquely bewildering mix of financing mechanisms.

b) Finance modalities

In this section we sketch the different modalities of paying for health care, and the role played by public expenditure. Each approach has different implications for who pays for the health system, and who receives health care. That is, the financing system has profound influences for the equity and efficiency of the health system. The intention is to examine the implications for government actions of different types of risk pooling.

Worldwide, 57% of expenditure on health is from public sources (direct government expenditure or social insurance) (World Health Organization 2002). Figure 10 summarizes the link between expenditure on health and the level of private (non-governmental) spending in national health systems. It shows a wide variation in government support for health expenditure amongst low income countries, but increased government spending as expenditure increases, with most OECD countries funding about 70-80% from public sources.

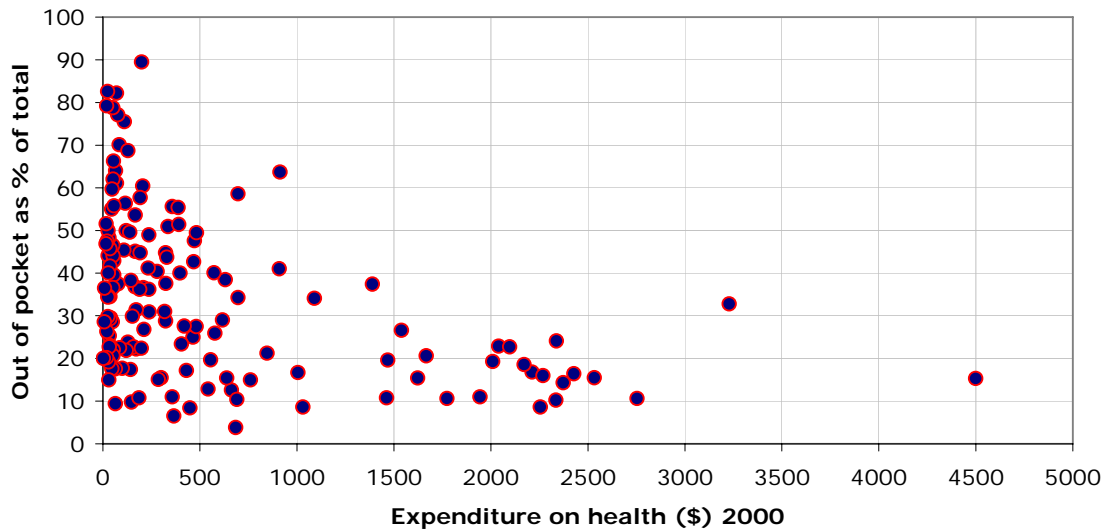
Figure 10: Total expenditure on health (int \$) and private expenditure %



Source: WHO (2002)

Private expenditure comprises private health insurance and out-of-pocket payments. As shown in Figure 11, there is a marked tendency for higher income countries to make lower use of out-of-pocket payments, instead diverting private health expenditure to prepaid private insurance plans, a major feature of the US health system (by far the highest spending observation in the Figures).

Figure 11: Out of pocket as a % of total spending on health care



Source: WHO (2002)

We now briefly explore the role of government expenditure in association with the following sources of health system finance: user charges; private insurance; local taxation; national taxation; and social insurance.

User charges

User charges are manifestly inappropriate as the main source of finance for most health care (Robinson 2002). They impose all of the costs of sickness on the sick, often resulting in catastrophic payments for those who fall sick (particularly the poor), and denial of treatment. They therefore have disastrous consequences for equity. Also, because patients are less informed than physicians, sole reliance on individual purchasing of health care might encourage patients to consume inappropriate or excessive health care. There may also be high transaction costs associated with calculating and collecting user charges. More generally, the large degree of uncertainty suffered by all citizens regarding future health care expenditure is likely to lead to high general levels of dissatisfaction with the health care system. For this reason, once other sources of finance become feasible – such as social insurance or government taxation – most countries seek to move away from heavy reliance on user charges, as emphasized in Figure 3.

In contrast, throughout much of Asia and sub-Saharan Africa, there is a strong reliance on out-of-pocket user charges as the main source of health system finance, with seriously adverse consequences for outcomes and equity, as noted in the World Health Report 2000 (World Health Organization 2000). User charges can take the form of either a formal, regulated payment, or an informal payment. The physicians (or other providers) might collect the payment on behalf of the government or some other agency, or might retain the payment for their own purposes.

Transition countries have a tradition of publicly funded health care, and in some countries the financial and administrative structures in place before the fall of the Soviet Union remain in place (Preker, Jakab et al. 2002). These include salaried professionals working in state funded

hospitals. So long as hospital costs were paid by the government in full, these supply side subsidies operated as quite an effective guarantee of near-universal access to health care with minimal user charges. However, as salaries have steadily become inadequate to maintain living standards (and sometimes are not paid at all), in countries such as Kazakhstan and Kyrgyzstan a widespread use of informal out-of-pocket payments has emerged with which professionals are able to supplement their incomes. Although by their nature these are difficult to research, it appears that informal charges secure higher quality care for those who pay, and sometimes have the effect of denying care to those unwilling or unable to pay (Lewis 2000).

In many systems that rely heavily on user charges, physicians and other health care professionals operate in a market, and charge according to local conditions of supply and demand. Public expenditure is severely constrained, rarely deployed according to explicit cost-effectiveness criteria, and often distributed according to historical accident rather than clinical need. Private insurance is available only to a small elite. The poor, and especially the rural poor, may be effectively denied access to any meaningful health care. For the 149 countries with populations over 1 million, Table 13 shows the 10 with the highest and 10 with the lowest proportion of health expenditure funded by user charges.

Table 13: Out of pocket: highest & lowest as percent of total health expenditure

HIGHEST			LOWEST		
1.	Georgia	89.5	140.	United Kingdom	10.6
2.	Myanmar	82.6	141.	Slovakia	10.4
3.	India	82.2	142.	France	10.2
4.	Nigeria	79.2	143.	Papua New Guinea	9.8
5.	Sudan	78.8	144.	Bhutan	9.4
6.	Pakistan	77.1	145.	Netherlands	8.6
7.	Cambodia	75.5	146.	Czech Republic	8.6
8.	Indonesia	70.1	147.	Oman	8.4
9.	Viet Nam	68.7	148.	Namibia	6.5
10.	Cameroon	66.3	149.	Saudi Arabia	3.8

Source: World Health Report 2002

User charges do nevertheless have a limited role to play in almost all health systems. In health systems where the tax base is weak they represent an important source of revenue, and could in principle be levied only on those able to pay, thereby guaranteeing access to the poor. Also, they can in some circumstances inhibit moral hazard – the excessive use of health care by people not required to make a direct payment. However, the overwhelming evidence is that heavy reliance on out-of-pocket payments leads to serious inequities and inefficiencies, and cannot be recommended as a desirable policy option.

Government expenditure (short of offering a full insurance function) can play a major role in abating the worst consequences of user charges for patients. These include:

- subsidizing user charges for some (or all) procedures, using a matching payment;
- placing a maximum limit on an individual's expenditure in (say) a year;
- offering a full or partial waiver for vulnerable user groups, such as the poor, or those with chronic disease.

These types of schemes have the virtue that they can be targeted at the demand side in line with policy intentions. However, they may place quite a heavy demand on administrative systems (for example, deciding whether a patient qualifies for a fee waiver), and they offer an open-ended obligation, with no certainty as to the government budgetary commitment.

Private insurance

Some expenditure uncertainty associated with out-of-pocket payments can be removed using a competitive medical insurance market (Maynard and Dixon 2002). Generally speaking, insurers will set individual premiums based on their assessment of an individual's risk profile. In these circumstances, the function of insurance is to eliminate the expenditure uncertainty associated with health care, but not to transfer health care resources between individuals. In effect, as the ability to predict expenditure improves, such insurance becomes a method of prepayment for health care (rather than insurance), with the principal objective of smoothing known expenditure needs across a lifetime.

Most private insurance arrangements will use the citizen's previous health record as an important element in setting a premium (so-called "experience rating"). Thus, even if a *current* episode of health care is covered by an insurance contract, the patient may implicitly pay for the episode in the form of increased *future* insurance premiums. Indeed many citizens will effectively become uninsurable for some or all health care risks in a system with no risk pooling. In practice, society might need to put in place some sort of health care for those unable to pay charges or insurance premiums, which in effect is a "safety net" risk pool comprising the poor and the sick.

In many circumstances, private insurers who wish to charge risk-rated premiums are confronted by a profound lack of information about the health status of their applicants for coverage. If – because of this lack of personal information – they are forced to charge a single premium to all insured, they create a risk pool and there arises the problem of *adverse selection* (McGuire 2000). The premium reflects the average costs of health care. But individuals may be able to judge more accurately than the insurer whether their own risk is above average (the sick) or below average (the healthy). If such private information exists, the sick may purchase the insurance, the healthy may not. Thus, with voluntary enrolment, the insurance pool in time becomes less healthy, leading to increased premiums and in turn withdrawal of the comparatively healthy members of the remaining pool. The insurance function therefore breaks down, leading to market failure (Pauly 2000).

A prerequisite of private insurance is that citizens have trust in the long-term viability and probity of the insurers. In general, voluntary private insurance arrangements are most attractive to the rich, so a heavy reliance on it gives rise to equity concerns. The transaction costs associated with private insurance include assessing an individual's health care risks, writing appropriate insurance contracts, monitoring the individual's utilization of health care, and reimbursing providers, and may be considerable. However, private insurance can serve as a means of drawing in extra finance to the health system from those able to pay, so releasing limited community funds to concentrate on meeting the needs of the poor. Private insurance can then be a *substitute* for a community insurance package, a *complement* to the community

insurance package (covering interventions not covered by the government package), or *supplementary* (covering user charges associated with the community package).

Few countries rely extensively on a competitive market in private health insurance, the notable exception being the United States. Here, the nature of private insurance available to a citizen is often tied to employment (for those in the workforce), and for many there is little effective choice of insurer. There are extensive government-funded insurance arrangements for the poor (Medicaid) and older people (Medicare). A significant proportion of the population (about 1 in 8) is not formally insured, and there is widespread dissatisfaction with the health system, even amongst the insured.

Of the 149 countries with populations over 1 million, 90 have recorded expenditure of less than 1% on private insurance plans. They account for 67% of the world's population. Table 14 shows the countries in which private insurance forms the greatest proportion of total health care expenditure.

Table 14: Prepaid private plans as percent of total health expenditure

South Africa	44.3
Uruguay	36.8
USA	34.8
Namibia	32.1
Zimbabwe	26.7
Netherlands	24.9
Chile	23.1
Brazil	20.8
Canada	19.8
Switzerland	18.8

Source: World Health Report 2002

Government expenditure can play a number of roles in a system of voluntary private insurance. These include full or partial payment of premiums for vulnerable population groups, or subsidizing the entire risk pool to allow the insurer to charge more affordable premiums. However, it is difficult to see circumstances in which extensive reliance on voluntary private insurance for mainstream health care offers any advantages in efficiency or equity over a system based mainly on governmental or social insurance.

Community rated insurance

In the pursuit of equity objectives, many systems of health care insist that an insurer must charge all insured within a risk pool the same premium (or the same rate of premium as applied to some measure of income or wealth) regardless of health risk. Under this regime, known as *community rating*, the insurer cannot discriminate on price. Such insurance can vary in a number of characteristics. For example, it can be voluntary or mandatory for the citizen, and there may or may not be choice of insurer for the citizen.

If membership is voluntary, there is a risk of adverse selection, as the sick find the insurance most attractive. In contrast, if there is choice for the citizen, the insurer has an

incentive to *cream skim* the relatively healthy (Van de Ven and Ellis 2000). Even if such cream-skimming is formally illegal, it is in practice difficult to prevent insurers from deterring sick applicants. In these circumstances, some individuals might become uninsurable, or insurers might withdraw from the market, in the extreme leading to market failure in the insurance market.

Under mandatory community insurance, individuals must be placed in a particular insurance risk pool, depending on criteria such as:

- where they live (geographical risk pools);
- the nature of their employment;
- their personal choice (for example, competing insurance funds).

Such risk pools will in general be of variable population size and imply variable *per capita* expected expenditure. Broadly speaking, pools with a higher proportion of older and sicker members will incur higher *per capita* levels of expenditure.

Tax-based systems

Many developed countries fund most of their health expenditure through direct government expenditure. Such systems fall into two broad groups: local government systems, in which the fundamental unit of organization is the local government, and revenue is raised at least in part through local taxation; and national government systems, in which expenditure is funded through national taxes.

Local government is responsible for health care in much of Scandinavia. The units of administration can be very small (Finnish municipalities, average 5,000) or quite large (Swedish counties, about 500,000). Countries such as Spain and Italy are moving towards decentralization to the regional level (populations about 3 million).

A more strategic form of decentralization can be found in federated countries, such as Canada and Australia. The federal government might provide some grant-in-aid, but the bulk of financial responsibility for funding the health system falls on state taxes. States within the federation may be required to offer some nationally agreed minimum level of care, but enjoy some freedoms as to how those minimum standards are delivered and financed. The states in turn must decide how to finance and organize the local management of their health care systems.

The essence of health systems focused on local governments is that – at the margin – they are funded by local taxation. However, central government expenditure also plays a very important role, in the form of grants-in-aid from the national level to local governments, funded by national taxation. The national grants-in-aid are required (a) to supplement local tax resources, and (b) to compensate local governments for variations in local tax base and local health needs. The intention is to enable each local government to offer some standard package of health care for some standard local tax rate.

National health services, of the sort found in countries such as the United Kingdom and New Zealand, represent a simpler form of public organization of health care, funded solely by national taxation. The intention is that all citizens should have access to a standard package of care. Even though such systems are nominally national, in practice health care budgets must be

devolved geographically to local administrations. There is therefore a concern to ensure that local administrations are fairly financed, to ensure that they can deliver the standard level of care to their citizens. The financing mechanism should therefore in principle recognize variations in the demography, social conditions and levels of sickness.

The reliance on general taxation (rather than a specific tax base, as in social insurance) has made national systems more financially robust than many systems relying on more specific sources. However, the large expenditure requirements of health care require the presence of a broad tax base and a general tolerance for relatively high levels of taxation. Tax-based systems therefore suffer when tax bases are narrow, or there is strong pressure to reduce the general burden of taxation. Furthermore, health care must compete directly with other social programmes such as education, social security and police for government funds.

Social insurance

Systems of social insurance were amongst the earliest forms of collective health insurance, and remain the central source of health care finance in countries such as Germany, the Netherlands, Belgium, Austria, France and Japan (Normand and Busse 2002). These systems offer universal coverage, with contributions according to ability to pay (usually in the form of a payroll tax) rather than use of health care. Citizens are usually free to use any provider, and the insurance funds reimburse according to a schedule of fees. Without any transfers between funds, this means that variations in premium rates arise between funds, because of variations in the levels of sickness or the tax base of the fund members.

In the original form of social insurance, still in place in countries such as Austria and Japan, a citizen is assigned to a sickness fund on the basis of employment sector or place of residence. More recently, countries such as Germany, the Netherlands and Israel have allowed citizens to choose with which fund to be insured, introducing an element of competition between funds. This has led to an urgent need to implement financial transfers between funds to compensate for variations in the levels of sickness or the tax base of the fund members. Without such transfers, funds would not operate on a level playing field, and would have an incentive to cream skim healthy and high income members, at the expense of the sick and the poor.

Because of its compulsory nature, the insurance premiums associated with social insurance are effectively an earmarked (hypothecated) payroll tax. Thus, expenditure on social insurance is most appropriately considered a *public* source of health care finance, though it is often distinguished from *direct* government sources of finance. The reliance on a single revenue base has led to a funding crisis in some social insurance systems (such as France and Germany) because the tax base (payroll) has not increased in line with increases in health care expenditure, and the sickness funds have not felt able to implement required increases in the premium rate. As a result, many sickness funds have substantial funding deficits.

The government has an important financing role in a system of social health insurance in two respects. First, when revenues from premiums are inadequate, it might be supplemented with government funds from general taxation, as occurs (for example) to a considerable extent in Belgium. Secondly, especially in a system of competitive insurers, the government has an

important role in mandating and supervising financial transfers between the funds, as discussed in the next section.

c) Integrating risk pools

In the first instance, any form of collective insurance creates a fragmented set of risk pools, with variable health needs and (in the case of locally financed risk pools) variable magnitude of income sources. If unadjusted, these variations between risk pools can give rise to large variations in:

- the package of care offered to insured members
- the size of their financial contributions (insurance premiums, local taxes, out-of-pocket payments);
- quality of care;
- unplanned rationing or waiting for access to care.

Such variations are undesirable on both efficiency and equity grounds. The efficiency arguments are particularly important in systems of competitive insurance, when variations in the *per capita* needs can lead to variations in insurance premiums unrelated to efficiency. The competitive insurance market therefore breaks down unless corrective action is taken. The equity arguments are manifest. Fragmentation implies that pools with sicker, poorer memberships must charge higher premiums than their less disadvantaged counterparts, or offer more circumscribed packages of care.

The government policy response to the efficiency and equity problems brought about by fragmentation has been to develop the notion of *integrated risk pools*. Under this arrangement, the individual risk pools of the sort discussed above can remain in place, but financial transfers are arranged between pools so that some or all of the variation caused by pure fragmentation is eliminated (Smith and Witter 2001). Such integration is pre-eminently a national government function, and in this section we discuss the approaches to integration that have been adopted.

If it is assumed that the health care system should deliver a standard package of care to all citizens, the most obvious cause of variations in the spending needs of fragmented risk pools is the size of the population covered. A first step towards integration is therefore to base funding of integrated risk pools on the basis of a *capitation payment*. In its simplest manifestation, a capitation system would give an equal *per capita* amount to each risk pool.

Whilst offering a rudimentary correction for variations in the size of pools, this approach fails to reflect any variations in *per capita* needs between pools. Many countries have therefore developed *risk adjustment* methods, which alter the capitation payment associated with an individual, depending on the individual's characteristics, such as age, social circumstances and health status. The risk adjusted capitation scheme seeks to compensate risk pools for variations in *per capita* expenditure needs. A summary of approaches is given in the next section.

If revenues (in the form of insurance premiums or local taxes) are collected by the individual pools, a distinct issue is the extent to which they are compensated for variations in the revenue base. For example, if revenues take the form of a payroll tax proportional to income,

then - for the same package of health care - pools with relatively large numbers of high earning individuals and low numbers of non-earning dependants will be able to charge lower premium rates than their less well-endowed counterparts.⁵ If this is considered unacceptable on payment equity grounds, then there will be a need for a second set of transfers between pools that adjusts for variations in revenue bases. The two sets of transfers correspond respectively to the risk pooling and income redistribution functions. It is noteworthy that some transitional countries, such as Estonia, which set up decentralized health insurance funds with local collection powers in its first wave of reforms, found it hard to equalize between wealthier and less well off regions. This led to a re-reform in 1994, with the establishment of a central sickness fund for tax collection, from which *per capita* allocation of funds could be made to local sickness funds.

In practice, integration of the risk pooling and income redistribution payments can be effected simultaneously within a single payment system. If N_i indicates the total expected expenditure needs in pool i , and B_i is the revenue base for insurance premiums in pool i , then the policy objective is to secure an identical rate of premium r^* for all pools. This is achieved by noting that – using this global premium rate – the difference between revenue and expenditure in pool i is $r^* B_i - N_i$. This difference is the contribution of pool i to the risk adjustment pool (which becomes a receipt if it takes a negative value). For a self-funding system of health care, r^* must be chosen so that the sum of all receipts equals the sum of contributions to the risk adjustment pool.

In spite of the universal use of integration mechanisms (in the form of inter-fund financial transfers), the motivation for risk-adjusted capitation differs between types of system. In countries that have sought to introduce competitive health care insurance markets, such as Germany, the Netherlands, Belgium, Switzerland and Israel, it is recognized that sickness funds with low health care risk profiles and strong resource bases are able to charge low insurance premiums, and therefore have a competitive advantage that is unrelated to their own performance. If left unadjusted, this arrangement offers funds a powerful incentive to cream-skin members who are healthy, have high incomes, and low numbers of non-earning dependants. The main focus of risk adjustment schemes is therefore the efficiency concern of compensating insurers for variations in their risk profiles and revenue bases (Van de Ven, Van Vliet et al. 1996). In effect, the intention of integration is to enable all insurers to levy a standard premium rate if they deliver a standard package of care at a standard level of efficiency, thereby securing a system of integrated risk pools.

Local government systems are financed partly by central government grant-in-aid and partly by local taxation and user charges. Because the central grant is fixed, marginal expenditure must be raised from these two local sources. The central government grant therefore seeks to enable municipalities to deliver a standard package of care at a standard rate of local tax and user charges, and therefore fulfils both a risk adjustment and an income redistribution role. However, local governments are to some extent free to choose the package of care offered and local tax and user charge levels. The intention of the risk adjustment is therefore to offer local communities the *opportunity* to deliver a standard package of care. However, the residual freedom for the pool

⁵ Note in this section the distinction between a *premium rate* (the income per unit of the revenue base) and the *premium* (the amount paid by a particular member). Most systems of managed competition seek to secure equal premium rates, not equal *per capita* premiums.

to vary from that standard means that this is in effect a system of fragmented risk pools which is only *partially compensated*.

In most centrally insured systems, such as those found in the United Kingdom, New Zealand and many Canadian and Australian states, fragmentation takes place in the form of budgetary devolution to local administrative organizations based on geography. Revenues are generated centrally, so that there is no requirement for any formal income redistribution mechanism. However, there will in general be an important need to adjust for differences in health care needs profiles, so that a standard package of care can be offered in every area. Thus the main motivation of the risk adjustment is to secure equity between areas, often considered essential if widespread popular support for tax-based health care is to be sustained.

d) Setting capitation payments

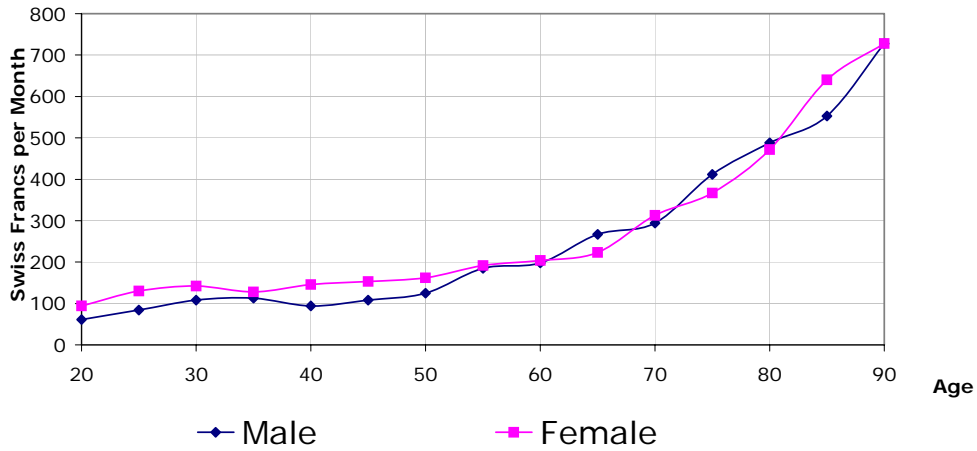
Although risk adjusted capitation is universally used throughout mature health systems, the level of sophistication of the risk adjustment process varies considerably between countries, and is highly contingent on information availability. Summaries of existing practice can be found elsewhere (Rice and Smith 2001). However, whatever the method adopted, the usual principle adopted is to seek to compensate risk pools fairly for the expected health care expenditure of each of their members.

Capitation payments relate to individuals, so – wherever possible – an empirical capitation formula should be based on individual level data. It therefore becomes necessary to decide which personal characteristics to serve as the basis for risk adjustment. Any item that is used as a risk adjuster should in principle be:

- useful - an acknowledged risk factor;
- reliable - not subject to major errors;
- practical - readily collected at reasonable cost;
- universal - available for all citizens in all areas;
- objective - not subject to substantial variations in judgement;
- up-to-date - capturing contemporary circumstances of the citizen;
- ethical – respecting confidentiality and other ethical considerations;
- free of perverse incentives - in particular, not encouraging providers to over-serve or under-serve, or to distort reports of patient characteristics.

These criteria severely restrict the range of data that can be used to effect capitation payments. Most systems at the very least seek to use individual level data as a basis for age and sex adjustments to capitation payments. An example from Switzerland is shown in Figure 12, illustrating the wide variations in expected health care expenditure amongst age groups.

Figure 12: Average monthly health care expenditure, Swiss Francs, by age



Source: Beck (2000)

Age/sex risk adjustments reflect important variations in expenditure needs of individuals, but omit consideration of many other individual characteristics that determine health care expenditure needs. Generally, data limitations in most countries preclude setting more refined capitation rates, and cruder allocation formulae (discussed below) must be used instead. However, an exception occurs in Sweden, where the existence of a comprehensive population register permits preparation of a detailed capitation matrix, for example as developed to distribute health care funds to health authorities in Stockholm County, summarized in Table 15.

Table 15: Abridged version of Stockholm capitations matrix, Swedish Krona, 1994.

Age	Medical & Surgical		Psychiatric	
	Owner occupier	Rented	Owner occupier	Rented
<1	7200		0	0
1-24	1900	2100	400	600
25-64 cohabiting				
Higher non-manual	3100	3600	400	800
Other non-manual	3700	4300	600	900
Manual	4000	4400	900	1300
Not employed	5300	6400	1400	2400
25-64 living alone				
Higher non-manual	3600	3900	900	1600
Other non-manual	3600	4200	1000	2400
Manual	3900	4600	1400	3800
Not employed	5100	5400	4900	12700
65-84				
Cohabiting	13500	16500	500	1000
Living alone	15400	18200	1100	2100
>84				
Cohabiting	27600	29800	300	1000
Living alone	24200	29400	500	1000

Source: Diderichsen, Varde et al. (1997)

In general, development of such elaborate individual level risk adjustment is infeasible, either because the necessary data on utilization are not available, or because – even if they were – the relevant population data are not available in some or all of the areas to which financial allocations will be made. In particular, note that – in order to implement the Stockholm matrix – the numbers of citizens in each matrix cell must be universally available in every health authority.

As a result, some countries have augmented their risk adjustment mechanisms using data on the social and economic characteristics of regions and other geographical areas, rather than on individual level data. One of the earliest examples of this was the work of the English Resource Allocation Working Party (RAWP) (Department of Health and Social Security 1976). This sought to allocate a fixed National Health Service budget to geographical regions in accordance with an equity criterion of seeking to secure “equal opportunity of access for those at equal risk”, and was based on disease-specific standardized mortality rates.

The methods adopted by the Resource Allocation Working Party were superseded by more empirically based approaches, an example of which is the ‘York’ formula for allocating acute hospital services to geographical health authorities (Smith, Rice et al. 2001). First a demographic adjustment is made in the usual way. Then an additional adjustment is made for the characteristics of the area, based on an empirically derived formula. The components of the formula are

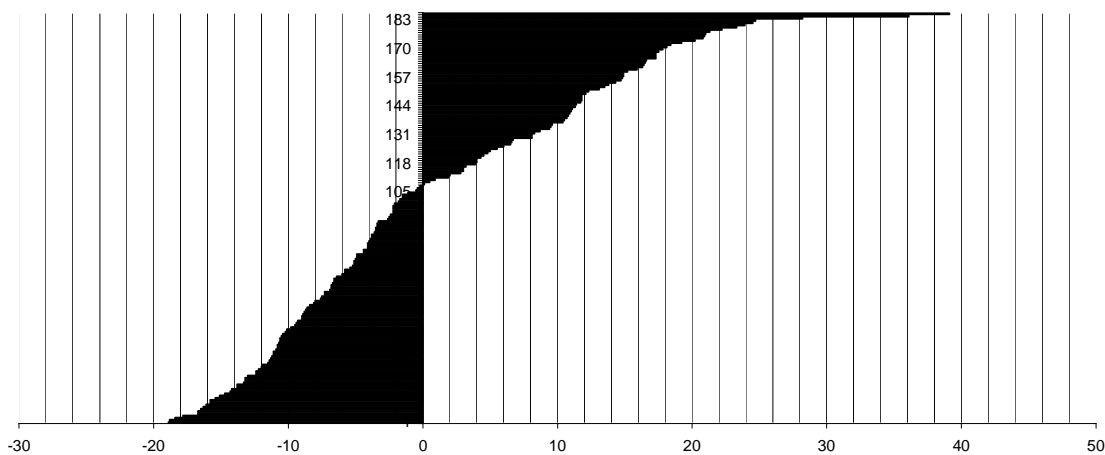
- Mortality rate for ages 0-74 (standardized)
- Disability rate ages 0-74 (standardized)

- Older people living alone (%)
- Children in single parent households (%)
- Unemployment rate

The redistributive consequences of applying the formula are shown in Figure 13. This ranks 183 health authorities according to their gains (or losses) from the formula, showing that the most disadvantaged (Manchester) secures a gain of 40% per capita, whilst at the other extreme West Surrey loses 20% .

Figure 13: Redistributive effect of the English York formula, acute services

Percentage gain (loss) from equalization grant, 183 English health districts



Source: Smith, Rice et al. (2001)

It is important to bear in mind that all systems of financial redistribution are moderated to some extent by some sort of ‘safety valve’. The regional reallocations implied by the English RAWP formulae were phased in over a 15-year period, and numerous prospective adjustments to the pure formulaic approach are in practice deployed in most systems. Moreover, prospective risk adjustment between risk pools is usually only the first stage of the resource allocation process. It is almost invariably accompanied by a retrospective stage, in which prospective allocations are altered in the light of actual expenditure experience. A number of arrangements exist for handling retrospectively variations in actual expenditure from the prospective budget. These include

- bilateral renegotiation of the budget retrospectively with the central payer (as effectively occurred for many years in Portugal, Italy and Spain),
- running down (or contributing to) the insurer’s reserves (as in many systems of competitive insurance funds),
- varying the future premiums or local taxes paid by the insurer members (as in Scandinavia and some competitive insurance systems),
- varying the user charges paid by the patients (as in Finland),
- varying the package of benefits available to patients,
- delaying or rationing health care to the population at risk (as occurs to differing extents in the United Kingdom, Norway and Sweden).

These arrangements can represent different modalities of reinsurance, and might exist in any system of fragmented risk pools. They are particularly important when risk pools are small (and therefore vulnerable to random fluctuation in demand), and imply important differences in the “hardness” of the fragmentation. They suggest that - to differing extents - the apparently scientific methods (such as risk-adjusted capitation) used to finance health care purchasers might in practice be tempered by many other methods of resource allocation, both prospective and retrospective. The intention is to reduce the managerial instability and political difficulties associated with rapid fluctuations in financial allocations.

V. CONCLUSIONS

In many respects, China’s health system has a remarkable record of achievement, most notably in its relatively high levels of life expectancy. However, as well as these successes, there are serious weaknesses, highlighted by numerous commentators. These include very high reliance on out-of-pocket payments, large and persistent inequalities in access and outcomes, and a more general lack of effectiveness in the deployment of resources.

In respect of public expenditure, this report has highlighted three key areas that require urgent attention by policy makers: the overall level of public expenditure; the modality of public expenditure; and the redistribution of public expenditure between population groups. We consider each of these in turn.

a) Level of public expenditure

China spends about 5.5% of GDP on health care. This is in line with expectations given its level of income. However, we have noted the unusually heavy reliance on user charges as the main source of finance (about 60% of total expenditure). High levels of out-of-pocket payments have obviously serious consequences for equity, as they expose the poor and the sick to the highest risk of catastrophic expenditure. They also militate against public health interventions, where the benefits accrue beyond the individual patient. Furthermore, the uncertainty associated with potential user charges is likely to have seriously adverse consequences for general levels of satisfaction with the health care system.

It is for these reasons that most countries seek to reduce reliance on user charges as national income increases. Public forms of insurance are the most usual approach to funding health care in higher income countries, defined either as direct government subsidies (funded by taxation) or social insurance. China’s contribution of 32.6% from public sources is low compared to countries at a similar stage of development, and will appear increasingly anomalous as national income increases. The search for new public sources of funding (either tax bases or social insurance) is therefore an urgent priority.

Apparent exceptions to high reliance on public spending can be found in some high income countries, most notably the United States, which places unusually heavy reliance on private health care insurance. However, the US arrangements are associated with very high levels of expenditure on health care and seriously adverse outcomes in terms of equity. We

therefore feel that European models of health care, with the emphasis on social solidarity and lower spending levels, offer a better model for China to emulate.

However, the transition to such a system is clearly a major undertaking, and will require the establishment of new and sustainable funding bases – whether social insurance premiums or other tax bases. Establishing and developing these sources of public funding will almost certainly have to be a gradual process, starting in the urban areas where the bulk of the financial capacity exists. It is worth noting that public funding of European health systems at first targeted only the poor, and was able to offer universal insurance only after several decades of experience. In China, the recently introduced urban health insurance scheme clearly offers a useful starting point. The proposed rural community medical schemes are also appropriately modest in their initial aims, leaving room to expand coverage as the revenue bases grow stronger. However, given the weakness of financial capacity in rural areas, it is likely that a sustainable rural scheme will require substantial cross-subsidy from general government expenditure (see (c) below).

b) The modality of public expenditure

Since the 1950s, public expenditure on health care in China has been dominated by subsidies to providers, in the form of contributions to capital and salary costs. So long as these subsidies covered the bulk of provider costs, providers were then able to offer free access, or charge only small out-of-pocket payments, so the subsidies were successful in securing widespread healthcare coverage for the bulk of the population, who were insured against financial risks due to poor health. Effectively, the providers acted as health insurers for their catchment populations. The main policy concern was then to ensure that providers were geographically distributed according to population needs.

However, since the 1980s the provider subsidy has declined as a proportion of total costs, and providers have therefore had to rely to an increasing extent on user charges. This has endangered the principle of universal access, and led to exposure to catastrophic risk amongst the poor. Furthermore, the inequitable distribution of supply side subsidies has led to unequal levels of out-of-pocket payments across the country. In time, one might also expect to see difficulties in recruiting and retaining clinical personnel in poor areas, where the capacity to pay out-of-pocket is low.

In the early stages of health system development, supply side subsidies have been the dominant modality of public finance. However, there has been a universal trend amongst mature health systems towards directing public finance towards demand side subsidies. These might take the form of direct insurance for certain groups of the population (for example, the poor or the elderly – such as under the Medicare and Medicaid programs in the US), or contributions to collective risk pools (such as local governments or social insurance funds). The rationale for the switch of emphasis to the demand side is that it enables public funds to be targeted much more carefully at the intended beneficiaries of public policy.

One of the lessons of recent reforms in OECD countries is that public funding of health care does not require public provision of health care, and indeed many OECD countries make use of a mix of public, not-for-profit and for-profit providers. Our recommendations therefore leave open the question of ownership structure and the nature of the provider market. However,

extensive public funding of health care does require strict guidelines on what the public system covers (the ‘essential package’ of care), along with a strong regulatory regime to ensure that public funds are spent efficiently and effectively.

Demand side subsidies could be aimed at either individuals or collectives. At the individual level, public subsidies might take the form of partial or total waivers of fees for patients satisfying certain criteria (say, age or income level). At the collective level, public funds might be directed at (say) local governments according to the expected level of health care needs in their locality, leaving the locality free to determine how it satisfied those needs.

Our recommendation would be that – in time – collective demand side subsidy is likely to be more effective than subsidy of individual patients. This is because – to be effective – an individual based system requires good information on who is entitled to benefits, and also exposes the system to supplier-induced demand (because of the asymmetry of information between patient and provider). Collective purchasers of health care (such as local governments) may be better able to ensure that expenditure is efficient and equitable. They are also better able to secure cost containment objectives. However, collective subsidy does require strong and trusted local institutions to hold providers to account, and to ensure that public funds are spent in line with policy intentions.

In the short run, the strongest local institutions in the health domain may be large providers, such as major hospitals. These are currently largely funded on the basis of their bed complement and salary bill. A modest move towards a more efficient funding mechanism would be to fund such institutions on the basis of the population served and its health care needs, based on factors such as age structure, climate and health status, as discussed in Section III. This was for example the basis of 1976 finance reforms in England.

In time, the switch to a population basis for funding enabled the English health system in 1991 to split the local *purchasing* function from the local *provision* function in health care. This gave local purchasers the freedom to purchase health care for its population from a mix of public and non-public providers. In principle, in countries with social health insurance, the sickness funds could also act as collective ‘purchasers’ of health care for their members. However, to date the purchasing function in most health systems has in practice been weak, and the World Health Organization has highlighted strengthening the purchasing function as a key priority for health systems of all types.

c) Financial redistribution between population groups

Any policy on health finance requires fundamental decisions to be taken on the extent to which redistribution of payment takes place (a) from the rich to the poor (b) from the healthy to the sick and (c) from the young to the old. Implicitly, there are also important decisions about the extent to which there is cross-subsidy between geographical areas. Most mature health systems effect substantial transfers of finance between insurers, to compensate for variations in their health care needs and resources bases. These transfers might take the form of central pooling of revenues and distribution according to some measure of need, or direct contributions from well-endowed insurers to the more disadvantaged.

The usual instrument for effecting such transfers are the methods of risk-adjusted capitation, which can take the form of very rudimentary (per capita) payments through to elaborate statistical models of comparative needs. The intention is to enable each insurer to offer its members some standard package of health care (with some standard level of out-of-pocket payments). In principle, therefore, the definition of a standard package is an intrinsic element of such fair financing mechanisms.

The sources of funding the public subsidy to insurers (in the form of taxes and premiums) can be designed largely independently of the expenditure allocations. The current design of both of the new urban and rural insurance schemes in China places the main insurance function at the local level – municipalities and counties for the urban, and counties and sometimes townships for the rural. This is consistent with the decentralized system of fiscal management. However, unless substantial commitments are put in place for subsidies from the central and provincial governments, this design subjects the schemes to the risk of reproducing the large inequities in the current system, which are the products of variations in local fiscal capacities.

Going forward, China faces a historic opportunity. The confluence of reforms in budgeting and in public service delivery units means that the health sector will be fundamentally transformed, with many of the changes in line with our recommendations above. The robust recovery of the budget in recent years puts more resources at the disposal of the central government, some of which could be injected to improving social services. The SARs epidemic of 2003 highlighted many of the inadequacies in health services and gives the health sector a strong claim to additional resources. Health authorities must seize this opportunity to put forward a blueprint for modernizing the healthcare system to be more efficient, equitable and responsive - goals that are consistent with the new people-centered development strategy being pursued in China

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