



Radiology Loading and Coverage Hours in Malaysia

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Malaysia, a developing nation in Southeast Asia, has a population of 33.6 million and an annual growth rate of 0.37%. The population is predominantly urban, 75.5%, with 69.6% being economically active and between 15 and 64 years old. Malaysia's healthcare system comprises both government-funded and private healthcare systems [1], with 359 hospitals providing radiology services (161 in government and 198 in private) [2]. However, an uneven distribution of staff and equipment exists, especially in non-urban areas such as East Malaysia [3].

While data on the national utility trends for diagnostic and interventional services is lacking, the University Malaya Medical Centre's yearly report (tertiary teaching hospital in an urban setting) indicates a 10% annual increase in clinical radiology and other departments' use of imaging [4]. This surge in demand for imaging services and interventional procedures has consequently increased the demand for radiologists, affecting their workload and coverage.

As part of the City Cancer Challenge initiative, a survey involving 19 hospitals with radiology services (including government, private, and university hospitals) in Greater Petaling (better known as Klang Valley, the most densely

populated area in Malaysia) was conducted to assess multiple aspects of radiology services [5]. The data presented in Tables 1 and 2 shed light on the radiology workforce in this densely populated region of Malaysia.

Table 1 reflects the distribution commonly seen in all hospitals in Malaysia; radiography, ultrasonography and CT modalities represent the core work performed in radiology. The inclusion of mammography, MRI, and fluoroscopy reflects the growing demand for these latter imaging techniques due to increasing public awareness and requirements by other specialities.

Regarding coverage hours, the average weekly operational time for radiology departments was 117 hours, with 12 hospitals operating 24 hours a day, 7 days a week, providing emergency services via an on-call team. On-call services are also offered over public holidays, which are numerous due to the multi-racial population. In Malaysia, consultants and residents are no strangers to 36-hour workdays. In organisations with a team system, some may make active calls (present in the hospital during the on-call) or passive calls (able to receive requests from home and perform remote reporting). In most hospitals, remote reporting is available, particularly in private hospitals.

Upon closer examination of operational patterns and workloads, it becomes evident that CT, MRI, and radiography are the most utilised modalities during the 24-hour cycle (Table 2). This is expected as many of these hospitals cover an Accident and Emergency Department and the inpatient population in a hospital. While this survey did not detail interventional radiology (IR) services, the increasing prevalence of elective and emergency IR services within radiology departments, either integrated or separate from diagnostic radiology, suggests a high and growing workload.

On average, it was observed that each hospital had approximately 10 radiologists practising full-time. Full-time radiologists generally work from 8 am to 5 pm,

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Table 1. Modality-based distribution in hospitals

Modality	n (%)
Radiography	19 (100)
Fluoroscopy	15 (79)
Ultrasonography	19 (100)
Mammography	18 (95)
Computed tomography	19 (100)
Magnetic resonance imaging	17 (89)

The data represent the number of hospitals and the corresponding % out of 19 hospitals surveyed in parentheses

Table 2. Utility hours of imaging modalities

	< 12 hours utility	> 12 hours utility
Radiography	8	10
Fluoroscopy	11	2
Ultrasonography	12	6
Mammography	17	0
Computed tomography	8	10
Magnetic resonance imaging	8	8

The data represent the number of hospitals, out of 19 surveyed, that provided information. The row sum is not 19 because not all hospitals submitted complete data on utility hours

Monday to Friday. They will do on-calls at a varying rate per month, depending on the workforce in that hospital and its diagnostic and IR requirements. Some radiologists in the private centres also work half a day on Saturdays. Sundays are generally considered off days in most hospitals nationwide, except in certain states. Therefore, a full-time radiologist's total working hours in a week is 45 hours in government practice, whereas in private, it may increase to 50 hours or more, depending on workload. The average cross-sectionals per radiologist vary widely based on centre location, with busy centres averaging 30 to 60 cross-sectionals per day, covering complex cases with post-surgical complications, oncology, and vascular imaging. While part-time work is not extensively practised in current radiology settings, special arrangements may be made in private or university sectors, especially for semi-retired or retired professionals.

In conclusion, Radiology is a highly sought-after and ever-expanding service that continually grows to meet the needs of other medical specialities and patients. As a result, radiologists all over Malaysia have to work tirelessly and around the clock to cater to the increasing demands.

The government has implemented several plans to provide more equitable health care throughout the population and increase the workforce of radiologists. The prospect of AI aiding radiologists in managing their workloads is a plausible consideration for the future.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

Author Contributions

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