

# Performance Measurement and Optimization of Resource Allocation in a Health Care System

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## 1. Introduction

### 1.1 Evolution of performance measurement system in health care organizations

While cost control has been a significant concern in public health care, stakeholders increasingly strive for a more balanced approach in assessing performance delivered by the health care service providers. This movement has been driven by health care organizations in the developed nations over the past two decades. For instance, in reviewing performance measurement and management in public health services of UK and Sweden, Ballentine et al. (1998) studied their performance measurement systems under a period of reform for market-based competition and discussed the challenges to striking the balance between cost control in the back office and delivery of quality service at the front. Moreover, Radnor and Lovell (2003) unveiled cases of balanced scorecard implementation in NHS of the UK that provided significant benefits for meeting national targets for better transparency, clarity and accountability for the stakeholders, including the patients and public in general. Their study suggests an effective use of a performance measurement system to enable focus on measuring long-term qualitative targets whereas the traditional financial reporting system could be biased towards short-term measures.

With implementation of a performance measurement system, healthcare practitioners are driven to make improvement on their accountability to stakeholders. An effective performance measurement system is vital for a healthcare organization to deliver cost-effective and quality services (Moullin, 2004). However, the overemphasis on the measurement of cost could have a significant effect on the delivery of performance by a hospital. Studying the hospital cost benchmarking introduced in National Reference Costing Exercise (NRCE), Llewellyn and Northcott (2005) argued that such increasing reliance on hospital cost benchmarking is promoting “averageness” among the hospital making the “average hospitals” cheaper to run and easier to control than the highly differentiated ones. While these hospitals might perform well on certain measures of service improvement in efficiency, they were transformed to comply closely with the “cost accounting average”. All

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in all, these prior studies revealed the imperative of striving for a balanced performance measurement system that embraces delivery of quality services with efficiency.

## **2. Improving the utilization of health care resources**

### **2.1 Efficiency in using health care resources**

Efficiency in the utilization of health care resources is considered to be an important issue not only to developed countries but also to developing economies. With reference to the report by WHO (2010), there could be trillion dollars of wastage in health care spending due to various forms of human related inefficiency, such as misallocation, mismanagement and fragmented administration. It is recommended that countries should attempt to improve the efficiency of their existing health systems so that they can release resources to cover services to people in need. Improvement in efficiency could be achieved through dealing with the incentive issues inherent in the health financing system as to how services are purchased and providers paid. As noted by WHO (2010), *“All countries can look to improve efficiency by taking a more strategic approach when providing or buying health services, e.g. decide which services to purchase based on information on the health needs of the population and link payments to providers on their performance and to information on service costs, quality and impact.”*

### **2.2 Potential slack in health care organizations**

The concept of budgetary slack has been utilized in the prior studies to explain managerial behavioural issues among profitable organizations. However, such managerial accounting concept is also considered relevant to health care organizations that are non-profit in nature with reliance on public funding. For instance, it was documented in a prior management study that slack could enable innovation and improvement in performance and quality among organizations (Bourgeois, 1981). On the other hand, excess slack could cause unnecessary empire building and demote performance in delivery of services to the end users as referenced to agency theory (Tan and Peng, 2003). For healthcare organizations, a prior study further suggests simultaneous improvement in productivity and quality might not be possible even when slack exists (Miller and Adam, 1995). Although slack could enhance efficiency, such resources might not necessarily help improve responses to externalities, such as quality of customer service (Cheng and Kesner, 1997).

### **2.3 Optimizing the use of health care resources through performance monitoring**

Goddard et al. (2000) examined the myopia that could take place within a healthcare organization due to the adoption of indicators that focused heavily on cost control and were short-term in nature. The study extended that such dysfunctional consequences of cost emphasis would not be optimal for quality. It was also pointed out by Van der Stede (2000) about the relationship between budgetary slack creation and managerial short-term orientation on achieving financial targets. With respect to behavioural issues in managing resources, it was examined in another study that incentives are critical to the success of a performance measurement system (Courty and Marschke, 2003). Without an effective performance measurement and control to deal with concerns of the stakeholders, healthcare

service provider would have a higher chance of encountering moral hazard in dealing with slack resources (Daniel et al., 2007).

Given the potential inadequacy of resource utilization, resource optimization needs to be considered as an important objective for health care organizations. On one hand a health care organization needs to contain costs while on the other to deliver proper quality services to the end users. Slack resources could be utilized to enhance quality delivery beyond a short timeframe but could also be treated a “buffer” for achieving a certain planned target.

**2.4 Performance of health care systems in developing economies**

Performance of a health care system could be driven by the emphasis what it aims to measure and monitor. While the developed nations have spent efforts to broaden their measurement of quality, constraint of resources remains as an area of concern. In developing economies of Asia, their rapid economic developments could have provided them with additional resources allocated to their health care systems. For instance, despite China’s rapid economic development in the past two decades, the country’s expenditures in public health have remained relatively low in comparison with the developed nations. WHO in fact ranked China’s health system as 144<sup>th</sup> out of 190 countries in areas of quality and access, among other developing nations in 2000. In a prior study, it was pointed out that China’s health care reform placed emphasis on the utilization of the social medical insurance system in delivery of health care solutions to her citizens; however, its effectiveness has remained debatable (Lee et al., 2007). As shown Figure 1, the mechanism within such a social medical insurance system focuses on procedural compliance with the health care service providers as well as the financial sustainability of the health system. There appears to be extraneous emphasis on quality through a performance measurement system over the service providers (Lee et al., 2007).

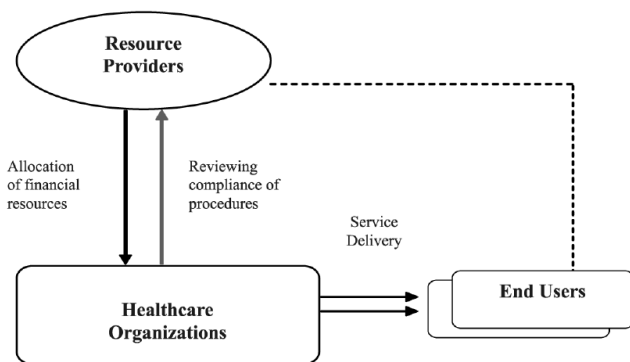


Fig. 1. Resource allocation mechanism (Lee et al. 2007)

Nevertheless, quality performance remains varied in terms of patient satisfaction and outcomes among other developing economies in Asia. In particular, Singapore was ranked 6<sup>th</sup> in the World Health Organization's ranking of the world's health systems in the year 2000 in terms of overall performance. Hong Kong Special Administrative Region of China (HKSAR) has been ranked as one of the healthiest places in the world reference to life

expectancy at birth. The outstanding performance in these two health systems is worth better understanding and a brief review is provided in the following section. The balance between their financial and social sustainability is discussed.

### **3. Experience of HKSAR and Singapore**

#### **3.1 Hong Kong Special Administrative Region (HKSAR)**

The Department of Health is HKSAR's agency to execute health care policies and aims to safeguard the health of the community through promotive, preventive, curative and rehabilitative services. In 1991, the government transformed its portfolio of public hospitals into a statutory corporation, the Hospital Authority (HA). The reform denoted an attempt to implement a new management structure for public hospitals and shift the responsibility of operating and managing public hospitals from government bureaucracy to the newly established entity (Cheung, 2002). Major reform measures taken by the HA during the early stage include the organizational restructuring of public hospital systems at both the hospital, region and corporate level with a general management focus; extensive development of information technology and systems; management training and development for staff; the institutionalization of citizens' participation in the management of public hospitals at hospital, regional and corporate levels (Yuen 1991, Yuen 1994, and Yuen and Lieu, 2004).

By 2003, the government further assigned HA with management responsibility of all of the government's primary care general outpatient clinics, which are formerly run by the Department of Health. In assuming responsibility of the clinics, the HA also assumed responsibility for the health of the entire population (Caulfield and Liu, 2006). Under a unified corporate governance structure, HA currently manages 41 hospitals/institutions, 48 Specialist Out-patient Clinics (SOPCs) and 74 General Out-patient Clinics (GOPCs), which are organized into seven regional clusters.

Through this delegation of public health services to HA, the delivery of patient care has been modelled on a cross-functional team approach. Improvement has been observed in the quality of care in public hospital; however, spending has gone up considerably as well. The nature of the mechanisms for accountability for HA and the resulting incentives continued to be mainly driven by the assessment of government officials. HKSAR's Health, Welfare and Food Bureau is responsible for a wide range of health related policy matters, including review of health care delivery and financing systems, development of primary care services, prevention of communicable and non-communicable diseases, as well as provision of hospital services (Yuen and Lieu, 2004).

Direct public funding is provided through an annual subvention mechanism and budgetary control and continues to be the major source of funding for in-patient services. Such funding is however not driven completely by the actual occurrence of services. HA has been receiving its budget directly from the government and serving but also taking the roles of both purchaser and supplier of health services. The dual role of the HA would cause implications about patients' rights and its accountability to the patients. Incentives for performance of the HA were not linked to market exposure (Yip and Hsiao, 2003). As money does not follow patients, there is limited incentive for better service or competition (Yuen & Lieu, 2004).

Although it was expected that the quality of care in public hospital would be improved further after the establishment of the HA, a closer inspection of available evidence revealed that while the physical environment and medical facilities of public hospitals were generally acceptable patients were dissatisfied with the waiting and queuing time in public hospital and clinics.<sup>1</sup> Previous study by Yuen (2004) also indicated that there remained ample room for improvement regarding the quality of care and the attitude of staff in public hospitals. For instance, it was observed that the corporate disclosures by HA revealed that its performance indicators had been focused on the financial aspects of performance with relatively less on the quality ones (Yuen and Ng, 2009). While there is alleged cost efficiency in HKSAR's health care system, the concern about overall quality remains.

In recent years, HKSAR has introduced mechanisms to enhance the resource allocation of funding to its health care system through a performance-driven approach.<sup>2</sup> It was announced by HA's Chief Executive, Shane Solomon, towards end of 2008 that a new internal resource allocation system would be used to renew HA's internal budget allocation system for improved transparency and fairness. The new funding model called "Pay-for-Performance" would link resources with workload while rewarding quality and providing incentive for efficiency. Resource allocation would be driven by a case-mix approach to evaluate the number and complexity of patients treated.

### 3.2 Singapore

Health care services in Singapore are largely the responsibility of Singapore's Ministry of Health. Singapore has developed a universal healthcare system with emphasis on affordability achieved through compulsory savings and price controls as well as a strong public-private partnership. In fact, its private sector currently plays a significant role in delivery of health care services. Besides its high ranking by the World Health Organization in 2000 for its overall balanced performance, Singapore is among the countries that have attained the lowest infant mortality rate in the world and high life expectancies from birth. Public hospitals in Singapore went through a plan of restructure in the 1990s and were re-organized as government-owned corporations rather than as typical public hospitals in other countries. Unlike the HKSAR's mechanism to form a single, mega health care service organization, Singapore established two major healthcare groups that oversees the operations of restructured hospital: SingHealth and the National Healthcare Group (NHG). In addition, the health care system contains a smaller group affiliated with the National University of Singapore called the National University Health System (NUHS).<sup>3</sup>

With respect to health care financing, Singapore has adopted a system that makes use of a combination of compulsory savings from payroll deductions, a nationalized catastrophic

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<sup>1</sup> The increase in demand was found not accompanied by increases in resources under an inflexible cost structure. Such constraint in resources can be reflected in the waiting time of public hospital services is long in Hong Kong. The average waiting time for urgent cases to get a first appointment at the Special Out-Patient Clinic (SOPC) was 92 days while 101 days for non-urgent cases. The waiting time of SOPC had been on an increasing trend started from 1999 onwards. The waiting time then varied from 5 to 30 weeks (Soloman, 2006). It was considered relatively long when compared to the OECD average of 2 to 3 months (Hurst and Siciliani, 2003).

<sup>2</sup> Source: <http://www.info.gov.hk/gia/general/200811/19/P200811190266.htm>

<sup>3</sup> Source: [http://www.moh.gov.sg/content/moh\\_web/home.html](http://www.moh.gov.sg/content/moh_web/home.html)

health insurance plan and government subsidies. The deductions from payroll are shared jointly by both employers and employees. To obtain further protection, Singaporeans would purchase supplemental private health insurance on services not covered by the government's schemes. Moreover, the government would actively regulate the supply and prices of healthcare services in the country in order to monitor the associated costs carefully. Singapore has developed a co-financing scheme for its health care system that shares the overall burden and financial risk. Its dynamic regulations over the supply and prices have also made its comprehensive system fairly unique when compared with other countries. For example, people are empowered to seek a suitable service provider from the private sector but required to pay a share of health care service charge regardless of the level of subsidy.

To complement its health care financing approach, Singapore has recognized the importance of reducing information asymmetry between the end users and the health care service providers on quality performance. As advocated by Lim (2005), *“Singapore’s regulatory framework should not merely consist of 2 parties, namely the regulator (MOH) and the regulated (public and private providers). It should ideally be tripartite, in which empowered and well-informed consumers play their rightful role in selecting health care providers on the basis of price and quality of care provided. Information asymmetry would not be an insurmountable barrier once the full power of information technology plus the role of the media is brought to bear.”* Such an advocated regulatory framework by Lim (2005) is provided in Figure 2.

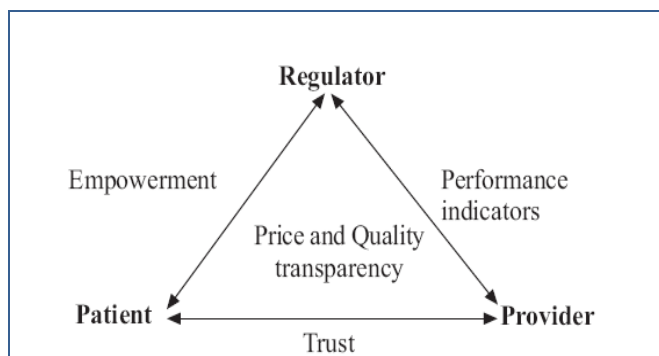


Fig. 2. A tripartite regulatory framework (Lim, 2005)

#### 4. Concluding remarks

As revealed in prior studies, slack could be created when there is rigid budgetary control system and there are certain consequences on the performance delivered by an organization (Bourgeois, 1981; Miller and Adam, 1995; Van der Stede, 2000). A transparent performance measurement system is critical for the stakeholders to monitor quality performance. As a government funded organization, HA of Hong Kong operates under a rather rigid budgetary control culture which reinforces accountability for its cost efficiency and quality of services. However, its mega organizational structure makes monitoring quality performance of its numerous health care entities a challenge and quality transparency with the end-users a difficulty.

Subsequent to HA's incorporation, the organization has been under pressure to strengthen cost efficiency as a publicly funded operation. While cost containment as an important objective that HA has strived to achieve, there is no indication that quality performance expected by the end users has been met. In fact, HA has voluntarily disclosed more cost-related performance indicators than those concerning quality-related, non-financial information. Similar experience is reflected by Daniel et al. (2007) that, lacking an effective performance measurement and control to deal with concerns of the stakeholders, a healthcare service provider could create moral hazard in dealing with slack resources. As a consequence, a phenomenon of "average hospital" that focuses on the cost control might emerge within HA as reflected in a prior study by Llewellyn and Northcott (2005). Hong Kong SAR appears to retain an embedded cost optimization system that operates to maintain acceptable service levels. However, quality performance remains a key concern while there is continuous emphasis on cost containment as the population expands. While prior literatures suggest that not all additional resources could improve performance, an organization needs incentives to better utilize its slack resources towards performance improvement. HA's recently introduced "Pay-for-Performance" incentives with increasing measurement of performance would enable its system to induce optimal use of resources towards pre-determined quality performance targets.

In the case of Singapore, the country proceeds with an increasingly transparent performance measurement system that not only monitors cost efficiency but also quality performance as a key concern among the stakeholders. Performance measurement system plays a critical role in enhancing stakeholders' decision for purchasing services as well as in facilitating the development of a public-private partnership for health care financing that makes the overall health system a relatively more self-sustainable one. Table 1 provides a brief comparison

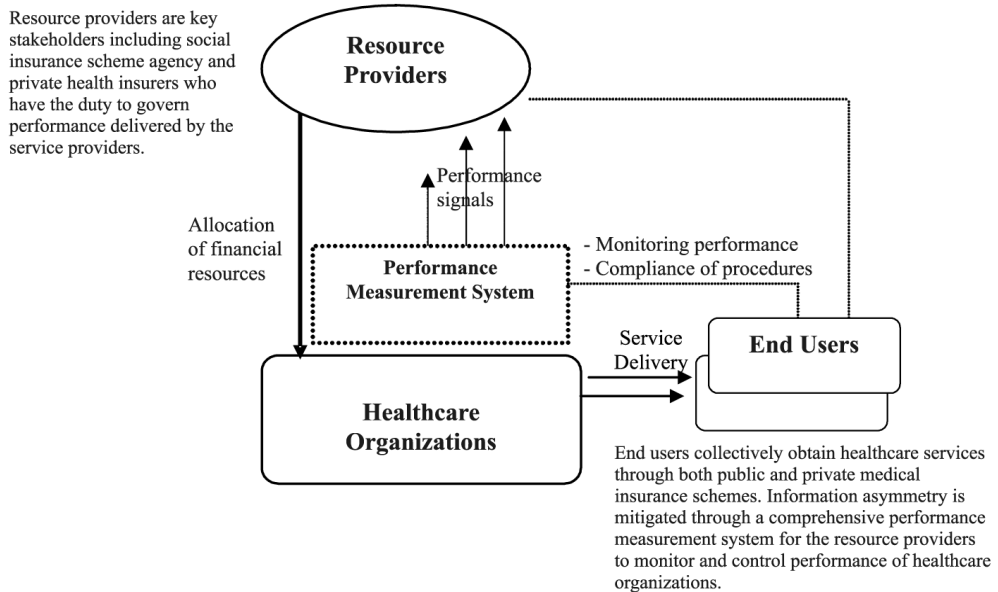


Fig. 3. Enhanced resource allocation mechanism through a balanced performance measurement system (Lee et al. 2007)

	Health care financing	Performance measurement system	Quality improvement initiatives
<b>Hong Kong SAR</b>	<ul style="list-style-type: none"> <li>- Jointly but separately by public and private sectors</li> <li>- Reliance on a subvention budgetary system to monitor cost efficiency</li> <li>- Advocating self-insured schemes</li> </ul>	<ul style="list-style-type: none"> <li>- Subvention budgetary control measures with disclosures at the corporate level</li> <li>- Emphasis on cost efficiency with selected qualitative data through a high-level corporate disclosures - limited linkage to corporate governance</li> </ul>	<ul style="list-style-type: none"> <li>- Introducing performance-based incentives</li> <li>- External accreditation on hospitals<sup>4</sup></li> </ul>
<b>Singapore</b>	<ul style="list-style-type: none"> <li>- Well-designed public-private partnership</li> <li>- Multiple sources of funding</li> <li>- Complementary roles and specializations of participants, with active regulatory measures by government</li> </ul>	<ul style="list-style-type: none"> <li>- Extensive disclosures and performance indicators on a range of quality performance by cluster companies<sup>5</sup></li> <li>- Focusing on both cost efficiency and quality performance</li> <li>- Commitments through corporate governance</li> </ul>	<ul style="list-style-type: none"> <li>- Further focus on quality performance and pertinent indicators</li> <li>- Positioned as the regional hub for health care services</li> </ul>

Table 1. Comparison between HKSAR and Singapore in Health Care Financing and Performance Measurement System

between HKSAR and Singapore with respect to health care financing and performance measurement system. It also remarks their initiatives on quality improvement.

In conclusions, this article explores the interplay between resource management for health care service and a balanced performance measurement system within a health care system. Two outstanding health care systems in Asia are reviewed briefly. It argues that an effective health care financing system that empowers the end users to allow financial resources could be enhanced by a transparent performance measurement system that provides relevant information about quality performance of a health care service provider and thereby

<sup>4</sup> HA, with the support and collaboration from the Department of Health and Private Hospitals Association in Hong Kong, launched the "Pilot Scheme of Hospital Accreditation" in May 2009 with the following objectives: (i) Establish infrastructure of accreditation, including Standards and Surveyors, (ii) Assess the feasibility of implementing accreditation program, (iii) Enhance public-private collaboration and; (iv) Evaluate and recommend on future model of accreditation in Hong Kong.

<sup>5</sup> For instance, SingHealth discloses clinical outcomes on various measures to track the quality of clinical services provided at its institutions.



reduces information symmetry among the stakeholders (see Figure 3). Second, Singapore has developed a relatively smaller but apparently more optimal corporate structure for her clusters of health care service providers. Such an optimal size facilitates an effective corporate governance function of monitoring performance and accountability for quality when integrated with a balanced performance measurement system.<sup>6</sup> This experience is relevant to other public health care systems that aim to become more effective and responsive to deliver quality health care services.

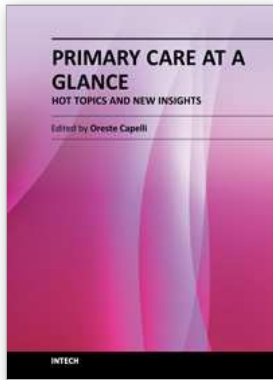
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<sup>6</sup> For instance, SingHealth - the largest health care cluster in Singapore is incorporated with its own corporate governance structure and oversees only two major public hospitals among other specialty centres and polyclinics. On the other hand, Hong Kong's HA maintains a single board of directors while overseeing seven regional clusters; some of the largest clusters alone contain seven public hospitals.

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