

A Structure-Conduct-Performance Analysis of Medical Tourism in Singapore

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ABSTRACT

This study presents a structure-conduct-performance analysis of the 17 Singaporean hospitals that are engaged in the medical tourism industry. Heart bypass surgery would cost an American patient US\$ 70,000 to US\$ 133,000 in the United States, but would only cost US\$ 16,300 in a high-tech hospital in Singapore using Western-trained surgeons. The price differential is very important to patients traveling from the United States to Singapore.

KEYWORDS: Hospital, medical tourism, structure-conduct-performance, Singapore

JEL Codes: I11, L11, R30

INTRODUCTION

Today, advanced developing nations in Asia such as India, Singapore, Thailand and Malaysia are able to offer medical services that were once only available in Europe and North America. Some Asian hospitals have devoted funds to improving the quality of their services by improving the training of their doctors, upgrading the condition of their buildings, and by purchasing the most modern equipment. Many of these hospitals have now earned accreditation from international agencies, such as the Joint Commission International. Because healthcare costs in these nations are a fraction of the cost of services in the United States or the United Kingdom, there is an economic incentive for residents of Western countries to travel outside their countries to seek medical services, whether elective or non-elective. The resulting flow of patients has accelerated the growth of medical tourism.

The primary motivating factor for medical tourism is the price differential between hospitals in Europe and North America and hospitals in Asia. For instance, a heart bypass surgery (CABG) that costs US\$ 70,000 to US\$ 133,000 in the United States might only cost US\$ 16,300 in a high-tech hospital in Singapore using Western-trained surgeons. Hip replacement can be done for around US\$ 12,000 in Singapore or Thailand but can cost in the range of US\$ 33,000-US\$ 57,000 in the United States (Woodman, 2008). As many as 52 million U.S. residents are uninsured as of 2009. The price differential on complex, as well as less complex, medical procedures is very important to these Americans. Yet another motivating factor is the waiting time for medical services. In countries such as United Kingdom and Canada, patients are often

required to wait a long time before they can undergo a surgery or other medical procedures. In contrast, patients face minimal waiting times for similar services in Asian hospitals.

In a move that increases Americans' incentives to go abroad for medical care, the growing U.S. costs of providing healthcare have caused some employers and insurance companies in the United States to provide extra incentives to use medical tourism. These incentives include waiving deductibles and copayments when covered employees use medical tourism.

According to a recent study (Deloitte, 2008), the number of Americans traveling abroad for medical care is expected to reach six million in 2010 and 15.8 million by 2017. Cross-border revenues are expected to grow from US\$16 billion to US\$68 billion (+325%) from 2008 to 2010. Another study revealed that the medical tourism industry earned global revenues of US\$ 20 billion in 2005 and the Asian market comprising India, Singapore, Thailand and Malaysia stood at approximately US\$ 2.5 billion in 2006 (Mitra, 2007). While the global market is predicted to double in size to US\$ 40 billion a year by 2010, it is estimated that the Asian market will generate in excess of US\$ 4.4 billion by 2012.

Singapore has been witnessing an increase in the number of international medical travelers in recent years. Approximately 150,000 medical tourists visited Singapore in year 2000 and that number grew to 210,000 in 2002 and 230,000 in 2003 (see Figure 1) (Yap, 2005; Mitra, 2005). The industry experienced the largest growth (at 39%) from 2003 to 2004 in the wake of the SARS epidemic, and soon after Singaporean government took initiatives to make medical tourism a key revenue generator for their countries' economies. Between 2006 and 2007, while

medical tourist numbers dropped, the dollar value of expenditure went up by 30% to US\$ 1.7 billion (Ministry of Health, 2009a). By 2012, the country expects the number of medical tourists to double to 1 million.

[Insert Figure 1 here]

Medical tourists are usually accompanied by at least one other family member and the Singapore Tourism Board estimates that the inflow of accompanying tourists along with medical travelers could make a significant contribution to the country's overall tourism revenues (Mitra, 2005). The one million medical tourists targeted for year 2012 are estimated to generate US \$3 billion in expenditures or a contribution of more than one percent in value-added to Singapore's GDP.

MARKET STRUCTURE

In 2007, the Singaporean government spent about US\$ 1.3 billion or 0.9% of GDP on health services. Approximately 6.7% of total government spending in Singapore was devoted to health, and the public expenditure on health per capita was US\$ 408. As of 2007, there were 30 hospitals in Singapore. These hospitals represented 50% of total health care workforce or 28,678 jobs in the island nation (Department of Statistics, 2007). They were also the largest contributors in terms of operating receipts (US\$ 2.3 billion) and value added (US\$ 1.2 billion), representing 49% and 47% respectively of the industry totals in 2007. During the same period, the average annual remuneration per hospital employee was US\$ 36,624, although the profitability ratio for these hospitals declined from 9% to 8% between 2006 and 2007.

Market Definition

Most hospitals can be considered as multiproduct firms that simultaneously offer a multitude of diagnostic and therapeutic services. In terms of product dimension, the market for medical tourism in Singapore can be defined as a combination of inpatient hospital services and day surgeries offered by medical facilities to meet the needs of the medical tourists who travel to Singapore seeking medical treatment. In addition to general surgeries, the top treatments medical tourists sought were cardiology by inpatient surgeries and ophthalmology by day surgeries in 2002. In this paper, we identified hospitals that cater to medical tourism by selecting the 17 hospitals listed on SingaporeMedicine's Web site as having international patient centers. An international patient center is a department within the medical facility that provides a variety of services for medical tourists, such as scheduling an appointment or admission, interpretation services, travel arrangements, accommodations, or even sightseeing activities.

The medical tourism market in Singapore in terms of its geographical location is clearly an international market, with demand coming from countries such as Indonesia, Malaysia, United States/Canada, and the United Kingdom -- the top 4 countries of origin for medical tourists who traveled to Singapore (Khoo, 2003b).

Market Size

As in most advanced developing economies, the Singaporean healthcare system is comprised of a public sector and a private sector. We note that the public sector provides approximately 80% of the costly hospitalization care of the local residents, and the private sector offers the remaining 20% of care. However, when it comes to medical tourism, the public-private split is reversed;

the public sector had around 20% and the private sector 80% of inpatient care in Singapore in the decade prior to 2002 (Khoo, 2003b).

There were a total of about 11,547 hospital beds in the 30 healthcare establishments in Singapore in 2007. Some of these are long-term care facilities that would not interest medical tourists, such as the Institute of Mental Health. The 17 healthcare establishments in our study include eleven public medical facilities and six private hospitals. The public medical facilities include five acute hospitals (namely Alexandra Hospital, Changi General Hospital, National University Hospital, Singapore General Hospital, and Tan Tock Seng Hospital), two specialist hospitals (KK Women and Children's Hospital, and Johns Hopkins-NUH International Medical Centre¹), and four specialty centers (National Heart Centre, National Cancer Centre, National Eye Centre, and National Dental Centre).² The public hospitals provide inpatient and specialist outpatient services (SOC) and a round-the-clock emergency department.

In 2000, the Singaporean government restructured its public hospitals into two groups: Singapore Health Services, having Singapore General Hospital as its flagship hospital, and National Healthcare Group, having National University Hospital as its flagship hospital. The two groups run their public hospitals and specialty centers as private companies and manage them as not-for-profit organizations, as they are wholly owned by the government. The rationale was “creating management autonomy and flexibility to respond more promptly to patient needs” (Ministry of Health, 2009b). Each public hospital was given a high degree of autonomy, including the authority to set its own prices and to negotiate its own staff salaries. For example, when Alexandra Hospital was restructured in 1999, its new CEO was able to choose the mix of

services that would be most appropriate for his hospital (Hua and Pok, 2003). The role of the governing boards of the public groups is to determine the broader policy issues (Reisman, 2006).

In addition to the eleven public medical facilities, we also include six private hospitals in our study. The one private group is Parkway Health, which consists of Mount Elizabeth Hospital, Gleneagles Hospital, and East Shore Hospital. Raffles Hospital is the largest of the three unaffiliated private hospitals.³ Together, these four hospitals offer cutting-edge technologies treatment in fields such as cardiology, neurology, endocrinology, and oncology. Two other smaller private hospitals are also included in our study. They are Thomson Medical Centre, a private specialist hospital, and Mount Alvernia Hospital, a not-for-profit Catholic hospital.

Market Growth

Next, we look at the market growth in terms of the number of hospital admissions between the private and the public healthcare establishments in Singapore from 1997 to 2008. There was a drastic decline of 12.8% in the number of hospital admissions in year 2003, when Singapore was plagued with SARS for several months (see Figure 2). The fear of SARS has probably caused many patients, both local and foreign, to switch from the public hospitals to the private hospitals, as the admission figures in the latter experienced an increase of 4.8% during the same year. In terms of the number of day surgeries performed (both public and private), there was an overall decline of 4.3% in year 2003 (see Figure 3). However, in the following year, we soon saw a large increase in hospital admissions in both the public (14.9%) and the private (9.8%) sectors. During the same period, there was also a dramatic jump of 28.7% in the number of day surgeries performed (see Figure 3). This was probably due to a combination of two factors: a recovery

from the fear of SARS and its related postponement of surgeries from 2003, and the Singaporean government's push for medical tourism as a result of the initiative called SingaporeMedicine introduced in October of 2003. Both the growth trends for hospital admissions and day surgeries have been on a steady and healthy increase between 2004 and 2007.

[Insert Figure 2 here]

[Insert Figure 3 here]

Market concentration

We look at the market share of the healthcare industry in Singapore by using the number of hospital admissions (includes inpatient discharges) and the number of beds available for both private and public hospitals (see Table 1). In our sample of 17 healthcare facilities, the market share in terms of hospital admissions between the public and the private sector is 73.4% and 26.6%, respectively. Measuring the market share by the number of beds, they are 76.1% for the private and 23.9% for the public sector.

Using the proportions of hospital admissions and the percentage of the number of beds by each individual healthcare facility separately as a proxy for market share, we compute the four-firm concentration ratios, C_4 , for the industry. They are 56.1 and 60.6 for admissions and beds, respectively. These numbers show that the largest four individual hospitals control over half of all admissions and beds in Singapore. We further compute Herfindahl-Hirschman Indices (HHI). When we treat the hospitals as 17 individual hospitals, the HHIs are 1,055 for hospital

admissions and 1,142 for hospital beds. When we treat the three groups as three entities along with the three unaffiliated hospitals, we find that the HHIs increase to 2,976 and 3,140, respectively. These numbers indicate that the industry for the foreign healthcare providers in Singapore may be a highly concentrated oligopoly. The correlation coefficient between the number of beds and the number of admissions is 86%, so we get similar results whether we measure hospital size by admissions or by beds.

Looking specifically at the number of hospital admissions, the market shares are once again highly concentrated among the top four public hospitals, namely Singapore General Hospital (SGH), KK Women's and Children Hospital, National University Hospital (NUH), and Tan Tock Seng Hospital (TTSH). Since the industry is dominated by the two health groups that run the public hospitals and are owned by the government, they can easily cooperate and integrate their services vertically within the two groups, forming a collusive oligopoly.

[Insert Table 1 here]

High barriers to entry

Barriers to entry in the healthcare industry of Singapore take on several forms. Licensing to operate a hospital in Singapore is a direct form of a barrier to entry. Currently, no facility may be used as a private hospital, maternity facilities, nursing home, medical or dental clinic, clinical laboratory unless it is licensed under the Private Hospitals and Medical Clinics (PHMC) Act by the Ministry of Health, which is the regulator of the healthcare industry in Singapore. The Ministry of Health carries out stringent checks to ensure potential private hospitals meet all the

requirements to provide high-quality healthcare services. The guidelines for application for license, requirements and protocols for providing specialized medical services are provided in the PHMC. As such, through licensure and strict requirements for establishing a private hospital, the regulator imposes a barrier to entry for potential firms.

The subsidies provided by the government to the public hospitals are yet another barrier to entry to private investors. Affordable healthcare is catered to all Singaporeans through subsidized rates at public hospitals, and three quarters of these hospital beds are heavily subsidized by the Singaporean government.⁴ Although foreign patients are not entitled to subsidies, subsidies provided to local patients who visit the public hospitals may still make it difficult for the private sector to compete effectively in medical tourism unless the latter can capitalize on its individual niche treatments or services. A dominant public sector can potentially crowd out the private sector. A case in point was the exit of Health Management Institute, the operator of Balestier Hospital from the hospital market in Singapore in 2002 (Gee, 2004).

The economics of learning-by-doing to some extent create a barrier to entry. Some studies such as those carried out by Farley and Ozminkowski (1992) and Stone, *et al.*, (1992) have found that for certain diagnoses, a greater volume of admissions leads to a lower mortality rate for those illnesses. These studies suggest that hospitals with greater admission volumes may tend to attract even larger markets share over time. This suggests that pioneer hospitals in Singapore may have a first-mover advantage in terms of experience gained in treatment of certain health complications. For instance, National University Hospital and Singapore General Hospital are

known respectively for liver transplants and nuclear medicine. Such experience takes time to accumulate, and thus serves as a barrier to entry in the healthcare industry.

Lastly, the initial high sunk costs involved in setting up a comprehensive hospital constitutes a high barrier to entry. For example, a typical hospital building is designed much differently than a typical office building. It has utilities, such as oxygen and vacuum lines, that would be unnecessary if the building is used for other purposes.

Barriers to entry in the healthcare industry in Singapore are therefore considered high in terms of government interventions, costs and learning-by-doing economies.

In summary, the market structure of the medical tourism industry in Singapore is dominated by two public groups and one private group (i.e., Parkway Health). It is likely to be of an oligopolistic nature with fairly limited competition as evidenced by the high market concentration and low potential competition due to the high barriers to entry.

CONDUCT OF MEDICAL TOURISM PROVIDERS IN SINGAPORE

The seventeen hospitals in our study which cater to foreign patients behave like an oligopolistic industry.

Grouping -- Cooperative Behavior

A notable feature of the hospitals in Singapore is that most of them are in groups. All of the public hospitals are in either the National Healthcare Group or the Singapore Health Services

(SingHealth). Three of the private hospitals (East Shore, Gleneagles, and Mount Elizabeth) are parts of the Parkway group. These groups include not only the hospitals themselves, but also a variety of outpatient clinics and, in the case of the public hospital groups, specialty centers such as the SingHealth's National Heart Centre and the NHG's Institute of Mental Health.

[INSERT Table 2 HERE]

Grouping can be seen as a way to gain from economies of scale and economies of scope that exist in the hospital services industry. In an analysis of the 1996-97 restructuring of hospitals in Ontario, Preyra and Pink (2006) found that economies of scale and scope existed prior to the restructuring. In particular, they found that cost complementarities existed between primary/secondary inpatient care and ambulatory outpatient care. It is reasonable to assume that Singapore's hospitals gain similar economies of scale and scope. In this vein, the Ministry of Health (2009b) explains these groups as a way to "enable comprehensive yet affordable quality healthcare services through co-operation and collaboration among our public healthcare establishments."

As an example of this "co-operation and collaboration", within the National Health Group the National University Hospital (National University Hospital, 2009) and Tan Tock Seng Hospital (Tan Tock Seng Hospital, 2006) have gastroenterology sections, but Alexandra Hospital (Alexandra Hospital, 2008) does not list one. Also, while both the National University Hospital (NUH) and Alexandra Hospital (AH) have orthopedics sections, the NUH emphasizes orthopedics of the hands and spine, whereas AH emphasizes orthopedics of the feet and geriatric orthopedics, which are in keeping with AH's specialties in sports medicine and geriatrics. Tan Tock Seng Hospital does not list an orthopedics section. Cardiac services provide another

example of coordination within the National Health Group. All of the group's three largest hospitals provide cardiac services, but these are coordinated by The Heart Institute, which does not have its own treatment facilities, but sends cardiac specialists to the hospitals in the group. Similar examples can be found in the Singapore Health Services group.

Furthermore, the fact that most of Singapore's hospitals rely on their respective groups to operate their networks of international referral agencies is probably due to economies of scale in operating these networks. Similarly, SingaporeMedicine was created by the Ministry of Health to take advantage of economies of scale in promoting Singapore's hospitals to foreigners (SingaporeMedicine, 2007).

Pricing

Economic theory suggests that price discrimination between foreign and domestic patients would occur. The conditions for successful price discrimination are satisfied: a degree of monopoly power, different demand elasticities, and the ability to prevent sales between the groups. We found no instances of price discrimination, however. It is true that foreign patients are charged higher prices than Singapore residents are, but this is because foreigners are not eligible for the government of Singapore's subsidies to hospitals. Foreigners pay the same rates that unsubsidized Singaporeans pay.

We tested to see whether the private hospitals' rates are higher than the public hospitals' rates. The private for-profit hospitals' need to compensate investors could lead them to charge higher fees than the public hospitals and the not-for-profit private hospital charge. To test the

hypothesis, we used data on the median fees for various types of treatment that were reported to Singapore's Ministry of Health from March 1, 2008, to February 28, 2009 (see Table 3). The Ministry of Health subsidizes patients at public hospitals to varying degrees. To assure compatibility of the data, we compared the fees charged to unsubsidized patients at public hospitals with the comparable fees at for-profit hospitals. When the treatment was for admitted patients (inpatient care), we compared unsubsidized fees for Ward A (a private room) in public hospitals to private hospitals' fees for a private room. When the treatment was for day surgery (outpatient care), we compared the unsubsidized fees charged by the public hospitals to the fees charges by private hospitals. Private hospitals are not subsidized, and furthermore medical tourists in Singapore would not receive any subsidy. We found seven treatments types which were performed at both public hospitals and at private hospitals in sufficient numbers to be published by the Ministry of Health.⁵

[INSERT Table 3 HERE]

The data in Table 3 give the median fees for each type of treatment at the various hospitals. Our F tests for equality of variances only detected unequal variances in the cases of breast lump removal ($p = 0.0674$) and delivery by Caesarian section ($p = 0.00019$). For those two cases, we used the t-test with unequal variances; all other tests used the equal-variances assumption. The t-tests are shown in Table 3. Negative t statistics indicate that the average of the median fees among the for-profit hospitals was higher than the average of the median fees among the public hospitals. For each type of treatment, our results show that the for-profit hospitals tend to charge more than the public hospitals charge, although there were a few treatments for which a for-profit hospital charged less than some public hospitals. For example, East Shore Hospital and

Mount Elizabeth Hospital charged less for cataract surgery than National University Hospital (S\$3,524 and S\$3,614 vs. S\$3,774, respectively).

There is one hospital in the sample that is neither public nor for profit: Mount Alvernia Hospital, which is run by a Catholic order. The median billings reported by Mount Alvernia were consistently between the average of the median billings of the for-profit hospitals and the average of the median billings of the public hospitals. Since Mount Alvernia is smaller than most of the public hospitals, one possible explanation for Mount Alvernia having higher fees than the public hospitals might be that being small it is unable to take advantage of economies of scale. An alternative explanation is that Mount Alvernia's mission differs from that of the public hospitals. The same Catholic order which founded Mount Alvernia hospital also runs Assisi Hospice on the same grounds as the hospital, and the order's hospital cross-subsidizes its hospice. In 2007, Mount Alvernia donated S\$429,000 to Assisi Hospice (Assisi Hospice, 2008).

Dominant firms/fringe firms. The two public hospital groups, National Healthcare Group and Singapore Health Services, clearly dominate the market for hospital services in Singapore. Each public group has the power to set its own prices, subject to the policies of its government-controlled board of directors. Presumably, the groups try to maximize their current surpluses, which could be used to improve the hospitals' facilities or for other goals. The smaller Parkway Health Group and the unaffiliated hospitals limit the dominant groups' ability to raise their prices because their presence in the market, though small, increases the elasticity of demand for the services of the public hospital groups.

Nonprice competition

Quality. Just as hospitals can compete with each other over prices, they can also compete with each other over quality. Most of the seventeen hospitals in this study use accreditation by the Joint Commission International (JCI) as a way to demonstrate their high quality, especially to foreign patients, and to differentiate themselves from other Asian hospitals. The Joint Commission International is an arm of the same organization which accredits most hospitals in the United States. National University Hospital was the first hospital in Singapore, and the third hospital in Asia, to receive JCI accreditation, on August 1, 2004. Three days later, Johns-Hopkins Singapore-IMC became the fourth hospital in Asia to have JCI accreditation. Between 2004 and 2006, only 23 hospitals in Asia (including five in India and four in the People's Republic of China) received JCI accreditation. Ten of them were in Singapore (see Table 2). The speed with which the Singaporean hospitals received JCI accreditation after NUH and Johns Hopkins did suggests that these seventeen hospitals are keenly aware of the rivalry among themselves in the market for foreign patients, and that they see JCI accreditation as important in their efforts to attract foreign patients. Interestingly, the contrapositive to this statement is illustrated by West Point Hospital, which opened in 2007. It is the only significant general hospital in Singapore that does not have an international patient center, and it does not have JCI accreditation.

Outcomes. The for-profit hospitals can only charge higher prices if hospital services are differentiated in some way in the patients' minds. If the for-profit hospitals have better outcome statistics, it might explain the price differences. Outcomes data from these hospitals are not readily available, so it would be difficult to tell whether there are significant quality differences

between the public and for-profit hospitals. Other studies in other markets find mixed results. A meta-analysis by Eggleston, *et al.* (2008) of U.S. hospitals found that government hospitals tend to have slightly worse quality than not-for-profit hospitals have, but found no significant difference between not-for-profit and for-profit hospitals. Similarly, Jensen, *et al.* (2009) found that among Australian hospitals, private hospitals have consistently lower rates of unplanned readmission and mortality than public hospitals have. However, using data from Taiwan's hospitals, Lien, *et al.* (2008) found that not-for-profit hospitals had lower mortality rates than for-profit hospitals had. So, given these studies, and given the efforts that both public and private hospitals have undertaken, such as achieving JCI accreditation, it is hard to argue that the for-profit hospitals have better health outcomes than the public hospitals have.

Product and Service Differentiation

There are other ways in which the private hospitals can and do differentiate themselves from the public hospitals.

Specialization in Treatments: Singapore's medical tourism hospitals also differentiate themselves by specializing in various niche services (see Table 2). The private hospitals are able to charge higher prices, in part, because they are noted for various specialties. Although several hospitals are noted for their delivery care, KK Women's and Children's Hospital and Thomson Medical Centre are especially famous in this area. Mount Elizabeth specializes in heart and neurosurgery, while Gleneagles specializes in cosmetic surgery. Raffles Hospital offers traditional Chinese medicine.

Waiting Times: A more apparent and significant way in which the for-profit hospitals differentiate themselves from the public hospitals is by providing a less crowded atmosphere and shorter waiting times. Public hospitals in Singapore are notorious for their waiting times to see a doctor, to get a bed, or to get medications from the hospital pharmacy. In recognition of this problem and as a service to their clientele, Alexandra Hospital and National University Hospital have special Web pages which give the lengths of the queues in their emergency departments and even provide Webcams of the waiting areas to let the public see the queues in real time. After checking these Web pages, patients may choose to use a different hospital, but the long waiting times are still a problem.

Location: Location is a common way for firms in an industry to differentiate themselves. In Singapore, East Shore Hospital has as its mission to serve the east side of Singapore (Parkway Group Healthcare, 2008a). This is a neighborhood with low real-estate values, and East Shore's prices reflect the lower costs. Changi General Hospital, located even farther to the east, uses its proximity to Singapore Changi Airport, to draw medical tourists. Traffic congestion in Singapore's central business area is something most drivers, medical tourists and residents alike, would rather avoid. To ease the problem, Singapore has created a restricted zone known as the central business district (CBD). When drivers pass under electronic payment gantries located in the CBD, they are billed electronically. Foreigners in Singapore, being unfamiliar with where the gantries are and how to avoid them, would find the billing especially annoying. Most of the hospitals are located outside of the restricted zone, but SingHealth's flagship hospital, Singapore General Hospital, as well as the National Cancer Centre-Singapore are located in the heart of the central city. Raffles Hospital is located just outside the restricted zone, though it has a surgical

center in the city center.

Language and Diet

Singapore is considered a cosmopolitan yet harmonious society that accommodates many cultures. Medical tourists from cultures with relatively specialized needs would find their needs met at Singaporean hospitals. For instance, the Middle Eastern patients would find mosques, *halal* food being served in any local hospitals, and social acceptance. Medical tourists from China would find Mandarin plus four major Chinese dialects (Hokkien, Cantonese, Hainanese, Teochew) being spoken by the local ethnic Chinese (75% of the population) in addition to the availability of specialized Chinese cuisines and dishes originated from various parts of China.

Regional Niche: In the Asia-Pacific region, Singapore's emergency departments have earned a reputation for timely, efficient management of mass-casualty incidents (Yip, 2009). Two cases in point are the Bali bomb blasts in 2004 and the Asian Tsunami in 2005, in which patients were evacuated to Singapore.

International Marketing

Most of the seventeen hospitals in our study actively market themselves to foreign patients. All of them operate an international patient center to arrange care and accommodations for international patients. Each of the three hospital groups and one of the independent private hospitals (Raffles Hospital) operates a network of international referral agencies outside of Singapore. These are foreign travel agencies or foreign medical tourism facilitators which can direct foreign patients to Singaporean hospitals. For the most part, these international referral

agencies are in nearby Southeast Asian countries, such as Malaysia, Indonesia, Bangladesh, and Vietnam, but two of the groups have agencies in eastern Russia and one group (Parkway Health) has agencies in the United States and Canada. Although several of the hospitals provide information in foreign languages, one of the for-profit hospitals, Raffles Hospital, has created a special center that caters to Japanese patients and is staffed entirely by Japanese physicians.

SingaporeMedicine. While facing competition from Thailand and Malaysia, Singapore's healthcare industry continues to be a front runner in Southeast Asia and has undertaken initiatives to increase medical tourism as a generator of export service revenues for the country's economy. Significant among these was the launch of SingaporeMedicine in October 2003. SingaporeMedicine is a multi-agency government initiative aimed at developing Singapore into one of Asia's leading destinations for international patients by promoting Singapore's health facilities and its culture. The agency is comprised of Ministry of Health, Economic Development Board, Singapore Tourism Board, International Enterprise, and firms engaged in the medical travel industry. All of the seventeen hospitals in this study, including the private hospitals, participate in SingaporeMedicine.

PERFORMANCE

Prices and Profits from a National Perspective

From Singapore's perspective, its medical tourism industry performs well when it obtains the most profit from foreign patients. However, in their pursuit of foreign profits, the Singaporean hospitals and specialty centers recognize that they are constrained by competition from healthcare providers in the rest of Asia and around the world, as noted in Section 2. Foreign

competition increases the price elasticity of demand for their services and limits their market power.

Singapore's healthcare providers face more competition when competing for patients from Western patients from Europe and North America than when competing for patients from other countries in Asia. Because of the monetary and time costs of travel, when Western patients consider treatment in Singapore, they tend to be seeking the more expensive treatments such as coronary artery bypass grafts (CABGs), lap banding⁶, or joint replacements, for which the difference between prices in Western countries and prices in Singapore would be more significant. For example, the median price of a CABG in Singapore was about US\$16,000, whereas U.S. hospitals charge between US\$70,000 and US\$133,000. Patients from Singapore's neighbors seek these treatments, too, but they also seek the less expensive procedures, such as LASIK, colonoscopy, and dental services. For example, the median price for LASIK in Singapore was around US\$860, which was comparable to LASIK prices in the United States. The American who goes to Singapore for a lap band and the German who goes for a hip replacement can choose from many alternative healthcare providers in countries that are closer to them than Singapore, such as Mexico, Costa Rica, or Panama. These patients will choose a healthcare provider on the basis of price and perceived quality. Presumably, having more alternatives than patients from Asian countries have, the patients from Western countries will be more sensitive to prices and their demand for a given type of treatment will presumably be more price elastic than the Asian patients' demand is. The Singaporean hospitals can reduce the price elasticity of Western patients' demand for their services by differentiating their services from those of other healthcare providers around the world. Achieving JCI accreditation has certainly

helped to do this.

On the other hand, Indonesians and Malaysians who go to Singapore for dental services or for colonoscopies, for example, have fewer acceptable options. This is because it requires less time and money for them to travel to Singaporean hospitals and there are fewer alternatives available to them for an equal amount of travel costs. Also, whereas many Western patients, especially Americans, are willing to incur high travel costs because of the large difference between treatment costs in their home countries and the treatment costs in Singapore, the difference between Singapore's treatment costs and those in Indonesia and Malaysia are much less. In fact, Woodman (2008, p. 10) shows that many treatments are more expensive in Singapore than in Malaysia. For these treatments, Malaysians would be motivated by Singapore's reputation for quality, rather than by price differences. The Indonesians and Malaysians should have less elastic demand for Singapore's healthcare services than Western patients have. The Singaporean healthcare providers have more market power in such cases. Thus, Singaporean hospitals face two different markets: the market for Western patients and the market for Asian patients.

Singapore's hospitals maintain that they do not engage in price discrimination between domestic and foreign patients, nor between Western patients and medical tourists from other Asian countries, and we have found no evidence of price discrimination. Thus, if they intend to get more profit from foreign patients, the only means of doing this is to charge higher prices for the services that foreigners typically seek in Singapore, such as CABGs and hip replacements.

The price elasticity of demand for the less costly services sought mainly by Asian patients is

expected to be lower than that of the demand for the high-cost services sought by Western patients. Therefore, it is expected that the hospitals' profit margins in performing dental care or colonoscopies to Asian patients should be higher than their profit margins in providing lap bands or hip replacements to Western patients. We will extend this study in this direction as better data on hospital profit margins become available.

Prices and Profits from a Global Perspective

From a global perspective, Singapore's medical tourism industry performs well when it provides services to foreign patients at prices which equal the marginal costs of the services, and charges minimal economic profits, as perfectly competitive firms would do. As mentioned above, Singapore's healthcare providers face more elastic demand in the markets for some services than in the markets for other services. The price elasticity of demand for services typically sought by Western patients is expected to be high. Basic economic theory implies that in such markets the price will be close to the marginal cost, which in turn implies a high degree of allocative efficiency.

Since the public hospitals do not publish financial data in their annual reports, our only evidence on the profitability of Singapore's hospitals comes from the for-profit hospitals. These sources do not provide separate data on the profits earned from medical tourism, but since they do not engage in price discrimination, the profitability of treating a foreigner should be the same as that from treating an unsubsidized local patient.⁷ Whereas the average return on equity among firms in Singapore's financial and non-financial service industries in 2005 (the most recent year for

which data are available) were 11.8% and 18.7%, respectively, (Singapore Department of Statistics, 2008a, p. 84), the Parkway Group Healthcare reported a 15.4% return on equity for 2005 (Parkway Group Healthcare, 2008b, p. 36), Raffles Medical Group reported only 11.1% for 2005 and 14.2% for 2008 (Raffles Medical Group, 2008, p. 2), and Thompson Medical Centre's return on equity for 2007-2008 was 10.5% (Thompson Medical Centre Limited, 2008). These figures suggest that the ROE for hospitals tend to be lower than those of firms in the other non-financial service industries and similar to the ROE of firms in the financial service industries.⁸

Ramesh (2008, p. 69) reported that in 1993, Singapore's Ministry of Health began to restrain healthcare prices. It imposed limits on hospitals' average charge per patient-day that varied by the treatment received by the patient. These limits were enforced by reducing the subsidies to the hospitals when the limits were exceeded. Furthermore, to foster more price transparency and price competition among the private hospitals, the Ministry of Health requires that private hospitals provide the estimated bill for a procedure to prospective patients and provide information about the average bill size for comparable procedures at public hospitals (Singapore Ministry of Health, 2007, p. 11)

We have shown above that the public hospitals in Singapore tend to charge lower prices for treatment than the for-profit hospitals charge. So, if the for-profit hospitals' prices do not generate abnormally high profits, then neither would the public hospitals' prices be likely to generate excessive profits.

Quality

Singapore's hospitals also compete among themselves and on the world markets in terms of quality. Ramesh (2008, p. 71) reported that since the late 1990s, the government of Singapore has pressured hospitals to improve the quality of their services.

Another policy tool the government has employed recently to improve hospitals' performance is to encourage them to meet and indeed exceed national and international quality standards. In 2000, the MOH mandated all acute care public and private hospitals to participate in the Maryland Quality Indicator Project (QIP), which involves monitoring a set of clinical quality factors and benchmarking them against national and international norms. . . . All public hospitals have gone on to voluntarily acquire accreditation from Joint Commission International (JCI) Although the objective of the effort to acquire international accreditation is mainly to make public hospitals more attractive to foreign full-fee paying patients, the benefits [extend] to the entire hospital system.

Most of Singapore's hospitals have also received Singapore Quality Class certification and ISO 9000 certification which attest to the hospitals' systems for quality improvement.

To further encourage the hospitals to improve their quality, the Singapore Ministry of Health in 2006 started to make public reports of selected hospitals quality outcomes for common procedures, though only a few reports have been issued to date. Ganesan (2006) shows that the Singapore's hospitals that specialize in eye surgeries have achieved high success rates and safety rates -- rates that surpass those found in studies of U.S. hospitals (see Table 4). Similarly, Yong (2007) studied the mortality rates of patients who have had coronary artery bypass grafts (CABGs) in Singapore's two public hospitals that are equipped to perform heart surgeries (see Table 5), and found that these rates were lower than what would be expected among European patients in European hospitals.

[Insert Table 4 near here.]

[Insert Table 5 near here.]

It is difficult to tell whether the improvements in quality that have taken place since 2000 would have occurred in the absence of pressure from the Ministry of Health. However, the fact that most of Singapore's hospitals have gone beyond the government's requirements by achieving JCI accreditation suggests that their quality improvements were due to competitive forces, rather than the government mandate.

CONCLUSIONS

Despite the forecasts that the pace of growth in Asia will slow in 2008 and 2009, we expect the growth trend in medical tourism in Singapore to continue. In targeting her potential international patients, Singapore can practice market segmentation based on the price elasticity of demand of two geographical groups in the medical tourism industry. Fuelled mainly by high healthcare costs and constraints of economic resources as a result of aging populations, potential patients from Western nations such as North America and Europe constitute the first group of consumers with high price elasticity of demand. Singapore will do well to market big ticket item treatments such as CABG, knee and hip replacements, cancer treatment, cosmetic surgeries, etc to this group.

The second group of international patients comes from South East Asia, China, India, and the Middle East. These are the groups with lower price elasticity of demand. They are most likely to go for dental surgeries and colonoscopies. The rising affluence of the middle and higher income

groups in emerging economies like China and India and the higher expectations for better health management will drive the demand for medical tourism, especially that provided by the private healthcare sector in Singapore.

These trends will contribute to the growth of Singapore's medical tourism industry over the next several years and to the growth of medical tourism in other countries in the region. The consulting firm Frost and Sullivan predicts that medical tourism to Asian countries will grow between 2006 and 2012 at rates of around 20% to 30% (Mitra 2007) (see Table 6). Singapore and India were estimated to experience the fastest growth, though the expected growth of medical tourism in Thailand and Malaysia, and in South Korea and the Philippines, are noted as well. The total medical tourism revenue for the region was expected to grow to about US \$8 billion. Singapore's success in attracting medical tourism will depend on its ability to set its services apart from those of the other countries in the region.

[Insert Table 6 near here.]

Singapore's economy has been affected by the deepening global recession in 2009. It has been predicted that the Singapore economy may shrink as much as 9 percent, the worst in its 44-year history (BBC News, 2009). Manufacturing, which accounts for a quarter of the economy, fell 29% in the first quarter, causing key manufacturers to lay off workers as exports fell by 13% during the same period. In addition to tax reduction and job subsidization, and as one of the nation's initiatives to develop the biomedical science sector, the Singaporean government can step up its efforts in marketing medical tourism to the two groups of consumers both within and

outside Asia, making the exports of its medical services one of the key revenue generators for its economy. While the global recession may not increase the demand for medical tourism among the Asian patients in the region, it may very well raise the number of medical tourists from the West as they find good quality health care less affordable in their home countries as their countries face greater constraints for healthcare resources.

¹ Johns Hopkins-NUH International Medical Centre is a privately run member of the National Health Group. It was relocated from the National University Hospital to Tan Tock Seng Hospital (TTSH) in 2005.

² There are seven national specialty centers in Singapore for heart, cancer, eye, skin, neuroscience, communicable diseases, and dental care. We omitted the skin and communicable disease centers because they do not have international patient centers, and we omitted the neurological center because it does not provide information about the numbers of beds or admissions.

³ Raffles Hospital is part of Raffles Medical Group, but it is the only hospital in the group.

⁴ Class B1 to class C wards are given subsidies; 80% for class C, 65% for class B2, 50% for class B2+ and 20% for class B1.

⁵ The Ministry of Health does not publish data for a hospital-treatment-ward category when fewer than 30 billings were reported to the MOH for that category during the past year.

⁶ The term "lap band" is a short form of "laparoscopic gastric band" -- an adjustable plastic band that is placed around the patient's stomach laparoscopically as a weight-loss technique.

⁷ We think that the cost of treating a foreigner should be a bit higher than the cost of treating a local patient, due to the additional costs of operating the hospital's international patient center. Subsidized local patients represent a very different market.

⁸ The hospitals' returns on equity are included in the non-financial services figure.

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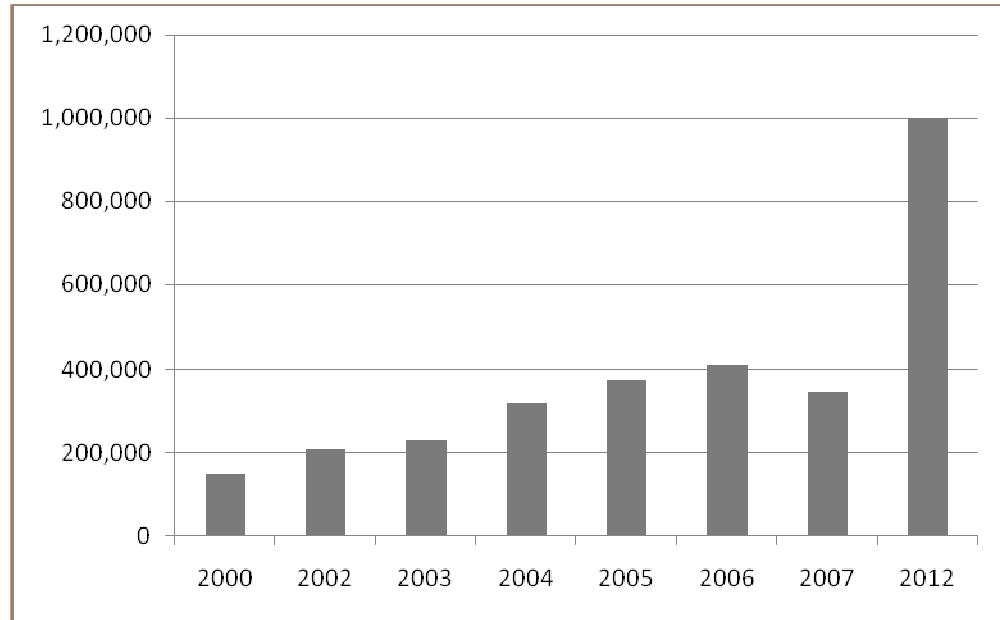
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FIGURES AND TABLES

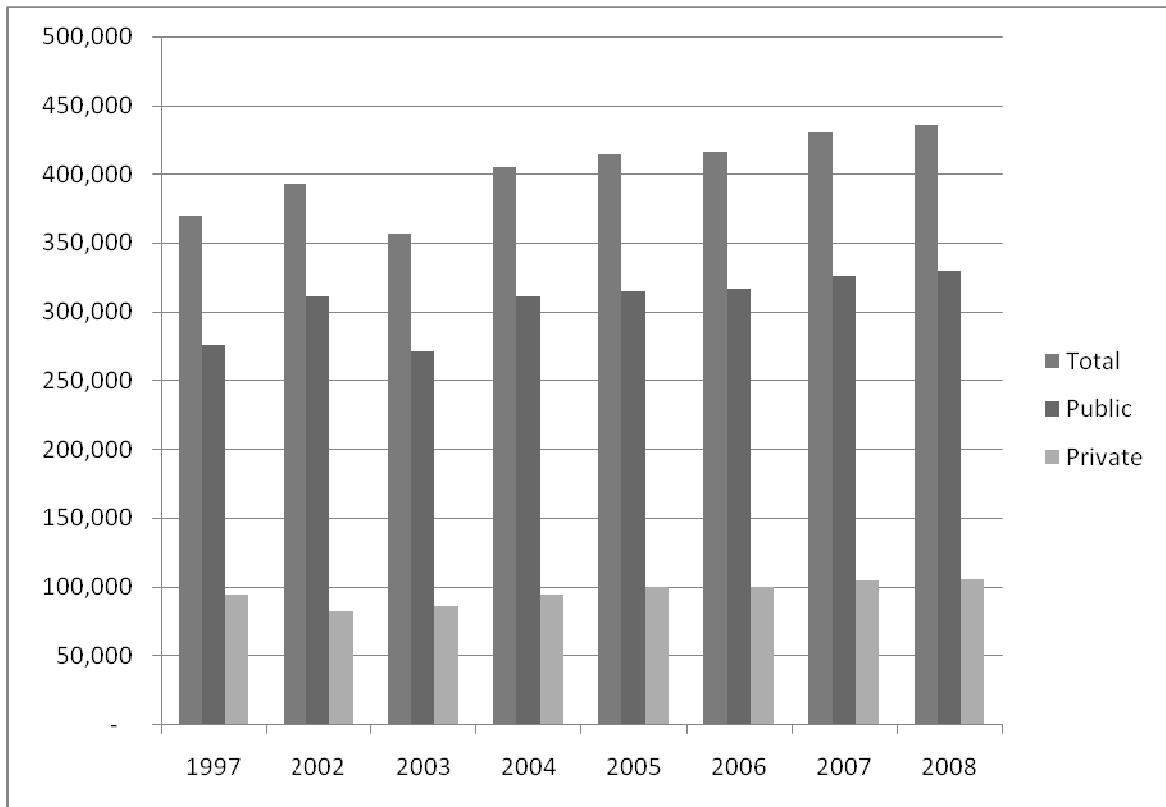
Figure 1. Number of International Patients, 2000-2012



Notes:

1. Figures for 2000 and 2003 are taken from Mitra, S. (2005) 'Medical Tourism and the Healthcare Services Industry: A Look at Singapore', 19 April.
2. Figures for 2002, 2004-05 are taken from Yap, J. (2005) 'Medical Tourism and Singapore.'
3. Figures for 2006-07, 2012 are taken from Hospital.SG (2009) 'Singapore Medical Tourism Figures Revealed by Health Minister', 28 Jan.
4. Figure for 2012 is the official targeted number released by the Ministry of Health, Singapore.

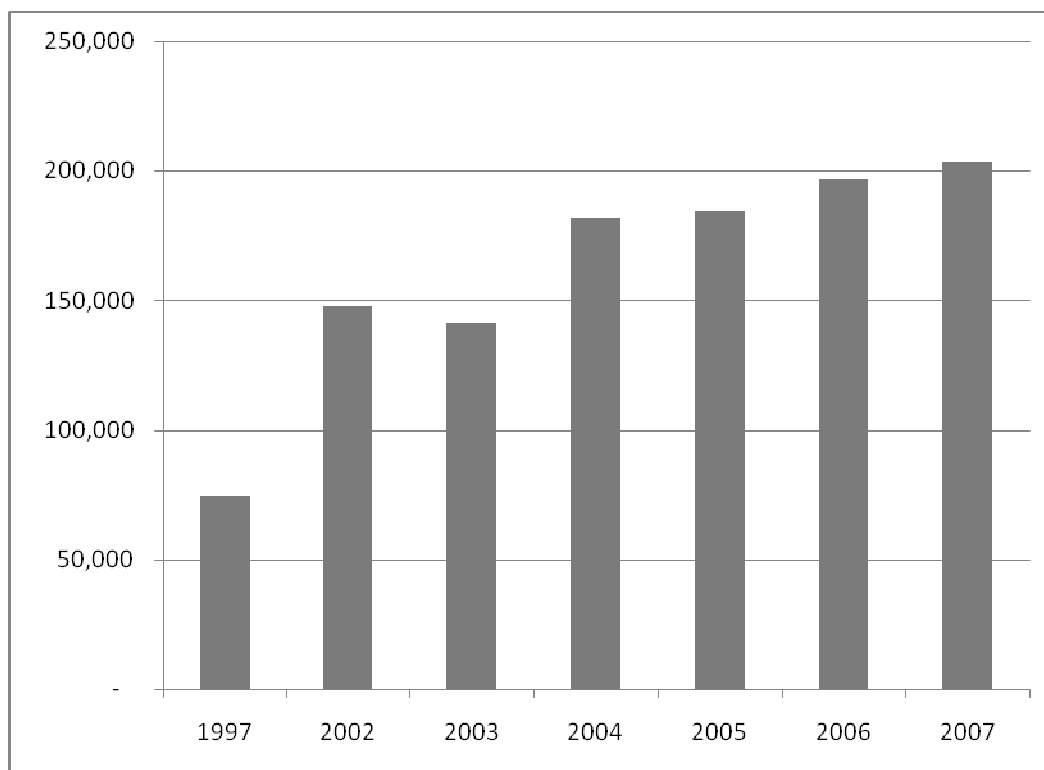
Figure 2. Number of Hospital Admissions: Private vs. Public Sectors, 1997-2008



Notes:

1. The number of admissions in public sector includes specialty centers.
2. Hospital admissions include inpatient discharges.
3. Figures for 1997-2007 are taken from *Yearbook of Statistics, Singapore* (2008, p. 261) Table 20.1 and Table 20.2.
4. Figure for 2008 is taken from *Monthly Digest of Statistics Singapore* (2009), Table 16.1 and Table 16.2, p. 97, March.

Figure 3. Number of Day Surgeries, 1997-2007



Notes:

1. Numbers include both public and private sectors.
2. Figures are taken from *Yearbook of Statistics, Singapore* (2008, p. 261), Table 20.1 and Table 20.2.

Table 1
Market Share of Hospitals by Admissions, Day Surgeries, and the Number of Beds

Hospital	Hospital Admissions³	%	Day Surgeries	%	Beds	%
National Healthcare Group¹						
Alexandra Hospital	21,476	5.0	14,995	6.6	397	5.0
National University Hospital	55,704	12.8	26,865	11.7	959	12.2
Tan Tock Seng Hospital	54,065	12.5	39,071	17.1	1,293	16.4
Johns Hopkins-Singapore IMC	431	0.1			23	0.3
Total NHG	131,676	30.4	80,931	35.4	2,672	33.9
Singapore Health Services²						
Changi General Hospital	42,922	9.9	18,098	7.9	797	10.1
KK Women's & Children's Hosp	63,458	14.6	14,708	6.4	830	10.5
Singapore General Hospital	70,195	16.2	41,143	18.0	1,516	19.2
National Heart Centre	9,877	2.3	119	0.1	185	2.3
National Cancer Centre	NA	NA	9,549	4.2	NA	NA
National Dental Centre	NA	NA	6,477	2.8	NA	NA
National Eye Centre	NA	NA	26,815	11.7	NA	NA
Total SHS	186,452	43.0	116,909	51.1	3,328	42.2
Parkway Health						
East Shore Hospital	5,992 ⁴	1.4			123 ⁵	1.6
Gleneagles Hospital	18,513 ⁴	4.3			380 ⁵	4.8
Mt. Elizabeth Hospital	24,602 ⁴	5.7			505 ⁵	6.4
Total Parkway	49,107⁶	11.3	30,866⁶	13.5	1,008	12.8
Unaffiliated						
Mt. Alvernia Hospital	20,537 ⁷	4.7			303 ⁸	3.8
Raffles Hospital	23,935 ⁷	5.5			380 ⁹	4.8
Thomson Medical Centre	22,032 ¹⁰	5.1			190 ¹¹	2.4
TOTALS	490,077	100.0	228,706	100.0	7,881	100.0
C₄		56.1				60.6
HHI by individual hospitals:		1,055				1,142
HHI treating groups as integrated entities:		2,976				3,140

Notes:

1. Figures are for FY2007, National Healthcare Group (2008, p. 108)
2. Figures are for FY2005, SingHealth (2009) "About Us: Fast Facts,"
3. Figures are for 2008 and they include inpatient discharges, Department of Statistics, Singapore (2009, p. 97) Tables 16.1 and 16.2.
4. The hospital admissions data for the Parkway Health group of hospitals were determined by allocating Parkway's total admissions in proportion to the hospitals' beds.
5. Parkway Health Group (2009b) "Global Presence,"
6. Figures are for FY2007, Parkway Health Group (2009a)
7. The hospital admissions data for Mount Alvernia and Raffles were estimated from a regression of admissions on beds (including the combined Parkway data): Admissions = 7,168.8 + 44.12*Beds + e, r² = 86%.
8. Mount Alvernia Hospital (2005), "At a Glance"
9. Raffles Medical Group (2009), "Corporate Fact Sheet,"
10. Figure is for FY 2008, Thomson Medical Centre Limited (2008a)
11. Thomson Medical Centre (2009)

TABLE 2
 Characteristics of the 17 Singapore Hospitals Catering to International Patients

Hospitals	IPC	IRA	JCI	Advertised Specialties
National Healthcare Group:				
National University Hospital	Yes	Yes ¹	2004	Heart, Cancer, Eye, Liver transplants, Orthopedics, Pediatrics, Gastroenterology, OB/GYN
Alexandra Hospital	Yes	Yes ¹	2005	Dental, Diabetes Centre, Geriatric Centre, Sports Medicine
Tan Tock Seng Hospital	Yes	Yes ¹	2005	Emergency care
Johns Hopkins Singapore IMC	Yes	No	2004	Cancer
Singapore Health Services:				
Changi General Hospital	Yes	Yes ²	2005	Serving the needs of Singapore's East
KK Women's and Children's	Yes	Yes ²	2005	OB/GYN, Pediatrics
National Cancer Centre	Yes	Yes ²	No	Cancer
National Dental Centre	Yes	Yes ²	No	Dental
National Heart Centre	Yes	Yes ²	2005	Heart
Singapore General Hospital	Yes	Yes ²	2005	Heart, Plastic surgery and burns, Kidney, Nuclear medicine
National Eye Centre	Yes	Yes ²	No	Eye
Parkway Health				
East Shore Hospital	Yes	Yes ³	2007	OB/GYN, Pediatrics
Gleneagles Hospital	Yes	Yes ³	2006	Cosmetic surgery
Mt. Elizabeth Hospital	Yes	Yes ³	2006	Heart, Neurosurgery
Unaffiliated hospitals				
Mt. Alvernia Hospital	Yes	No	No	Brain, Heart, Sports medicine
Raffles Hospital	Yes	Yes	2008	OB/GYN, Heart, Cancer, Orthopedics, Eye, Traditional Chinese Medicine
Thomson Medical Centre	Yes	No	No	IVF, OB/GYN, Pediatrics

Notes:

¹Operated jointly by the National Healthcare Group

²Operated jointly by Singapore Health Services

³Operated jointly by the parent company, Parkway Health

IPC -- Operates an international patient center

IRA -- Operates an international referral agencies

JCI -- Has earned Joint Commission International accreditation (first year)

TABLE 3
Median Bill Sizes (S\$) by Procedure in Singapore Hospitals
(March 1, 2008 to Feb. 28, 2009)

	Breast Lump Removal	Cataract Surgery	Colono- scopy	Delivery: Normal	Delivery: Caesarian	Gastro- scopy	Knee Replacement
<u>Public hospitals</u>							
Alexandra Hospital	n.a.	3,420	883	n.a.	n.a.	627	n.a.
Changi General Hospital	1,675	2,931	935	n.a.	n.a.	497	n.a.
KK Women's & Children's	2,495	n.a.	1,044	3,287	5,559	n.a.	n.a.
National Cancer Centre	2,007	n.a.	1,143	n.a.	n.a.	436	n.a.
National University Hospital	1,461	3,774	987	3,783	5,548	444	16,964
Singapore General Hospital	1,599	n.a.	1,278	2,697	5,574	517	15,817
National Eye Centre	n.a.	2,968	n.a.	n.a.	n.a.	n.a.	n.a.
Tan Tock Seng Hospital	1,619	2,832	926	n.a.	n.a.	436	n.a.
Average of median fees	1,809	3,185	1,028	3,256	5,560	493	16,390
<u>Private, not-for-profit hospital</u>							
Mt. Alvernia Hospital	2,872	3,315	1,175	4,271	6,416	701	n.a.
<u>Private, for-profit hospitals:</u>							
East Shore Hospital	n.a.	3,524	1,119	3,339	6,170	679	n.a.
Gleneagles Hospital	3,694	4,185	1,320	4,968	8,103	731	n.a.
Mt. Elizabeth Hospital	3,742	3,614	n.a.	5,125	8,122	n.a.	25,431
Raffles Hospital	n.a.	n.a.	1,269	4,547	7,162	834	n.a.
Thomson Medical Centre	n.a.	n.a.	n.a.	4,161	6,267	n.a.	n.a.
Average of median fees	3,718	3,774	1,236	4,428	7,165	798	25,431
Test of H ₀ : public - for profit = 0							
Student's t ¹	-12.10	-2.09	-2.28	-2.42	-3.79	-4.78	-9.10
p-value (left tailed)	0.00003	0.04086	0.02595	0.02593	0.00967	0.00101	0.03483

Notes:

1. All t tests, except the ones reported for breast lump removal and delivery by Caesarian section, assume equal variances. For breast lump removal and Caesarian, the F tests of equal variances had p-values of 0.0674 and 0.00019, respectively. All other F tests had p-values > 0.35, except for knee replacement for which the p-value could not be computed due to the small sample sizes.

Source: Ministry of Health-Singapore (2009c) <http://www.moh.gov.sg/mohcorp/billsizes.aspx>

TABLE 4
Surgical Outcomes: Cataract Surgery, 2004
(Phacoemulsification and ECCE, combined)

Hospital¹	Eyes	Success Rate	Safety Rate²
SNEC	10,013	98.53	97.92
SNEC (Changi)	1,519	95.98	98.54
TEI (TTSH)	4,575	98.47	99.48
JTES	203	99.49	100.00
US		93	n.a.
UK		92	96

Notes:

1. JTES is Jerry Tan Eye Surgery, a private clinic. SNEC is the Singapore National Eye Centre, part of Singapore Health Services. SNEC Changi is the SNEC's Changi area clinic. TEI (TTSH) is The Eye Institute, located at Tan Tock Seng Hospital. The TEI is part of the National Healthcare Group.

2. In the cataract surgery study (Ganesan 2006), the safety rate refers to the percentage of surgeries that had no unexpected consequences from the surgery.

Source: Ganesan, Ganga, (2006) *Cataract Surgery: Volumes, Costs and Outcomes* Ministry of Health Information Paper: 2006 number 12.

http://www.moh.gov.sg/mohcorp/uploadedFiles/Publications/Information_Papers/2006/OP_on_Cataract.pdf

TABLE 5
Surgical Outcomes: Coronary Artery Bypass Grafts, 2001-2005

Hospital¹	<i>Low-Risk Patients</i>			<i>Medium-Risk Patients</i>			<i>High-Risk Patients</i>		
	Number Patients	Safety Rate²	Exp.³	Number Patients	Safety Rate²	Exp.³	Number Patients	Safety Rate²	Exp.³
NHC	699	99.9	98.8	1,242	99.4	96.0	959	95.1	91.7
NUH	475	99.4	98.8	712	97.1	96.1	582	92.4	91.8

Country/State averages	Safety Rate²
Singapore (2001-2005)	97.4
UK (2003)	98.0
California, USA (2003-2004)	96.9
New York State, USA (2004)	97.9
Victoria, Australia (2001-2005)	98.0

Notes:

1. NHC is National Heart Center is part of Singapore Health Services. NUH is the National University Hospital, part of the National Healthcare Group.

2. In the CABG study, Yong (2008) reported mortality rates. Safety rates are reported here to be more consistent with the data in Table 4. The safety rates were calculated as 100% minus Yong's mortality rates.

3. Yong (2008) used the EuroSCORE to find the expected mortality rates. The EuroSCORE system is based on logistic regressions of several thousand Europeans' mortality status after heart surgery. It results in a patient risk score and an estimated mortality rate. The risk scores were used to classify patients as low risk, medium risk, or high risk.

Source: Yong, Lee Heow (2007) *Heart Surgeries at Singapore Public Hospitals, 2001-2005* Ministry of Health Occasional Paper: 2007 number 24.

[http://www.moh.gov.sg/mohcorp/uploadedFiles/Publications/Information_Papers/2007/MOH%20Info%20Paper_Cardiac%20Surgeries.pdf]

TABLE 6
Projected Medical Tourism Revenues for Selected Asian Countries

		Singapore	India	Malaysia	Thailand
2006	Estimated no. of medical tourists (in 1,000s)	360 ¹	175	150	1,000
2006	Estimates of actual MT revenues (in US\$)	900	333	400	803
2012	Governments' target revenues (in US\$)	3,000	1,555 ²	775 ²	1,200 ³
2006-2012	Planned annual revenue growth	27%	36%	14%	22%

Notes:

1. Mitra reported the number of Singapore's MT tourists as 350,000 to 370,000.
2. Mitra gave a range for these figures. We report the geometric mean of his minima and maxima.
3. Thailand's government target was for the year 2008.

Source: Mitra (2007) 'The Way to Go', Frost and Sullivan Market Insight, 5 October.
<http://www.frost.com/prod/servlet/market-insight-print.pag?docid=108452141>.