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The Public-Private Split in Health Care Systems: (i) how can it be characterised and (ii) does it matter?

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Introduction

It is arguable how much blame for the catastrophic decline in health in the Russian Federation can be attributed on failures within the health care system, or the failure of the public health community and government to respond adequately. The answer is probably academic in any case, because of the size of the economic shock following the fall of communism, and inherent features in the Russian culture and lifestyles that, left unchecked and unregulated, produce high volumes of chronic lifestyle-related disease and low life expectancy. The problem has got worse simply because, following the transition, the system became overwhelmed, due to simultaneous increases in demand and a collapse in finances, leading to shortages of almost everything (Sheimann, 1991; Adeyi et al, 1997).

Since the fall of communism, Russia has turned away from the centrally planned and operated health care model and edged its way towards a more market based system based on social insurance principles (Chernichovsky et al, 1996; Barr and Field, 1996). However, inequalities in access to health care continue to be rife at all levels, and in most areas of the country. A frequently remarked deficiency is the lack of clarity about what is meant by 'public health'. Public health plays a fundamental role in terms of promoting health, preventing disease and eradicating inequalities, but also in setting the context in which the health care system is planned and co-ordinated. As one Russian Ministry official recently said: "Russia has a Ministry of health care, *not* a Ministry of Health"¹.

An effective public health system requires political close co-operation at all levels of government, including cross-ministerial working and co-ordination. Finland, which has certain similarities with Russia, has shown that it is possible to tackle some of these issues given the political will and determination. However, resolution of this question is not the principal subject of this paper, because it is health care and *not* public health that has been the most recent focus of health reforms. This in itself may be regarded as a signal of political priorities.

Turning our attention to health care, it is generally accepted that the primary aim of government is to create the financial and physical capacity to deliver free or affordable health care services, depending on need and other factors. In coming years, Russia will need to restructure and re-invest in its entire health care infrastructure. The problem is how to navigate a pathway from where it is now to where it needs to be in the future, efficiently and effectively. The difficulty is that there is no 'off-the-shelf' model that can be borrowed from outside and simply translated into Russia.

¹ This paper was prepared for the workshop "Policy pathways to health in the Russian Federation," held at the International Institute for Applied Systems Analysis (IIASA) outside Vienna on September 19-21, 2003. The quotation arose from a preparatory visit to Russia at a meeting with academics and officials during 2003.

Even if there were there would immense difficulties in dismantling the existing system and creating a new one.

This paper considers the key lessons from modern health care systems with examples drawn from comparable countries and economies. It draws heavily on research undertaken by IIASA's Social Security Reform (SSR) Project in countries such as the US, China, Japan and the UK – each of which provide distinctive organisational models of health care. It considers the relevance of elements in each system to the Russian case through the incentives that are created, relating to infrastructure questions and administrative processes.

The analysis is partial, concentrating on key features rather than the subtle differences between individual systems, which are many and detailed. In the second part of the paper we provide a brief analysis of the extent to which each type of system provides 'value for money' based on a simple economic model relating financial inputs to health outputs. This in itself is a value-loaded question since it depends on which particular feature of a health care system one wishes to emphasise. Since the key concern of the Russian Federation is the collapse in healthy life expectancy (HLE), it seems natural to use that as our outcome measure.

The paper begins with a simple classification of health care systems in their *pure form*, whilst recognising that most country systems are hybrids of several types to a greater or lesser degree. It compares how features compare with one another and the logic of why some elements go together, and certain strengths and weaknesses that are mediated through the underlying philosophy of the system in each case. The second part of the paper turns to a comparison of outputs based on the model, in which HLE is compared with the level and composition of health care finance – whether public or private.

Categorising health care systems

All health systems share certain features. One is that physicians are generally powerful players in influencing and shaping health care services. Another common feature, regardless of system, is the dependence of all health care systems on the global market for pharmaceuticals and much medical equipment. The hugely expensive research commitment and time spans needed to bring new pharmaceutical products to market inevitably mean that the industry is concentrated among a small number of large international corporations. This requires that all health care systems, whether in Russia, the UK or China, require some means of controlling their drug expenditures, and the costs born by the individual and the system.

Another shared feature is that all health care systems increasingly struggle with the issue of looking after the elderly – who are the major consumers of health care today, especially in more developed countries. It is of some interest that nearly all health care systems seem to be drawing back from providing open-ended free personal and nursing care. Rather they are seeking in different ways to strike a balance of responsibilities and, therefore cost, between the individual, and the state.

The solutions range from making individuals entirely responsible for their own long-term care, with support provided only to those with limited resources, to the

introduction of another tier of insurance as in Japan and Germany. However, for Russia the long-term care market is self-limiting to a degree because of the much lower life expectancy although it is something that can be expected to develop with time.

Putting these common features to one side, one way to refine this classification of health care systems is on the basis of whether they are publicly or privately financed and publicly or privately operated. The four-way classification that this produces provides a convenient and insightful way of distinguishing between the systems and how they operate. It is also a way to concentrate debates about which type of system is in some sense 'best'.

Within each type there are several key features, which characterise each system. These are based on the levels of market exposure, the strategic management of priorities and level of responsibility ranging from the individual to the state, financial freedoms with regard to investment, and finally the degree of accountability and autonomy (WHO, 2000). These issues run through all the models discussed either explicitly or implicitly.

Table 1 provides a more detailed exemplification of the four-way classification we wish to develop along with the key distinguishing features. The principal sources of finance, either public or private, are shown in the rows of the matrix, and the responsibility for service delivery, either public or private, is shown in the columns. Each variant is now considered in turn starting with the 'public-public' model.

Public-public: An example of this type of system is the classic hierarchical centrally planned tax funded systems that typify former communist countries like Russia, and 'National Health Systems' in countries such as the UK. In its pure form, this model has several well-known strengths but also a number of key weaknesses. The strengths are that access is related to health needs and not on the ability to pay so that inequalities based on age, gender or income are not a material factor in who gets treatment. Such systems have relatively small administrative costs, provide good value up to a point, and can be planned and regulated on rational lines.

The weaknesses of such systems is the implicit rationing, based on waiting lists and queues, and the sometimes poor quality of services because of historically low levels of investment and poor maintenance. Patients may be denied direct access to specialists of their choice, and have to pay privately to circumvent these restrictions. However, there are several variants to this basic model, which are being implemented in countries such as the UK that could give such systems a new lease of life.

Typically such variants are based on the principle of separating service providers from service commissioners (public 'purchasers') in which the commissioners contract with providers to provide services in defined volumes, at agreed levels of quality and service. Services may be restricted to a degree to only those that are approved or where there is a clear justification for their supply – although some would argue that this is an advantage. The commissioners are therefore effectively public agents representing the 'an internal market', in which prices are mutually agreed between commissioner and provider.

A drawback with this approach is that competition between providers is still restricted through lack of patient choice. In the event of a financial crisis the public purse is still liable to take ultimate responsibility so it is a functioning market only up to a point. New variants are now being developed which will give providers more flexibility and local accountability to be allowed to compete on a level playing field with private sector competitors. For Russia, the relinquishing of the wholly centralised system probably precludes a return to a more sophisticated version of the public-public model, although a return cannot be ruled out if the experiment with the social insurance model fails.

Public-private: Typifying this kind of model are the social insurance based systems of Germany, Japan and certain other countries and is a model that Russia is currently implementing. In this example, the health care system is mostly owned and regulated within the public sector, although medical personnel are not necessarily public sector employees and have more freedoms to supplement their income through private practice than under the previous model. Social insurance is generally mandatory and publicly regulated, although the collection systems can be privately administered through privately owned insurance companies, which offer private insurance 'top-ups'. A feature of this system is the co-payments that are levied on medical interventions and which are billed to the patient.

The strengths of this system are the clearer relationships between provision and cost, so that patients are encouraged to moderate their demands and 'shop around'. A further advantage is that it has the capacity to diversify its sources of funding and therefore income through the provision of private insurance. Patients tend to have more choice in terms of physician and place of treatment, which arguably leads to an internal market of sorts and possibly a diminution of physician and bureaucratic 'power'. Finally the public provider can intervene and plan so retaining a degree of control over future plans and investment.

The main weakness of this model is the restricted coverage of the system. Social insurance is usually levied on employees and their families, which means that special arrangements are needed for people who are outside the system because they are unemployed or otherwise incapacitated. The administrative costs are also higher because collection and accounting systems need to be more sophisticated and responsive.

In 1993, Russia passed the health insurance law, which opened the way for the establishment of an insurance-based health care system to relieve the chronic shortage of funding by injecting new sources of finance. This has proved to be a massive task because of the difficulty of setting up complex and robust administrative systems for financial management and other purposes, often working against entrenched interests (Titchenko, 1995; Twigg, 1999). The resources available to the system are less than ideal and further reforms will undoubtedly be necessary. It is not possible to pass judgement on Russia's decision to follow this path since it is probable that the alternatives would not have fared any better in the wake of the power struggles and chaos of the early years of post Soviet rule.

Table 1: Four-way classification of health care systems and typical characteristics

		Service provider	
		<i>Public</i>	<i>Private</i>
Financial provision	<i>public</i>	<p>Hierarchical organisation:</p> <ul style="list-style-type: none"> - government regulated - financed through tax revenues - bureaucratic hierarchy - assets publicly owned - state employed physicians - free at point of use - subsidised prescription payments - no safety net required 	<p>Hybrid public hierarchy /private sector:</p> <ul style="list-style-type: none"> - government regulated - mandatory employer based social insurance - publicly regulated collection systems - main assets publicly owned - significant private sector - physicians privately employed or independent contractors - co-payments for treatment and medication - mandatory long term care insurance - public safety net
	<i>Private</i>	<p>Hierarchical organisation:</p> <ul style="list-style-type: none"> - government regulated - financed through private insurance and fees for service - publicly owned assets - separate payment for medication - optional publicly provided long term care arrangements - public safety net 	<p>Privately owned and operated:</p> <ul style="list-style-type: none"> - government regulated - corporate planning systems - financed through private insurance and fees for service - assets privately owned - physicians privately employed or independent contractors - separate payment for medication - no safety net

Private/private: The most well known exponent of this system is the US. In this system providers can be either in the private or public sector. Medical facilities can be part of a larger corporation or publicly owned by the municipality or a charitable trust. In either case patients must pay for care unless their income drops below a specified level in which case they receive public support. The key difference with the social

insurance model is that medical insurance is not a mandatory part of employment, whilst the benefits of medical insurance are more heavily circumscribed in terms of procedures and time-limited in terms of benefits. The US system is certainly expensive, accounting for over twice the proportion of GDP compared with the international average. Paradoxically, it is also the model adopted by developing countries, where public finance is limited and overall funding is well below where it should be (Cichon and Gillion, 1993).

The strengths of the US system are that it generates a lot of resources that can be deployed in medical research which results in the US being pre-eminent in many fields of medical research and the quality of care for those who can afford it can be very high. There are, on the other hand, considerable weaknesses. Because health insurance is not mandatory the system is vulnerable to adverse selection tendencies, which raise the cost of insurance. There are significant inequalities in coverage between those who receive employer benefits or pay directly and those who can't afford to pay or for whom the insurance has run out. The administrative systems to support private health care are considerable and substantially add to costs, whilst the insurance system encourages patients to over consume and physicians to over-provide.

The US recognises these problems and has evolved various means of overcoming them without actually dismantling the fundamentally private nature of the system. For low-earners, there is the "Medicaid" system, and for older people there is "Medicare," which provides certain free health care benefits to older people. To keep costs down, the US has also pioneered the concept of Health Maintenance Organisations in which provision and insurance are combined to lesson incentives to over-consume or over-provide. For some years, it has also used a system of standard costs for different interventions to reduce the temptation to charge exorbitant rates for specific interventions.

Private-public This method organisation is probably the most unusual of the four types and there are relatively few examples on which to base judgements or compare experiences. The best example is China, which has pursued a development path in which limited private sector reforms have been encouraged within an overall framework of state control. The origins of these reforms lie in the dismantling of the old state enterprises and with them employer-based health care and pension systems. Unlike Russia, the transition in China has been more controlled and thorough, with alternative arrangements being introduced selectively and at a measured pace.

In addition, China persists with the distinction between the rural and urban health systems, which are significantly different. In allowing the rural public health system to disintegrate, the Chinese government has effectively reneged on its commitment to provide state medical care to rural Chinese. In Russia, while there is certainly less than meets the eye to the state guarantee of universal access to free medical care, no such drastic backtracking on policy commitments has taken place.

As far as Chinese urban health care reforms are concerned, the hospitals and assets are still controlled by the state whilst physicians and other medical personnel remain public employees. The patient, by contrast, has essentially two options: enrol in one of public or private health insurance systems that are springing up or pay out of pocket.

The collection systems are still relatively crude, with insurance contributions made through personal visits to local offices, whilst public hospitals handle quite substantial amounts of cash that are handed over by the patient after a visit is completed.

These are transitional issues and the main limitation of the current system is that the insurance benefits are capped in any one year, and individuals exceeding their limits must pay the additional costs. Because the urban population is relatively young and healthy, the cash inflows from insurance contributions exceed pay-outs and so the system remains solvent at the moment. This will not always be the case however.

Health care financing and outputs

Modern medical practice is reasonably standardised and one would expect treatments provided publicly or privately to have about the same health impact. The means of finance, however, may be expected to significantly affect what treatments are provided and who receives them. In this section, we ask whether health outcomes vary systematically, not only with the overall level of funding, but with the public-private mix of health care expenditure.

One way to analyse the performance of different health care systems is to compare the average healthy life expectancy in each country with per capita expenditure. Healthy life expectancy may be defined as the average years of life lived in a healthy state. It is less than average life expectancy at birth, usually by a factor of 9-10 years depending on the country and its level of development (Mayhew, 2003). If we were to plot a graph based on HLE against the per capita level of health expenditure, we would obtain the curve shown in Figure 1, which is based on data published by the World Health Organisation for the year 2000 for 191 countries. It shows that HLE grows rapidly up to income levels of say \$1000 per head, after which HLE gains taper off.

Highlighted in the graph are the actual positions of the five countries, which have been discussed in the previous sections, each with different health care systems. They are, from left to right on the graph, China, Russia, UK, Japan, and US. Countries that are above the line are attaining a higher level of HLE for their relative spending on health care than countries below the line. The differences between the countries are clearly expenditure-related, but are they also related to their methods of financing? If there is a relationship between the public-private mix what can one conclude about the relative merits of one system versus another?

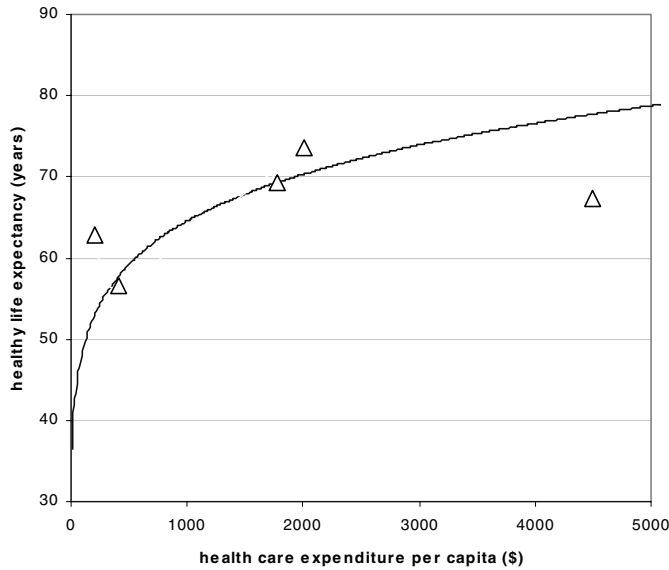


Figure 1: Healthy life expectancy (HLE) as a function of health care spending per capita: fitted curve based 192 countries ($\log HLE = 3.313 + 0.124x$, where x is spending per capita: $R^2 = 0.64$). Individual countries highlighted from left to right are China, Russia, UK, Japan and US.

We therefore re-ran the above model separating out public and private spending using a simple production type function in which the independent variables are private and public spending per capita. The equation fitted was

$$\ln(\text{healthy life expectancy}) = \alpha + \beta \ln(\text{public health expenditure per capita}) + \gamma \ln(\text{private health expenditure per capita})$$

This yielded coefficients for public spending of 0.0822 and 0.0376 for private spending ($R^2 = 0.64, \alpha = 3.42$). Thus, as our first inference we note that improvements to HLE from public spending on health care on average occur at over twice the rate compared with private spending.

In Figure 2, we present a way of interpreting residuals, i.e. the errors between expected HLE calculated using the fitted equation and observed HLE. On the horizontal axis is public expenditure and on the vertical axis private expenditure. A family of curves, of which we illustrate three, shows combinations of public and private expenditure, which will result in various levels of HLE. Curves lying to the right and higher above the origin represent higher levels of HLE. Note that these curves may be drawn on the basis of our parameter estimates by varying HLE and calculating the combinations of public and private spending that are consistent with it.

A “budget line” such as PQ represents combinations of public and private spending that sum to the same total, in this case \$400. Assuming that there is only \$400 to be spent, the highest HLE may be obtained by dividing it between public and private at the point of tangency A, corresponding to \$275 in public spending and \$125 in private spending (a ratio of 2.2 to 1; all points corresponding to this ratio are illustrated as a ray from the origin). We refer to this split as corresponding to “optimal allocative efficiency” because it results in the highest possible HLE given the overall \$400

constraint. In the example given, actual observed HLE is 57.5 years (point C) and, with improved allocation, this could be raised to 58 years (point A). Actual HLE, in this example, is assumed to be 60 years.

It turns out that the gap between expected HLE and actual HLE can be much greater than the gap between expected HLE and allocatively efficient HLE. We describe a country below its expected HLE, given its level of health spending, as having a ‘life style or public health deficit’. Countries that fall most frequently in this category are often developing countries especially those afflicted by AIDS, where the existing health care system have proved to be more or less powerless against this epidemic. Actual HLE in our example is well above the expected level. This suggests that this country has attained what might be described as a ‘life style or public health dividend’ because its HLE is above where it should be based on the average of all countries in the model.

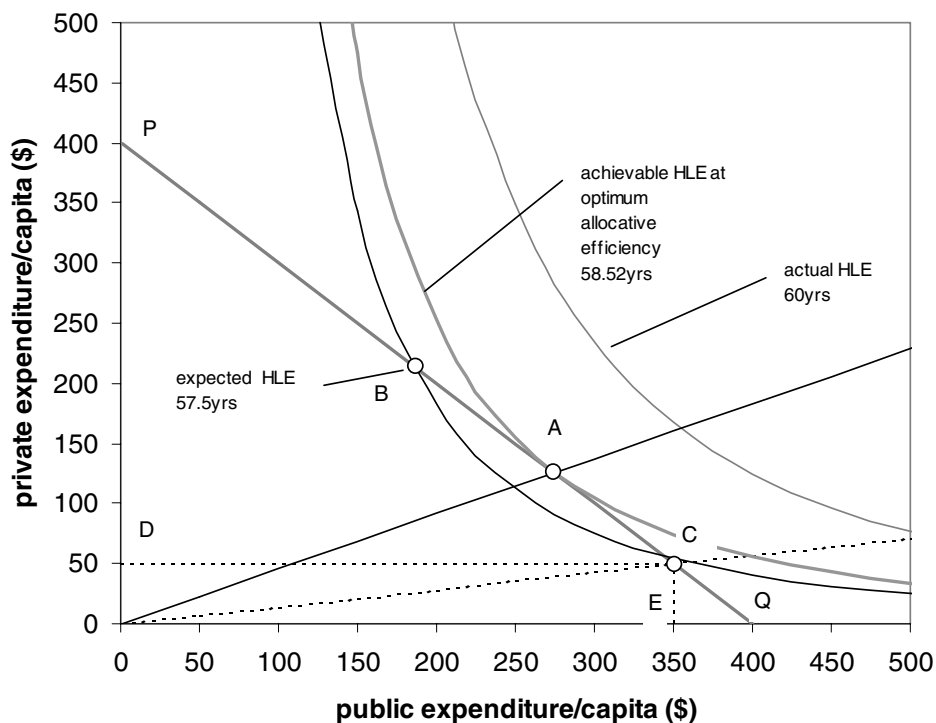


Figure 2: Healthy life expectancy as a function of public and private expenditure for a hypothetical country and its relationship to healthy life expectancy.

	Actual HLE (years)	Expected HLE (years)	HLE based on optimal allocative efficiency (years)	Actual public spending per capita (\$)	Actual private spending per capita (\$)	Ratio of public to private spending
China	62.8	52.37	53.70	75.0	130.0	0.58
Japan	73.5	70.45	70.59	1540.9	468.1	3.29
Russia	56.6	58.24	58.27	293.6	111.4	2.64
UK	69.2	69.18	69.55	1436.9	337.1	4.26
US	67.4	76.64	77.75	1993.1	2505.9	0.80

Table 2: Comparison of health life expectancy with public and private health care expenditure in countries with differently structures health care systems.

Table 2 shows results for the countries discussed in previous paragraphs, which were taken to be representative of the health care systems operating different financial arrangements. Expected HLE (Column 2) is as predicted by the equation just given. “HLE based on optimal allocative efficiency” (Column 3) is the highest HLE that could be obtained by re-allocating expenditure between public and private, keeping the total the same and according to the family of curves that we have estimated. The following are some key points arising:

- China spends least on health care based on these data. Actual HLE is 62.8 years compared with 52.37 expected HLE. At 10.43 years China has the largest healthy life style dividend among this group (although this author has some concerns about the quality of Chinese data). A more allocatively efficient system of financing would only achieve 53.70 years of HLE by comparison.
- Japan is the second biggest spender on health care in this group and has the highest HLE. Actual HLE is 3.05 years higher than expected HLE based on its level of spending, so there is also a positive HLE life style dividend in the Japanese case. A more allocatively efficient spending mix, however, would only add 0.14 years to expected HLE.
- The level of spending in Russia is below all the other countries except China. Actual HLE is the lowest among this whole group of countries, and lower than the expected HLE by a margin of 1.64 years, suggesting a lifestyle deficit using previous terminology. A more allocatively efficient system of financing would only contribute 0.03 years to the expected HLE.
- Actual HLE in the UK is 69.2 years compared with a similar expected value based on international comparisons. Its allocatively efficient level of HLE is 0.37 years above the expected level, so that the UK could perform slightly better with a more privately weighted public-private mix.
- The US spends far more than any other country on health care, but its actual HLE is only 67.4 years compared with an expected HLE of 76.64 years based on its level of expenditure. This represents a lifestyle deficit of 9.24 years. US spending on health care is proportionately more skewed towards private expenditure than the other countries with the exception of China. If the US were allocatively more efficient HLE would rise by 1.11 years.

Conclusion

In this paper, we presented a 2x2 matrix scheme for characterising health care systems by whether provision and financing of health care was public or private. This scheme allowed us to describe approaches to health care in countries as diverse as the US, UK, Japan, China, and Russia.

A great deal of attention has been devoted to finding the optimal public-private mix in health care finance. We found that, after controlling for the level of overall funding, deviations from expected healthy life expectancy were due not to misallocation of

spending, but to what we lumped together as “life style and public health” variables. In the Russian context, this suggests that health care reformers, while not ignoring questions of finance (or for that matter, provision) should urgently tackle contextual problems such as unhealthy life style.

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