



## **CHAPTER 1: CARDIAC SERVICES IN MALAYSIA**

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Several studies have shown that patients with cardiac problems have improved outcomes if part of their care is provided by cardiologists.<sup>1-3</sup> In this chapter, a hospital was considered as providing cardiac services when there were either resident cardiologist(s) or visiting cardiologist(s) (regardless of the frequency of visits) within the establishment. Therefore, our data did not include hospitals offering basic cardiology services (e.g. exercise stress-test, echocardiogram) and cardiac care unit (CCU) managed by physicians. Meanwhile, "CCU services" was defined as having either dedicated CCU or combined ICU/CCU within a hospital offering care for cardiac patients. We have also excluded fellows and trainee cardiologists from being considered as consultant cardiologists and cardiac surgeons. Density for each indicator was calculated based on the Malaysian population data in 2009.

A total of 90 hospitals out of 341 surveyed provided cardiac services, equivalent to an overall density of 0.03 per 10000 population. This varied from 0.01 in Sabah and WP Labuan to 0.09 in WP Kuala Lumpur. Disproportionate distribution of cardiac services was apparent especially between West and East Malaysia and in West Malaysia among states in West Coast and East Coast (Table 1.1).

Fifty-one hospitals in Malaysia which offered cardiac services also provided CCU services with a general density of 0.02 hospital per 10000 population. The majority of these were private hospitals (64.7%). The highest density was observed in WP Kuala Lumpur (0.05 per 10000 population), in contrast to only 0.01 per 10000 in Kedah, Johor, Pahang, Sarawak and nil in Terengganu (Table 1.2). In these 51 hospitals, a total of 355 CCU beds were reported, of which 65.6% beds were found in private hospitals. The overall density was 0.13 bed per 10000 population. Highest density of bed was again in WP Kuala Lumpur at 0.56 bed per 10000 population (Table 1.3).

It should be noted that there were at least 21 hospitals with physician-run CCUs (data not shown) which were not included in Tables 10.2 and 10.3 as they did not fulfil the criteria of 'providing cardiac services'. An example is in the states of Terengganu where there were CCU services<sup>4</sup> but was reported as null as they were operated by physicians. In addition, some hospitals provided CCU services from mixed facilities (combinations of CCU, ICU, and HDU) which could have caused inaccuracy in the data. In 2007, a total of 73 dedicated CCUs were reported in Malaysia.<sup>4</sup>

A total of 51 out of the 90 hospitals offering cardiac services had catheterisation laboratory (cath lab) within their establishments, most of which were private hospitals. This was higher than that reported in 2007 (36 hospitals) by NMDS<sup>4</sup>. The ratio of cath lab service to 10000 population was 0.02. Among all states in Malaysia, the highest density was 0.06 for WP Kuala Lumpur (10 hospitals), Pulau Pinang (7 hospitals) and Melaka (3 hospitals) as opposed to the absence of catheterisation lab in Perlis and Terengganu (Table 1.4).

The NHEWS 2009 had identified 175 cardiologists throughout the country (0.06 per 10000 population). The highest density of cardiologists was found in WP Kuala Lumpur (0.30 per 10000 population), followed by Pulau Pinang (0.15) and Melaka (0.14). This reflected that the higher density of hospitals with cardiac services were located within these three areas. On the contrary, the lowest number of cardiologists was found in Perlis (0), followed by Negeri Sembilan (0.01 per 10000 population) (Table 1.5). Overall our density of cardiologists was much lower than that recommended by the British Cardiac Society (0.53 – 0.84 per 10000 population).<sup>5</sup> In comparison, numbers of cardiologists in developed countries were 0.18 per 10000 population in England (2005)<sup>5</sup>, 0.23 per 10000 population in Singapore (2006)<sup>6</sup> and 0.56 per 10000 population in US (2008).<sup>7</sup>

Similarly, the density of cardiac surgeons in Malaysia was 0.02 per 10000 population, which was about 3 times less than that in England (0.056 per 10000 population in 2009).<sup>8, 9</sup> This number also varied between different regions and states, with the highest numbers recorded in WP Kuala Lumpur (0.10 per 10000 population) and lowest in East Coast of West Malaysia and East Malaysia (0 – 0.01 per 10000 population) (Table 1.6).

In a nutshell, all five indicators described above clearly illustrate the concentration of cardiac services in the West Coast of Peninsular Malaysia where there are bigger cities and larger populations. Most of the services are dominated by the private healthcare service providers. The proposal to set up at least one heart centre for every state (except Perlis) will hopefully address this uneven distribution of cardiac services within the country by 2020. On the other hand, addressing the issue of reimbursement for academic and public cardiologists will perhaps prevent brain drain to the private sector. Producing an adequate number of well-trained cardiologists and cardiothoracic surgeons who will devote themselves to prevention, early accurate diagnosis, and cost-effective treatment of cardiovascular disease will hopefully eliminate arteriosclerotic cardiovascular disease and many of its deadly complications.

#### **Limitations**

1. Hospitals with resident cardiologist(s) and visiting cardiologist(s) were reported together as providing “cardiac services” which might not reflect the actual extent of the service. Some visiting cardiologists could have been running only outpatient clinic and on a not-so-frequent basis (e.g. once in two months).
2. The survey did not differentiate dedicated CCUs with CCUs run in combination with ICUs and / or HDUs and did not include hospitals without consultant cardiologists, which could contribute to under-reporting of total CCU beds available in the country. Pediatric cardiologists were also not included and should be included in future reports as part of the cardiac service providers.



### Summary

1. There is an uneven distribution of cardiac services reported between regions and sectors.
2. Compared with developed countries, there is still much room for improvements in cardiac services in our country.
3. Timely establishment of new regional centres and intensifying training programmes are mandatory in view of the ever increasing disease burden.

### References

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**Table 1.1 Number and Density of Hospitals Providing Cardiac Services in Malaysia by State and Sector, 2009**

State	Sector	Number	Per 10000 population
Malaysia	Public	21	-
Malaysia	Private	69	-
<b>Malaysia</b>	<b>Total</b>	<b>90</b>	<b>0.03</b>
Perlis	Public	1	-
Perlis	Private	0	-
<b>Perlis</b>	<b>Total</b>	<b>1</b>	<b>0.04</b>
Kedah	Public	1	-
Kedah	Private	5	-
<b>Kedah</b>	<b>Total</b>	<b>6</b>	<b>0.03</b>
Pulau Pinang	Public	1	-
Pulau Pinang	Private	8	-
<b>Pulau Pinang</b>	<b>Total</b>	<b>9</b>	<b>0.06</b>
Perak	Public	2	-
Perak	Private	5	-
<b>Perak</b>	<b>Total</b>	<b>7</b>	<b>0.03</b>
Selangor & WP Putrajaya	Public	2	-
Selangor & WP Putrajaya	Private	13	-
<b>Selangor &amp; WP Putrajaya</b>	<b>Total</b>	<b>15</b>	<b>0.03</b>
WP Kuala Lumpur	Public	3	-
WP Kuala Lumpur	Private	13	-
<b>WP Kuala Lumpur</b>	<b>Total</b>	<b>16</b>	<b>0.09</b>
Negeri Sembilan	Public	1	-
Negeri Sembilan	Private	3	-
<b>Negeri Sembilan</b>	<b>Total</b>	<b>4</b>	<b>0.04</b>
Melaka	Public	1	-
Melaka	Private	4	-
<b>Melaka</b>	<b>Total</b>	<b>5</b>	<b>0.07</b>
Johor	Public	3	-
Johor	Private	7	-
<b>Johor</b>	<b>Total</b>	<b>10</b>	<b>0.03</b>
Pahang	Public	1	-
Pahang	Private	2	-
<b>Pahang</b>	<b>Total</b>	<b>3</b>	<b>0.02</b>
Terengganu	Public	1	-
Terengganu	Private	1	-
<b>Terengganu</b>	<b>Total</b>	<b>2</b>	<b>0.02</b>
Kelantan	Public	2	-
Kelantan	Private	1	-
<b>Kelantan</b>	<b>Total</b>	<b>3</b>	<b>0.02</b>
Sabah & WP Labuan	Public	1	-
Sabah & WP Labuan	Private	2	-
<b>Sabah &amp; WP Labuan</b>	<b>Total</b>	<b>3</b>	<b>0.01</b>
Sarawak	Public	1	-
Sarawak	Private	5	-
<b>Sarawak</b>	<b>Total</b>	<b>6</b>	<b>0.02</b>

**Table 1.2 Number and Density of CCUs in Hospitals with Cardiac Services in Malaysia by State and Sector, 2009**

State	Sector	Number	Per 10000 population
Malaysia	Public	18	-
Malaysia	Private	33	-
<b>Malaysia</b>	<b>Total</b>	<b>51</b>	<b>0.02</b>
Perlis	Public	1	-
Perlis	Private	0	-
<b>Perlis</b>	<b>Total</b>	<b>1</b>	<b>0.04</b>
Kedah	Public	1	-
Kedah	Private	0	-
<b>Kedah</b>	<b>Total</b>	<b>1</b>	<b>0.01</b>
Pulau Pinang	Public	1	-
Pulau Pinang	Private	6	-
<b>Pulau Pinang</b>	<b>Total</b>	<b>7</b>	<b>0.04</b>
Perak	Public	1	-
Perak	Private	4	-
<b>Perak</b>	<b>Total</b>	<b>5</b>	<b>0.02</b>
Selangor & WP Putrajaya	Public	2	-
Selangor & WP Putrajaya	Private	7	-
<b>Selangor &amp; WP Putrajaya</b>	<b>Total</b>	<b>9</b>	<b>0.02</b>
WP Kuala Lumpur	Public	3	-
WP Kuala Lumpur	Private	6	-
<b>WP Kuala Lumpur</b>	<b>Total</b>	<b>9</b>	<b>0.05</b>
Negeri Sembilan	Public	1	-
Negeri Sembilan	Private	1	-
<b>Negeri Sembilan</b>	<b>Total</b>	<b>2</b>	<b>0.02</b>
Melaka	Public	1	-
Melaka	Private	2	-
<b>Melaka</b>	<b>Total</b>	<b>3</b>	<b>0.04</b>
Johor	Public	2	-
Johor	Private	2	-
<b>Johor</b>	<b>Total</b>	<b>4</b>	<b>0.01</b>
Pahang	Public	1	-
Pahang	Private	1	-
<b>Pahang</b>	<b>Total</b>	<b>2</b>	<b>0.01</b>
Terengganu	Public	0	-
Terengganu	Private	0	-
<b>Terengganu</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Kelantan	Public	2	-
Kelantan	Private	1	-
<b>Kelantan</b>	<b>Total</b>	<b>3</b>	<b>0.02</b>
Sabah & WP Labuan	Public	1	-
Sabah & WP Labuan	Private	0	-
<b>Sabah &amp; WP Labuan</b>	<b>Total</b>	<b>1</b>	<b>0</b>
Sarawak	Public	1	-
Sarawak	Private	3	-
<b>Sarawak</b>	<b>Total</b>	<b>4</b>	<b>0.02</b>

**Table 1.3: Number and Density of CCU Beds in Hospital with Cardiac Services in Malaysia by State and Sector, 2009**

State	Sector	Number	Per 10,000 population
Malaysia	Public	122	-
Malaysia	Private	233	-
<b>Malaysia</b>	<b>Total</b>	<b>355</b>	<b>0.13</b>
Perlis	Public	4	-
Perlis	Private	0	-
<b>Perlis</b>	<b>Total</b>	<b>4</b>	<b>0.17</b>
Kedah	Public	8	-
Kedah	Private	0	-
<b>Kedah</b>	<b>Total</b>	<b>8</b>	<b>0.04</b>
Pulau Pinang	Public	7	-
Pulau Pinang	Private	50	-
<b>Pulau Pinang</b>	<b>Total</b>	<b>57</b>	<b>0.36</b>
Perak	Public	8	-
Perak	Private	15	-
<b>Perak</b>	<b>Total</b>	<b>23</b>	<b>0.09</b>
Selangor & WP Putrajaya	Public	17	-
Selangor & WP Putrajaya	Private	54	-
<b>Selangor &amp; WP Putrajaya</b>	<b>Total</b>	<b>71</b>	<b>0.14</b>
WP Kuala Lumpur	Public	22	-
WP Kuala Lumpur	Private	73	-
<b>WP Kuala Lumpur</b>	<b>Total</b>	<b>95</b>	<b>0.56</b>
Negeri Sembilan	Public	8	-
Negeri Sembilan	Private	3	-
<b>Negeri Sembilan</b>	<b>Total</b>	<b>11</b>	<b>0.11</b>
Melaka	Public	6	-
Melaka	Private	13	-
<b>Melaka</b>	<b>Total</b>	<b>19</b>	<b>0.25</b>
Johor	Public	11	-
Johor	Private	6	-
<b>Johor</b>	<b>Total</b>	<b>17</b>	<b>0.05</b>
Pahang	Public	6	-
Pahang	Private	5	-
<b>Pahang</b>	<b>Total</b>	<b>11</b>	<b>0.07</b>
Terengganu	Public	0	-
Terengganu	Private	0	-
<b>Terengganu</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Kelantan	Public	15	-
Kelantan	Private	8	-
<b>Kelantan</b>	<b>Total</b>	<b>23</b>	<b>0.14</b>
Sabah & WP Labuan	Public	5	-
Sabah & WP Labuan	Private	0	-
<b>Sabah &amp; WP Labuan</b>	<b>Total</b>	<b>5</b>	<b>0.02</b>
Sarawak	Public	5	-
Sarawak	Private	6	-
<b>Sarawak</b>	<b>Total</b>	<b>11</b>	<b>0.04</b>



**Table 1.4: Number and Density of Hospital with Catheterisation Laboratory in Malaysia by State and Sector, 2009**

State	Sector	Number	Per 10,000 population
Malaysia	Public	9	-
Malaysia	Private	42	-
<b>Malaysia</b>	<b>Total</b>	<b>51</b>	<b>0.02</b>
Perlis	Public	0	-
Perlis	Private	0	-
<b>Perlis</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Kedah	Public	1	-
Kedah	Private	3	-
<b>Kedah</b>	<b>Total</b>	<b>4</b>	<b>0.02</b>
Pulau Pinang	Public	1	-
Pulau Pinang	Private	6	-
<b>Pulau Pinang</b>	<b>Total</b>	<b>7</b>	<b>0.04</b>
Perak	Public	0	-
Perak	Private	3	-
<b>Perak</b>	<b>Total</b>	<b>3</b>	<b>0.01</b>
Selangor & WP Putrajaya	Public	1	-
Selangor & WP Putrajaya	Private	8	-
<b>Selangor &amp; WP Putrajaya</b>	<b>Total</b>	<b>9</b>	<b>0.02</b>
WP Kuala Lumpur	Public	2	-
WP Kuala Lumpur	Private	8	-
<b>WP Kuala Lumpur</b>	<b>Total</b>	<b>10</b>	<b>0.06</b>
Negeri Sembilan	Public	0	-
Negeri Sembilan	Private	1	-
<b>Negeri Sembilan</b>	<b>Total</b>	<b>1</b>	<b>0.01</b>
Melaka	Public	0	-
Melaka	Private	3	-
<b>Melaka</b>	<b>Total</b>	<b>3</b>	<b>0.04</b>
Johor	Public	1	-
Johor	Private	3	-
<b>Johor</b>	<b>Total</b>	<b>4</b>	<b>0.01</b>
Pahang	Public	1	-
Pahang	Private	1	-
<b>Pahang</b>	<b>Total</b>	<b>2</b>	<b>0.01</b>
Terengganu	Public	0	-
Terengganu	Private	0	-
<b>Terengganu</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Kelantan	Public	1	-
Kelantan	Private	1	-
<b>Kelantan</b>	<b>Total</b>	<b>2</b>	<b>0.01</b>
Sabah & WP Labuan	Public	0	-
Sabah & WP Labuan	Private	1	-
<b>Sabah &amp; WP Labuan</b>	<b>Total</b>	<b>1</b>	<b>0</b>
Sarawak	Public	1	-
Sarawak	Private	4	-
<b>Sarawak</b>	<b>Total</b>	<b>5</b>	<b>0.02</b>

**Table 1.5 Number and Density of Cardiologist in Malaysia by State and Sector, 2009**

State	Sector	Number	Per 10,000 population
Malaysia	Public	32	-
Malaysia	Private	143	-
<b>Malaysia</b>	<b>Total</b>	<b>175</b>	<b>0.06</b>
Perlis	Public	0	-
Perlis	Private	0	-
<b>Perlis</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Kedah	Public	1	-
Kedah	Private	3	-
<b>Kedah</b>	<b>Total</b>	<b>4</b>	<b>0.02</b>
Pulau Pinang	Public	5	-
Pulau Pinang	Private	19	-
<b>Pulau Pinang</b>	<b>Total</b>	<b>24</b>	<b>0.15</b>
Perak	Public	0	-
Perak	Private	11	-
<b>Perak</b>	<b>Total</b>	<b>11</b>	<b>0.05</b>
Selangor & WP Putrajaya	Public	6	-
Selangor & WP Putrajaya	Private	25	-
<b>Selangor &amp; WP Putrajaya</b>	<b>Total</b>	<b>31</b>	<b>0.06</b>
WP Kuala Lumpur	Public	8	-
WP Kuala Lumpur	Private	43	-
<b>WP Kuala Lumpur</b>	<b>Total</b>	<b>51</b>	<b>0.3</b>
Negeri Sembilan	Public	0	-
Negeri Sembilan	Private	1	-
<b>Negeri Sembilan</b>	<b>Total</b>	<b>1</b>	<b>0.01</b>
Melaka	Public	0	-
Melaka	Private	11	-
<b>Melaka</b>	<b>Total</b>	<b>11</b>	<b>0.14</b>
Johor	Public	3	-
Johor	Private	7	-
<b>Johor</b>	<b>Total</b>	<b>10</b>	<b>0.03</b>
Pahang	Public	1	-
Pahang	Private	2	-
<b>Pahang</b>	<b>Total</b>	<b>3</b>	<b>0.02</b>
Terengganu	Public	0	-
Terengganu	Private	2	-
<b>Terengganu</b>	<b>Total</b>	<b>2</b>	<b>0.02</b>
Kelantan	Public	3	-
Kelantan	Private	3	-
<b>Kelantan</b>	<b>Total</b>	<b>6</b>	<b>0.04</b>
Sabah & WP Labuan	Public	2	-
Sabah & WP Labuan	Private	4	-
<b>Sabah &amp; WP Labuan</b>	<b>Total</b>	<b>6</b>	<b>0.02</b>
Sarawak	Public	3	-
Sarawak	Private	12	-
<b>Sarawak</b>	<b>Total</b>	<b>15</b>	<b>0.06</b>

**Table 1.6 Number and Density of Cardiac Surgeons in Malaysia by State and Sector, 2009**

State	Sector	Number	Per 10,000 population
Malaysia	Public	18	-
Malaysia	Private	37	-
<b>Malaysia</b>	<b>Total</b>	<b>55</b>	<b>0.02</b>
Perlis	Public	0	-
Perlis	Private	0	-
<b>Perlis</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Kedah	Public	0	-
Kedah	Private	0	-
<b>Kedah</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Pulau Pinang	Public	3	-
Pulau Pinang	Private	6	-
<b>Pulau Pinang</b>	<b>Total</b>	<b>9</b>	<b>0.06</b>
Perak	Public	0	-
Perak	Private	1	-
<b>Perak</b>	<b>Total</b>	<b>1</b>	<b>0</b>
Selangor & WP Putrajaya	Public	6	-
Selangor & WP Putrajaya	Private	10	-
<b>Selangor &amp; WP Putrajaya</b>	<b>Total</b>	<b>16</b>	<b>0.03</b>
WP Kuala Lumpur	Public	3	-
WP Kuala Lumpur	Private	14	-
<b>WP Kuala Lumpur</b>	<b>Total</b>	<b>17</b>	<b>0.1</b>
Negeri Sembilan	Public	0	-
Negeri Sembilan	Private	0	-
<b>Negeri Sembilan</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Melaka	Public	0	-
Melaka	Private	5	-
<b>Melaka</b>	<b>Total</b>	<b>5</b>	<b>0.07</b>
Johor	Public	3	-
Johor	Private	0	-
<b>Johor</b>	<b>Total</b>	<b>3</b>	<b>0.01</b>
Pahang	Public	0	-
Pahang	Private	0	-
<b>Pahang</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Terengganu	Public	0	-
Terengganu	Private	0	-
<b>Terengganu</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Kelantan	Public	2	-
Kelantan	Private	0	-
<b>Kelantan</b>	<b>Total</b>	<b>2</b>	<b>0.01</b>
Sabah & WP Labuan	Public	0	-
Sabah & WP Labuan	Private	0	-
<b>Sabah &amp; WP Labuan</b>	<b>Total</b>	<b>0</b>	<b>0</b>
Sarawak	Public	1	-
Sarawak	Private	1	-
<b>Sarawak</b>	<b>Total</b>	<b>2</b>	<b>0.01</b>

