Hospital Industry

Sri Lanka

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Our report on the **Hospital Industry** intends to provide investors with a basic understanding of the industry, in order to assist them in their decision-making. The report provides our investment thesis, a discussion of the key attributes and economics of the industry.

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Overview

Investment Thesis

Demand for hospital care has increased, primarily driven by shifts in disease patterns.

Demand for healthcare has increased over the past five years with hospital visits increasing by 3.2% on average. This growth is driven by a multitude of factors, among which the change in disease patterns, change in health seeking behaviour life styles and change in the environement take center stage.

Shift in demographics and the increased tendency to obtain healthcare will increase the demand for health care in the future.

The shift in demographics is the main driver of the shift in disease patterns with diseases impacting the old age showing marked increases. However, the current demand is dominated by diseases affecting the 16-50 age group. The shift in disease patterns along with the change in the health seeking behaviour will be the key drivers of the increasing demand for healthcare. Changes in life styles and the environment have also accelerated the growth of many diseases. Whilst the above factors will drive demand growth in the long-term, seasonal effects such as weather will shift demand for particular types of diseases in the short term.

Expenditure on health will increase in line with the increase in demand.

With increasing demand, the expenditure incurred on healthcare will also increase. Projections point expenditure to increase from 4.2% of GDP recorded in 2005 to 4.8% by 2015, 5.3% by 2025 and is expected to reach 6-8% with the stabilization of the population.

The state sector has failed to keep up with the change in demand.

The state/public sector accounts for the bulk of the hospital and healthcare infrastructure in the country. Although demand has increased rapidly over the past few years, it has failed to keep up with this demand, both in terms of quantity and quality.

Private sector popularity via meeting the 'consumers' need.

The private sector has grown to capitalize on this gap, especially in the quality of care dimension. Demands of the consumer for non-medical aspects of the care delivery process have been met by the private sector players.

Major players are multi-speciality hospitals and function as hospital-lab combinations.

Majority of the major private sector hospitals operates as multi-speciality hospitals. Another defining characteristic is the fact that these players combine the businesses of hospital services and diagnostic services, hence are not standalone hospital operators. Financial performance of the hospitals are heavily influenced by the diagnostic services business.

Shortages in bed capacity present the private sector players with opportunity for growth.

Whilst gaps in quality have presented the private sector operators with growth opportunities, shortages in beds will also present avenues for growth. Based on our estimates there is a shortage of around 1,341 beds in general. However, the greatest opportunity for growth lie in key specialities, such as cardiology.

Returns have been low but signs of improvements can be seen.

Although the private sector has experienced growth, this has been accompanied by low returns on capital. In most of the cases the returns generated were not sufficient to cover the cost of funds employed in the business. However the sector shows signs of improvement which have been driven by the efficient use of assets.

Low margins and low efficiency in asset utilization have dragged down returns.

The reason for the low returns could be attributed to low margins that are earned on services provided and the low efficiency in asset utilizations. Given the industry dynamics we believe improvement in returns would primarily come from increases in efficiency levels.

Low margins earned on services can be attributed to the doctor's dominance in the industry.

The low margins earned on services can be attributed to the high bargaining power of doctors in the industry. Their dominance enables them to absorb approximately 45-55% of the charges made for surgical interventions and approximately 15-20% of the charges made for medicinal treatments, leaving only a small portion to cover the hospitals costs.

Improper pricing has also contributed to low returns on capital.

Another reason for the low margins on services is related to issues with pricing. The underpricing of services and unwillingness of hosptial operators to increase prices at the rate of inflation or above have a negative impact on margins.

Improvements in occupancy levels drove the increase in efficiency.

Increase in demand for private hospital care services increased the occupancy levels of the hospitals to 90-100%. This facilitated the increase in efficiency in asset utilization, driving improvement in returns.

Margins could be improved via changes in operating model and product portfolio.

Shifiting to an operating model that is based on a resident specialists/doctors model would enable improvements in margins. However, considering the high bargaining power of doctors, such a shift would be costly and difficult to implement. An alternative would be to add and improve contribution of ancillary services to the product portfolio that yield high margins.

Diagnostics is a key driver of the strong performance posted by Asiri and Durdans.

Diagnostics is the strongest performer in the ancillary service product portfolio. It has been a key driver of high returns posted by the top performing hospitals in the sector, Asiri and Durdans. We believe that given the strong growth in the

market, high margins and scalability of the business present hospital operators with the best path to improved returns on capital.

Efficiency can be improved via strict implementation of the selected operating model.

Opportunity to improve efficiency levels lies in reducing the idle time of assets used and selecting an operating model and sticking to it. Implementing an information system and changing the structure and layout of hospitals will also enable the hopitals to improve its efficiency.

Our prescription for success, the winning strategy would entail a hospital being consumer centric.

We believe a hospital operator could earn a higher rate of return on capital and generate positive economic profits to its owners. Achieving this would require building a strong brand name, operating on a resident doctor model, focus on specialization, delivering of non-medical attributes of healthcare, greater use of information techonology, and investing in medical techonolgy that fits in with its overall philosophy of care delivery. Proactively introducing new treatment methods that are affordable can enable a hospital to become the price leader in the particular area as well.

Key Features of the Hospital Industry

Consumers are sophisticated and doctor centric

The local healthcare consumer can be considered to be sophisticated in comparison with other regions. The entire decision-making process relating to consumption of healthcare is based on the doctor they wish to be treated by, rather than the hospital they wish to get care from.

The industry is regulated. The level of regulation is expected to increase.

The government is in the process of increasing the level of regulation in the industry. The shift was marked by the introduction of the new act ‘Private Medical Institutions (Registration) Act, No.21 of 2006’ in July 2006. This act covers a wide range of areas not covered by the previous act.

Major players in the industry have clustered around the main state sector hospitals.

At present the majority of the key players in the industry have clustered around the largest hospitals in the state sector. This clustering is mainly attributed to the issue of attracting specialists/doctors to these hospitals.

Economics of the Private Hospital Industry

The industry is highly concentrated.

The private hospital industry is highly concentrated and is characterised by oligopolistic competition. Whilst interaction is based on price, the type and level of service, is the basis on which the players compete with each other.

Although demand for hospital care is inelastic, price increases have been cautious.

Pricing has primarily trailed the increase in salaries and wages. Hospitals have been rather cautious in increasing prices due to the structure of the industry, as well as the social nature of the service offered. However, the low elasticiy of demand point to more proactive increases in prices.

Increase in supply is limited due to shortages in HR and the scale of expansion required.

Increase in supply in the industry have come in large increments. Shortage in trained human resources such as nursing will be a factor that limits growth. Training and development of the required staff categories will have to be undertaken by the hospitals themselves.

Bargaining power of doctors and nurses are high.

The bargaining power of hospitals are extremely low against doctors. They exert a large influence in the industry. Although nurses also command a high bargaining power thay have not tended to exercise this to the detriment of the hospitals. The hosptials exercise a high bargaining power over other suppliers in the industry.

Although the level of rivalry and the threat of new entrants are low, we expect this to change.

The level of rivalry in the indsutry is low. However, we expect this to increase with the entrance of new players who have different operating styles and strategies. Although the threat of entry into the industry is low, we believe the recent growth and attractive demographics will increase the level of interest in the sector.

Investment Thesis

STRONG GROWTH, WITH IMPROVING RETURNS

Demand for private health care increased rapidly over the past few years.

The demand for private hospital care has increased rapidly over the past few years due to both an increase in overall demand for healthcare as well as the poor performance of the public sector hospital care providers who account for bulk of the hospital care infrastructure in the country.

The growth has been accompanied with low returns, primarily due to the high bargaining power the doctors command in the industry.

However the returns earned by the private sector hospitals have remained low in general and most often lagged behind the cost of funds employed, due to the low profits earned on the services performed and the low level of efficiency. We believe that the low profitability of the private sector hospitals is mainly due to the high level of bargaining power commanded by the doctors, whilst low efficiencies could be attributed to lack of a clear strategy, well-planned structures and proper information systems.

Opportunities to increase returns via improved margins and efficiency exist.

Opportunities to increase both profitability and efficiency exist. However, implementing such measures will require a large and sometimes costly changes to the hospitals operating style and changes to its layout and systems.

Demand for healthcare has increased

Total hospital visits and per capita hospital visits increased by 3.2% and 2.4% respectively.

The demand for healthcare as measured by in-patients and out-patient visits recorded an average growth of 3.2% over the past five years. The increased demand for healthcare is also reflected by the increase in per capita hospital visits from 4.72 to 5.20 over the same period.

Change in the disease pattern triggered by the demographic shift and the change in health seeking behaviour are the major drivers of demand for healthcare.

The changing disease patterns in the country triggered by the aging population and the change in health seeking behaviour, have been the major drivers of the increasing demand for healthcare in the country and would continue to drive the demand into the future. Other factors such as changing lifestyle and changes in the environment will also contribute to the increase in demand.

Table: 1 Demand for Healthcare

	2002	2003	2004*	2005*	2006*	CAGR
	'000	'000	'000	'000	'000	%
Inpatients	4,179	4,244	4,313	4,375	4,437	1.5
Outpatients	84,938	86,976	90,073	93,326	96,744	3.3
Total demand	**89,117**	**91,219**	**94,385**	**97,700**	**101,181**	**3.2**
Population	**18,878**	**19,022**	**19,168**	**19,315**	**19,463**	**0.8**
Per capita hospital visits	**4.72**	**4.80**	**4.92**	**5.06**	**5.20**	**2.4**

*Based on estimates of JBS Research and Institute for Health Policy

Source: Annual Health Bulletin 2003, Institute for Health Policy (http://www.ihp.lk/) and JBS Research

Disease patterns are changing

The prevalence of non-communicable diseases has increased with the change in the demographic profile.

The aging population has triggered an epidemiological transition with non-communicable diseases such as cancer, diabetes, circulatory and genitourinary complications gaining increasing prominence whilst there is a decrease in the prevalence of communicable diseases such as Malaria, Diarrhoea, Whooping Cough, Measles, Polio etc. The increased prevalence of non-communicable diseases will increase the cost of care provision since a cure would require invasive and complicated procedures requiring longer hospital stay.

The ageing population will have a large impact on the disease pattern

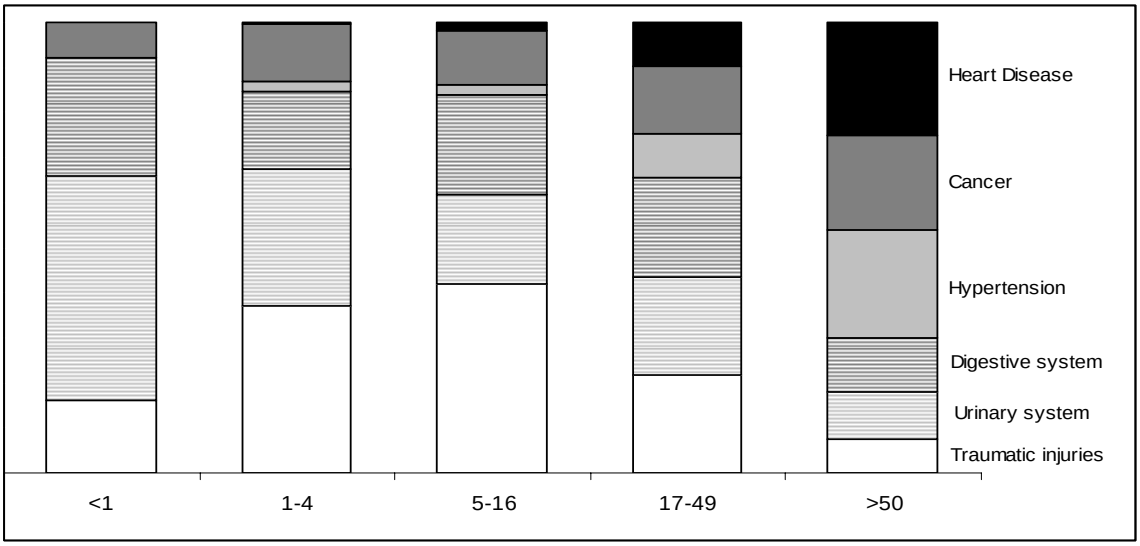
The large population in the 15-55 age group and the increase in the elderly population are the main characteristics of the demographics.

The present demographic structure is characterised by the large population in the 16-50 age group and the increase in the elderly population. The increase in the elderly population poses the greatest challenge to the health system in the country, since it was mainly set up focusing on diseases that affected the population in age groups of below 15 and 16-50.

An individual's need for health care will change with his/her age.

Demographics is the main factor shaping the demand for healthcare, having implications on the type as well as the level of demand for healthcare. The need for healthcare is at its highest at birth and gradually declines as an individual approaches the age of 15. Between the ages of 16 to 50 the need for healthcare remains relatively low but rapidly increases upon reaching the age of 51 and above.

Figure 1: Change in disease pattern with change in age profile



Source: JBS Research

The share of the elderly population increased from 9.5% in 1997 to 13.4% in 2006.

At present 63.0% of the population is in the age group of 15-60, which is the highest recorded to date. It is expected that the contribution of this age group to the size of the population would remain relatively stable within 5-10 years. However Sri Lanka has moved into the third phase of the demographic transition which is characterised by old age, increased life expectancy and low population growth. We have the fastest ageing population in the region. As the population in the 15-60 age group grows old the population above 51 years will increase. In 1997 the population above 60 accounted for 6.6% of the total population and

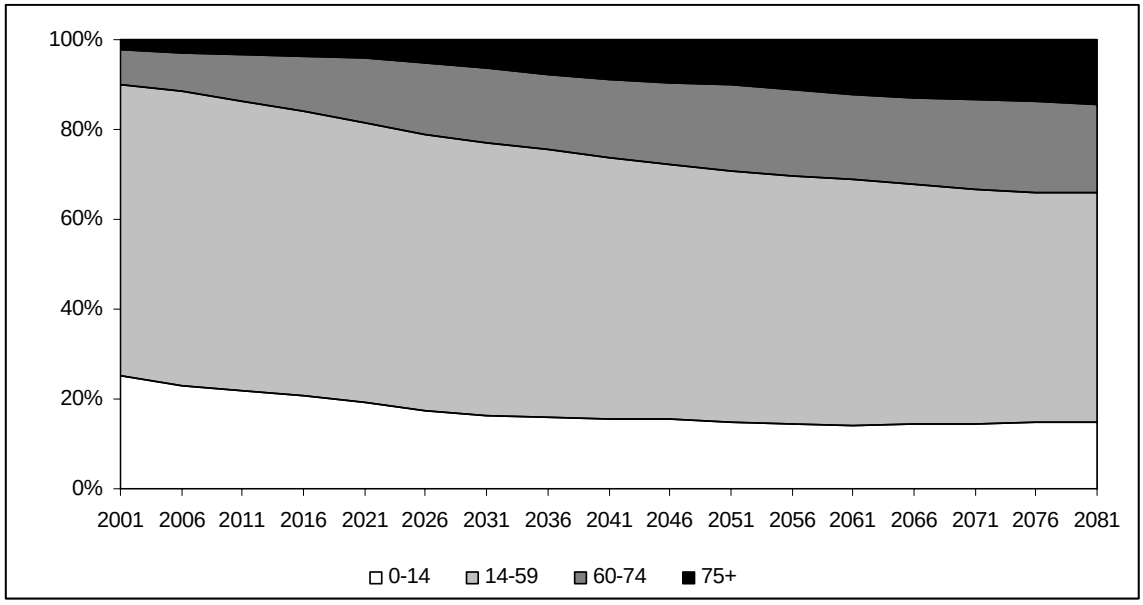
increased to 9.4% in 2006. Projections made by Prof. Indralal De Silva point to the elderly population being 15.8% and 18.5% in 2016 and 2021 respectively.

Table 2: Age profile

Age Group	Absolute			Relative			Growth	
	1997	2006	2016E	1997	2006	2016E	2006	2016E
0-14	6,531	5,297	4,292	35.2%	26.6%	20.8%	**-18.9%**	**-19.0%**
15-24	3,911	3,768	2,887	21.1%	18.9%	14.0%	**-3.7%**	**-23.4%**
25-49	5,682	7,081	7,493	30.6%	35.6%	36.3%	**24.6%**	**5.8%**
50-59	1,202	1,879	2,705	6.5%	9.4%	13.1%	**56.3%**	**44.0%**
60-74	966	1,433	2,513	5.2%	7.2%	12.2%	**48.3%**	**75.4%**
75 & over	260	428	739	1.4%	2.2%	3.6%	**64.6%**	**72.6%**
	18,552	**19,886**	**20,629**				**7.2%**	**3.7%**

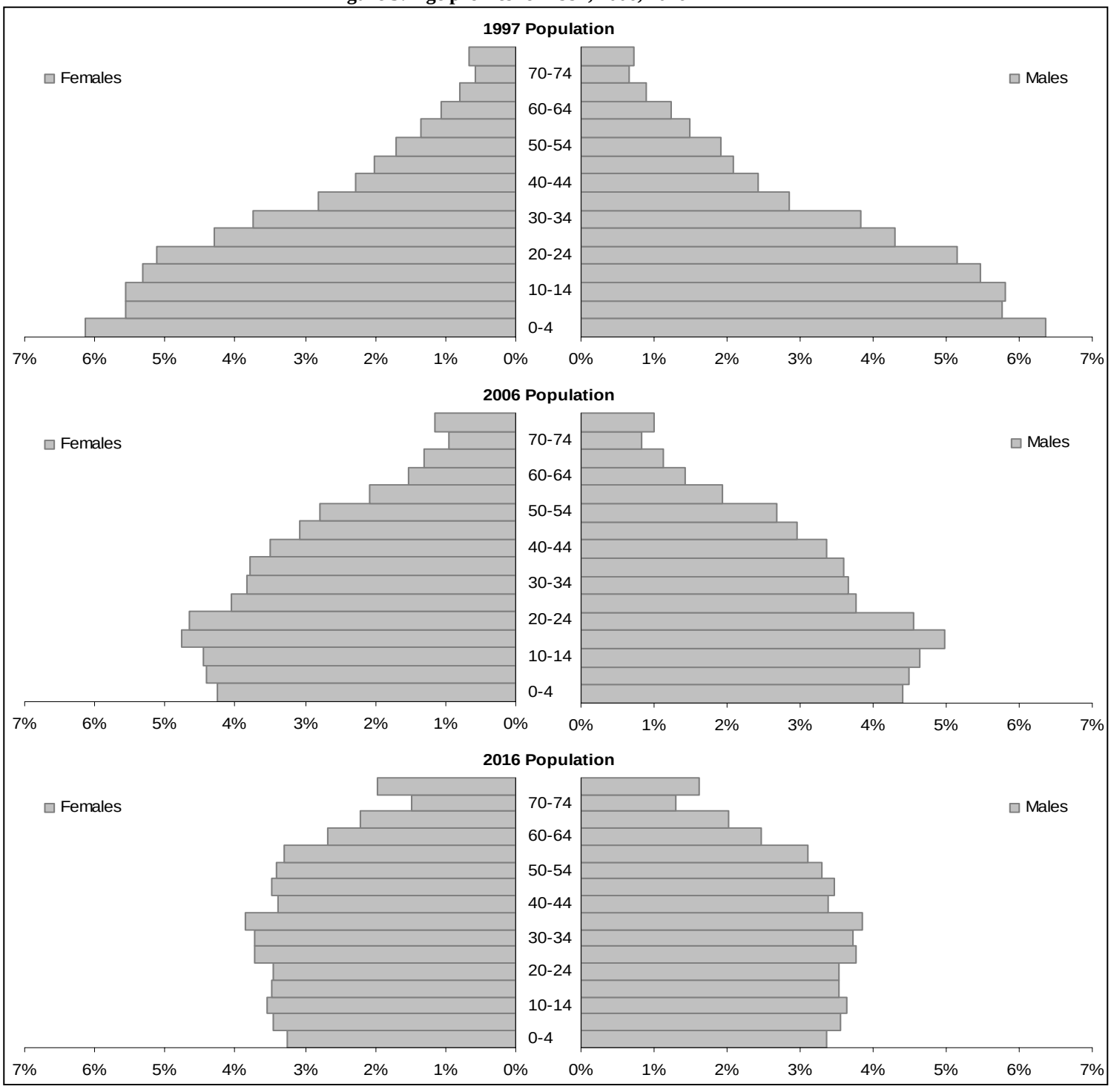
Source: Central Bank of Sri Lanka, Economic and Social Statistics of Sri Lanka 2007 and Prof. Indralal De Silva, Beyond Twenty Million: Projecting the population of Sri Lanka 2001-2081

Figure 2: Projected change in the age structure of the country



Source: Prof. Indralal De Silva, Beyond Twenty Million: Projecting the population of Sri Lanka 2001-2081 and JBS Research

Figure 3: Age profiles for 1997, 2006, 2016



Source: JBS Research, Central Bank of Sri Lanka and Prof. Indralal De Silva, Beyond Twenty Million: Projecting the population of Sri Lanka 2001-2081

Diseases which affect the elderly population, that is, heart related illnesses, cancer etc. has shown a marked increase.

The prevalence of diseases and conditions that primarily affect the elderly population has shown an increase over the past years. These are primarily non-communicable diseases. Table 3 sets out the diseases that have shown marked increases over the past decades. Growth in diseases and conditions relating to heart and circulatory system, digestive system and cancer dominate. Given the large growth experienced and that is expected in the elderly population as reflected in table 2 above, the increase in demand for such diseases will increase rapidly into the future.

Table 3: Diseases driven by the ageing population

Diseases	1980	1985	1990	1995	2000	2001	2002	2003	Growth	CAGR	
										23 Y	8 Y
Heart Disease	117.3	163.9	163.2	263.3	313.2	377.8	339.9	341.7	**191.3%**	**5.0%**	**2.9%**
Hypertenstion	182.7	186.8	200.7	326.7	428.3	514.1	462.5	444.1	**143.1%**	**4.1%**	**1.2%**
Nervous system	114.9	134.1	126.6	172.4	243.4	261.6	264.9	257.7	**124.3%**	**3.7%**	**1.9%**
Cancer	128.3	121.3	142.1	190.1	260.2	287.4	301.7	276.2	**115.3%**	**3.5%**	**5.5%**
Diseases of the eye	183.1	181.8	166.4	276.6	299.9	347.9	349.3	366.4	**100.1%**	**3.2%**	**4.1%**
Digestive system	687.5	613.0	528.8	739.2	1,056.7	1,147.4	1,128.4	1,095.6	**59.4%**	**2.1%**	**5.8%**
Genitourinary system	727.2	685.6	746.6	998.9	1,124.8	1,216.0	1,206.0	1,124.9	**54.7%**	**2.0%**	**1.7%**

* Cases per 100,000 population

Source: Annual Health Bulletin 2003

The following table sets outs diseases that primarily affected the elderly population.

Table 4: Disease pattern of old age group

Diseases and Conditions	% In the 50 > age group*	Total Morbidity+	Relative Size++
Ischaemic heart disease	75.3%	62,168	1.6%
Hypertensions	75.0%	88,522	2.3%
Diabetes	68.2%	43,935	1.1%
Other diseases relating to the circulatory system	66.3%	42,837	1.1%
Other heart diseases	64.5%	22,848	0.6%
Diseases of the eye	61.6%	70,544	1.8%
Cancer	55.3%	51,895	1.3%
Disorders of the musculoskeletal system	40.7%	113,022	2.9%

* Proportion affected with the particular disease in the age group

\+ Total number of individuals affected by the disease

\++ Total number of individual affected by the disease relative to total morbidity

Source: Annual Health Bulletin 2003

Health Ministry forecasts point to further increases in diseases associated with old age.

Based on above data and projections made by the Health Ministry we could expect an increase in the demand relating to the following conditions and diseases.

- Diseases relating to the Circulatory system –Heart diseases, hypertension, strokes and other related diseases
- Diseases relating to the respiratory system
- Diseases relating to the nervous system
- Diseases relating to the digestive system
- Disorders of the musculoskeletal system
- Diseases relating to the genitourinary system
- Diabetes
- Cancer

Demographic shift will result in a net increase in the demand for healthcare

The demographic shift would cause a net increase in demand for health care in the country.

Whilst a decrease in health care demand from the underage population is expected, we do not believe that this would be sufficient to offset the increase in demand that would come from the elderly population. Hence the demographic shift would cause a net increase in the demand for healthcare in the country. Based on the assumption that the per capita hospital visits will remain the same, we expect the net increase in indoor morbidity to be approximately 10.6% over the next five years as reflected in the following table.

Table 5: Increase in morbidity driven by demographic shift

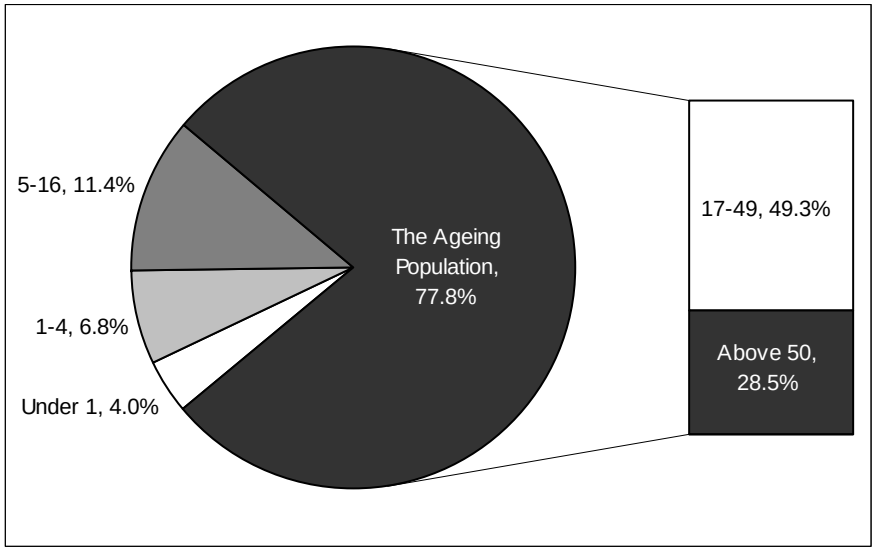
Age	Morbidity	Population (in millions)	Per capita morbidity	Population (in millions)			Morbidity			Change in morbidity		
	2003	2003		2006	2011(F)	2016(F)	2006	2011(F)	2016(F)	*2006*	*2011(F)*	*2016(F)*
0-4	422,548	1,663	0.25	1,508	1,458	1,367	383,063	370,485	347,338	*-9.3%*	*-12.3%*	*-17.8%*
5-16	446,023	4,592	0.10	3,967	3,848	3,794	385,329	373,694	368,451	*-13.6%*	*-16.2%*	*-17.4%*
17-49	1,928,852	9,378	0.21	9,601	9,600	9,512	1,974,786	1,974,539	1,956,394	*2.4%*	*2.4%*	*1.4%*
50-69	743,371	2,858	0.26	3,423	4,088	4,646	890,251	1,063,166	1,208,407	*19.8%*	*43.0%*	*62.6%*
70>	371,686	761	0.49	964	1,118	1,312	470,785	545,855	640,608	*26.7%*	*46.9%*	*72.4%*
	3,912,479	**19,252**	**0.20**	**19,463**	**20,111**	**20,630**	**4,104,214**	**4,327,740**	**4,521,198**	*4.9%*	*10.6%*	*15.6%*

Source: JBS Research and Annual Health Bulletin 2003

Per capita hospital visits of the elderly population are higher than that of other age groups.

As at 2003, 77.8% of the morbidity in the public sector hospitals was accounted for by the population above 17 and 37% of the morbidity in that age group came from the population aged above 50. Morbidity of the underage population only accounted for 22% of the total cases. On a per capita basis the number of admissions relating to the elderly population was much higher relative to those in the lower age groups. For example the per capita number of visits of the population above 70 was double as that of children aged below 4. It is the population in the 17-49 age group that would be ageing and subsequently joining the population above the age of 50. Hence the demand that is accounted for by the elderly population will increase over time.

Figure 4: Demand for health from the ageing population



Source: JBS Research, Annual Health Bulletin 2003

The total demand for healthcare will increase as the age structure changes.

The decrease in demand for heathcare from the population below 15 will be overcompensated by the increase in demand that will come from the elderly population.

Morbidity in 16 – 50 age group will account for bulk of the current demand

Bulk of the demand would be accounted for by the 15-55 age group. Traumatic injuries and conditions relating to reproductive health will dominate.

Traumatic injuries was the leading cause of illness and hospitalisation in the year 2002 and 2003 accounting for 14.2% and 16.7% of the indoor care provided by the government health institutions. It also accounted for 13.3% of the morbidity in 2003. This is a reflection of the large population in the 16-50 age group resulting in high level of activity and crowding, hence prone to more injury. Furthermore, another implication of this large age group is the increased need for care relating to reproductive health. In 2002 and 2003 conditions

related to gynaecology and obstetrics have accounted for 4.0% and 4.7% of the total admissions, 12.7% of the morbidity in 2003 and was the 6th leading cause of hospitalisation in both 2002 and 2003. The following table sets out the major diseases that impacted this age group.

Table 6: Disease pattern of middle age group

Diseases and Conditions	% In the 16-50 age group*	Total Morbidity+	Relative Size++
Traumatic injuries	53.3%	522,050	13.3%
Conditions relating to obstetrics and gyneacology	99.0%	497,523	12.7%
Disease relating to the digestive system	53.6%	195,157	5.0%
Disease of the urinary system	53.2%	126,726	3.2%
Disorders of the musculoskeletal system	48.1%	113,022	2.9%
Disease of the skin	44.2%	109,049	2.8%

* Proportion affected with the particular disease in the age group
+Total number of individuals affected by the disease
++ Total number of individual affected by the disease relative to total morbidity

Source: Annual Health Bulletin 2003

Change in health seeking behaviour will be another key factor driving increase in demand for healthcare

Tendency to obtain health care has increased.

The tendency of Sri Lankans to obtain healthcare has increased over time due to the increased level of consciousness of health related issues in the general population. This would be a main factor driving the increase in demand for medical care in the future.

Table 7: Per capita visits for the period 2000-2006

Year	Inpatients	Outpatients	Per Capita Visits	
			Inpatient	Outpatient
2000	4,155	93,073	0.22	5.04
2001	4,239	94,656	0.23	5.05
2002	4,179	101,394	0.22	5.33
2003	4,233	98,747	0.22	5.13
2004	4,312	101,662	0.22	5.22
2005	4,375	104,663	0.22	5.32
2006	4,430	107,753	0.22	5.42
Overall change			**-1.02%**	**7.48%**

Source: JBS Research, Annual Health Bulletin and Central Bank

Table 8: Trends in healthcare utilization rates according to Central Bank Consumer Finance Survey, 1978/79 – 2003/04

Visits per capita per annum	1978/79	1981/82	1986/87	1996/97	2003/04
Unadjusted*					
Outpatients	1.91	2.31	2.62	2.99	2.97
Inpatients	0.09	0.16	0.19	0.22	0.27
Average annual change					
Outpatients		9.97%	3.20%	1.33%	-0.10%
Inpatients		33.33%	4.39%	1.48%	2.97%
Adjusted**					
Outpatients	4.77	5.13	5.14	4.42	5.20
Inpatients	0.16	0.16	0.18	0.21	0.22
Average annual change					
Outpatients		3.70%	0.05%	-1.50%	2.35%
Inpatients		0.00%	2.99%	1.55%	0.67%

* Rates derived directly from the survey results

** Rates adjusted for possible reporting bias by cross-referencing to reliable administrative data of government health facilities

Adapted from: Ravi P. Rannan-Eliya. 2007. "Population Ageing and Health Expenditure: Sri Lanka 2001-2101". IHP Research Studies. IHP Research Studies Series Number 2. Colombo: Institute for Health Policy

Per capita outpatient visits are higher relative to countries with similar income, whilst per capita inpatient visits are on par with those of developed countries.

As reflected in the above tables, utilization of healthcare services has increased and it is expected that utilization rates would continue to increase into the future. Per capita outpatient visits in Sri Lanka are higher than that of other countries such as India, Indonesia and Egypt who have similar income levels but lower when compared with developed countries such as Japan and Hong Kong as discussed by Dr. Rannan-Eliya in *Population Ageing and Health Expenditure: Sri Lanka 2001-2101* (Table :9- 'Comparison of per capita hospital visits')**.** It is believed that the overburdening of the primary care services, especially in the public sector, to be the main factor driving the high per capita inpatient visits in the country. Increased burdens on the doctor may result in him/her admitting the patient when in doubt and hence result in an increase in inpatient numbers.

Increase in educational levels will raise awareness of diseases, importance of obtaining treatment and availability of the same.

Increased health consciousness could be attributed to the increased awareness and knowledge relating to health issues. The provision of free education and the emphasis of Sri Lanka's health policy on health education have contributed to the:

- Increased knowledge and awareness of diseases and treatments available
- Understanding the benefits of treatment and the increased trust in them

- Increased tendency of people consulting doctors and following their instructions

Table 9: Comparison of per capita hospital visits

Country	GNP per capita in $PPP	Year	Outpatient visits per capita	Inpatient visits per 100 capita
Developing economies				
Zambia	860	1995	1	-
Bangladesh	1,010	1996	1	2
Tamil Nadu, India	1,580	1997	3	14
Egypt	2,860	1996	4	3
Indonesia	3,310	1993	-	1
Thailand	6,700	1993	2	8
Malaysia	10,390	1993	-	4
Developed economies				
Taiwan, China	15,000	1998	15	12
United Kingdom	19,960	1993	6	13
Japan	23,420	1993/6	16	9
Hong Kong SAR, China	24,260	1996	10	13
USA	28,020	1991/6	6	12
Germany	21,110	1991	7	21

Adapted from: Ravi P. Rannan-Eliya. 2007. "Population Ageing and Health Expenditure: Sri Lanka 2001-2101". IHP Research Studies. IHP Research Studies Series Number 2. Colombo: Institute for Health Policy

Outpatient per capita visits are expected to increase to levels seen in developed countries whilst per capita inpatient visits are expected to remain stagnant.

Projections made by Dr. Rannan-Eliya, point to an increase in per capita outpatient visits, as income levels improve to those found in developed countries. Further inpatient utilization rates is expected to remain constant overtime given the fact that inpatient visits are at present equal to those found in developed countries.

Changing life styles and environmental issues will also drive demand for healthcare

Changes in the lifestyle and environment have contributed to the increase of disease occurrence.

Changes in lifestyles, which have led to unhealthy diets, reduced physical activity, stress, urbanization and increased pollution, have also contributed to the increase in diseases, and could be expected to gain pace over time if proper preventive measures are not implemented accordingly. For example, a study published by the *Journal of American Medical Association* pointed out that the South Asians are at a greater risk of heart attack at a younger age than in other regions. This is attributed to the leisure time, physical activity and daily intake

of fruits and vegetables being markedly lower than other countries as well as the regular intake of alcohol.

An increase in the prevalence of life style diseases is seen, with diabetes dominating.

Increase in the prevalence of disease such as Diabetes, Cancer, Asthma and Cardiovascular disease and other Respiratory diseases is indicative of the increase in lifestyle associated health problems. Among them diabetes has shown a marked increase, recording a growth of 6% and Diabetes accounted for 1.1% of the total morbidity in government institution in 2003 whilst Heart Diseases recorded a growth of 5.0% as indicated in the following table.

Table 10: Diseases driven by the life style changes

Diseases	1980	1985	1990	1995	2000	2001	2002	2003	Growth	CAGR	
										23 Y	8 Y
Diabetes	65.6	86.6	87.5	78.6	204.8	254.9	229.3	231.1	**252.3%**	**5.9%**	**16.7%**
Asthma	396.6	395	554.7	779.3	894.8	1033.3	29.6	921.4	**132.3%**	**3.9%**	**2.4%**

*Cases per 100,000 population

Source: Annual Health Bulletin 2003

Weather patterns will impact on the prevalence of disease, tilting demand towards a particular disease during certain periods of the year

Disease patterns in the short term will be primarily affected by weather patterns.

There is a seasonal element to the demand for healthcare, which is primarily driven by the weather patterns. For example, the prevalence of Dengue Fever, a mosquito borne infection, increases during the rainy seasons, as this is a favourable environment for the breeding of the mosquito vector. Hence during this period the demand for hospital and healthcare increase rapidly. Another recent example is the spread of Chicken Gunya, another mosquito borne disease, which resulted in a sharp rise in hospital admissions. In December almost 90% of the patients in Apollo Hospital, Asiri Hospitals and other private hospitals were cases which were related to viral flu. In addition, hospital admissions also decrease during festive seasons, since patients prefer to stay home, even though they may be suffering from an ailment.

Increase in demand will increase the expenditure on healthcare in the country

Expenditure on health care has increased due to the increase in demand as discussed above.

The increase in demand for healthcare as discussed has resulted in the increase in expenditure on healthcare, and is expected to increase into the future. Projections point to the increase mainly being driven by the changes in the demographic structure and the increased willingness to obtain healthcare.

Table 11: National expenditure on health

	1990	1995	2000	2001	2002	2003	2004	2005
Total expenditure on healthcare*	11,992	23,933	47,512	53,828	61,519	69,767	86,281	98,896
National health expenditure on health as a % of GDP	3.73%	3.58%	3.78%	3.82%	3.89%	3.96%	4.25%	4.18%
Growth								
Year on year		21.0%	14.2%	13.3%	14.3%	13.4%	23.7%	14.6%
Annual average								
- 5Y								**15.8%**
- 10Y								**15.2%**
- 15Y								**15.1%**

**Rupees million*

Source: Institute for Health Policy (http://www.ihp.lk/) and JBS Research

As reflected by the above data, expenditure on health in the country has increased by 15% on average over the past few years.

National expenditure on health is set to increase. Main factors driving the increase are the change in health seeking behaviour and the demographic shift.

Projections made by Dr. Ravi P. Rannan-Eliya point to expenditure on healthcare to increase from 4.2% of GDP in 2005 to 4.8% by 2015, 5.3% by 2025 and is expected to reach 6-8% with the stabilization of the of population after 2030. Dr. Ranna-Eliya sites the following to be the main drivers of these cost increases.

- The change in health seeking behaviour: Increased tendency to obtain medical care is expected to increase health expenditure as a percentage of GDP by 0.23%-0.47% in 2025 & and 1.32%-3.44% in 2101.
- Change in the demographic structure: Increase in the elderly and female population is expected to increase health expenditure as a percentage of GDP by 0.4% in 2025 & and by 0.69%-0.81% in 2101. The expenditure on medical services by age group has been set out in the table 12. As reflected in the table the portion of the medical expenditure accounted for by the elderly population is expected to increase from 14.3% in 2001 to 26.0%, 37.5% and 44.4% in 2026, 2051 and 2101 respectively.

Table 12: Expenditure on health analysed by age groups

Age group	As a % of GDP				As a % of medical expenditure			
	2001	2025	2051	2101	2001	2025	2051	2101
75+	0.1%	0.2%	0.4%	1.2%	2.5%	4.5%	9.5%	19.0%
60-74	0.4%	0.9%	1.3%	1.6%	11.8%	21.5%	28.0%	25.4%
15-59	2.0%	2.4%	2.3%	2.7%	59.1%	57.3%	49.6%	42.9%
0-14	0.9%	0.7%	0.6%	0.8%	26.6%	16.7%	12.9%	12.7%
Total	**3.4%**	**4.2%**	**4.6%**	**6.3%**	**100%**	**100%**	**100%**	**100%**

Source: Ravi P. Rannan-Eliya. 2007. "Population Ageing and Health Expenditure: Sri Lanka 2001-2101". IHP Research Studies. IHP Research Studies Series Number 2. Colombo: Institute for Health Policy and JBS Research

- Other important cost drivers are the possible productivity improvements in the public sector and the increases in prices by the private sector healthcare providers.

The epidemiological shift will result in the increased expenditure towards non-communicable diseases such as cardiovascular disease and diabetes.

Projection of expenditure analysed by disease category reflects the epidemiological shift in the country with the increase in the prevalence of non communicable diseases and decrease in communicable diseases. As explained previously demand for diseases such as cardiovascular diseases, diseases relating to the respiratory systems are set to increase and the expenditure for these diseases are expected to increase in line with this growth. The following table sets out the diseases that are expected to have the highest growth.

Table 13: Increase in expenditure on medical services by disease category

Disease	2010	2015	2020	2025	2030	2035	2040	2045	2050
Cardiovascular	9.0%	9.8%	9.7%	7.0%	4.9%	6.2%	6.0%	6.8%	5.7%
Diabetes mellitus	6.3%	8.9%	9.6%	5.5%	3.0%	4.3%	4.8%	6.6%	5.4%
Musculoskeletal	7.0%	8.3%	7.7%	5.2%	4.0%	4.8%	4.9%	7.1%	6.1%
Nervous system disorders	4.9%	7.1%	6.4%	4.3%	3.5%	3.3%	3.2%	7.0%	6.5%
Endocrine and metabolic	7.9%	4.4%	3.8%	2.0%	1.2%	5.2%	5.6%	1.7%	-0.7%
Neoplasm	5.4%	4.3%	3.8%	4.0%	4.1%	2.9%	1.8%	3.4%	3.0%
Genitourinary	3.2%	3.0%	2.7%	1.3%	0.8%	2.3%	2.7%	3.8%	2.7%
Nutritional deficiencies	8.8%	3.8%	2.7%	1.0%	0.9%	7.6%	10.3%	4.0%	-0.4%
Chronic respiratory disease	3.9%	3.0%	2.7%	3.1%	3.4%	3.6%	3.3%	4.2%	3.4%
Skin diseases	0.6%	1.7%	2.4%	2.6%	1.5%	1.3%	1.1%	3.5%	3.6%
Benign neoplasm	2.0%	0.4%	2.2%	1.6%	-0.3%	1.4%	1.4%	1.4%	0.7%
Digestive system	1.2%	2.3%	2.2%	1.0%	0.8%	0.8%	0.9%	3.8%	3.5%
Injuries	1.8%	2.0%	2.1%	2.1%	2.3%	2.2%	2.0%	4.1%	3.8%
Mental disorders	2.7%	1.9%	1.6%	0.3%	-0.3%	1.1%	1.2%	1.7%	0.9%

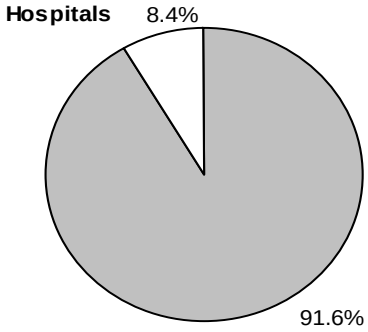
Source: Ravi P. Rannan-Eliya. 2007. "Population Ageing and Health Expenditure: Sri Lanka 2001-2101". IHP Research Studies. IHP Research Studies Series Number 2. Colombo: Institute for Health Policy and JBS Research

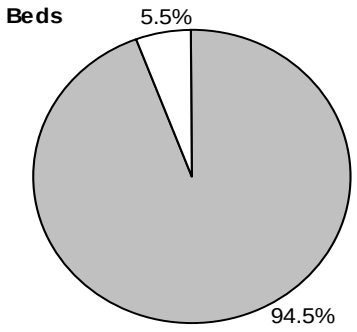
Supply has failed to keep up with the demand

The state sector, which contributes to bulk of the supply in the country, has failed to keep up with the demand both in terms quality and quantity.

The public sector accounts for bulk of the supply of healthcare services in the country (Figure 5). However it has failed to meet the demand made on it by a 'consumer of healthcare' and still continues to serve the 'patient', therefore leaving large gaps in quality. The state sector has also failed to meet the shift in demand from a quantitative perspective, with shortages seen in many key specialities in which an increase in demand has been experienced as discussed above. Further we believe there to be a shortage in bed capacity in the country in general.

Figure 5: Relative contribution to supply





	Public Sector		Private Sector	
	No's	%	No's	%
Hospitals	1,001	**91.6%**	92	**8.4%**
Beds	61,835	**94.5%**	3,629	**5.5%**

Public sector
Private sector

Source: Institute for Health Policy (http://www.ihp.lk/) and Annual Health Bulleting 2003

State sector has failed to meet the demand of the 'consumer'

The state sector lags far behind the private sector in terms of non-medical care delivery.

Hospitals operated by the public sector are notorious for the poor quality of service they provide**.** (Refer 'Appendix – 2: Industry Overview' for an analysis of the public sector supply). Doctors working in both the public and private sector were of the opinion that the public sector hospitals were on par, and sometimes surpassed the private sector in the delivery of clinical/medical services, but lagged far behind the private sector in the area of the provision of non-medical services. Increasing sophistication of the consumer has led to increased focus on the non-medical aspect of care delivery.

The shift from public sector towards private sector hospitals can be attributed to the following reasons, which were recorded by the respondents to a survey conducted.

- Lack of choice in-terms of the doctor they wish to get treatment from and time of consultation.

- Over-crowding
- Impolite staff and lack of personalised service
- Long waiting times and improperly maintained facilities
- Lack of essential facilities in certain hospitals such as drugs and diagnostics
- Disruptions due to various trade union actions

Key specialities lacked the required bed capacity

Change in disease patterns will increase the demand for selected specialities.

The state sector has also failed to keep up with the required bed capacities in several key specialties. Changes in the disease pattern discussed before have triggered an increase in the demand for hospital care in those specialities.

Given the expected increase in demand, beds allocated for specialities such as cardiology and cancer may not be sufficient.

The distribution of beds among the specialties in the public sector indicated that bulk of the bed capacity was highly concentrated towards paediatrics, gynaecology, medicine and general surgery. Such a concentration was, and continues to be, suitable to meet the demand of the population below the age of 55. However, given the increasing importance of the elderly population and the resultant increase in related diseases, we believe that areas such as cardiology, orthopaedics, eye and cancer lack the required bed capacity. Further, shortages could also be expected in gynaecology and obstetrics related areas as well.

Table 14: Distribution of total bed capacity in terms of speciality

Speciality	Beds	Morbidity	Beds per Patient
Cardiology	272	85,016	0.003
Cancer	870	51,895	0.017
Eye	891	70,544	0.013
Genitourinary	220	223,771	0.001
Skin	355	112,771	0.003
Obstetrics/Gynaecology	7,233	497,523	0.015

Source: Annual Health Bulletin 2003

Shortage in overall bed capacity exists

Given the current standard, the system is short of 1,200-1,500 beds.

We believe there to be a shortage in beds in the local health market. Based on the current standard of 34 beds per 10,000 individuals, we believe the shortage to be approximately 1,200 – 1,500 beds.

Table 15: Shortage in beds for 2007

Excess demand	
Population (Forecasted)	19,648
Number of beds as at 2006	65,464
Beds per 10,000 as at 2006	34
Total beds needed	66,805
Excess demand	**1,341**

Source: JBS Research

Sri Lanka's bed capacity was high relative to the region, but low relative to healthy countries.

The number of beds per 10,000 population, as at 2006, stood at approximately 34. In comparison to other countries in the region, Sri Lanka's bed capacity was high (Table 16). However, relative to countries which have high rankings in-terms of life expectancy, Sri Lanka ranked lower (Table 17).

Table 16: Life expectancy and bed capacity in the Asian region

Country	Beds per 10,000	Year	HALE*
Sri Lanka	34	2006	61.5
Singapore	28	2004	70.0
Malaysia	19	2003	63.5
India	7	2003	53.5
Pakistan	7	1998	53.0
Bangladesh	3	2001	54.0
Nepal	2	2001	51.5

H ealth **A** ctive **L** ife **E** xpectancy: The average number of years that a fit person of a given age can be expected to have before experiencing disability

Source: WHO and JBS Research

Table 17: Life expectancy and bed capacity of the healthiest nations

Country	Beds per 10,000	Year	HALE
Japan	129	2001	75.0
France	76	2003	72.0
Switzerland	59	2003	72.5
Greece	47	2000	71.0
Italy	41	2003	73.0
Australia	40	2003	72.5
Spain	37	2004	72.5
Sweden	30	2004	73.5

Healthy **A**ctive **L**ife **E**xpectancy: The average number of years that a fit person of a given age can be expected to have before experiencing disability

Source: WHO and JBS Research

Sri Lanka will have to increase the supply to match the healthiest nations, in moving towards a higher life expectancy.

The objective of any individual and country is to increase its life expectancy; hence we used the average bed capacity of the healthiest nations to derive the shortage in beds. The average life of these countries was around 73 and in moving towards this target Sri Lanka would also have to increase its supply in beds to a similar level found in such countries.

The need for more beds will be driven by the increase in population and the standard bed requirement.

This increase will be necessitated by both an increase in the population, as well as an increase in the standard bed requirement (beds per 10,000). As the country progresses towards an improved level of health, it is anticipated that the need for beds will increase further.

Table 18: Shortage in beds with increasing standards

Shortage in bed capacity given an increase in standards assuming population is constant				
Population (Forecast for 2007)				19,648
Number of beds as at 2006				65,464
Beds per 10,000	***35***	***36***	***38***	***40***
Total beds needed	68,769	70,734	74,664	78,594
Excess demand	**3,305**	**5,270**	**9,200**	**13,130**

Source: JBS Research

Private sector has grown to capitalize on the weaknesses of the public sector

The private hospital operators have capitalized on the poor quality of the public health system.

The failure of the public sector hospitals in meeting the changing demand has resulted in the consumer shying away from the public sector and opting for the private sector, despite the fact that care delivery is on par and provided free of charge. The private sector's contribution to healthcare has increased significantly over the past two decades, capitalizing primarily in the gap related to the quality of care dimension. Over the past five years the demand for private sector inpatient and outpatient care has increased at an average rate of 4.89% and 6.18% respectively as reflected in table 19. The number of consultation visits also increased at an average rate of 5.18% over the same period.

Table 19: Growth in demand for private sector

	2000	2001	2002	2003	2004	2005	CAGR
	000'	000'	000'	000'	000'	000'	5Y
Inpatients	140	147	147	157	170	177	**4.89%**
Outpatients	3,487	3,803	3,966	4,692	4,689	4,707	**6.18%**
Consultation patients	33,964	35,365	37,290	38,518	41,058	43,728	**5.18%**

Source: Institute for Health Policy (http://www.ihp.lk/) and JBS Research

The private sector accounts for 45% of the outpatients and 4% of inpatients.

The poor service, overcrowding at government facilities and growth in income levels have continued to fuel the growth in the sector. At present the private sector provides care for approximately 45% of the out-patients and 4% of the in-patients seeking care. Results of the Socio Economic Survey conducted in 2004 reflected the increased preference for the private sector in obtaining care, with the percentage opting for private healthcare increasing from 36.9% to 45.1% .

Table 20: Source of treatment

Source of Treatment	1996/07				2003/04 (b)			
	Urban	Rural	Estate	All Sectors	Urban	Rural	Estate	All Sectors
Private (Western)	40.7	36.7	28.4	**36.9**	56.5	44.1	31.4	**45.1**
Private (Ayurvedic)	4.9	7.9	1.1	**7.3**	4.2	5.2	2.2	**5.0**
Government (Western)	47.6	48.5	61.6	**48.9**	33.6	44.3	58.0	**43.6**
Government (Ayurvedic)	1.7	2.0	0.0	**1.9**	1.0	1.3	1.5	**1.2**
Other	1.2	1.5	5.3	**1.6**	1.1	1.6	2.2	**1.6**
No Medication	3.9	3.4	3.7	**3.5**	3.5	3.5	4.7	**3.5**
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: The Consumer Finances and Socio Economic Survey Report, 2003/04

The industry generated revenue of Rs. 9 billion, with total investment being Rs. 1.6 billion in 2005.

The private hospital industry generated revenue of Rs. 8.2 billion in 2005, whilst investment in the sector totalled Rs. 1.6 billion in the same year. 55.7% of the revenue was generated by inpatient treatments, whilst the balance was generated through outpatients and provision of diagnostic services, which accounted for 30.6% and 13.7% respectively. Majority of the revenue was generated by hospitals having a bed capacity of 100 and greater due high volumes they command and provision of diverse and complex medical care services which yields high revenues per patient.

Table 21: Revenue generated by the private hospital industry

	2003	2004	2005
Total industry revenue (Rupees 000')	5,300,000	6,760,000	8,250,000
Share of revenue generated by			
Hospitals with 100+ beds in Colombo	85.2%	83.2%	80.7%
Balance	14.8%	16.8%	19.3%
Revenue mix			
Inpatient care	52.1%	55.8%	55.7%
Outpatient care	34.0%	30.6%	30.6%
Diagnostic services	13.9%	13.6%	13.7%

Source: Institute for Health Policy (http://www.ihp.lk/) and JBS Research

The private hospital industry was composed of 92 hospitals as at December 2005 and had a capacity of 3,629 beds.

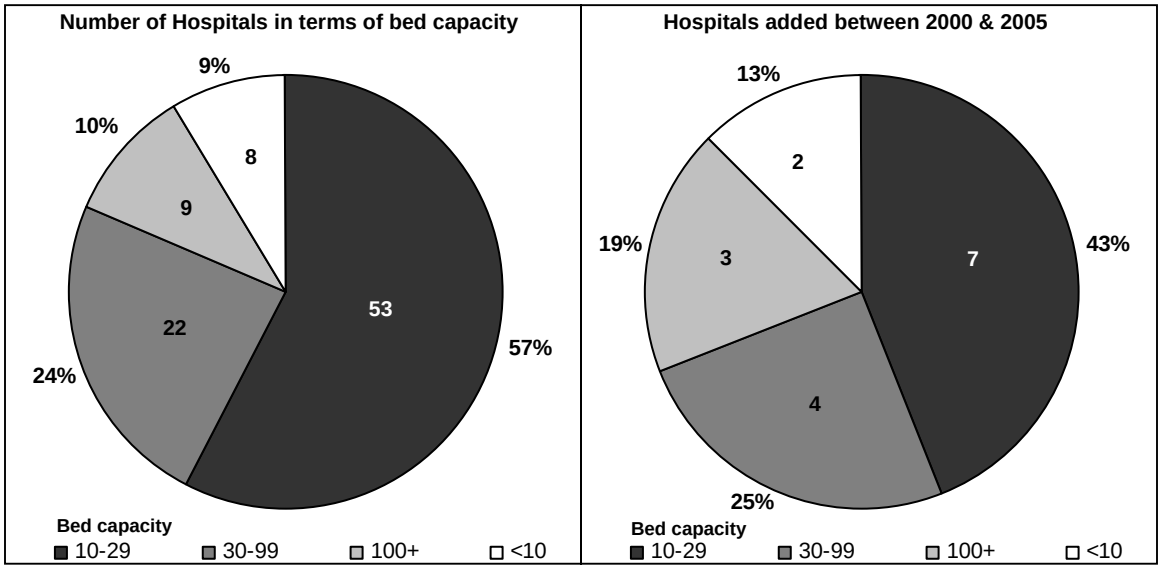
Table 22: Status of the private hospital industry

	1990	1995	2000	2001	2002	2003	2004	2005
Hospitals	49	60	76	81	81	83	89	92
Growth								
Year on Year		22.4%	26.7%	6.6%	0.0%	2.5%	7.2%	3.4%
Annual average								
-5								**3.9%**
-10								**8.9%**
-15								**13.4%**
Bed capacity	1,654	2,242	2,575	2,669	2,768	3,115	3,465	3,629
Growth								
Year on Year		35.6%	14.9%	3.7%	3.7%	12.5%	11.2%	4.7%
Annual average								
-5								**7.1%**
-10								**10.1%**
-15								**17.0%**

Source: Institute for Health Policy (http://www.ihp.lk/)

From the 92 hospitals, 9 have a capacity of 100+ beds, whilst majority of the hospitals have a bed capacity between 10 and 29. Within the period 2000- 2005 a total of 16 hospitals were added, including 3 hospitals with a 100+ bed capacity and 4 hospitals with a bed capacity of 30-99.

Figure 6: Hospitals and bed capacity



Source: Institute for Health Policy (http://www.ihp.lk/) and JBS Research

The private sector has been concentrated to the Western Province.

The private sector is mainly concentrated in the Western Province. The growth has also primarily been limited to this region. This could be attributed to the relatively high per capita income in the region as well as the concentration of many leading consultants in the country to the western province. Based on figures available as at 2002, 66.2% of the hospitals and 72.8% of the bed capacity was located in the region.

Table 23: Geographical distribution of private sector hospitals and beds

	2000		2001		2002		2003		2004		2005	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds
Western	43	1,709	45	1,742	44	1,801	44	2,099	46	2,356	46	2,415
Southern	9	238	9	225	8	211	8	211	8	223	8	240
Central	7	253	9	285	9	295	10	310	11	328	11	356
Northern	1	13	2	62	2	62	2	64	3	102	3	102
Eastern	2	44	2	44	3	64	3	67	4	79	5	101
North Western	8	215	8	207	8	207	8	220	8	223	9	249
North Central	-	-	-	-	-	-	-	-	1	14	1	16
Uva	3	54	3	54	3	47	4	63	5	71	5	77
Sabaragamuwa	3	50	3	50	4	81	4	81	3	69	3	73
Total	**76**	**2,575**	**81**	**2,669**	**81**	**2,768**	**83**	**3,115**	**89**	**3,465**	**91**	**3,629**

Source: Institute for Health Policy (http://www.ihp.lk/)

The multi speciality model has been the popular operating model in the private sector.

The major private sector players are essentially a combination of a hospital and a diagnostic service provider.

The large private hospitals mainly operate as multi speciality hospitals, focusing on a few key areas whilst also providing the basic care required in other specialties as well. Although the popular operating model is the multi-speciality model several new entrants to the industry have chosen to operate as single speciality (Nine Wells Hospital) and super speciality hospitals (Golden Key Eye and ENT Hospital). Another key characteristic of the major private sector operators is that they are not stand alone hospitals but are also major players in the diagnostic services market, as evident from the revenue generated from the hospitals as reflected in the data set out in table 21: 'Revenue generated by the private hospital industry'. Hence the private sector hospitals essentially are a combination of both hospitals and diagnostic service providers and not stand alone hospitals.

Rising income levels coupled with the shift in disease patterns will fuel growth for private sector hospital care

Increase in income levels will fuel the growth in the sector.

Income levels are directly correlated to the status of health in the country. Sri Lanka has been experiencing an economic growth of about 5-6% resulting in rising levels of income of the general population.

Increased prevalence of non-communicable diseases will result in health care taking on characteristics of a luxury good.

Rising levels of income makes healthcare affordable, gives wider access and choice relating to facilities, treatment types and medicine, hence increasing the demand for healthcare. Further income growth has also resulted in increased popularity of health insurance as discussed below. Health preservation measures tend to be considered luxury goods as non-communicable disease prevalence increase and a country moves into the third stage of the health transition. Therefore, we can expect demand for healthcare to increase significantly in the future with increase in income.

The private sector's share of health expenditure is increasing.

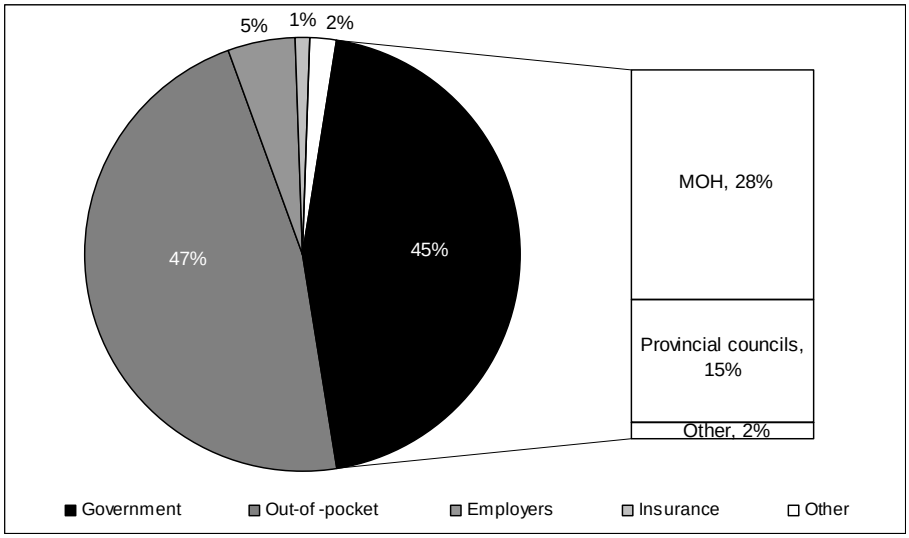
Although government accounts for the bulk of the supply of healthcare in the country, the private sector has continued to finance a large portion of the total health expenditure in the country. The increase in total expenditure on health and the growth in the private sector financing of the same is indicative of the growth the sector is experiencing. As at 2005, total non-governmental financing accounted for 55% of the total expenditure on health.

Table 24: Source of health expenditure financing

Source of finance	2000	2001	2002	2003	2004	2005
Private	52.6%	53.8%	56.4%	59.0%	53.5%	**55.0%**
Government	47.4%	46.2%	43.6%	41.0%	46.5%	**45.0%**
Expenditure as a % GDP	3.8%	3.9%	3.9%	3.9%	4.3%	**4.2%**

Source: Institute for Health Policy (http://www.ihp.lk/)

Figure 7: Source of health expenditure financing in 2005



Source: Institute for Health Policy (http://www.ihp.lk/)

Insurance has increased the affordability of private hospital care

Rising income levels and education levels have increased the popularity of health insurance.

The increase in income and education levels has increased the popularity of health and other related insurance products. Many private hospital operators have indicated that they have experienced an increase in consumers who have health insurance covers and have sighted this as another source of growth in revenue.

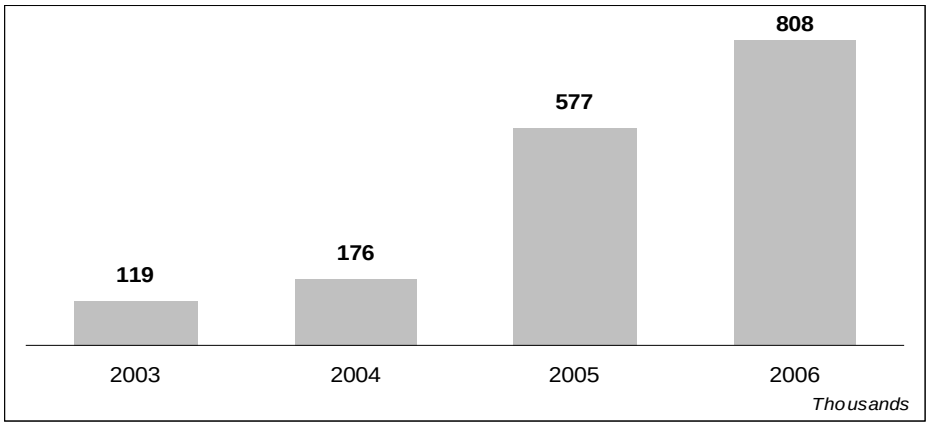
A cover worth Rs. 100,000 could be obtained for a premium of Rs. 7,500.

Use of health insurance increases the affordability and attractiveness of using private hospitals care. For a small sum of Rs. 7,500 a consumer can obtain a cover worth Rs.100,000 for a year. Most health insurance policies have been obtained via corporate insurance covers, rather than being directly obtained by individuals. The largest contributor to the growth in health policies have come from the corporate insurance covers.

Approximately 800,000-850,000 policies have been issued in 2006

We believe that there are approximately 800,000-850,000 policies outstanding as at December 2006. Ceylinco Insurance and Sri Lanka Insurance lead the market for health insurance.

Figure 8: Demand for health insurance



Source: JBS Research

Increase in capacity to spend for health care will make the sector more lucrative for the private sector in the future.

With rising income and increased use of insurance covers, the consumers' ability and willingness to pay a fee for improved access and better quality care will increase. Specialities such as Cardiology and Cancer require large investments. However, building hospitals to capitalize on such specialities could yield attractive returns, given the willingness to pay and the large volumes that could be expected.

Returns on capital low but improving

Returns earned by the private hospitals have not been sufficient to cover the cost of funds.

The growth in the private healthcare industry has not been associated with high returns (as reflected by the private hospitals that were listed, which accounted for 60% of industry revenues). Returns earned by majority of the hospitals were not sufficient to cover the cost of funds employed, generating negative economic profits.

Figure 9: Return on invested capital

Spread

	Durdans	Nawaloka	Asiri	Asha	Apollo	Asiri M
2002/03	2.8%	n/a	16.9%	3.5%	-15.7%	n/a
2003/04	-2.2%	-1.4%	9.8%	-1.4%	-17.5%	-13.6%
2004/05	-2.4%	-5.3%	3.7%	4.0%	-12.9%	-10.1%
2005/06	**4.0%**	**-7.7%**	**-4.2%**	**3.7%**	**-11.3%**	**-7.3%**
2006/07	**-3.1%**	**-8.7%**	**-7.8%**	**-3.8%**	**n/a**	**-5.8%**

Return on Invested Capital

	Durdans	Nawaloka	Asiri	Asha	Apollo	Asiri M
2002/03	16.0%	n/a	30.2%	16.6%	-2.6%	n/a
2003/04	14.5%	14.9%	26.1%	14.9%	-1.3%	2.6%
2004/05	15.6%	12.9%	22.0%	22.0%	4.7%	7.1%
2005/06	**23.3%**	**11.4%**	**15.3%**	**23.2%**	**7.9%**	**12.0%**
2006/07	**20.0%**	**14.5%**	**15.4%**	**19.8%**	**n/a**	**17.5%**

Cost of Capital

	Durdans	Nawaloka	Asiri	Asha	Apollo	Asiri M
2002/03	13.2%	n/a	13.3%	13.1%	13.1%	n/a
2003/04	16.8%	16.2%	16.4%	16.4%	16.2%	16.2%
2004/05	18.0%	18.2%	18.3%	18.0%	17.6%	17.2%
2005/06	**19.3%**	**19.2%**	**19.5%**	**19.5%**	**19.2%**	**19.2%**
2006/07	**23.1%**	**23.1%**	**23.1%**	**23.6%**	**n/a**	**23.3%**

Source: JBS Research

Historically, Asiri Hospital was the strongest performer in the segment, with Asha Central and Durdans following. In the financial year 2005/06 and 2006/07, Durdans led the pack followed by Asha Central.

Asiri Hospitals was the strongest performer in the sector, but increased investments from 2003 onwards resulted in a reduction in returns earned. The strong returns earned by the hospital can be attributed to its dominance in the diagnostics market, which yields extraordinary high returns, as explained below. Asha Central ranked second in performance, but benefited from the tax holiday and low level of investments. Durdans recorded a strong improvement in the financial year 2005/06 and 2006/07, primarily due to the strong performance in diagnostics, as well as their subsidiary, The Durdans Heart Centre. Apollo and Asiri Medical showed improvements in their returns. Nawaloka Hospitals also witnessed a turnaround in its performance due to an increase in revenue. (Refer 'Appendix – 2: Industry Overview' for a description of the listed private sector players).

Increase in returns was driven by improvements in asset utilization.

Improvements in the returns generated in the sector were primarily driven by increased levels of efficiency in the utilization of the assets employed in the business, whilst operating margins remained relatively flat. An improvement in occupancy levels was the main force behind the efficiency increases witnessed in the sector.

Table 25: Efficiency improved

	Profit Margin	Efficiency	Pre Tax ROIC
2002/03	19.2%	0.81	15.6%
2003/04	19.9%	1.04	20.7%
2004/05	20.3%	1.17	23.7%
2005/06	18.5%	1.27	23.4%
Average Change	**-1.3%**	**15.9%**	**14.5%**

*Excludes results of Asiri Medical and Apollo Hospitals

Efficiency : Indicates how efficiently a hospital is utilizes its assets. The measure could be interpreted as revenues generated per rupee of invested capital.

Profit Margin : The pre-tax operating profit earned on sales by a hospital. Excludes non-recurring income and expenditure.

Pre-Tax ROIC : The return earned on invested capital on a before tax basis.

Source: JBS Research

Industry dynamics limit potential to improve margins on services.

Given the industry dynamics, improving returns generated via increases in margins on the core services provided will be limited but opportunity exists for improvements by boosting efficiency in asset utilization.

New entrants may have a greater opportunity to improve returns on capital.

However we believe that relative to the existing players' new entrants to the industry have more room and opportunity to create an environment to earn a higher return on their investment since,

- Changes required will entail going against the current industry norms, a risk that is most likely to be taken by a new entrant rather than the incumbents
- Certain changes could entail the risk of reduced volumes and dilution of their perception in the consumers' mind
- Certain contributors to profitability are largely determined at the planning stage, especially the structure and layout of the hospital
- In essence, changes would also require forcing a change in the mindset of the consumer

Dynamics of the industry limits potential for improvement in operating margins

Doctors exert a large influence in the industry and absorb bulk of the value created by the hospitals.

High bargaining power of doctors has resulted in the hospitals only absorbing a portion of the charge made out to customers. Furthermore doctors also influence the pricing of services in hospitals to a certain extent. Therefore from a revenue perspective the economics of the hospital industry are unfavourable. However from the perspective of costs the industry dynamics are favourable to a certain extent.

Industry dynamics unfavourable to revenue

45-55% of the charge made out to patients undergoing surgery accrues to doctors.

The high bargaining power of the doctors has enabled them to capture a large portion of the value created by the private sector hospitals. (Refer 'Industry Attractiveness: The Five Forces Analysis'). Discussions with heads of finance in hospitals revealed that 45-55% of the charge made out to patients who undergo surgery and 15-20% of the charge made out to patients who obtain medicinal treatment accrue to the doctors, leaving the hospital with the balance to cover the cost of all resources used in provision of care, that is, nurses, equipment and supplies etc. Hence profits earned by hospitals on core services are low. Based on our estimates and available information we believe the margin earned on core service to range between 8%-11%. The main contributor of the high returns earned by hospitals such as Asiri and Durdans is the Diagnostic business as will be explained below.

Table 26: Margins earned on core services

	Durdans	Asiri
Revenue on core services	845,046,489	334,585,000
Profits earned on core services	74,352,490	34,937,340
Operating margin	**8.8%**	**10.4%**
	* Based on 2007 revenue	

Source: JBS Research

Reason for doctors' lion share?

Inability of hospitals to attract resident practitioners is the main reason for the low rates of absorption.

Inability of private hospitals to attract doctors as permanent/resident practitioners and hence operate using a visiting consultant/specialist model is the main cause of doctors capturing a large share of the revenue earned on services provided.

Resident vs. visiting operating model

The operating model will determine whether the,

- **Doctor is an employee of the hospital**
- **Doctor will be remunerated by the hospital**
- **Total fee charged will be booked and retained by the hospital**
- **The fixed and variable component of the earnings of the doctor and the costs of the hospitals**

A hospital could be operated based on two models. One is the resident model where the specialist works for the hospital and is part of its medical team. Here the specialist will work for that particular hospital only. The doctor will be remunerated by the hospital and the fixed component of his income will increase whilst the fixed costs of the hospital will also increase. The total fees paid by the consumer will be booked by and retained in the hospital. From the perspective of accounting, the total revenue of the hospital will include total fees paid by the consumer.

Under a visiting model the doctors essentially work as independent contractors whilst the hospital provides the facility and other services such as the nursing staff and equipment required for them to engage in their practice. The doctor is not remunerated by the hospital and earns by directly charging his fee to the patient. Hence the variable component of their income increases whilst the fixed cost of the hospital will be lower relative to the resident model. When booking revenue the hospital will account for charges attributed to rooms, medication, nursing etc and not for the doctor's charge. The doctor's fee will directly go to the doctor and will not be booked by the hospital.

Table 27: Dependence on visiting consultants

Hospital	Visiting Consultants
Nawaloka	270
Durdans	174
Asiri	123
Asiri Surgical	108

Source: E-Channeling

We believe the inability of hospitals to attract doctors as permanent employees is due to the following factors:

- **Shortage of specialists**

Main reason for the popularity of the visiting consultant model is the shortage of specialists.

Private hospitals are highly dependent on the service of specialists. Specialists are in short supply, hence each account for a large share of the total patient population (Refer 'Industry Attractiveness: The Five Forces Analysis'). This enables them to earn a large income by working as visiting consultants. In

order for the private sector hospitals to attract the doctors as residents they would have to pay a large sum of money, resulting in a large increase in costs.

- **Loss of volume**

Doctor-centric consumer behaviour may result in low volumes if the hospital chooses to base operations on a resident specialist model.

One strategy may be for hospitals to attract a few specialists to meet their need, but this could in-turn result in a reduction in patient volumes. Consumers are doctor-centred (Refer 'Key Attributes, Consumer Behaviour'), hence if the hospital switches to a resident doctor model, this could decrease the patient volumes in hospitals, both for core services and ancillary services, such as laboratory tests. Hence such a transition is highly risky for the hospitals operating in the industry.

- **Doctors prefer to work and be attached to the public sector**

Specialists'/doctors' preferred employer is the state sector.

From discussions we have had with many doctors belonging to various specialities, it was evident that the doctors prefer to be attached to public sector hospitals and continue to work there. Impact on reputation, case mix, ability to build and improve the private practice, job security and reduced risk of litigations and ability to engage in teaching were the main reasons provided by newly qualified doctors, as well as experienced doctors, who wish to remain in the public sector as full time practitioners.

Change in the recruitment policy of the government will not affect the supply of specialists.

Although the government plans to recruit only 50% of the graduates passed out from 2010 onwards, which would enable the private sector to attract general practitioners as residents, the situation with respect to the specialists will not change. (Refer 'Industry Attractiveness: The Five Forces Analysis').

Why not increase prices?

Prices mainly track increases in salaries. Historic rate hikes will not be sufficient in the face of rapid increase in inflation.

Price increases in the industry have not been pre-emptive, taking into consideration the value proposition of the services provided, but have tracked increases in costs, mainly increases in salaries. However, due to rising inflation, historical rates of price increases will not be sufficient in the short to medium term.

Hospitals have increased their prices at an average rate of 10-15%. The nature of the service supports the case for more aggressive price increases.

Discussions with heads of finance in private hospitals revealed that prices charged by hospitals for services have increased by 10-15% on average over the past 4 to 5 years. Data available points to an average increase in prices charged for inpatients to be 11.2% in 2005 as reflected in the following table.

Table 28: Price increase for inpatient services for listed hospitals in 2005

	2004	2005
Revenue from inpatients for listed hospitals	4,058,090,465	4,690,446,325
Increase in inpatient revenue		15.6%
Increase in inpatient volumes		3.9%
Price increase		**11.2%**

Source: Institute for Health Policy (http://www.ihp.lk/) and JBS Research

The following factors support the case for price increases.

- Health services are non-discretionary products, and hence the price elasticity for health services is low/ inelastic.
- The private sector hospitals occupancy rates have averaged between 95-100% between the last 2-3 years. Many hospitals maintain waiting lists for certain in-house procedures, whilst out-patient and consultations are accompanied with long waiting times and queues, reflecting the high demand that exists for private healthcare.

Hospitals have refrained from making pre-emptive price increases.

However the industry has largely refrained from pre-emptive price increases. Even in instances where the hospitals had the leading technology and were delivering a differentiated service, the prices they offered for the service were not any different from those offered by other hospitals. We believe the following to be some of the reasons for this.

- Doctors are concerned about the impact the price increase may have on their patients and favour minimal increases in prices. Considering their dominance, the hospitals have to abide with these restrictions.
- Owners of the hospitals and the top management are concerned with the social nature of the services offered by them. Hence, the pricing decision is not purely based on financial consideration and takes on a social and moral dimension as well.
- Fear of over pricing the services relative to the other players.

Are we under pricing?

Prices charged by local hospitals were lower relative to India and Malaysia.

A comparison of average prices charged (adjusted for PPP) on certain procedures and services offered by hospitals in India, Malaysia and Sri Lanka indicate that in certain instances the local chargers were much lower than those charged in those countries.

Table 29: Price comparison with India and Malaysia

Type of treatment	India*	Malaysia*	Sri Lanka	Difference India	Difference Malaysia
Normal delivery	64,415	32,959	56,000	**8,415**	**(23,041)**
Caesarean section	147,874	95,073	90,000	**57,874**	**5,073**
Average room chargers	5,401	3,423	3,450	**1,951**	**(27)**
Consultation OPD	4,481	1,711	663	**3,819**	**1,049**
Lipid profile	2,241	593	803	**1,438**	**(209)**
Appendectomy	103,063	101,412	47,750	**55,313**	**53,662**
Endoscopy	13,443	7,986	6,100	**7,343**	**1,886**

*Converted at PPP adjusted exchange rates

Source: Swastha Health Services (Pvt) Ltd and JBS Research

Proper pricing of rooms is critical due to the large investment in the land and buildings.

The issue of pricing is critical when it comes to room chargers. The investment in buildings and land account for approximately 35%-55% of the total investment in a hospital. Therefore under pricing the rooms will decrease the return on investment made by a hospital.

Table 30: Investment in land, property, plant and equipment

Investment	Investment in land, building and furniture	Total Property, plant and equipment	Proportion accounted for by PPE
Apollo	1,518,469,224	2,762,511,619	55.0%
Asha	865,541,046	1,019,103,011	84.9%
Asiri	519,818,000	1,337,114,000	38.9%
Asiri Medical	668,561,871	1,279,983,623	52.2%
Durdans*	924,768,662	1,733,634,057	53.3%
Nawaloka	965,996,281	2,349,778,391	41.1%

* Figures are based on written down values since the company employs the diminishing balance method to calculate depreciation

Source: Company annual reports

The local players under charge the room rates by 50% to 70% relative to rates charged by the regional players.

Room rates charged by the main players in the industry are low when compared to those charged by hospital operators in the region. For normal rooms and ward beds the level of under pricing was approximately 50%-53% whilst for luxury rooms it was approximately 70-75%. We believe that the industry should consider revising room rates upwards, at least the rates charged for the luxury rooms, in order to ensure that they earn their cost of capital.

Table 31: Comparison of room rates

Hospital name	Apollo Hospital	Bangkok Hospital	Gleneagles Hospital	Average for Sri Lankan Hospitals	Under pricing
Location	**New Delhi, India**	**Thailand**	**Malaysia**		
Room Type					
Ward bed	4,290	-	-	2,083	**51.4%**
Normal room	7,722	-	7,666	3,320	**57.0%**
Semi luxury room	15,730	10,382	10,999	4,017	**74.5%**
Luxury room	18,590	19,690	19,998	4,458	**76.0%**
Suite	35,750	31,504	32,663	8,850	**75.2%**

Source: JBS Research

Lower price charged by hospitals could reflect the fact that the hospitals are undercharging and the fact that the industry participants are undercharging.

The lower price charged may reflect the fact that the hospitals are undercharging their services, whilst also reflecting the fact that the other value chain participants, such as doctors and nurses are also undercharging their services relative to their counter parts. Different prices charged by industry participants from country to country may reflect the differences in the industry dynamics. For example, the high salaries earned and the high cost associated with channelling a specialist in the United States reflects the high risk of litigation that is associated with the provision of treatment.

Cost side impact is limited

Hospitals dominate in transactions carried out with other suppliers; hence they are in a favourable position.

From the perspective of costs the hospitals are in a relatively favourable position. Whilst other suppliers are not demanding an unhealthy price increase for the services they provide, any price hikes made have been matched by the hospitals with an equivalent increase in the prices of services, as explained above.

Nurses command a high bargaining power but have not exercised that power to the detriment of the sector.

Next to doctors, nurses command the highest bargaining power, primarily stemming from their importance to care delivery, as well as the shortage the industry as whole faces for well trained nurses (Refer 'Industry Attractiveness: The Five Forces Analysis'). However, they have not tended to exploit their bargaining power to the detriment of the hospital sector, as in the case of their counterparts in the state sector. Since a nurse is attached to the hospital from the point of training onwards, they tend to build a high level of loyalty towards the hospital.

With respect to other suppliers in the industry hospitals command a high bargaining power.

With respect to the suppliers of drugs, medical supplies, other staff categories, etc. the hospitals command a high bargaining power due to their large size and also due to the level of competition that exists in the respective suppliers' industry. For example, the medical supplies industry is largely fragmented, with approximately 15-20 players competing with each other. We found price to be the main form of competition in this market. Therefore, hospitals could apply downward pressure on prices charged. (Refer 'Industry Attractiveness: The Five Forces Analysis').

Would scale yield purchasing economies?

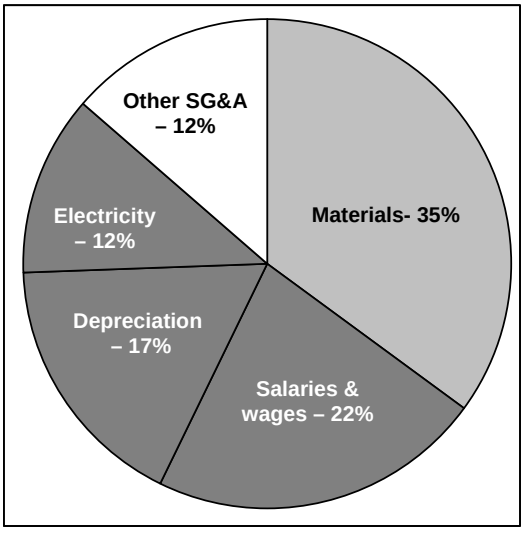
Increase in scale will not yield a significant improvement in profitability.

Increase in the scale of operations in a hospital would not yield a significant impact on the costs and profitability via purchasing economies since the cost of materials purchased accounts for a relatively small portion of the costs and the suppliers would already be supplying the products at a minimum cost possible due to prevailing level of competition.

Material costs account for 35% of the total operating costs.

Purchases of medication, medical supplies, laboratory supplies etc accounts for 35% of the cost of a hospital. The bulk of the balance goes towards paying salaries, electricity costs and depreciation.

Figure 10: Cost breakdown of a hospital



Source: JBS Research, annual reports and management discussions

A 10% decrease in material cost would yield a 4% improvement in operating margins.

Hence any purchasing economies would not have a significant impact on the bottom line of the hospital. For example a 10% decrease in purchasing cost would only yield 4% increase in margins.

Table 32: Impact on bottom line from cost saving

	Current	Cost savings		
		2.5%	10.0%	15.0%
Revenue	122	122	122	122
Material cost	(35)	(34)	(33)	(31)
Salaries and wages	(22)	(22)	(22)	(22)
Depreciation	(17)	(17)	(17)	(17)
Electricity	(12)	(12)	(12)	(12)
Other SG&A	(14)	(14)	(14)	(14)
Operating profit	**22**	**23**	**24**	**25**
Operating profit margin	18.0%	18.7%	19.5%	20.9%
Improvement margin		4.0%	3.8%	7.4%

Source: JBS Research

Due to the intense price competition in industry, there is little room to make significant and material price reductions.

The high level of competition that prevails in the medical suppliers and pharmaceutical industry has resulted in intense price competition among players and discussions with suppliers revealed that prices of most products are priced at very low margins. Hence we do not believe that suppliers would be in a position to offer very attractive prices discounts to buyers procuring large quantities.

Lab operations would benefit from scale, since it enables direct importation of lab chemicals.

However scale does bring in purchasing economies to lab operators since this would give them the opportunity to procure lab chemicals directly from the principals operating abroad as apposed to from the local agents. Hospitals making such direct purchases of lab chemical are said to enjoy cost advantage of 30-35%. Direct importation of pharmaceutical and medical related supplies is not pursued by hospitals since the process of obtaining the necessary approval to make such direct imports is a lengthy and highly complex.

Opportunities to increase profitability

Improvement in profitability is possible via adopting a resident specialist model.

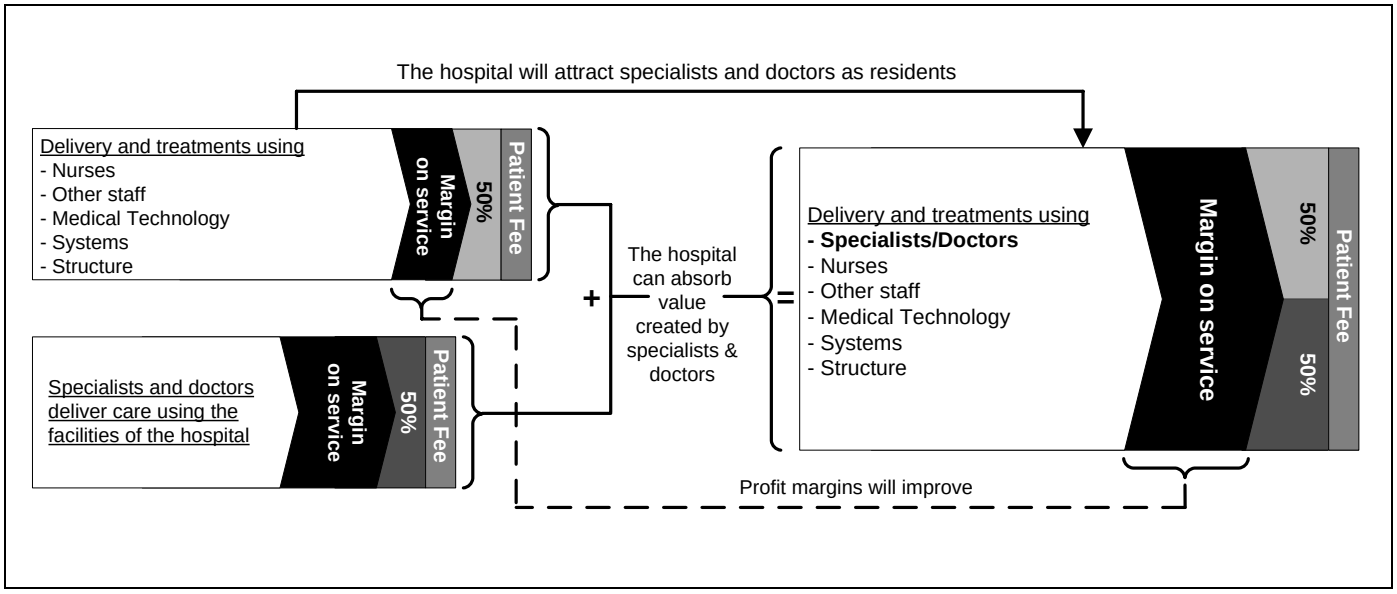
We believe the greatest opportunity to increase margins on the services provided lies in adopting an operating model based on a team of resident specialists and 'internalising' the care delivery process. However, such a strategy is risky and may take a considerable time to payoff, due to the nature of the consumer's behaviour. The second opportunity lies in adding ancillary services. Building and marketing such services as a separate business that yields high returns to the product portfolio can improve margins. The star performer among such services is diagnostics. The success of Asiri can be directly attributed to its dominance in the diagnostic services market.

A resident specialist model will lead to higher margins

Having a team of resident specialists will enable a hospital to retain the total value created for the consumer.

As explained above, on average, the doctors' fee accounts for 45-55% of the charge made out to patients for surgery and 15-20% of the charge made out to patients for medicinal treatment. By attracting a permanent team of doctors consisting of specialists, general practitioners, anaesthetists etc., the hospital can retain the portion of the charge that accrues to the doctor within the hospital and increase the total revenue and profits, relative to a hospital serving a similar case mix.

Figure 11: Transition to a resident doctor model



Source: JBS Research

The strategy enables a higher profit provided that sufficient volumes are achieved.

However, the hospital would have to attract a higher volume of patients if it is to achieve this, making the strategy risky and difficult to implement. The following scenario (Refer figure 12), which considers the case of caesarean section, is indicative of the increase in profitability that is possible through a shift to a resident specialist based model. Based on the evaluation, the hospital would be achieving breakeven on the procedure at approximately 11-12 cases per month, a profit equivalent to the resident model at approximately 13-14 cases per month and extra profits beyond that threshold on the procedure. However, on a hospital wide basis, adopting a resident doctor model will increase overall fixed costs and hence requires generating higher volumes relative to a hospital operating on a visiting doctor model if it is to earn a higher profit.

Figure 12: Resident vs. visiting specialist scenario

Resident vs. Visiting - Caesarean Section			
The hospital will achieve breakeven at 11 cases per month			
Breakeven number of cases in a month			**10.67**
Price charged for a Caesarean Section			90,000
Total revenue			**960,000**
Doctors fee			(600,000)
Other costs			(360,000)
Profits			**-**
The hospitals profits will be equivalent at 13 cases per month			
		Visiting Specialist	**Resident Specialist**
Profits equivalent at		**13.33**	
Price accruing to hospital		45,000	90,000
Total revenue		**600,000**	**1,200,000**
Costs		(450,000)	(1,050,000)
Profits		**150,000**	**150,000**
Extra profits will be earned on a resident model beyond 13 cases			
Number of cases	**15.00**	**17.00**	**20.00**
Extra profits earned	75,000	165,000	300,000

Assumptions		
	Specialist	Anaesthetist
1. Doctor fee	500,000	100,000
2. Percentage revenue accruing to doctors 50%		
3. Margin earned per caesarean section under a visiting model is 15%		

Source: JBS Research

Risks

However, adopting the model runs the risk of low volumes, given the consumer behaviour.

Given the doctor-centred patient behaviour, where the decision to purchase healthcare is centred around the doctor, as opposed to the hospital, sticking to a limited number of specialists may limit the patient volumes. This in turn may reduce the demand for the core services, as well as ancillary services provided by the hospital. However, with the high fixed costs associated with the operating model the hospital would require high volumes to benefit from the shift in the model as discussed above. In this conflict lies the high risk of adopting the model.

Since adopting a resident model will entail pushing a hospital centric behaviour to the consumer, more research would have to be undertaken in this regard.

By building on a resident specialist model the hospital is essentially pushing a hospital centric model to the consumer, which is in stark contrast to the observed behaviour. Hence a hospital hoping to operate on this model would have to conduct intensive market research in order to asses the market's reaction to the adoption of such a model, prior to entering the market. The ability to market the hospital would underlie the success of the approach.

Benefits

Adopting a resident specialist model would yield financial and non-financial benefits.

In addition to the increased financial gains we believe there are many positive benefits that could accrue to the hospital by adopting a resident specialist model and adopting/pushing for a hospital-centred behaviour pattern. The main benefit would be the ability to take control of the entire service delivery process. This in turn could bring about improvements in

- Control over quality and standards, which would not be the case when depending on a doctor who works as an independent contractor
- Ability to standardize medical procedures and improve efficiency and effectiveness of service delivery
- Control over the vital decisions, such as investment, pricing, design etc.
- Adopting a resident model will also enable a hospital to improve on asset utilization as discussed below.

Why would the specialist/doctor agree to work as a resident?

Whilst working as a resident purely on financial grounds is unattractive to a specialist, non financial benefits associated with the setup would help in convincing and attracting them as residents.

Working as a resident in a private hospital would mean less income for the consultant. For example, at the rate of 13 cases per month the consultant can earn a sum of Rs. 715,000 before tax as opposed to the Rs. 600,000 he can earn as a resident. Although the doctor would be reluctant to join in as a resident purely on financial grounds, we believe the following non-financial benefits would make the option attractive.

- The specialist would have a stable flow of patients and practice at one place rather than moving around, whilst being assured of a fixed income. We found that a specialist visits a minimum of 3-4 hospitals a day to conduct their private practice.
- Working as a visiting consultant requires putting long hours of work. The majority of the specialists work 6 days a week, for a minimum of 13-16 hours a day. By working as a resident he/she would have more time on his/her hands to spend with his/her family and other activities.

- A specialist, who would be starting his practice from scratch, would not have to be concerned with aspects like marketing and attracting patients. The burden of attracting patients, at least in the short run, would fall on the hospital, if he joins in as a resident. Hence the option is attractive for a specialist starting out new.

Adding ancillary services and marketing it as an independent business unit

Diagnostics is an attractive option on which a hospital can capitalize on to compliment existing services and improve returns generated.

Adding high margin products and services that complement the care delivery process can improve both margins, as well as the efficiency in asset utilization. We believe Diagnostics to be the most important and suitable service for a hospital to focus on since

- Being attached to a hospital would enable the laboratory to build upon the most critical success factor in diagnostics, the trust and confidence in the results.
- At a scale on which a hospital could expect to operate in (that is, investment, technology and volume), there is relatively less competition as opposed to segments like pharmaceuticals.
- Could build upon the internal demand of the hospital, whilst using the brand name to expand into other areas, such as standalone units.

The major operators are essentially hospital-lab combinations rather than pure play hospitals.

Traditionally, the successful private sector operators have operated as hospital-lab combinations, rather than pure hospital operators. As evident from table 33 they are key contributors to revenue and profitability and hence form the core of the financial performance of the hospitals.

Table 33: Diagnostics make a large contribution to revenue and profits

	Asiri Hospital	Durdans Hospital
Contribution to revenue	63.4%	28.7%
Contribution to operating profit	82.8%	55.3%

Source: Company Annual Reports and JBS Research

High returns earned by Asiri and Durdans can be attributed to dominance in diagnostics market.

We attribute the high operating margins earned by the Asiri Hospital and the Durdans Hospital (Refer figure 9: ‘Returns on invested capital’) to their dominance in the diagnostics services market. Asiri is believed to perform approximately 6,000-7,000 tests per day. Durdans performs an estimated 3,500-4,000 tests per day.

Capable of earning high returns on sales and capital

Diagnostics would yield an operating margin of 25-30% and full recovery of the investment made within a maximum of 2-3 years.

Based on an evaluation done by us we believe the lab is capable of earning an operating margin of approximately 25%-30% and a return on operating assets of approximately 65%. Full recovery of initial investment within a maximum of two to three years is possible, subject to capacity utilization. By having the sufficient volumes and scale, a hospital could improve the returns generated on its assets via Diagnostics. (For further information refer 'Appendix 1: Evaluation of lab operations')

Our evaluation was based on a lab that has capacity to perform approximately 2,500 tests operating at 80% capacity. The assumptions and findings have been set out in figure 13.

Figure 13: Profitability of lab operations

Income & Expenditure

	Per Test	No. of Tests	Total
Price	150	730,000	109,500,000
Variable cost	(70)		(51,100,000)
Contribution	**80**		**58,400,000**
Depreciation			(2,305,000)
Electricity			(1,200,000)
Staff cost			(21,600,000)
Other Staff cost			(2,880,000)
Other costs			(600,000)
Operating profit			**29,815,000**
Taxes			8,944,500
Net profit			**20,870,500**
Returns			
Operating margin			27.2%
Net profit margin			19.1%
On invested capital			64.6%
Asset turnover			3.86

Invested Capital

Equipment	15,000,000
Building & land	12,000,000
Working capital	5,295,000
	32,295,000

Assumptions

1. Number of tests per day: 2,000

2. Variable cost per test
   - Chemical cost: 35
   - Cost of containers: 35

3. Depreciation
   Equipment and building were depreciated over 10 years

4. Electricity cost was assumed to be 100,000 per month

5. Staff costs

	Number	Salary	Total
Lab technician	60	30,000	21,600,000
Other staff	20	12,000	2,880,000

4. Inventory
   Assumed an inventory holding period of 2 months for chemicals and containers

Source: JBS Research

Increased preference for lab investigations and increased disease occurrence will drive demand up

Increased dependence on laboratory investigations and increased prevalence of disease will drive up the demand for diagnostics.

Discussions we conducted with specialists/doctors revealed that doctors are increasingly depending on laboratory investigation results as opposed to clinical examinations when diagnosing medical conditions. Increase in the number of patients per doctor is the main factor that has triggered this shift. We believe this increased dependence on lab tests, coupled with the increase in disease occurrence, heightened awareness, increase in income levels and the use of health insurance will lead to strong growth in the demand for diagnostic services in the future.

Scalability of the business will add to volumes and profits

Scalability of the business is a key attribute of the business.

A laboratory operation can be scaled via the setting up of satellite labs and collection centres to capture the demand from patients other than those of the hospitals.

Collection centres and satellite labs can be set up across the island to capture demand from health care providers across the country.

Installing collection centres across the island in the vicinity of government hospitals and numerous channelling centres scattered around the country will enable the hospital to capture the demand that arises from these institutions. Collection centres can be set up at a minimum cost, with minimum equipment and the samples collected at the centres could be processed at the centrally located labs. This would boost the asset utilization and add to the bottom line of the hospital.

Poor service quality offered by the MOH laboratories and independent lab operators has resulted in a low level of confidence being placed on their services.

Laboratories maintained within the MOH hospitals and small laboratories operated by numerous individuals that have mushroomed across the country have failed to deliver on the attributes of reliability and timeliness. Government laboratories are plagued with shortages in materials and frequent service disruptions and have failed to deliver on the attributes of timeliness and dependability. Small laboratories mostly use manual procedures to process samples and the lack of proper regulation has raised doubts as to the reliability of the results generated.

Labs attached to major private sector hospitals have earned the trust of the key decision-maker, the doctor.

Laboratories operated by the major private sector hospitals have been able to earn the trust of the key decision-maker, the doctor. Use of automated processing, use of proper systems and procedure that have been accredited by

organizations, such the ISO and the credibility of the labs derived by being attached to a hospital has enabled them to earn this trust.

These labs have used the scalability of the business to capitalize on the credibility gap, attracting the demand met by the traditional lab operators via collection centres and branches.

The major hospital operators have capitalized on the credibility gaps of the traditional laboratory operators and have set up satellite labs and collection centres targeting the demand met by them. Asiri and Durdans have set up collection centres in the proximity of large MOH hospitals such as the National Hospital and the Colombo South and North Teaching Hospitals. This strategy has enabled hospitals, such as Asiri and Durdans to become leaders in the diagnostics services market. Asiri has 5 branches and 350 collection centres operating whilst Durdans has 9 satellite labs and 240 collection centres in operation.

Low prices will enable tapping the bottom of the pyramid

Addressable market for diagnostics is relatively larger than the market for core services offered by the hospital.

The relatively lower cost of common tests such as those set out in table 34 makes the use of diagnostics affordable to low income earners in the country, unlike other core services and products offered by the hospital. Hence the addressable market for diagnostic services is much larger than that of the core services offered by private hospitals. Whilst the private sector provides in-patient and out-patient care to 6% and 50% of the patients in the country, the hospitals can tap into the balance of the patient population via the provision of laboratory services, given the essential nature of the service and the relatively affordable price.

Table 34: Prices of frequently performed tests

Test	Asiri	Asha Central	Apollo	Ceymed	Durdans	Nawaloka
Pap smeer	710	785	1,000	650	640	1,200
Blood glucose	130	140	150	110	140	150
ESR	140	130	140	110	120	140
WBCDC	180	180	170	160	180	190
Urine full report	150	130	150	120	120	140
Blood urea	150	190	250	180	190	200
Haemoglobin	230	190	190	160	180	190
Platelet count	230	180	190	160	180	190
Packed cell volume test	230	180	190	160	180	190

Source: JBS Research

Can a focused player tap into the market, offering a value proposition greater than that offered by the hospitals?

We believe the threat from a focused diagnostics player to be low.

Historically the diagnostics services market in the island has been dominated by the hospital-diagnostics combined operators. There have been no focused players in the market. However, we believe that the possibility of such a player entering the market successfully and posing a threat to the hospital-lab combinations to be low, due to the following reasons. Hence there is a vast potential for exiting and potential players in the hospital industry to capitalize on the growth in the diagnostics services market.

Hospital-lab combinations have a strong link to the key decision-maker, the doctor.

- The hospital-lab combinations have the direct access to, and a close relationship with, the doctors. The key decision-maker and the consumer of the service is the doctor. His/her key concern would be the accuracy of the results generated. Being part of a hospital would help to build up this confidence and credibility required since a doctor practicing at a particular hospital will have a close association with the brand and a relatively high level of confidence as to its capabilities.

Hospitals have invested heavily in the business and have adopted the latest technologies.

- Hospitals currently active in the market have employed the latest technologies and procedures and continue to invest heavily in the equipment. For example, during the financial year 2006/07 Asiri Hospital invested in a computerized Seminal Fluid Analyzer, which is considered to be the first in the island. Hence it would be difficult for a focused player to offer a differentiated or incremental value proposition.

Hospitals will have the capability to strongly retaliate in the face of a threat.

- As evident from facts and figures discussed above, diagnostics is a key contributor to its financial performance, sometimes even subsidising core services offered by the hospital. Hence the threat of a focused and capable player would be met with severe resistance from the entrenched players. We believe the following facts would support the case for a strong retaliatory attack from the incumbents.
  - High margins earned on tests leaves the operators with significant room for price cuts. Given that the hospitals also command high volumes, they would have significant staying power if they commence a price war in order to stave off a potential competitor.
  - The hospitals have direct access to the key decision maker and could use the relationship they have built with the doctors to lock out the new entrants.

- Given that a relatively few number of players dominate the market there is room for collusion.

Strength of brand name linked to association with a hospital.

- Having a strong brand that epitomizes reliability and dependability is crucial. Being associated with a hospital and having the same brand helps to build the required brand strength.

Ability for a focused player to enter as a BPO partner is limited.

- Another way to enter is to come in as an outsourcing partner. Given that the private sector players will not consider outsourcing their laboratory operations the government sector is the best target for such a strategy. It would give the new entrants instants access to large volumes and demands. Whilst the current level of efficiency and effectiveness of the state sector labs would call for and justify outsourcing, such a move would be met with a stiff resistance from trade unions.

Alternative path for improved returns: Efficiency

Improvement in asset utilization will provide hospitals with greater opportunity to improve returns.

Given the limitations on improving profit margins on services, we believe the greatest opportunity to increase returns comes from the improvements in asset utilization. Recent improvements in returns generated by the major private hospitals were primarily achieved via improvements in asset utilization.

Recent increases in efficiency levels can be attributed to improvements in occupancy levels, hence such high returns may not be sustainable in the long run.

Discussions with heads of finance attributed the increase in efficiency to the increase in occupancy levels in hospitals, which in-turn lead to the improvements in the returns generated. In 2005 and 2006 occupancy rates averaged between 90-100% whilst before they hovered around the 70-80% mark. However we believe that the efficiency improvements achieved via high rates of occupancy could be unsustainable in the long run, since

- High rates of occupancy would eventually affect the quality of care
- Such improvements are limited by capacity constraints. Hence, is not a source of sustainable improvement.

Efficiency of asset utilization can be improved in the short run by reducing the average length of patient stay.

Under full capacity utilization and limited capacity the hospitals can increase asset utilization in the short-term, via reducing the average length of patient stay. (Average length of stay is computed by dividing the number of days stayed from the date of admission in an in-patient institution by the number of discharges (including deaths) during the year). At present the industry average is considered to stand at approximately 3-4 days. Longer stay has diminishing returns. Thus, ideally, a hospital should turnover patients faster while maintaining high occupancy.

Contribution to revenue and profits per bed is optimized within the first 48 hours of a patient's admission.

Contribution to revenue and profits per bed is optimized within the first 48 hours of a patient's admission, in which all interventions and tests are performed and medication is provided. Early part of the stay yields the highest potential for other services. After the 48 hours the demand for services by the patient declines and will have a marginal contribution to the hospital's revenue and profit.

Table 35: Average length of stay for hospitals

Hospital	Length of stay (Days)
Apollo	6-7
Asiri/Asiri medical	2-3
Asha central	3-4
Durdans	3-5
Nawaloka	3-6
Industry average	**3-4**

Source: Discussions with management & regulator

Further improvements in efficiency are possible.

We believe there is room for further improvement in efficiency in hospitals through the following sources, which are more sustainable in the long run.

- Reducing the idle time of revenue-generating units within the hospital.
- Selecting fields of specialization and focusing technology and equipment investments on meeting demand for the selected specializations.
- Custom built hospitals with a layout focused on both efficiency and effective care delivery.
- Use of information systems to increase internal operations

Reducing the idle time of assets

Asset utilization can be improved by reducing idle time of assets.

Key revenue generating units, such as operating theatres are not utilized fully, and reducing the idle time of these assets can improve the underlying efficiency of assets and the return generated on capital.

Revenue generating units such as theatres and consultation rooms are only used after 4 o'clock and left idling in the morning hours.

Considering that the private hospitals operate on a visiting model, as explained above, revenue-generating activities such as surgical interventions take place only after 4.00pm and would continue till around 12.00 to 1.00am. Specialists/doctors attached to the health ministry institutions are allowed to conduct private practice only after 4 o'clock. Hence for the remainder of the day, operating theatres, channelling rooms etc. remain idle. Reducing the idle time of these assets would give a hospital immediate access to improved asset utilization.

Shifting away from the resident model is required to reduce the idle time.

However, the hospitals ability to do this will depend in its ability to implement a resident doctor model or increase the number of resident doctors to a level that would enable at least a partial decrease in idle time.

Selecting the area of specialization and sticking to it

Disciplined specialization would enable a hospital to reduce its capital intensity.

Selecting the area of specialization and restricting all activities to it would enable a hospital to reduce its capital intensity, as well as develop expertise and standardize all work processes. We believe this to be vital for improvements in efficiency level in the private sector hospitals, given the technology/capital intensive nature of the operations.

Type and level of investments in medical equipment will depend on the areas of specialization.

The annual value of investments in the sector (as reflected by the listed private hospitals) averaged Rs.200 million in 2006 with bulk of it concentrated in medical equipment and buildings. The level and type of investments made by the hospitals will be driven by the areas on which the hospital focuses on.

Strategy of specialization has been implemented rather loosely in majority of the private hospitals.

Although private hospitals operate as specialised hospitals, relative to the state sector general hospitals, the implementation of the strategy has been done rather loosely. Many private hospitals offer services in many specialisations rather than focusing on a few. By lacking focus on its investments a hospital would find itself investing in the most advanced and expensive equipment, not adding any value to its target patient population and hence, not generating sufficient revenue and profits on the investments made.

Strict specialization will add discipline to investments in medical equipment.

The decision to invest in equipment should always be based on the area of specialization. Investments in advanced and complicated equipment should be limited and concentrated to the area in which the hospital is specializing and investment in equipment related to other areas should be limited.

Custom built layout

The effectiveness of the layout is a key driver of efficient asset utilization.

The level of quality delivered, operating costs and efficiency of operations would be a function of the layout and will largely be defined during the planning and design phase of the hospital.

All the major private hospitals do not have a custom built layout.

All the major private hospitals in the industry were not custom built, but were developed by adding components to the structures that existed when the operations were started.

The best layout will optimize the resource utilization of the hospital.

The layout of the hospital would setout the resource requirements of the hospital in terms of equipment, human resources, space and energy requirements. The best layout would be the one that optimizes on these four factors to deliver the healthcare needs of the consumer.

The design of the layout should focus on

- Smooth patient flow with focus on faster turnouts
- Ambience
- Minimizing the risks of infections
- Facilitate
  - Easy and comfortable access and movement for patients being treated
  - Easy and smooth movement for medical staff and equipment
  - The use of common facilities and services

Employing good information systems

The information intensive nature of the service makes employing good information systems essential.

Information is vital for the effective and efficient management of hospitals given the complex and information intensive nature of the service provided. Information systems assist in more informed decision-making, improved utilization of resources and enable high levels efficiency. Further, given the knowledge and information intensive nature of the service provided, an effective IS would also be a vital source of competitive advantage.

Introduction of an IS, enabled a cut down in discharge time to 30 minutes.

For example, Durdans was able to reduce the patient admission and discharge time from 1.5-2.0 hours to 30 minutes. In addition, an effective information system could also reduce the staff requirements for support activities, such as accounting/finance and provide information to better cost the services provided.

Only one player uses a proper information system.

Except for Durdans, other hospitals did not use an integrated information system. Therefore, we believe that there is vast room for improvements in the operations of other hospitals, whilst it would also be a source of competitive advantage for new entrants at least in the short term.

The winning strategy would require a hospital to adopt a consumer-centric philosophy

Adopting a consumer centric approach is the key to sustainable economic profits.

Based on the above findings we believe a hospital could generate high rates of return and positive economic profits for its owner by adopting a customer-centric operating model. Adopting a consumer-centric model, however, would require the operator to be a contrarian in the industry, which has traditionally grown on the doctor-centric operating model.

Being consumer-centric, that is, complete focus on the consumer would entail the following:

- **Care delivery based on resident doctor model**

Adopting a resident doctor model would enable the hospital to improve profits and quality.

The hospital will yield higher margins, improved asset utilization along with the ability to control the care delivery process. The control will enable the hospital to adopt and build in quality standards into procedures across the hospital. Having capable doctors within the hospital will enable the management to focus their energy on the consumer, rather than having to worry about attracting visiting consultants.

However, as discussed above the financial success of the model will depend on the hospital being able to convince specialists to join the hospital permanently and its ability to generate sufficient volume of patients.

- **Equal focus on medical and non-medical aspects of care delivery**

Delivering on both medical and non-medical aspects of care delivery is essential. We believe the greatest gaps lie in the delivery of non-medical care.

As explained previously, medical and non-medical aspects of care are equally important. Hospitals should focus on minimizing and controlling for errors in treating the patients, whilst also meeting the expectations of the consumers with respect to convenience, communication and information, freedom of choice, dignified treatment etc. We believe that the existing players have a long way to go in meeting the demand of the consumer from the dimension of non-medical care. Hence, it will be a source of competitive advantage for a new entrant. However, the ability to focus on these aspects will depend upon the ability to have resident doctors, well-trained staff in other categories, use of good information systems and well-planned custom built layouts.

- **Specialization**

The model of specialization has proved to be the successful model of operation for a hospital in many countries.

The model of specialization has proved to be successful for hospitals in many countries, both from a care delivery perspective and a financial perspective. To site two examples from India: the Narayana Hrudayalaya Heart Care Centre and Aravind Eye Care have been recognized for their effective care delivery and financial performance. Specialization would enable the hospitals to build superior expertise and experience and have the right scale.

Implementing the strategy would require the hospital to move away from the one stop shop mentality.

Implementing the focused strategy would require the hospital to move away from the concept of the one-stop shop which has been a popular philosophy in the industry, among operators and consumer alike. Trying to be all things to everybody would have a huge drag on any attempt of the hospital to improve care delivery and financial results. Specialization would have to accompany partnering with other players in the industry.

- **Building a strong brand name**

A brand name that epitomizes trust, care and quality would be essential to attract patients as well as qualified and experience personnel.

A strong brand name that is associated with trust, care and quality will be key driver of volumes of the hospital and have implications on attracting qualified and experienced personnel. The factors discussed above will eventually lead to a creation of a strong brand name. Whilst benefiting the core operations, it would also enable hospital to aggressively enter and expand their ancillary services into areas beyond their immediate location.

For example,

- Expanding diagnostic services to capture demand from other regions
- Setting up channeling centers in other regions

- **Efficient and effective use of information systems**

Information intensive nature of the services makes effective use of an information system essential.

Healthcare delivery is an information intensive process involving complex interactions between individuals, technology, procedures etc. Collecting, storing and processing this information is essential for the effective management of a hospital. The content and quality of information will impact on decisions taken on a wide area of activities such as pricing, resource allocation, quality, investment co-ordination etc. We believe there to be a shortage in the availability of quality information on a timely basis in the industry. Hence adopting an IS will also be another source of competitive advantage.

- **Investing in medical technology based on need and financial feasibility instead of having a me too and pioneering attitude**

Effective application of technology is the key to success rather than mere use of technology.

Medical care and technology are highly interrelated. Whilst having a large impact on the level and quality of care provided, it also will have a large impact on the finances of a hospital due to the high cost associated with the equipment. The area of specialization should be the guiding pillar of all investments of the hospital. Each investment should contribute to achieving excellence in its area of focus and be based on a real need and financial feasibility.

- **Pioneer the introduction of novel medical technologies that are affordable and fits in with overall philosophy**

Introduction of new treatment methods and technologies will enable a hospital to become the price leader in that particular area.

The field of medical care and medical technology is constantly evolving with new treatment methods being introduced frequently. New entrants, as well as existing players, have the opportunity to introduce affordable treatment methods that have proven to be successful. Being the first to introduce such treatment methods will enable the hospital to become the price leader in the industry and to augment the brands positioning in the consumer's mind by providing a differentiated service. However, introduction of such methods should, as explained above, fit the test of need and feasibility.

Key Features of the Private Hospital Industry

Consumer behaviour

Consumers are doctor-centric and are very particular about the doctor they wish to consult.

The demand for private healthcare in the county is primarily centred around the doctor, with consumers being specific about which doctor they wish to consult, rather than visiting the hospital of choice and being treated by a doctor that is available at the time. The consumers' behaviour could be considered to be more complex relative to other countries, such as the UK and US, since there is no properly functioning referral system and is also characterized by a high level of loyalty to the doctor.

The consumer accesses the private health care system via three points.

The private healthcare consumer in Sri Lanka accesses the private healthcare system through the following entry points.

- Consulting a doctor through the channelling centres set within private hospitals and stand alone channelling practices
- Use of private sector diagnostic services, both laboratory testing and imaging
- Admission to a hospital as an out-patient or in-patient

Complex behaviour

The Sri Lankan consumer exhibits a complex behaviour relative to counterparts in other regions.

The consulting practice is most often the first point of contact for private healthcare in Sri Lanka, and it acts as the gatekeeper of the private healthcare system. Since there is no referral system in the private sector and popularity of general practitioners to date is low, the consumers themselves based on past experiences, experience of relatives and friends or via unofficial referral systems that are found inside private hospitals, for example, referrals by nurses and front office staff, determine the specialty their ailment belongs to. Specialists we talked to were of the view that almost all patients who came to them fell under the purview of their area of specialization, but whether these patients actually needed specialist attention could not be ascertained. Given this behaviour the local consumer could be considered to be more complex and advanced, relative to consumers in developed countries such as the UK, in which the decision on which specialist to consult is through the referral system that is in place.

Lack of a proper functioning referral system and the low popularity of GPs' have resulted in the consumers themselves determining what specialist to visit.

Doctor-centric behaviour

Which doctor to obtain treatment from rather than which hospital to visit is the main concern of the consumer.

The local healthcare consumers' decision-making process is primarily driven by their preference of which doctor they would like to obtain treatment from, rather than visiting a particular facility and obtaining treatment from the doctor available at the time.

Decision to purchase health care is made under several scenarios.

Consumers' decision on healthcare consumption in the private sector would be made under the following scenarios:

1. In order to get a consultation relating to some form of ailment.
2. When being transferred from the outdoor patient care section to the inpatient care section.
3. When admitting oneself directly as an inpatient.
4. When confronted with a condition which requires immediate treatment, requiring a visit to the outdoor/emergency care section of a hospital

Conscious choice as to the hospital will be made if the doctor visits multiple hospitals.

In scenarios 1, 2, and 3 the decision of the consumer is directly based on the doctor they wish to be treated by, and the decision on which hospital to visit is primarily based on whether the doctor in question visits the particular hospital and other factors set out below. A conscious choice on which hospital to visit will be made only if the doctor visits multiple hospitals. If the doctor visits only one private hospital then choice of hospital would be automatic and no evaluation of the hospital would be carried out.

Factors affecting the selection of a doctor

Factors considered when selecting a doctor

- **Reputation**
- **Own and relatives' experience**
- **Doctors participation in various events**
- **GP recommendations**
- **Recommendations by internal staff**

The consumer typically considers the following factors when selecting the doctor.

- The doctor's position, experience practice and reputation in the public sector hospital. The practice in the government sector is a key piece of information the consumers use to assess how good a particular doctor is. The signalling effect of practicing in the government hospitals is one of the key motivations for doctors to work part-time in the public sector hospitals.
- The consumers own experiences and the experience of close relatives and acquaintances.
- Doctors participating in documentaries and talk shows on electronic and printed media.
- Recommendations from general practitioners.

- Recommendations by internal staff members at the hospitals or channelling centres and private hospitals, for example nurses, front office staff etc.

Why doctor-centric?

Doctor-centricity due to
- **Shortage of doctors**
- **Use of private channelling to access state sector**
- **Lack of information to make decision**
- **Doctors' visiting multiple hospitals.**

We believe that the following factors may have contributed to this behaviour pattern.

Shortage of doctors

The shortage of doctors, especially specialists who are experienced and have a good track record, (which may be based on incorrect information as explained below) is the main factor that has driven the consumer towards being doctor-centred. This shortage has resulted in the consumer being selective about whom they are treated by and they exhibit a high level of awareness relating to doctors, knowing doctors individually and with many having opinions of which doctor is good in a given speciality.

Use of private sector channelling to access government sector hospitals

The overcrowding and long waiting lines in the government hospitals led to the popularity of the private channelling practice being used as a shortcut to get a bed and the attention required in a government hospital. This again resulted in the consumer following the doctor.

Lack of information to assess quality of healthcare provided by institutions

The health care consumer has no information to assess the quality of care offered by a particular hospital. Hence, the only way the consumer could make a judgment on the quality of the healthcare is by evaluating the service given to him/her by the doctor treating them and the experience of close relatives and friends. This would result in the consumer linking the quality of care to the doctor they obtain treatment from, rather than the facility they get treatment from.

Doctors practicing in multiple hospitals

Doctors working in the private sector practice in multiple hospitals. Specialists practice in at least 3 hospitals, whilst some specialists practice in 4-5 hospitals. Hence a private hospital will not reflect uniqueness in-terms of expertise. Coupled with the above fact this again does not enable the customer to link the quality of care with the hospital, resulting in linking the quality with the doctor.

The decision in scenario 4 is based on primarily the hospital, since the circumstances do not permit the consumer to have discretion on the doctor they wish to be treated by. However, the doctor-centeredness could have an impact on this decision indirectly, since the selection may be also influenced by the knowledge that the doctor of their choice visits the hospital.

Factors considered when selecting a hospital

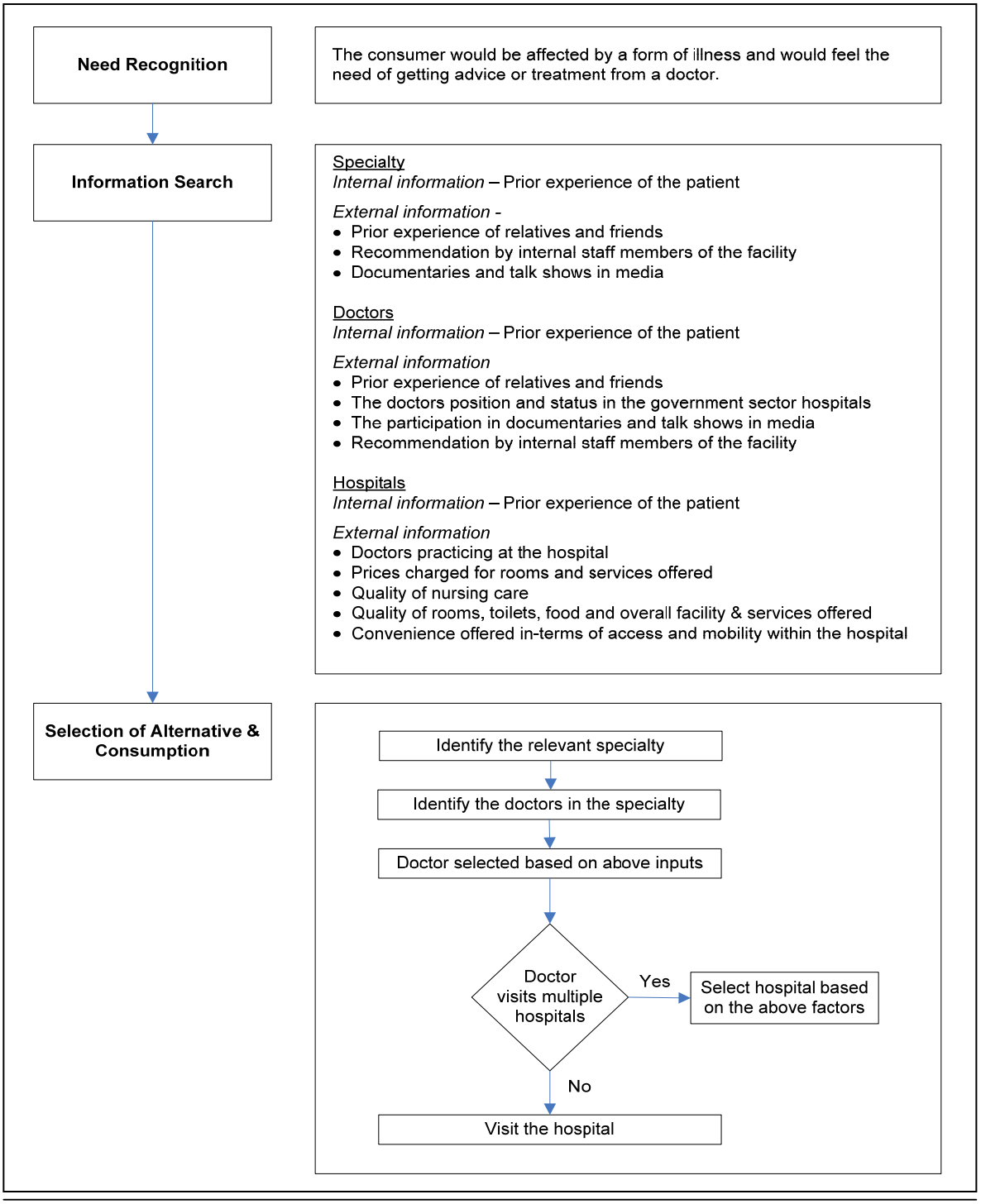
The consumer considers many factors when making a conscious choice about the hospital to visit.

We believe that in general the following factors would influence the consumers' choice of the hospital.

- Doctors visiting the hospital: this would be the primary factor that is considered.
- Prices charged for rooms, diagnostics and other services where the consumers are in a position to make price comparison between players.
- Quality of nursing care.
- Quality of rooms, toilets, food and the overall facility of the hospital.
- Convenience offered to the patient in terms of location and layout of the hospital.

The consumers' decision-making process can be modelled using the cognitive behaviour approach set out below.

Figure 14: Cognitive behaviour approach



Source: JBS Research

Implications to the private health are providers

The behaviour of the consumer has resulted in the hospitals focusing on the doctor rather than the consumer.

The visiting consultant model leaves the hospital with no control over the care delivery process. The hospital has less control over the quality of care.

The doctor-centred behaviour has resulted in doctors taking precedence over patients in the running of a hospital in the private sector and has resulted in the increasing popularity of the visiting consultant's model. Attracting doctors who have built up a reputation for themselves and have a good channel practice is essential for the hospital since it brings in the customer and feeds all other business segments in a hospital. However this results in operators having no control over the quality of patient care and the inability to maintain a level of consistency in care delivery. For example one frequent complaint made by patients is the punctuality of doctors for which hospitals are not in a position to enforce a strict rule. Other implications to the hospital would be:

- The hospitals cannot supplement visiting consultants with resident consultants, since this would invariably result in a drop in the patient numbers.
- Hinders the ability to implement changes in the hospital such as the implementation of new information systems, adoption of information sharing and achieving a level of standardisation of operations.
- Impacts the investment made by the hospitals, relating to equipment, nursing staff, setting up of channelling rooms etc. For example, decisions on equipment are largely based on the demands of the visiting consultants and channelling rooms are sometimes tailor-made to fit certain consultants' needs, whilst some consultants request for channelling rooms for their exclusive use.
- Marketing and advertising is primarily targeted at the doctors rather than the end consumer.

Shifting to hospital-centeredness?

Consumer's behaviour is in the transition stage.

We believe that the consumer behaviour would be characterised by the doctor-centeredness in the short term, but the behaviour is in a transition phase, hence in the medium to long-term we expect the consumer to revert to a hospital-centred behaviour pattern.

Increase in the number of doctors

As the number of doctors and specialists increase the issue about availability of capable doctors will be resolved.

As the number of doctor increase the tendency of the consumers to be doctor-centric would decrease, since this would ensure the availability of capable and experienced doctors in each specialization in almost all hospitals. Therefore, the consumers would tend to be less concerned about the doctor they consult and shift their focus towards the quality and uniqueness of the service they get from the hospital. Furthermore, as the number of doctors increase we believe the

tendency of doctors to practice in multiple hospitals would decrease, enabling the hospital to differentiate itself in-terms of capabilities and expertise.

Increased demand and attention towards non-health aspects of treatment delivery

Consumers are increasingly focusing on non-health aspects of health care delivery. This focus, coupled with the increase in doctors could shift the consumer towards being hospital - centric.

Healthcare consumers are increasingly focusing on non-health aspects of treatment, for example, more communication and information exchange with the doctors, less waiting time etc. At present there are frequent complaints voiced by the consumer on the amount of time they get to spend with the doctor and waiting times. As the number of doctors, especially the number of specialists increase, consumers would tend to focus more on non-health aspects rather than health aspects of treatment delivery. This focus would convert the customer towards being more hospital-centric, since meeting non-health aspects of care delivery is the task of the hospital.

WHO's framework on responsiveness spells out the dimensions of non-health care.

The World Health Organization has developed a conceptual framework, under which all non-health related aspects are captured under the term 'Responsiveness' and include the dimensions of dignity, autonomy, confidentiality, prompt, attention, quality of amenities and access to social support networks during care and choice of care provider.

Increase in consumer education and awareness

Increasing understanding of health care among consumers will increase the trust that they have in doctors and make them more attentive to the overall quality of care.

As the consumers become more knowledgeable their trust in the doctors' capabilities would increase and be more attentive to the overall quality of care, rather than focusing on only the medical issues. This could also lead them to understand that although the doctor plays an important role in the level of care they receive, there are a multitude of other factors that affect the quality, which are more specific to the hospital such as nursing care, equipment, layouts etc.

Increasing focus on convenience

Importance of convenience has increased and is another driver of the shift.

Consumers increasingly look for convenience, opting to visit the hospital/channelling centre that could be easily accessed and be consulted by the doctor who is available.

Implications

A drastic increase in the focus on quality would be needed if the consumers shift their focus.

Hospitals would have to increasingly focus on quality which will entail a significant shift to many private and public hospitals operating at present. The focus would entail enhancing the quality of the total experience of the customer and communicating it.

Such an improvement would entail
- **Improving the quality of facilities.**
- **Improving and maintaining good results.**
- **Reducing errors.**
- **Respecting the patients' requirements.**

Improvement in quality would require

- Improving the quality of the facilities, such as improvements in sanitary facilities, parking facilities, increasing allocation of space for waiting areas etc.
- Improving and maintaining good results: this would involve improving survival rates, reduction of incidence of complications, time to recover and return to normal activity etc.
- Reducing errors made by the hospital. The hospital should implement systems, procedures and controls to ensure that the hospital has taken all possible measures to reduce errors.
- Meeting the patients' requirements by respecting patient preferences, coordinating patient care among different doctors and the rest of the hospital support team, ensuring care is delivered in an organized manner without duplication and lapses, providing accurate and understandable information and education, maximizing the physical comfort of the patient etc.

Decision-maker

The decision-maker will depend on the circumstance.

The decision-maker in a household on healthcare consumption depends on the circumstance. When it comes to maternal and child related illnesses the decision is taken by the mother, whilst in other illnesses the decision is taken by the affected party themselves.

Types of treatment

Sri Lankans' turn to seven types of treatment. 94% of the demand is for western medical care.

Sri Lankans turn to seven kinds of treatment, being self treatment, western medicine, ayurvedic treatment, rituals, homeopathy and acupuncture. Around 94% of the demand is for allopathic or western medicinal treatments, 5% for ayurvedic and the balance is accounted by the other forms of treatment.

Market regulation

The regulator's role in the health care market is very important,

Development of the health sector in Sri Lanka requires the private sector to play an active role. Regulation plays an important role in ensuring that healthcare provided by the private sector meets a high level of standard. The private healthcare industry in Sri Lanka is regulated via the health policy of the government.

Health policy: Regulatory framework

A new act was passed in July 2006, replacing the earlier act.

Prior to14th July 2006, private healthcare institutions were regulated under Nursing Homes (Regulation) of 1949. Taking the growing importance of the private healthcare institutions into account, a new act by the name "Private Medical Institutions (Registration) Act, No.21 of 2006" was passed covering a wide range of areas pertaining to private healthcare.

Comparison of old and new regulations

The establishment of the Private Health Service Regulatory Council is the key feature of the new act.

The most important change is the introduction of the concept of the "Private Health Service Regulatory Council". The new regulation requires the establishment of "Private Health Service Regulatory Council" (PHSRC) as the custodian, which consists of a wide range of stakeholders, including the representatives from private healthcare institutions.

Certain responsibilities of the Health Minister have been transferred to the council.

The new act clearly specifies the scope of the council and has transferred some of the responsibilities and powers that were previously assigned to the minister to the council. For instance, the section 19(1) of the new act has widened and transferred the powers given to the minister under the section 7(2) "d" of the old act to PHSRC. This section empowers PHSRC to make rules in respect of books to be maintained, returns to be furnished, minimum size to be allotted for wards and rooms, required machinery, equipments, devices etc, charges for accommodation, drugs and services rendered etc, qualification of the medical staff, methods of evaluation etc.

Whilst the establishment of the council could be considered a positive, its composition raises doubts as to its effectiveness.

The establishment of PHSRC can be viewed as a positive move in uplifting the standards of private healthcare institutions, because it is a powerful body, which facilitates the interaction between the government regulators and the representatives of private healthcare institutions. However, the composition of the related legal provisions pertaining to the Council might be a barrier in bringing about much needed changes in the private sector. For instance, the

majority of the Council members will have a material relationship with the private sector. Furthermore, it is not clear as to who can convene meetings and what powers the Chairman and the Secretary have.

However the PHSRC could be a forum for an effective public-private partnership in the health sector.

Nevertheless we believe that the PHSRC should be a forum that the representatives of both government and private sector harmoniously work for the betterment of private healthcare which will enable the country to further improve health standards.

Areas to be regulated

The private sector has maintained standards despite poor regulation.

Though the private health industry is highly unregulated, the quality of care has voluntarily been maintained at an acceptable level by the professionals involved in the industry.

The rapid growth in private health care should be accompanied with effective regulation.

The private health industry is growing at a rapid speed with the rising per capita GDP and increased urbanisation. We believe that regulation must be further strengthened in order to make sure that the industry is growing in the proper direction and the competition occurs at the correct levels.

Areas which needs added regulation include,

- **Private channelling centres**
- **Laboratories**
- **Waste management**
- **Supply of medical professionals**
- **Increasing the availability of information**

These are the areas that the regulators must pay immediate attention to.

1. Independent channelling centres have been growing rapidly. The government must put in place a proper regulatory mechanism specifying the criteria to be satisfied before and after the establishment of channelling centres. For instance, the Ministry of Health may specify the basic hygiene facilities at a channelling centre and the qualifications of the individuals assisting the physicians.
2. Laboratories are also growing at a rapid pace, but are subject to minimum or no regulation. There is no proper mechanism to maintain the quality of the service provided by these labs.
3. Waste management will become a serious issue, especially in the Greater Colombo region where all the major hospitals and other healthcare institutions are located. Presently, the individual institutions are disposing of their own waste through the normal waste disposal routes. However, considering the special nature of clinical waste and the high concentration of healthcare institutions in certain geographical locations, the government intervention is mandatory in implementing a proper mechanism to dispose of clinical waste.

4. Government must seriously consider increasing the supply of medical professionals, that is, physicians, nurses and technicians. The private sector is the likely candidate to partner the government in this regard. We are of the view that the government should strike partnerships with private institutions which produce medical professionals in accordance with the standards defined by the government.
5. Lack of information hinders the patients from comparing the healthcare institutions. Therefore, the regulators must construct a reliable mechanism through which the clinical and non-clinical information could be made available to the consumers.

Clustering

Majority of the private sector health care market participants in Colombo have clustered around the National Hospital.

All the major private sector hospitals and associated services have clustered in the greater Colombo region. For instance, Nawaloka, Asiri, Asiri Medical, Asha, Apollo, Oasis, Durdans, numerous private channelling centres and laboratories are located within a radius of five kilometres from the Colombo National Hospital. Furthermore, many new private hospitals (for example, hospitals of the Ceylinco Group) and expansion plans of existing private hospitals (for example, Durdans, Asiri, Nawaloka and Asha) are to be concentrated in the same locality.

Why clustering?

Clustering brings in the following advantages,

- **Easy access to specialists**
- **Colombo city hospitals function as a centre for specialist care**
- **Easy access to ancillary services**

Private hospitals enjoy the following advantages from clustering.

Attracting specialists from the Colombo Hospitals Group

The Colombo Hospitals Group in the greater Colombo region employs a vast majority of specialist physicians and attracts a large number of patients for specialist treatments. This site specificity induces the leading multi-speciality hospital operators of the private sector to locate their facilities in the vicinity of the government hospitals in the greater Colombo region.

National Hospital Colombo the National Referral Centre in the Heart of Colombo

The National Hospital Colombo is the national referral centre for specialist care. Patients come in search of these specialists, who practice at both NHC and the leading private hospitals. For instance, some patients visit the specialist's private practice in order to secure a bed and preferred treatment at NHC.

Ease of obtaining ancillary services

Ancillary services usually flock around the hospital cluster and offer their service at a reasonable price because of the competition between themselves and large markets. The hospitals in the Colombo cluster, for instance, can get ambulance service at a reasonable fee at any time of the day, which is not the case with the hospitals in other parts of the island.

Helps to improve competition in the industry and benefit to consumers

Proximity improves the consumers' ability to compare the services offered by each hospital and hence make a more informed decision on which hospital to visit. Improved customer awareness and information helps to increase the level of competition and the overall quality of an industry. Further clustering of the core and ancillary services to a particular location will enable the consumer to reduce the overall cost of care.

Problems of clustering

Clustering impairs the bargaining power of the patients and physicians.

Clustering impairs the bargaining power the hospitals have over patients and physicians.

Patients

Increase in the bargaining power will have detrimental effect on the hospitals in the short run.

Whilst clustering is beneficial to the consumer and the industry as a whole, the increase in the bargaining power will negatively impact the hospitals in the short-term.

Physicians

Physicians are not dependent on a particular hospital.

Physicians are involved in private practice in more than one hospital in the cluster, reducing their dependency on one hospital. For instance, a specialist visits two private hospitals a day and, on average, schedules 25 appointments at each place. This impairs the bargaining power of hospitals against physicians.

Wrong level of competition

Clustering could encourage price competition and unnecessary investments.

Increasing number of incumbents in the cluster may fuel price competition and unnecessary investments. For instance, the MRI scanner has become a norm in all the listed hospitals, though all hospitals cannot attract the required number of patients to breakeven in the standard payback period of 5 years. At present there are 6 MRI machines in the country. 4 machines are located in Colombo.

Table 36: Locations of the 6 MRI machines

Sector	Hospital	Location
Private	Asiri Medical	-Colombo
	Apollo	
	Naw aloka	
Public	National hospital	
	Teaching Hospital: Kandy	-Kandy
	Teaching Hospital: Karapitiya	-Galle

Source: JBS Research

The following may show an approximation of the payback period of MRIs at two leading hospitals in the cluster.

Figure 15: Payback of a MRI machine under different scenarios

	Scenario				
	1	2	3	4	5
Revenue per scan	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
Number of scans per day	***20***	***21***	***22***	***23***	***24***
Total revenue	**48.00**	**50.40**	**52.80**	**55.20**	**57.60**
Cost of operating MRI	40.26	40.26	40.26	40.26	40.26
Operating profit	**7.74**	**10.14**	**12.54**	**14.94**	**17.34**
Operating cash flow	**25.18**	**27.58**	**29.98**	**32.38**	**34.78**
Payback (Years)	**6.99**	**6.38**	**5.87**	**5.44**	**5.06**

Assumptions	*Rs. Million*
1. Cost of an MRI	176.00
2. Operating costs per annum	
Replacing liquid helium	1.50
Full service contract	12.30
Depreciation	17.44
Other	9.02
Total cost	**40.26**

Source: JBS Research

Despite the above statistics, new entrants, as well as the existing players plan to invest in MRIs. The resulting increase in supply may result in hospitals competing with price, driving down prices in the industry.

Economics of the Private Hospital Industry

Hospital industry and competition

The industry is highly concentrated.

The private hospital industry is highly concentrated with five hospitals accounting for approximately 60% of the total industry revenues. The market structure is characterised by oligopolistic competition, with price being the base on which industry participants interact with each other.

Competition is based on the type and level of services provided.

Hospitals compete mostly based on the level of services, but most often the competition is for attracting the specialist/doctors rather than the end consumer. Due to the doctor centricity of the end consumer, competing for specialists/doctors is equivalent to indirectly competing for the consumer.

Price increases have been made cautiously, despite the inelastic nature of the product.

Although demand for health related products tend to be price inelastic, increases in prices in the industry have been made rather cautiously following wage increases and salary hikes. We believe this to be a function of both market forces and dynamics plus the social nature of the product.

An effective HR strategy should be implemented prior to setting up a new hospital or expanding an existing hospital.

Supply in the industry has been increased in large increments, with recent expansions in capacity ranging from 100-150 beds per hospital. One limiting factor to the expansion in the industry is the shortage of human resources, especially in nursing. Hence an HR strategy would have to pre-empt expansions in the industry.

Table 37: Services offered

Services & equipment offered by the leading private hospitals
- Outpatient care
- Channelling service
- Wards & rooms
- Diagnostic services
Pathology laboratory
Imaging services - X-Ray, CT Scanner, MRI, Echo Cardiography etc.
- Operating theatres
General operating theatres
Specialised operating theatres - Cardiac, Ophthalmology, Neuro surgery et
- Critical care units
Medical, Cardiac, Neonatal, Emergency
- Blood banks and transfusion

* For a detailed description of the services offered check Appendix 3: 'Operating units of a hospital'

Source: JBS Research, Annual Reports and Prospectus

The market is characterised by oligopolistic competition.

The private hospital industry is characterised by oligopolistic competition, which is indicated by the high level of concentration that exists in the industry. As at 2005 the five leading hospitals accounted for 80.7% of the total private sector market share and in terms of bed capacity they accounted for 32.4% of the bed capacity in the market.

Table 38: Concentration of the hospital industry

Hospital	Revenue* (Rs Million)	Market share
Apollo	1,832	22.2%
Asha Central	495	6.0%
Asiri Group	1,258	15.3%
Durdans	1,401	17.0%
Nawaloka	1,673	20.3%
Other	1,591	19.3%
Total	**8,250**	**100%**
Herfindahl Index Value		**0.15**
Equivalent firms		**6.82**
5 Firm concentration ratio		**80.7%**

* Based on revenue for year 2005 and includes revenue from lab services

Source: Institute for Health Policy (http://www.ihp.lk/) and annual reports

Table 39: Bed capacity of the major operators

Hospital	Beds
Asiri	100
Asiri Medical	100
Apollo*	237
Asha Central	120
Durdans	155
Nawaloka	325

*The hospital has an installed capacity of 350 beds, but only 237 are in operation

Source: JBS Research

Competition is based on the service level, with focus on the doctor

Competition is based on the level of service offered. A level of tacit corporation is reflected by in price setting.

Competition in the industry is based on the service level offered by the hospitals, rather than on price. A tacit co-operative behaviour is reflected in the setting of prices, where each player tends to look at the prices charged by the other players and attempts to price at the level of the market. Price changes are initiated by the leader in the respective business segments of the industry and the rest follow the change instep.

Hospitals primarily compete for doctors as apposed to the end consumers.

The private hospitals mainly compete for the specialists in the industry rather than for the end consumer. Since the local consumer mostly tends to follow the specialist attracting sufficient patient volumes will depend upon the number of specialists that practice at the particular hospital. Competition for doctors and the end consumer is based on the service level offered as reflected by the quality of nursing care, number of services offered, adoption of the latest technologies, ambience etc. For example at the

- Doctor/Specialists level: Investing and adopting the latest technology increases the attractiveness of the hospital to visiting specialist, since they would prefer to use the latest equipment available in treating the patient.

- Consumer/Patients level: The fact that a hospital invests and adopts the latest technology plays an important role in the shaping the perception of the hospital and increase the strength of the brand name of the hospital.

Demand is inelastic, but price increases have been done cautiously

Price increases have averaged 10-15% a year, tracking increases in costs.

Health services are non discretionary products and hence the price elasticity for health services is low/ inelastic. Therefore price revisions are not accompanied by large changes in the demand. As discussed previously, prices charged by the hospital for services have been increased by 10-15% on average over the past years, but demand for private healthcare has continuously increased. The private sector hospitals' occupancy rates have averaged between 95-100% between the last 2-3 years.

Aggressive pricing is possible given the level of demand experienced by the hospitals.

Many hospitals maintain waiting lists for certain in-house procedures, whilst out-patient and consultations are accompanied with long waiting times and queues, reflecting the high demand that exists for private healthcare. Although this presents the operators with the opportunity to raise prices significantly, they have refrained from doing so. We believe this to be a function of the following:

But hospitals' for many reasons have refrained from raising prices aggressively.

- Doctors are concerned about the impact the price increase may have on their patients and favour minimal increases in prices, considering their dominance the hospitals have to abide with theses restrictions.
- Fear of overpricing the services relative to the other players, which is a function of the market structure.
- Owners of the hospitals and the top management are concerned with the social nature of the services offered by them. Hence the pricing decision not purely based on financial consideration and takes on a social and moral dimension as well.

Supply has increased in large increments

Setting up a hospital is a highly complex task. Economies of scale require large increments to capacity.

The supply of hospitals are in-elastic. The building of a hospital requires a large capital outlay and is a complex process relative to setting up other facilities such as a production plant. Since economies of scale are critical for hospital profitability, augmentation in supply takes place in large increments. Expansions undertaken by many hospitals such as Nawaloka, Durdans and new hospitals that are in the process of being set up have an average bed capacity of 100-200.

Table 40: Capacity additions of the listed operators

Hospital	Bed Capacity	
	Addition	Date
Asha Central	130	2010
Durdans	160	2010
Nawaloka	100	2008

Source: JBS Research

Shortage of human resources will require the hospital to train and develop HR in several staff categories, especially nurses.

Given the shortage of the human resources of the country, especially in nursing, setting up a hospital requires the development and training of many staff categories. For example, a nurse needs at least a minimum of 3 years training for him/her to have the necessary capabilities to handle the patients. Hence, although construction of the hospital would take 1.5 – 2 years to complete, formulation and implementation of the human resource strategies related to the hospitals would have to pre-empt building of the hospital.

Industry attractiveness: The five force analysis

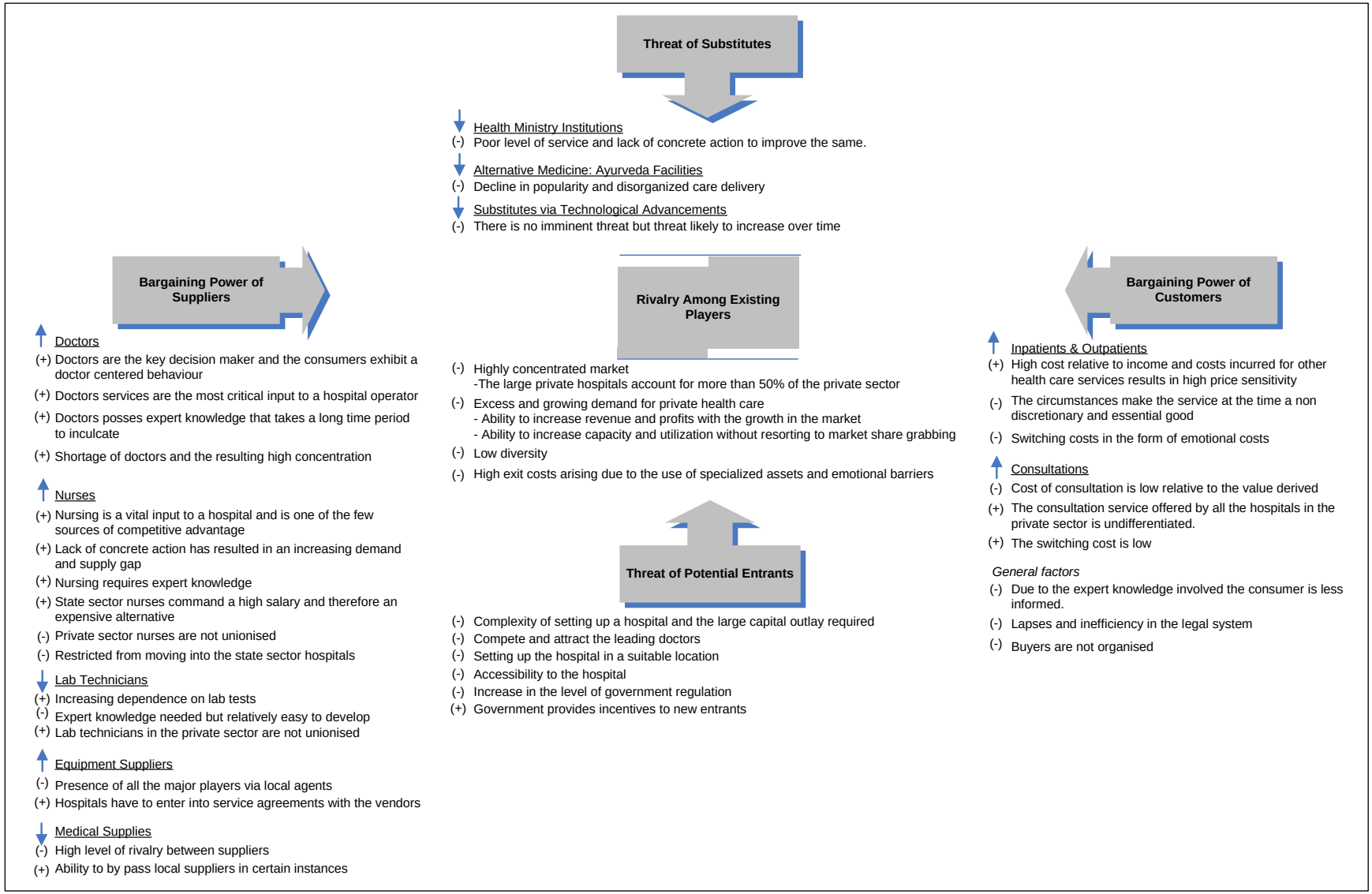
Doctors' dominance in the industry reduces the attractiveness of the industry for private sector hospital operators.

The high bargaining power of doctors is the main factor that weighs in as a negative in the industry. As discussed in our investment thesis we believe this to be one of the main reasons for the low spreads earned by the industry. Whilst nurses and the customers have a higher bargaining power, their tendency to exercise this bargaining power has been low.

The entry of several new players into the industry could increase the level of rivalry in the industry.

Whilst industry dynamics indicate the threat of potential entrants to be low, there are several new entrants in the industry who are in the process of setting up their hospitals. Although the current level of industry rivalry is low we believe this will increase in the future, mainly driven by the fact that these new players have different operating styles.

Figure 16: Five forces of the private health industry



Rivalry between existing players

Rivalry will vary from region to region.

The level of rivalry is regional due the nature of the service, hence geographical concentration matters. In regions where concentration is high we observe a relatively high level of rivalry as opposed to a region where the concentration is low.

The rivalry between existing players remains to be low.

The rivalry between existing players is low, which could be attributed to the large excess demand that prevails in the market. However we could expect the rivalry to increase in the long term, as more and more players enter the market.

High level of concentration

Since few players account for bulk of the market share, they will co-ordinate the actions of the market.

The high level of concentration in the industry as explained in the previous section ensures that the market would be co-ordinated by the leaders and hence prevent the triggering of price wars, advertising battles etc., keeping the inter company rivalry low. The major players in the industry compete with each other, but this is mostly based on quality of care and technology as opposed to price, and thus has a positive impact on the industry as whole, as well as improving the value that the end consumer receives.

Excess demand and growing demand for private hospital care

Excess demand for hospital care points to growth in the industry. This will enable players to increase revenues and profits with the growth in the industry rather than poaching market share fro rivals.

The large growth that is expected in the private hospital market, coupled with the unmet demand ensures that the level of rivalry would not become unhealthy since,

- Players can increase revenue and profits due to the industry growth rather than poaching market share from other players. In the absence of industry growth, company growth is only possible through re-arrangement of market share either by price based competition or superior service affecting industry profits.
- Large scale increases in capacity, which are required in the case of hospitals due to economies of scale, will not result in excess capacity in the industry due to the growing demand. Hence an expansion will not be followed by price cutting and other harmful tactics to fill up the added capacity.

Low diversity

The major players have similar operating styles.

At present all the major players in the industry have similar operating styles, although we see several players in the process of adopting new strategies that differ from the way they operated over the past. This lack of marked variation between the players has also contributed to the low level of rivalry in the industry. Each player is in a position to understand their rivals' current and expected behaviour.

High exit cost

High exit cost, financial and emotional, could increase the level of competition in the industry as new players enter the market.

In our opinion this is the only factor that may bring in some form of competition to the industry. High exit costs are due to the following:

- Use of specialised assets: The high specialization of assets makes it difficult for a hospital operator to exit from the business.
- Emotional Barriers: Certain private hospitals that are in operation, such as Sulayman and Ratnam Hospitals, have been in operation for decades with ownership passing on from one generation to another. Owners have an emotional attachment and a sense of pride towards the hospital, resulting in 'exit' not being an option regardless of the economics of their hospital.

Factors that could change the rivalry between players

Rivalry could increase in the future.

Although the existing rivalry is low in the industry, we believe that the following factors could increase the level of rivalry in the industry.

Increase in the popularity of specialist hospitals

Rivalry could increase as more specialist hospitals enter the market.

Certain private hospital operators are focusing towards specialising in a few areas such as Cardiac, Maternity Care and Ophthalmology whilst certain existing/new operators, such as Nawaloka, Asha Central, Oasis and Delmon operate more or less as general hospitals with focus on a few key specialities.

General hospitals may loose profitable customers to specialist players.

As the number of players operating as general hospitals vs. specialist hospitals increase over time the level of rivalry may intensify in areas chosen by speciality hospitals. Since speciality operators choose the specialties which are most profitable and exhibit a large growth potential, general hospitals may end up losing the more profitable customers and be unable to capture the expected growth.

For example, Nawaloka and Durdans both invest heavily and promote Cardiac care. Nawaloka operates as a general hospital whilst Durdans has shifted their focus towards specializing in Cardiac care and three other areas of specialisation. Durdans may threaten Nawaloka hospitals Cardiac business and increase the level of rivalry in this segment.

New players with different approaches and personality entering the hospital market

Entry of new players will increase the diversity in the industry. This may increase the level of competition in the future.

Within the next few years new large scale hospital operators will be entering the hospital market, mainly Hemas and Ceylinco. These players are new to the industry and may have different operating styles and motives from the existing operators. This may increase the level of rivalry in the industry. For example Hemas operating model is geared towards delivering high end customer care and improving operating efficiency and is in position to capitalize on and accelerate the gradual shift of the consumer from the doctor-centricity towards hospitals centricity.

High exit barriers and increase in competition could lead to extreme tactics

High exit cost may push existing player to resort to harmful forms of competition.

As the level of competition increases the higher exit costs attached to the existing players who are faced with difficulties in attracting doctors and well qualified support staff may face dwindling patient numbers could turn to extreme tactics that could harm the industry as a whole. At present many small private hospitals are running below capacity.

Bargaining power of suppliers

Many types of suppliers function in the market.

Physicians, nurses, technicians, other supporting workers and the local agents of the manufacturers of medical equipment and pharmaceuticals are the suppliers to the private healthcare industry.

Bargaining power of doctors

Doctors' influence all aspects of the health care market.

The doctors command the highest bargaining power in the industry. The behaviour of doctors have a major impact on a private sector hospital operator and the industry as a whole, in many key areas such as pricing, investment, the level and intensity of competition etc. We believe the following factors to be the key factors that have led to the increased bargaining power of doctors.

The consumer is attracted to the doctor rather than the hospital.

Doctors act as the gateway to the consumers of health care.

When it comes to healthcare consumption doctors function as the key decision-maker, with the consumer following the doctors and acting according to the advice given by the doctors. Therefore, hospitals mostly compete for doctors and specialists rather than the end consumers since, in essence, the revenue source of hospitals are controlled by the doctor. The visiting consulting model, which is in operation in all private hospitals in Sri Lanka has resulted in the hospital most often deriving revenue indirectly rather than directly.

Doctors are the most critical input to service delivery

Expertise of the doctor is essential for delivery of any form of healthcare.

This factor is self explanatory. Whilst the hospital cannot function without a doctor, doctors are seldom directly employed by the hospital. This tilts the balance power of against the private hospital operators. This situation is in stark contrast to other firms providing services and is mainly due to the specialised nature of the knowledge the doctor possesses.

Doctors' possess expert knowledge that takes a long time period to inculcate

The process of developing a fully trained doctor takes many years to complete.

A doctor functioning as general practitioner is required to undergo 7 years of training, whilst to function as a specialist an additional 6 years is required thereon. This long time period, coupled with the vast resources required to train a doctor, means slow increase in supply and zero availability of substitute personnel.

Shortage of doctors and the high concentration

There are only 1,504 specialists for a population of 19 million.

As at 31st December 2006 there were only 1,504 board certified specialists in the country while we believe that the total number of doctors to be approximately 11,400. Given a population of approximately 19 million this reflects a large concentration of patients per specialist, again leading to the increased power of doctors in the industry. This high concentration indicates a large shortage in supply.

Table 41: Number of specialists in each discipline

Discipline		Discipline		Discipline	
Anaesthesiology	105	Gastroenterology	2	Oral Surgery	4
Cancer Surgery	9	General Medicine	165	Orthodontics	13
Cardiac Electrophysiology	3	General Surgery	113	Orthopaedic Surgery	31
Cardiology	35	Genito Urinary Surgery	15	Otolaryngology	29
Cardiothoracic Surgery	13	Haematology	22	Paediatric Surgery	13
Chemical Pathology	5	Histopathology	56	Paediatrics	146
Community Dentistry	5	Medical Microbiology	49	Plastic Surgery	6
Community Medicine	95	Medical Parasitology	2	Psychiatry	39
Dental Surgery	28	Nephrology	5	Radiology	58
Dermatology	20	Neuro Surgery	12	Radiotherapy & Oncology	23
Endocrinology	3	Neurology	20	Respiratory Medicine	14
Family Medicine	12	Neurophysiology	3	Restorative Dentistry	5
Forensic Medicine	41	Obstetrics & Gynaecology	183	Rheumatology & Rehabilitation	14
Gastroenterological Surgery	8	Ophthalmology	75	Thoracic Surgery	2
				Vascular & Transplant Surgery	3
				Total	**1,504**

Source: Post Graduate Institute of Medicine

It could take many years to meet the shortage of doctors in the country.

The healthiest countries (ranked in terms of life expectancy) of the world maintain 300 physicians for a population of 100,000. If this is considered to be the global standard, there will be a shortage of 48,957 physicians in Sri Lanka. However the above estimated shortage can be viewed unrealistic for a developing country like Sri Lanka. If the estimate is made using the physician/patient ratio of Singapore, which is 140 physicians for a population of 100,000, there will be a shortage of 16,150 doctors in Sri Lanka. Considering a net addition of 1,900 doctors per annum, it will take at least 19 years to bridge this gap (Refer table 42).

Table 42: Shortage of doctors

	Doctors per 1,000 population	Shortage
Monaco	5.0	
Japan	2.0	
France	3.4	
Switzerland	3.6	
Greece	4.4	
Italy	4.2	
Australia	2.5	
Spain	3.3	
Sweden	3.3	
Average	**3.5**	**56,687**
Singapore	**1.4**	**16,092**

Source: WHO

Future outlook

As a whole doctors will continue to be dominant in the industry.

We believe that the doctor's bargaining power as a whole will remain the same in the future, but the general practitioners' bargaining power will decrease due to the proposed changes in the government medical graduate recruitment policy, whilst the specialists' bargaining power is expected to remain high.

Change in the government recruitment policy

Change in the recruitment policy of the government will reduce the bargaining power of the general practitioners.

The government has plans to limit the number of medical graduates absorbed into the MOH hospitals from 2010 onwards in response to a shortage of available vacancies at these hospitals and the escalating costs of operations. The government plans to reduce the level to 50%. This will in-turn result in an increased supply of General Practitioners to the private sector. As explained before the doctors have a strong preference to work in a public sector hospital. This limits a private sector hospital's ability to directly employ doctors and build an in house physician team to decrease the dependence on visiting doctors. If the policy decision is implemented we believe that the above situation would change with respect to general practitioners, since the resulting increase in supply and the need for doctors to find a job would enable the private operators to attract doctors easily and at a lower cost.

But the specialists bargaining power will not be affected and will continue to remain high.

But we do not believe that this would have a beneficial impact on the private hospitals in-terms of reducing the bargaining power of doctors, since the above change in policy would not have an impact on the specialists. Since none of the private sector operators are capable of providing the required case mix that is necessary for the training of specialists, they will always be attached to the MOH hospitals and the status quo will not change. Majority of the private healthcare consumers seek specialist care either due to perceived or actual need hence unless there is a sharp increase in the specialists in the country and their bargaining power will continue to be high. In the future, Colombo and few other locations, such as Kandy and Galle, will emerge as the major specialist referral centres in the island. This can be expected to generate more patients to the specialities run by the leading multi-speciality hospitals in Colombo.

Bargaining power of nurses

Nurses are the second most important input to care delivery.

Nursing ranks second in-terms of its importance to the functioning of a hospital. They enjoy a high bargaining power in the private sector hospital industry in Sri Lanka, which is primarily driven by the chronic shortage of nurses that is experienced by both public and private sector hospital operators.

We believe that the following factors contribute to the high bargaining power of nurses.

Nursing is a critical input to a hospital and is one of the few sources of competitive advantages

Hospitals can control and have an impact on the care delivery process only through nurses.

Nurses play a critical role in the provision of care throughout the care delivery cycle and play a key role in the efficient and effective functioning of all care delivery processes. Further, since doctors do not work for the hospital, from a hospitals perspective nurses are the only way in which hospitals are able to directly make an impact on the care delivery process. Hence we believe proper handling and training of nurses can enable a hospital to build a competitive advantage in competing for doctors and end consumers.

Lack of concrete action has resulted in an increasing demand-supply gap

Large demand and supply gap exists for nurses.

Sri Lanka has only 158 nurses per 100,000 of population. In comparison, Singapore has 420 nurses per 100,000 of population and the healthiest countries have close to 800 nurses per 100,000.If one takes Singapore’s relative measure of 420, Sri Lanka is short of 50,540 nurses

The shortage of nurses has resulted in new entrants having to set up their own training schools to train their required cadre.

Nursing requires expert knowledge

Nurses posses expert knowledge.

As in the case of doctors, nurses require expert knowledge to function effectively. Nurses require training for a minimum of 3-4 years, including experience in dealing with a wide array of cases. Given the shortage, a high turnover of nurses would severely affect the operations of a hospital.

Inability to attract nurses employed in the state sector

Given the state sectors status as the preferred employer of nurses, the private sector is not in a position to attract nurses from the state sector.

The only alternative source of well-trained nurses is the state sector hospitals. However, as with the case of doctors, the government is the preferred employer when it comes to nurses, due to higher salaries, better training and the prestige associated with working as a nurse. Hence, if the private sector hospitals are to attract nurses employed in the government sector they would have to offer higher salaries than the rate prevailing in the private sector. Given that the private sector rate is 30-35% lower than the public sector rate, this would lead to a sharp increase in operating costs.

However, we believe that the following factors contribute to the lessening of bargaining power of nurses.

Private sector nurses are not unionised

Private sector nurses are not unionised.

The private sector nurses are not unionised, so unlike their counterparts in the state sector they lack the power of organisation. The state sector nurses are organised under the 'Public Services United Nurses Union' which comprises of approximately 95% of the nurses employed in the sector and have the ability to severely disrupt the public healthcare system in the country by taking on trade union action.

Restricted from moving into the state sector hospitals

Non recognition of private sector training limits their ability to shift to the state sector.

Nurses trained by the private sector do not have a formal accreditation system. As a result, their formal education and training is not recognised by the state sector hospitals, restricting them from moving to state sector where the wages offered are 50-60% higher. On average, a nurse in the state sector has the ability to earn between Rs. 25,000-30,000 per month, whilst in the private sector it would be in the range of Rs. 15,000-20,000. Another major impediment to

moving to the state sector is the heavy opposition of the powerful state sector nurses' union to recruiting from the private sector.

Future Outlook

No concrete action has been taken to increase the current rate of supply.

Although the government has proposed to increase the intake of nursing undergraduates, we are yet to see any concrete action being taken. We do not see any change occurring in the industry in relation to nurses, thus we believe that they will continue to enjoy a high bargaining power in the industry.

Bargaining power of lab technicians

Lab technicians also enjoy a high bargaining power.

Lab technicians also command a high bargaining power in the industry, which is also driven by the increasing demand and supply gap in the industry.

Increasing dependency on lab test

Increasing dependence on lab test will drive up the demand for laboratory technicians.

Due to the increase in the number of patients seen by doctors on a given day, there is a shift away from clinical diagnosis towards a dependence on laboratory tests. Further, the supply of trained medical lab technicians is severely constrained, since only the state offers formal training for lab technicians. Considering the above factors, we see a widening demand and supply gap for technicians in the industry.

Table 43: Shortage of technicians

Lab technicians	Density per 1,000
China	0.16
Sri Lanka	0.07
Lab technicians	**1,325**
Estimated shortage	**1,704**

Source: WHO

The supply is not sufficient to cater to the demand.

Data for technicians are not published for most Asian countries, including Singapore, which is the benchmark that we have used previously. Therefore, China is selected as a benchmark. The statistics suggest that there is a shortage of 1,704 lab technicians in the island, which is demonstrated by the inability to perform timely lab tests at government hospitals and the inability of the private sector to recruit the required number of lab technicians to run their satellite labs.

Expert knowledge required but developing the necessary skill set is less complex

Training lab technicians takes relatively less time.

Although lab technicians require specific expert knowledge, it is relatively easier to train suitable candidates. We have seen that many private sector hospitals employ graduates in their labs and provide them with sufficient training to function independently and effectively in a short span of time. This applies downward pressure on the lab technicians bargaining power.

Not unionised

Technicians are not unionized.

The private sector lab technicians are not unionised. Their counterparts in the state sector are unionised and command a high bargaining power over the authorities.

Equipment suppliers

Equipment suppliers bargaining power is fairly neutral.

Equipment suppliers' bargaining power could be considered to be fairly neutral since they most often tend to act in partnership with hospitals.

Existence of multiple players in the local market

All the major equipment suppliers have a presence in the local market.

All the major medical equipment suppliers, such as Phillips and Siemens are represented by local agents. Hence the hospitals have a choice when it comes to the selection of equipment. Further, the demand for equipment is determined by the reputation and technological advancements made by the parent company, which has a negative effect on the supplier is bargaining power.

Hospitals enter into service agreements with the particular equipment manufacturer

Hospitals' enter into service agreements for the maintenance of equipment.

The equipment suppliers would be the only party capable of repairing and maintaining the equipment and the hospitals enter into service agreement with the suppliers over the life of the equipment. This has a positive effect on the bargaining power of the equipment suppliers.

Medical supplies and pharmaceutical suppliers

Bargaining power of the suppliers is low.

Medical suppliers bargaining power is the lowest in relation to all the suppliers to the private hospital industry. The following factors are the main factors contributing to the low bargaining power.

High competitive intensity

Intense competition in the respective suppliers industry gives hospitals an upper hand.

At present there are approximately 20 players operating in the industry and there is intense competition between the players. This competition is due to the lack of differentiation and the ease of entry into the industry. Competition is mostly based on price. In addition, a particular hospital would account for a large portion of the suppliers' revenue and profits. These factors have favoured the hospital operators who are in a position to play one supplier against the other.

Ability to bypass local suppliers in certain instances

Hospitals' can bypass the local suppliers.

Hospitals have the ability to by pass the local agents of certain suppliers and purchase directly. The tendency to directly import medical supplies has been increasing, especially over the last 1-2 years. Asiri, Durdans and Apollo have opted to import their lab chemical (mostly chemicals relating to, and especially those relating to biochemistry tests) and certain medical supplies. It is believed that the hospitals are able to yield a cost benefit of approximately 35%-40% due to this.

Threat of new entrants

Entry in to the industry is no trivial task.

Entry to the hospital industry is no trivial task given the complexity involved in setting up and running hospitals and the large capital expenditure that is required. Therefore, in the recent past, only well capitalized large corporations with experienced management teams have made moves to enter the sector.

Setting up and running a hospital is complex and requires a large capital outlay

Building a hospital would require approximately Rs. 1.0 – 1.5 billion.

Setting up a hospital is a highly complex task and requires a large capital out lay. For example, setting up a 100 bedded multi-speciality hospital would cost in the range of Rs. 1.0-1.5 billion. An HR strategy would precede any planning of the actual construction since it is essential that the entrant has a team that possesses all the expert knowledge required for planning and implementation, as well as for operations. For example, a new entrant would have to set up a nursing training school to have a team of nurses ready to commence work upon the completion of construction work. Therefore, organising and financing a hospital project is tougher than many other projects.

Acquiring an existing hospital would also entail a large capital outlay.

Acquiring an existing hospital would also entail large capital outlays. The probability of a new owner being able to turnaround a hospital with operational problems could be low.

Compete and attract the leading doctors

The new entrants would have a tough time attracting doctors to their hospital.

The new entrants would have to attract the leading physicians to the hospital in order to attract consumers. Given that doctors most often run on a tight schedule and have associations with the hospitals they currently visit, it would be difficult to encourage many doctors to shift to the new entrants hospital.

Finding a suitable location to site the hospital

Location of the hospital is vital.

Finding a suitable location is crucial for attracting both consumers and doctors, as well as for the effectiveness of the care delivery process. At the macro level finding a suitable location would entail looking at the income levels in the area and the demographic patterns whilst at the micro-level accessibility to the hospital to both consumers and doctors is important.

- *Income level and demographics*

Income levels in the location will be key driver of the expected demand.

Income is the main determinant of the effective demand for private healthcare. On average, a patient spends around Rs. 40,000 - 44,000 on private inpatient care and Rs. 1,000 - 1,400 on private out patient care annually. This was the main reason for the private healthcare institutions to converge to the Western Province, where 51% of the GDP is generated and growing at a rate of 15% per annum on average.

Demographics of the locality is a source of competitive advantage.

Demographics of the locality where a hospital is located is not vital but places the hospital at a competitive advantage.

- *Accessibility to the hospital*

A new entrant would also have to consider the accessibility to the location, both from the perspective of the doctors and the consumers.

Private hospitals should be easily accessible to the physicians working in the public sector. For instance, all the private listed hospitals are clustered around the Colombo public hospitals (National Hospital, Lady Ridgeway Hospital, Castle Street Women's Hospital and De Soyza Maternity Hospital), in order to attract the public sector physicians who are reluctant to spend much time in travelling. Accessibility to the end consumer should also be convenient since travelling time and cost would influence their decision in selecting the hospital to visit.

Increase in government regulation

The level of regulation in the industry is increasing.

As will be discussed in greater detail in the next section, the government is in the process of increasing the level of regulation of private sector healthcare providers. Whilst these pose a challenge to a new entrant, these measures could also be viewed as a positive measure since it ensures that in the long term the standards of the industry would be upgraded. (Refer 'Market Regulation' in the Key Attributes section)

Government provides incentives to new entrants

The government has extended financial incentives to new entrants through the BOI.

The GOSL has extended incentives for investments in the health and pharmaceutical sector in the form of tax concessions. Tax concessions offered via the BOI are as follows.

Minimum investment - US$ 500,000/=

Incentives - 5 years full income tax holiday, 10% tax rate for further 02 years, 20% tax rate thereafter.

Minimum investment - US$ 10,000,000/=

Incentives - 06-12 years full income tax holiday based on investment, 15% tax rate thereafter. Exemption from 100% land transfer tax.

Future

Threat of new entrants will be a valid concern in the industry.

Threat of new entrants will be a valid concern in the foreseeable future, since the increasing levels of income and favourable demographic structures have increased the attractiveness of the industry.

Bargaining power of customers

The bargaining power of the consumer is controlled by the doctors.

The doctor-centric behaviour of the local healthcare consumer has resulted in them being the customer of the doctor, rather than the hospital. Most often it is the doctor who has the bargaining power of the end consumer and influences many decisions taken by the hospital in the provision of healthcare. For example, services to deliver, prices charged, etc.

However focusing on consumer is important.

However, from the perspective of a hospital operator, the end consumer should be its prime focus, and should consider the competitive threat/opportunities they pose.

The cost involved in obtaining health care makes the consumers more demanding.

In general the healthcare consumer's bargaining power is high, mainly owing to the high costs of obtaining healthcare, but it could vary depending on whether the customer is entering the hospital as an individual who wants to get a consultation or whether he/she is an inpatient or outpatient.

Outpatients/Inpatients

Inpatients and outpatients command a high bargaining power in the industry.

Outpatients and inpatients tend to exercise a high level of bargaining power over the hospitals directly, as well as indirectly, via the doctor. This is mainly due to the cost factor, especially in the case of inpatient care. The doctors' power in the industry and the continued poor service in the state sector have helped suppress this power, although there is a shortage of facilities in the market. We believe the following factors contribute to the high bargaining power of the consumer.

High cost

High costs associated with the purchase of health care increases the price sensitivity of the consumers.

Due to the low use of health insurance, many healthcare consumers personally bear the hospital bill. For example, an Appendectomy would cost around Rs. 50,000, whilst a Caesarean Section would cost around Rs. 100,000, including the doctor's fee. Other costs also would have to be incurred such as on drugs, diagnostics, food and the room fee. All in all, the final cost would be very high, and would account for a large portion of the income of middle and upper middle income earners who make up bulk of the inpatient/outpatient consumers. This increases the price sensitivity of the consumers to price increases. In addition, we believe that, since healthcare has traditionally been a free service, there is hesitancy to pay large fees for health services.

We believe that the following factors decrease the bargaining power of the consumer, but the 'high cost' factor is the most powerful and tilts the balance of power in the favour of the consumer.

An essential good

Health services are an essential good.

Conditions that require a visit to the hospital as an inpatient or outpatient would require some sort of intervention and attention. The needs will be non-discretionary. Given the poor performance of the government hospitals, the only substitute there is, the private sector hospital, would be the only option the consumer has. Hence the bargaining power of the consumer is decreased.

Switching costs

Switching costs, in the form of loss in familiarity and inability to obtain treatment from a particular doctor exists.

Although in monetary terms the consumer does not incur a cost to switch from one hospital to another, emotionally, there may be costs attached to the shift. For example, loss of familiarity in-terms of nursing care and facility and increase in distance are some of the cost that the consumer may incur when switching from one hospital to another. The fact that the doctor visits only a particular hospital may also deter the consumer from switching from one hospital to another.

Consultation

The consumers in this segment tend to exert less power.

The consumers of consultation services tend to exert less power since the cost of visit represents only small fraction of the income segments the private hospitals typically serve. We believe that the following factors will determine the level of power exerted by this consumer.

Cost of a consultation is small, relative to income and cost for other healthcare services

The consulting fee is small relative to other costs incurred.

Consultation fees vary from Rs. 250-500 with the average fee amounting to approximately Rs. 350. From this fee only Rs. 100 goes towards the hospital whilst the balance is to the doctor. Given that majority of the consumers of the consulting service belong to the lower middle income and above, the cost incurred is small, relative to their income. In relation to the value they derive, the fee is a small payment.

Undifferentiated service

The consultation service provided by hospitals is not differentiated.

There is no marked difference between consultation services offered by the private hospitals. Since doctors are all visiting consultants the hospital provides only the consulting room which requires very basic equipment. Although opportunities exist to provide a differentiated service via the use of Information Technology Solutions and better congestion management, none of the hospitals has capitalized on this. This factor leads to the increase of the bargaining power of the consumer.

Switching cost

The switching cost is low for consumers of the consultation service.

Switching cost to a consumer of the consultation time offered by the hospital would come in the form of:

- Additional cost of transport both in terms of time and cost
- If the doctor they wish to see does not visit other hospitals

At present we believe that the switching cost for the consumer is low leading to increased power of the consumer.

Low cost involved in the consumption of the service has resulted in the consumer exerting less bargaining power.

Although the last two factors tilt the bargaining power in favour of the consumer, the 1st factor overrides these and hence results in the consumer exercising less power over the hospitals. This gives the opportunity for the hospitals to increase the fee charged since the lower bargaining power of consumer indicates less price sensitivity. However the doctors have an important say on fees. Thus the hospitals are not in position to determine prices inline with their greater bargaining power.

The following factors tend to decrease the consumer's bargaining power in general.

Less informed consumer

Complex nature of the service has resulted in the consumer being less informed and knowledgeable.

The lack of information relating to healthcare provision and the highly technical and complex nature of the service has resulted in a less informed consumer. Lack of information prevents the consumer from understanding and measuring the value they receive.

Lapses and inefficiency of the legal system

Ineffective legal system reduces the power of the consumers.

Weaknesses in the legal system, and the poor regulation in the industry also results in the diminished bargaining power of the healthcare consumer.

The AHRC reports that concealment and lack of efficient systems impedes the ability of malpractice victims to seek justice.

As reported by the Asian Human Rights Commission(AHRC), cases of medical negligence and malpractice at both private and government hospitals in Sri Lanka have been accompanied by concealment (Statement ID: AS-49-2005, issued on May 11, 2005). Even when such cases are reported there is no effective and efficient system via which the victim could secure an inquiry or seek justice. The AHRC states that delays in commencing inquiries by health authorities such as the Health Services Institute have left the perpetrators with time to falsify, destroy and manufacture evidence. Taking civil action is also not an option for majority of those affected due to the long time period (can take 5 to ten years and sometime even more) the court system takes to settle such disputes.

Buyers are not organised

Lack of organization of consumers has reduced the bargaining power of the consumers.

Consumers are not organised into groups. Thus they lack bargaining power unlike in the United States in which consumers are insured through health management organisations that exert a greater bargaining power.

Threat of substitutes

Largest substitute to the private sector hospital operators are the state sector hospitals. However given the continuous poor performance of these hospitals we do not believe them to pose a threat to the private sector hospitals.

At present the largest substitute to private sector hospitals are the institutions run by the Ministry of Health. As mentioned in other parts of this report, the performance of these hospitals have declined over time and no concrete action has been taken to rectify the weaknesses in the system. This poor performance is what spawned the development of the private sector. Hence we do not believe that the public sector would pose a threat to the private sector players given the current conditions. Further, the policy of the GOSL is focused on creating an environment in which the private sector could increase its contribution to the health sector.

Improvements in the major state sector hospitals won't threaten the hospitals.

However, some teaching hospitals such as the Colombo South and North are being upgraded with new state-of-the-art wards and equipment with aid received from various donor agencies and programmes. However, given that Government hospitals still primarily serve the lower income and lower middle income segments in terms of inpatient care we do not believe that such developments would pose a threat to large private hospitals. These developments, though, could pose a threat to the small private hospitals in the future.

Price to performance trade off offered by the private sector hospitals is superior.

In the light of the above, we believe that the price to performance trade off offered by the private sector hospitals are superior in comparison to public sector hospitals, and do not believe that they pose a threat to the sector.

A threat from alternative treatments such as ayurveda is virtually non existent.

Alternative treatments such as Ayurveda, which at present are not provided by the private sector hospitals currently in operation, also pose little threat to hospitals, since the popularity of Ayurvedic treatment has not shown an increasing trend. The Consumer Finance and Socio Economic Survey of 2003/2004 conducted by the Central Bank indicated that only 6.2% of the population seeking healthcare had obtained Ayurvedic treatment during the period of study, as opposed to 9.2% in 1996/97 period, indicating a declining trend. Ayurveda treatment facilities are largely limited to small channelling centres that have been setup in urban areas, whilst in rural areas the care

delivery is mostly done at the doctors living premises. Due to the lack of coordination and organization of care delivery and various misconceptions, the possible growth in Ayurveda therapy has been hindered. Investments in this sector have mostly being focused towards capitalising on the popularity of Ayurveda among tourists.

Table 44: Relative contribution of Ayurveda

Provider	1996/97	2003/04
Private sector	7.90%	5.00%
Public sector	1.30%	1.20%
Total	**9.20%**	**6.20%**

Source: WHO

The future

Advances in technology will pose the biggest threat in the future. However the threat is not imminent.

In time to come we believe that the threat from substitutes spawning from technological advancements are high, due to the pace at which new technologies are emerging and changing the way healthcare is provided. Although no imminent threat exists we expect such developments to gradually increase over time and affect hospitals in certain limited areas only, for example, specialities such as ophthalmology and diagnostics. Whilst rate of technological advancement would be the primary factor, the pace of adopting the same would also play major role in the level of threat that may be posed.

Substitute for hospital care could take the form of the following:

Treatment and methods that enable treatment of disease in a different setting

New technologies may change the setting of the treatment and do away with the need to visit a hospital.

For example, the development of new diagnostic equipment and methods that enable the individual to perform tests themselves would render a visit to the hospital unnecessary. This was witnessed in Blood glucose tests. This is a common type of test that enables a lab to earn a margin of approximately 60%, and is now capable of being performed at home using glucose meters at a much lower cost with results being generated within minutes. There is the development of new equipment and procedures that enable treatment in a different setting, such as nursing homes or channelling centres, rather than visiting a hospital.

Improvements in technology that results in the reduction of the required hospital stay and care being converted to out patient from in patient.

Certain new procedures have converted inpatient procedures into outpatient procedures.

New procedures that do not require the patient to be admitted to a hospital, such as Laparoscopic surgery has cut short the patient recovery time, enabling patients to leave the hospital within a matter of hours. Cataract eye surgeries, which previously required a hospital stay, now could be performed in a matter of hours. Such procedures are especially a threat to hospitals, which have invested heavily in hospital infrastructure focused on hospital accommodation and since almost all hospitals make money from services provided during the patient's stay at the hospital.(for example, drugs and lab tests). Whilst faster turnarounds, meaning shorter stay enables earning a higher rate of return on capital invested in the infrastructure (as discussed in the 'Investment Thesis - Alternative path for improved returns: Efficiency'), not requiring the infrastructure all together would result in poor returns on such assets and the overall investment in the hospital.

Hence in the future the utilization of investments in inpatient infrastructure may come down.

India and China will increase the rate of diffusion of technology in the country.

India and China have been emerging as a producer of medical equipment in the recent past, hence the rate of diffusion of technology to Sri Lanka has risen sharply.

Appendix

Appendix – 1: Evaluation of lab operations

In our opinion the laboratory makes the largest contribution to a hospitals revenue as well as profit. Based on our estimates the most commonly performed tests such as blood glucose , WBCDC, full blood counts enable a hospital to earn a minimum contribution margin of approximately 40-50%.

Table 45: Contribution margin on common tests

	Avg. Price*	Cost	Contribution	Margin
Blood glucose	137	70	67	**48.8%**
ESR	130	65	65	**50.0%**
WBCDC	177	100	77	**43.4%**
Hemoglobin	190	100	90	**47.4%**
Platelet count	188	100	88	**46.9%**
PCV test	188	100	88	**46.9%**

** Based on prices charged by major players*

Source: JBS Research

A fully functioning laboratory performs tests under 6 categories, being Bio Chemistry accounting for 40% of the tests performed, Haematology, Clinical Pathology, Immunology together accounting for 50% and the balance coming from Micro Biology, Histopathology. Histopathology tests mostly relate to biopsies and hence would be performed in labs which operate within a hospital.

A lab that caters exclusively to hospital patients would generate approximately 60% of the volume from in-patients whilst the balance being accounted for by out-patient demand.

Staff Requirements

In general a lab that performs 1,000 tests a day would require at least 30 qualified lab technicians with 20 additional staff members for bleeding, billing and other functions.

Investment and Profitability

A fully automated laboratory that has a capacity to perform around 2,500 tests a day would require a minimum investment of Rs. 14-15 million in equipment,

whilst requiring an additional Rs. 10-15 million for setting up a suitable building and investments in working capital.

The high prices that prevail in the market for tests enable a lab to earn a high return on sales. There is little difference in the prices charged by the major players in the market. We believe that the following factors help to maintain the current level of prices in the market:

1. Since the market for diagnostics is large and is expected to grow, increasing market share does not have to come primarily through capturing market share from the competitors, which is often achieved in its most aggressive form via price cutting. This would drive industry wide prices and profits down.
2. The market for tests are highly concentrated, with a few large players dominating the market.
3. The level of prices acts as a signal of the level of quality and accuracy of the tests; hence a price cut would result in a decrease in total revenue earned by initiator.
4. Brand and trust play a critical role, hence acts as strong barrier to potential entrants.

Table 46: Prices charged by the private sector operators

	Asiri	Asha Central	Appollo	Ceymed	Durdans	Nawaloka
Pap smeer test	710	785	1,000	650	640	1,200
Blood glucose	130	140	150	110	140	150
ESR	140	130	140	110	120	140
WBCDC	180	180	170	160	180	190
Urine full report	150	130	150	120	120	140
Blood urea	150	190	250	180	190	200
Hemoglobin	230	190	190	160	180	190
Platelet count	230	180	190	160	180	190
PCV test	230	180	190	160	180	190

Source: JBS Research

Given the high turnover rates that could be obtained from the invested equipment due to the high price as well as the high volume generated, a lab is capable of earning very high rates of return on invested capital. The key to improving asset utilization, as proven by the current leader in the laboratory, Asiri, is to expand the operations of the lab beyond the hospital to capture demand from patients that obtain medical care from other hospitals, that is hospitals run by the MOH and other private sector health facilities. This demand

could be captured by setting up satellite labs and collection centers. Satellite labs could be set at a small cost by equipping it to handle simple test such as full blood counts tests whilst performing the more complex tests at the central lab run within the hospital. Collection centers have to be set up in order to facilitate the safe collection, storage and transportation of the collected samples.

Set out below is an evaluation of the financial performance for a lab that has a capacity of 2,500 tests per day operating at 80% capacity.

Figure 17: Projected returns on lab

Income & Expenditure

	Per Test	No. of Tests	Total
Price	150	730,000	109,500,000
Variable cost	(70)		(51,100,000)
Contribution	**80**		**58,400,000**
Depreciation			(2,305,000)
Electricity			(1,200,000)
Staff cost			(21,600,000)
Other Staff cost			(2,880,000)
Other costs			(600,000)
Operating profit			**29,815,000**
Taxes			8,944,500
Net profit			**20,870,500**
Returns			
Operating margin			27.2%
Net profit margin			19.1%
On invested capital			64.6%
Asset turnover			3.86

Invested Capital

Equipment	15,000,000
Building & land	12,000,000
Working capital	5,295,000
	32,295,000

Assumptions

1. Number of tests per day 2,000

2. Variable cost per test
   - Chemical cost 35
   - Cost of containers 35

3. Depreciation
   Equipment and building were depreciated over 10 years

4. Electricity cost was assumed to be 100,000 per month

5. Staff costs

	Number	Salary	Total
Lab technician	60	30,000	21,600,000
Other staff	20	12,000	2,880,000

4. Inventory
   Assumed an inventory holding period of 2 months for chemicals and containers

Source: JBS Research

Appendix – 2: Industry Overview

The hospital industry is made up of both private sector and public sector players, with the public sector accounting for the bulk of the hospitals and the bed capacity in the country. The private sector players can be segregated into those that are listed public hospitals and private hospitals.

The public sector

The public sector provides curative healthcare through primary, secondary and tertiary medical institutions. There are 605 facilities capable of providing in-patient and out-patient care whilst 406 facilities cater exclusively for out-patient care. The number of facilities under each category is set out in table 47. Curative care is delivered through 276 health units. At present 9 base hospitals are in the process of being upgraded to district general hospitals.

Table 47: Public Sector Hospitals

Primary Healthcare Facilities	
Central dispensary	476
Rural hospital	174
Peripheral units	100
District hospitals	127
Estate hospitals	10
Other	2
	889

Secondary Healthcare Facilities	
Base hospitals	61
Provincial hospitals	5
District general hospitals	17
	83

Tertiary Healthcare Facilities	
Teaching hospitals	19
Special hospitals	1
National hospital	1
	21

Source: Annual Health Bulletin 2003

Through the above facilities the public sector caters to approximately 50% of the consumers seeking outpatient care and 95% seeking in patient care. Health Ministry Institutions are plagued with underinvestment, resulting in many facilities being poorly maintained and also having equipment that is out dated or non-functional. The provision of service is subject to frequent disruptions due to trade union actions. Coupled with the overburdening of these facilities the above factors have resulted in the continuous deterioration of the level of care provided at government hospitals.

Although the government has set up healthcare facilities to enable a referral system to operate, the bypassing of lower level institutions has resulted in this referral system not bringing in the required results. Lower level facilities are bypassed with patients directly seeking treatments at the higher level institutions resulting in over crowding and under utilization of resources allocated to both lower and higher level facilities. It is believed that 10-30% of the patients treated at higher level facilities can be treated at lower level facilities. Feeling of less attention being paid to them at the lower level institutions, inability of lower institutions to function as one stop shop for all requirements (Laboratories), lack of doctors in the lower level institutions, staff at lower level institutions themselves instructing patients to visit the higher level institutions directly are some of the factors that have led to this bypassing.

The bed capacity in the government sector as at 2003 was 59,626, and recorded a CAGR of 1.58% over the period 1975-2003. Due to the above by passing of facilities there is a situation of over-utilization of bed capacity at the higher level institution and an under-utilization of bed capacity at the lower level institutions.

Table 48: Growth in hospitals and bed capacity in the public sector

	1975	1980	1985	1990	1995	2000	2001	2002	2003	CAGR
No of hospitals	458	480	490	422	467	558	**569**	**576**	**607**	**1.58%**
No of beds	40,761	43,389	44,861	42,079	47,665	57,027	**57,946**	**59,144**	**59,262**	**2.10%**

Source: Annual Health Bulletin 2003

The private sector

The private sector is mainly concentrated to the Western Province with 70% of the hospitals and 73% of the bed capacity located in the region. The supply of the private sector is concentrated among a few large players, of which the majority are listed entities on the Colombo Stock Exchange. The average bed capacities of these large entities average 100 beds whilst the average bed capacity of the entire private sector was only 30 beds per hospital.

The major players in the private sector operate as multi-speciality hospitals and speciality hospitals, whilst the majority of the other players offer care in a few selected specialities at a generic level.

Set out below is a description of the listed private hospitals, which collectively account for approximately 60% of the total industry revenue.

Nawaloka Hospitals

Nawaloka with a capacity of 325 beds is the largest hospital in the private sector. The hospital commenced operations in 1982 with 100 beds and has grown rapidly over time introducing many new technologies to the healthcare market in Sri Lanka.

Nawaloka hospital operates as a general hospital and offers care in approximately 17 specialities. In addition to the main city hospital it also extends its services through 5 medical centres and its associate company 'Ruhunu Hospital', a 50 bed facility located in Matara. The hospital has the largest consulting practice, with 270 specialists visiting the hospital. It is also a major player in the diagnostics services market. The hospital entered into a joint venture with Metropolis Health Services in India in 2006.

The hospital is currently operating at full capacity and is in the process of expanding the hospital to add another 100 beds. The construction has already begun and is expected to be completed by November 2007. It also hopes to setup 10 poly clinics across the island within the next 3 years.

Figure 18: Financial performance and position

Financial performanc	02/03	03/04	04/05	05/06	06/07	Financial position	02/03	03/04	04/05	05/06	05/07
Revenue	1,090	1,232	1,480	1,673	1,987	Assets	1,319	1,342	1,421	2,355	2,406
Gross profit	492	599	635	751	898	Equity	428	729	1,103	1,557	1,443
Operating profit	159	186	187	212	222	Debt	680	619	339	836	1,000
Pre tax profit	60	90	140	142	81	Operating assets	1,277	1,296	1,304	1,401	1,501
Net profit	35	64	117	53	(113)	NPPE	1,217	1,223	1,222	1,338	1,454
EBITDA	255	297	292	331	437						
NOPLAT	162	190	167	149	204						
Return on Investmer	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Debt capacity**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**
Operating capital	12.7%	14.7%	12.8%	10.6%	13.6%	Leverage - Debt/Equity	158.9%	84.9%	30.7%	53.7%	69.3%
Total assets	12.0%	13.8%	13.2%	9.0%	9.2%	Leverage - Debt/Total capital	61.4%	45.9%	23.5%	34.9%	40.9%
Equity	8.1%	8.7%	10.6%	3.4%	-7.9%	Interest coverage	1.47	1.89	3.56	2.74	1.56
Return on Sales	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Growth**	**03/04**	**04/05**	**05/06**	**06/07**	**AVG**
Gross profit	45.1%	48.7%	42.9%	44.9%	45.2%	Revenue	13.0%	20.1%	13.0%	18.8%	16.2%
Operating profit	14.6%	15.1%	12.7%	12.7%	11.2%	Gross profit	21.8%	6.0%	18.3%	19.6%	16.2%
Net profit	3.2%	5.2%	7.9%	3.2%	-5.7%	Net profit	82.6%	83.5%	-54.4%	-313.4%	8.8%
EBITDA margin	23.4%	24.1%	19.7%	19.8%	22.0%	NOPLAT	17.1%	-12.2%	-10.6%	36.4%	5.8%
NOPLAT margin	14.9%	15.4%	11.3%	8.9%	10.2%	Assets	1.7%	5.9%	65.7%	2.2%	16.2%
Valuation Matrices			**04/05**	**05/06**	**06/07**	**Market values**			**04/05**	**05/06**	**06/07**
Enterprise value/NOPLAT			20.4	12.6	11.1	Enterprise value			3,407	1,886	2,252
Enterprise value/EBITDA			11.7	5.7	5.2	Market value of equity			3,150	1,762	1,903
P/E ratio			27.0	33.1	n/a	EPS			0.3	0.1	(0.2)
P/B ratio			2.9	1.2	1.4	NAV			2.4	2.2	2.0

* Figures in Rs. Million

Source: Annual reports and JBS Research

Durdans Hospitals Group

Durdans Hospitals Group is composed of two hospitals, the Ceylon Hospitals and the Durdans Heart Surgical Centre. The Ceylon Hospital has a bed capacity of 155 whilst the Durdans Heart Centre has a capacity of 9 beds.

At Durdans the main focus lies in the areas of cardiac care, ophthalmology, paediatrics, obstetrics and gynaecology and diagnostics. The hospital is visited by 174 consultants. Durdans is a dominant player in the diagnostics market and the provision of cardiac care in the private sector. It holds a market share in diagnostics of 25% and offers services via the main lab located at Ceylon Hospitals, 9 satellite labs and approximately 240 collection centres.

The group is also operating at full capacity at present and is planning to expand its capacity by 160 beds, investing 1.8 billion rupees over the next two years.

Figure 19: Financial performance and position

Financial performance	02/03	03/04	04/05	05/06	06/07	Financial position	02/03	03/04	04/05	05/06	06/07
Revenue	598	696	1,009	1,401	1,639	Assets	606	814	923	1,105	1,722
Gross profit	339	339	392	520	732	Equity	436	735	796	914	1,552
Operating profit	97	94	146	236	258	Debt	226	116	221	306	325
Pre tax profit	66	75	132	212	230	Operating assets	676	733	773	1,034	1,139
Net profit	47	61	69	88	145	NPPE	662	689	751	976	1,142
EBITDA	125	132	186	277	310						
Operating profit - Recurrin	98	98	149	233	255						
NOPLAT	98	98	114	180	206						
Return on Investment	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Debt capacity**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**
Operating capital	14.5%	13.4%	14.8%	17.4%	18.1%	Leverage - Debt/Equity	51.9%	15.7%	27.8%	33.5%	20.9%
Total assets	15.9%	11.5%	15.8%	21.3%	15.0%	Leverage - Debt/Total cap	34.1%	13.6%	21.8%	25.1%	17.3%
Equity	10.7%	8.3%	8.7%	9.7%	9.3%	Interest coverage	3.22	5.15	8.39	7.68	7.29
Return on Sales	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Growth**	**03/04**	**04/05**	**05/06**	**06/07**	**AVG**
Gross profit	56.6%	48.7%	38.9%	37.1%	44.7%	Revenue	16.4%	45.1%	38.9%	16.9%	28.7%
Operating profit	16.2%	13.5%	14.5%	16.8%	15.8%	Gross profit	0.0%	15.8%	32.7%	40.7%	21.3%
Net profit	7.8%	8.8%	6.9%	6.3%	8.9%	Net profit	30.5%	13.7%	27.6%	63.9%	32.7%
EBITDA margin	20.9%	19.0%	18.4%	19.7%	18.9%	NOPLAT	0.2%	16.4%	57.5%	14.7%	20.5%
NOPLAT margin	16.4%	14.1%	11.3%	12.8%	12.6%	Assets	34.3%	13.5%	19.6%	55.9%	29.8%
Operating profit margin	16.4%	14.1%	14.7%	16.6%	15.6%						
Valuation Matrices		**03/04**	**04/05**	**05/06**	**06/07**	**Market values**		**03/04**	**04/05**	**05/06**	**06/07**
Enterprise value/NOPLAT		4.2	5.0	5.9	6.4	Enterprise value		415	571	1,058	1,322
Enterprise value/EBITDA		3.1	3.1	3.8	4.3	Market value of equity		489	665	1,046	1,341
P/E ratio		8.0	9.6	11.8	9.2	EPS		4.6	3.4	5.6	6.6
P/B ratio		1.3	1.1	1.9	1.0	NAV		28.3	30.3	34.4	59.0

* Figures in Rs. Million

Source: Annual reports and JBS Research

Asiri Hospital Group

The Asiri Hospitals group is composed of Asiri Hospital, Asiri Surgical Hospital and Asiri Diagnostic Services. Asiri and Asiri Surgical hospital each have a capacity of 100 beds. Asiri Surgical commenced operations in 2003.

The groups main focus lies in diagnostics and surgery. Asiri is the market leader in diagnostics, conducting a minimum of 7,000 tests per day. It has set up 350

collection centres and five satellite labs operating in Kandy, Kalubowila, Matara, Negombo and Ragama. The Asiri Surgical Hospital is considered to have the best operating theatres in the country and believed to be on par with operating theatres in the west. The theatre has been set up focusing on neurosciences.

The group is also planning to expand its capacity, with an addition of 50 beds to the Asiri Surgical Hospital. In addition, consultation areas and rooms in the Asiri Hospital were upgraded and refurbished during the 2006/07 financial year.

Figure 20: Financial performance and position – Asiri Group

Financial performance	02/03	03/04	04/05	05/06	06/07	Financial position	02/03	03/04	04/05	05/06	06/07
Revenue	646	740	1,073	1,292	1,707	Assets	980	1,004	1,774	1,771	1,972
Gross profit	242	297	323	477	575	Equity	723	773	1,200	1,238	1,329
Operating profit	171	179	399	287	465	Debt	290	732	441	643	669
Pre tax profit	158	135	341	243	388	Operating assets	576	800	1,879	2,041	2,329
Net profit	120	115	258	125	184	NPPE	629	791	1,793	1,965	2,208
EBITDA	203	221	321	401	621						
NOPLAT	131	152	181	213	343						
Return on Investment	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Debt capacity**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**
Operating capital	22.8%	19.0%	9.6%	10.4%	14.7%	Leverage - Debt/Equity	40.1%	94.8%	36.7%	51.9%	50.4%
Total assets	17.5%	17.8%	22.5%	16.2%	23.6%	Leverage - Debt/Total cap	28.6%	48.7%	26.9%	34.2%	33.5%
Equity	16.6%	14.8%	21.5%	10.1%	13.9%	Interest coverage	12.67	4.11	6.87	6.62	6.00
Return on Sales	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Growth**	**03/04**	**04/05**	**05/06**	**06/07**	**AVG**
Gross profit	37.5%	40.1%	30.1%	36.9%	33.7%	Revenue	14.6%	45.1%	20.3%	32.1%	27.5%
Operating profit	26.5%	24.2%	37.2%	22.2%	27.2%	Gross profit	22.7%	8.9%	47.5%	20.6%	24.2%
Net profit	18.6%	15.5%	24.0%	9.7%	10.8%	Net profit	-4.6%	124.8%	-51.5%	47.5%	11.3%
EBITDA margin	31.5%	29.9%	29.9%	31.0%	36.4%	NOPLAT	15.7%	19.1%	17.6%	61.5%	27.2%
NOPLAT margin	20.3%	20.5%	16.8%	16.5%	20.1%	Assets	2.5%	76.7%	-0.2%	11.4%	19.1%
Valuation Matrices	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Market values**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**
Enterprise value/NOPLAT	2.1	2.2	7.2	7.5	8.2	Enterprise value	275	478	2,319	3,001	5,106
Enterprise value/EBITDA	1.4	3.5	6.8	12.3	13.2	Market value of equity	80	179	642	350	561
P/E ratio	6.0	9.2	5.7	13.5	14.8	EPS	3.2	3.2	6.5	4.4	4.4
P/B ratio	0.9	1.3	1.3	2.0	2.9	NAV	20.4	21.7	29.1	30.8	22.5

*Figures in Rs. Million

Source: Annual reports and JBS Research

Figure 21: Financial performance and position– Asiri Medical

Financial performance	03/04	04/05	05/06	06/07	Financial position	03/04	04/05	05/06	06/07
Revenue	58	344	531	719	Assets	453	496	1,175	1,251
Gross profit	39	171	269	384	Equity	370	413	1,099	1,179
Operating profit	20	69	139	226	Debt	93	104	101	118
Pre tax profit	2	7	14	22	Operating assets	971	1,169	1,288	1,305
Net profit	20	69	139	221	NPPE	990	1,139	1,236	1,226
EBITDA	26	107	191	300					
NOPLAT	25	69	140	225					
Return on Investment	**03/04**	**04/05**	**05/06**	**06/07**	**Debt capacity**	**03/04**	**04/05**	**05/06**	**06/07**
Operating capital	2.6%	5.9%	10.9%	17.3%	Leverage - Debt/Equity	25.2%	25.3%	9.2%	10.0%
Total assets	4.4%	14.0%	11.9%	18.0%	Leverage - Debt/Total capital	20.1%	20.2%	8.4%	9.1%
Equity	5.4%	16.8%	12.7%	18.7%	Interest coverage	7,874.48	10,063.59	568.58	53.09
Return on Sales	**03/04**	**04/05**	**05/06**	**06/07**	**Growth**		**04/05**	**05/06**	**06/07**	**AVG**
Gross profit	67.5%	49.6%	50.6%	53.4%	Revenue		489.6%	54.2%	35.5%	131.0%
Operating profit	34.3%	20.1%	26.3%	31.4%	Gross profit		333.9%	57.3%	43.0%	113.7%
Net profit	34.3%	20.1%	26.2%	30.7%	Net profit		245.8%	100.8%	58.6%	122.5%
EBITDA margin	44.8%	31.0%	36.1%	41.7%	NOPLAT		175.7%	102.2%	60.8%	107.8%
NOPLAT margin	43.1%	20.1%	26.4%	31.3%	Assets		9.6%	136.8%	6.4%	40.3%
Valuation Matrices		**04/05**	**05/06**	**06/07**	**Market values**			**04/05**	**05/06**	**06/07**
Enterprise value/NOPLAT		19.3	12.8	20.5	Enterprise value			1,338	1,788	4,623
Enterprise value/EBITDA		12.6	9.3	15.4	Market value of equity			1,233	1,057	3,875
P/E ratio		17.5	12.0	30.6	EPS			0.2	0.3	0.36
P/B ratio		3.0	2.3	7.1	NAV			1.2	1.3	1.6

*Figures in Rs. Million

Source: Annual reports and JBS Research

Asha Central Hospital

Asha Central has a bed capacity of 120. A management change took place in 1998. The new management has taken several steps to upgrade the services provided by the hospital.

Approximately 125 doctors visit the hospital to channel patients. The hospital also provides diagnostic services and is reputed for providing speedy results. Expansions and capacity additions of the hospital have been severely limited due to the restrictions placed on it by the Urban Development Authority since the premises on which the hospital is located has been designated as a Special Primary Residential Zone.

The management of the hospital has set in motion a plan to relocate the hospital to a new facility with a capacity of 250 beds at a new location. The company has set up a subsidiary called 'Central Hospital' for this purpose. The hospital is in the process of being built and is expected to reach completion in 2010.

Figure 22: Financial performance and position

Financial performance	02/03	03/04	04/05	05/06	06/07	Financial position	02/03	03/04	04/05	05/06	06/07
Revenue	370	386	440	495	555	Assets	454	484	514	1,061	1,584
Gross profit	130	133	163	172	201	Equity	284	316	378	946	965
Operating profit	77	71	110	116	117	Debt	170	158	137	115	620
Pre tax profit	49	54	96	106	75	Operating assets	461	490	498	536	518
Net profit	34	32	62	39	19	NPPE	453	470	478	1,019	1,030
EBITDA	100	96	133	142	165						
NOPLAT	75	69	108	115	136						
Return on Investment	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Debt capacity**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**
Operating capital	16.3%	14.1%	21.7%	21.5%	0.2627	Leverage - Debt/Equity	59.9%	50.1%	36.1%	12.2%	64.2%
Total assets	16.9%	14.7%	21.3%	10.9%	7.4%	Leverage - Debt/Total cap	37.5%	33.4%	26.5%	10.9%	39.1%
Equity	11.9%	10.1%	16.5%	4.1%	1.9%	Interest coverage	2.71	4.07	7.51	9.64	3.13
Return on Sales	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Growth**	**03/04**	**04/05**	**05/06**	**06/07**	**AVG**
Gross profit	35.2%	34.5%	37.0%	34.8%	36.3%	Revenue	4.2%	14.1%	12.3%	12.3%	10.7%
Operating profit	20.8%	18.4%	24.9%	23.5%	21.1%	Gross profit	2.1%	22.4%	5.7%	17.1%	11.5%
Net profit	9.1%	8.2%	14.1%	7.8%	3.4%	Net profit	-6.2%	96.2%	-38.1%	-51.6%	-13.8%
EBITDA margin	27.0%	24.9%	30.3%	28.8%	29.8%	NOPLAT	-8.3%	56.7%	7.0%	17.9%	16.0%
NOPLAT margin	20.3%	17.8%	24.5%	23.3%	24.5%	Assets	6.6%	6.3%	106.3%	49.3%	36.7%
Valuation Matrices	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**Market values**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**
Enterprise value/NOPLAT	7.2	6.7	6.9	8.0	7.3	Enterprise value	544	460	739	925	986
Enterprise value/EBITDA	5.4	4.8	5.5	6.5	6.0	Market value of equity	374	302	603	810	893
P/E ratio	7.6	5.6	6.3	7.7	14.1	EPS	2.2	2.4	4.3	4.7	2.84
P/B ratio	1.3	1.0	1.6	0.9	0.9	NAV	12.7	14.1	16.9	42.4	43.2

* Figures in Rs. Million

Source: Annual reports and JBS Research

Apollo Hospital

Apollo Hospital which commissioned operations in 2002 is the most recent entrant to the industry. The hospital provides care via the main facility located in Colombo and eight off site clinics located around the country.

Apollo Hospitals is the only hospital operating on a resident specialist model and is the first consumer-centric hospital in the country. It operates as a multi-

speciality hospital and has an installed bed capacity of 350. However, only 230-240 beds are being utilized for the delivery of care.

With the change in management that took place in 2006, there have been many changes made to the operating model of the hospital. Attracting many local doctors is one key change that has been effected.

Figure 23: Financial performance and position

Financial performance	02/03	03/04	04/05	05/06	Financial position	02/03	03/04	04/05	05/06
Revenue	805	1,487	1,657	1,832	Assets	2,380	2,166	1,943	1,762
Gross profit	507	992	1,129	1,261	Equity	1,392	1,191	1,134	1,137
Operating profit	(74)	(30)	115	184	Debt	1,178	1,267	1,265	1,226
Pre tax profit	10	2	9	50	Operating assets	2,663	2,505	2,402	2,326
Net profit	(272)	(207)	(56)	4	NPPE	2,690	2,501	2,418	2,299
EBITDA	(54)	180	245	316					
NOPLAT	(69)	(32)	114	183					
Return on Investment	**02/03**	**03/04**	**04/05**	**05/06**	**Debt capacity**	**02/03**	**03/04**	**04/05**	**05/06**
Operating capital	-2.6%	-1.3%	4.7%	7.9%	Leverage - Debt/Equity	84.6%	106.4%	111.5%	107.8%
Total assets	-3.1%	-1.4%	5.9%	10.5%	Leverage - Debt/Total capital	45.8%	51.5%	52.7%	51.9%
Equity	-19.6%	-17.3%	-4.9%	0.3%	Interest coverage	(2.63)	(5.81)	1.48	0.98
Return on Sales	**02/03**	**03/04**	**04/05**	**05/06**	**Growth**	**03/04**	**04/05**	**05/06**	**AVG**
Gross profit	62.9%	66.7%	68.1%	68.8%	Revenue	84.6%	11.4%	10.6%	31.5%
Operating profit	-9.2%	-2.0%	6.9%	10.1%	Gross profit	95.7%	13.8%	11.7%	35.5%
Net profit	-33.8%	-13.9%	-3.4%	0.2%	Net profit	-24.2%	-72.9%	n/a	n/a
EBITDA margin	-6.7%	12.1%	14.8%	17.3%	NOPLAT	-54.2%	n/a	60.6%	n/a
NOPLAT margin	-8.5%	-2.1%	6.9%	10.0%	Assets	-9.0%	-10.3%	-9.3%	-9.5%
Valuation Matrices	**02/03**	**03/04**	**04/05**	**05/06**	**Market values**	**02/03**	**03/04**	**04/05**	**05/06**
Enterprise value/NOPLAT	n/a	n/a	32.5	25.1	Enterprise value	3,841	2,872	3,692	4,593
Enterprise value/EBITDA	n/a	15.9	15.1	14.5	Market value of equity	2,662	1,605	2,427	3,367
P/E ratio	n/a	n/a	n/a	864.4	EPS	(2.0)	(1.3)	(0.4)	0.02
P/B ratio	1.6	1.4	2.1	3.0	NAV	10.5	7.6	7.2	7.2

* Figures in Rs. Million

Source: Annual reports and JBS Research

Appendix – 3: Operating Units of a Hospital

In general a hospital will organize the operation of the hospital under the following operating units

- Critical care units
- Operating theatres
- Rooms and wards
- Channeling rooms
- Diagnostics and laboratory

Operating Theatre

The operating room is the unit where all surgical procedures are carried out. Operating theatres could be designed to handle a range of procedures or could be set up to handle specific conditions only, for example the Nawaloka Hospital has 4 theaters that have been designed to handle specific procedures. The equipment needed to handle certain surgeries are heavily specialized hence specialized theatres have to be set up to handle these cases. Setting up a general operating theatre costs approximately Rs. 15 – 18 million whilst setting up a specialized operating theatre to handle cardiac surgery would cost an additional Rs 22-28 million.

Most operating theatres in the private sector remain vacant in the morning hours from around 9.30am till 5.00pm in the evening. This is due to the fact that hospitals do not employ many resident doctors and many surgeries are carried out by visiting consultants who work in the private sector after 4.00 pm.

At present from the total charge made to a patient approximately 50% accrues to the hospital with the balance paid out as the doctor's fee. For example from the Rs. 100,000 charged on average per cesarean section, approximate Rs. 45,000 to 50,000 is made up by the team of doctors who perform the surgery.

Critical Care Units

Critical care units are set up for the treatment and monitoring of patients who have life-threatening conditions and could benefit from the special treatment and care given.

The bed capacity in a private sector critical care unit varies from about 3-15 beds. The cost of setting up a critical care unit is estimated to be around Rs. 2.5

million per bed in a general ICU, while it will cost around Rs. 5 million per bed for a specialized ICU.

All the leading private hospitals have their own critical care units, both specialised and general.

Channeling Rooms

Channeling rooms are set to cater to the channeling practice. They are furnished to facilitate a basic check up and are used mostly in the evenings after 4.30. Providing well-furnished consulting rooms with sufficient support staff such as nurses is essential to attract consultants to the hospital.

Although a patient is charged a consultation fee of Rs. 500 on average, the hospital receives only Rs. 100 per patient.

Rooms and Wards

Rooms and wards cater to the in-house patients and occupied for pre-surgery preparation and post surgery recovery. Rooms are categorized, based on the level of comfort they offer to the patient. Wards have the very basics needed for overnight stay and is the cheapest option available to in-patients.

A ward bed is priced at an average of Rs. 1,750 whilst the price of a room ranges from Rs. 2,700 to Rs. 10,000 based on the facilities provided. Rooms are equipped with facilities such as televisions, air conditioning and the hospitals also provide meals. Taking into account the above factors, it is evident that the rooms are a loss maker for the hospital, however, rooms create the demand for all other services of the hospital.

Table 49: Room rates

Category	Sub Category	Durdans	Nawaloka	Asiri Medical	Asiri	Asha Central	Apollo
Ward		2,750	1,800	2,200	2,200	2,050	1,500
Normal	1	2,950	3,300	3,250	3,250	3,600	3,200
	2						
Semi luxury		4,750	3,700	3,750	3,750	3,850	4,300
Luxury		4,950	4,100	4,000	4,000	4,200	5,500
Suite	1		9,200				8,500
	2						12,500

Source : JBS Research

Diagnostics

Diagnostics encompasses laboratory operations and imaging and radiology. The demand for diagnostics has increased rapidly over the past few years with doctors increasing their dependence on test results to obtain a prognosis as apposed to clinical diagnosis.

A detailed description of the laboratory operations have been set out in Appendix 1. Imaging services and equipment include X-Ray, CT scans. MRI scans, Ultrasound scans etc.

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