

ORGANISATION OF LABORATORY SERVICES IN MALAYSIA

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INTRODUCTION

Modern day medicine has begun to rely more and more on investigations including laboratory investigations. Automation in many laboratory tests has added a new dimension to the easy availability of tests. Public awareness on the value of laboratory tests has led to increased demands by patients themselves for such tests. Many do not feel that this situation is the desired one and traditionalists particularly feel that over-reliance on laboratory tests is at the expense of the time honoured art and science of clinical medicine. Rising costs of laboratory tests have also been the subject of much debate. Is society or the patient himself really prepared to and capable of meeting the additional financial burden of all this supplementary testing? There is no doubt, however, that the laboratory if used properly is **indispensable** to the practice of good clinical medicine. The crux of the matter lies therefore in proper usage. Tests must be requested for only when they will be needed and not simply because they are available. Planners of laboratory organisation therefore have to take into consideration not only the provision of a service but must also ensure the education of its consumers. It can be seen that laboratory services can be brought up to basically three levels — the minimum, the optimum and the maximum. Developing countries with budgetary and other constraints should be satisfied if the optimum is reached. Certainly they should strive to be above the minimal mark. It would certainly not be recommended to try to provide the maximum. The above thoughts, I hope, will help to place in its proper perspective the following description of the laboratory services in Malaysia.

SECTORS

Medical laboratory services in this country are provided by the following sectors:

- a) Government — the laboratories of the government medical service network, catered for by the Ministry of Health.
- b) The Universities — relevant departments in the faculties of medicine at the University of Malaya, the Universiti Kebangsaan Malaysia and the Universiti Sains Malaysia.

- c) Independent private laboratories.
- d) Laboratories attached to private hospitals, group practices and individual clinics.

THE LABORATORY SERVICES PROVIDED BY THE MINISTRY OF HEALTH

Organisational setup

The provision of clinical laboratory services in the government network of hospitals, clinics and health centres is currently the responsibility of the Division of Hospitals in the Ministry of Health, through the respective state directors of Medical and Health Services. Conceptually, the laboratories in the service fall into a number of levels:

Level I — Laboratories at the main health centres, outpatient departments attached to hospitals and institutions, static outpatients (polyclinics) and clinical side room laboratories.

Level II — Laboratories situated in district hospital without specialists.

Level III — Laboratories situated in general hospitals or district hospitals which have specialists.

Level IV — Laboratories attached to “**regional**” hospitals.

Table 1 lists the range of tests and the categories of staff designated for the different levels. Table 2 lists the number of laboratories of different levels in the various states of Peninsular Malaysia. Table 3 lists the number of laboratory tests done by these laboratories.

In the provision of blood transfusion services, the National Blood Transfusion Centre (NBTC), located at the General Hospital, Kuala Lumpur, has helped set the standards and establish blood banks **throughout** the country. It also serves as the central reference centre. The administration and day to day running of these blood banks is a responsibility of the state pathologists.

Currently the needs of the Health Division of the Ministry of Health have also to be met by these laboratories. In addition, the Food Quality Control Unit of the Division of Health has embarked on a programme to establish a network of laboratories to serve their requirements for the chemical and microbiological analyses of foods. Such a laboratory has already started functioning

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TABLE 1
THE DIFFERENT LEVELS OF LABORATORIES IN THE GOVERNMENT
MEDICAL SERVICES

Level	Range of tests	Staff				
		Pathologist	Bact.	Biochemist	MLT	AMLT
I	Simple basic tests: Blood — Hb, TWDC, TRBC, PCV, Bleeding time, clotting time, BF for malaria parasite. Parasitology — Stool examination for ova, cysts, trophozoites, cellular exudates, and occult blood. Urine — routine urinalysis Sputum and body fluids — AFB, Gram stain smears, skin smears for <i>M. leprae</i> , wet preparations for trichomonas and <i>Candida albicans</i> .					X
II	Basic biochemical tests Basic haematological tests Basic blood banking Bacteriology: only microscopic examination, collection of specimens and inoculation of (transport) media (isolation and identification of organisms not performed).				X	X
III	Basic biochemical test Basic haematological tests Basic blood banking Bacterial culture and identification Serological tests such as Widal, Weil Felix, VDRL etc. Histopathology and cytology.	X	X	X	X	X
IV	Wider range of activities from level III laboratories	X	X	X	X	X

TABLE 2
LABORATORIES IN THE STATES OF PENINSULAR MALAYSIA
(Ref: Bahagian Perkhidmatan Perubatan, Kementerian Kesihatan, Malaysia.)

State	Laboratories		
	Level I	II	*III/IV
Perlis	7	—	1
Penang	16	3	2
Kedah	33	3	2
Perak	52	9	3
Negeri Sembilan	19	3	2
Selangor	35	4	1
Melaka	19	1	1
Johore	50	4	5
Pahang	33	7	2
Kelantan	29	7	1
Trengganu	18	3	1
Wilayah	—	—	1

* Some of these, though designated, are not yet fully functional.

TABLE 3
 WORKLOAD OF LABORATORY SERVICES — PENINSULAR MALAYSIA
 (Reference: Bahagian Perancangan dan Pembangunan,
 Kementerian Kesihatan Malaysia)

<i>Type of examination</i>	<i>No. of tests performed in 1980</i>
Clinical Pathology	3,717,800
Chemical Pathology	1,749,000
Bacteriology	568,500
Serology	340,400
Histopathology	58,000
Haematology	892,300
Cytology	12,200
Post mortem and other medicolegal	2,300

in Penang and another one is due to start in Kelang. By 1986 there should be laboratories in Kangar, Johor Baru and Kuching. Similarly, the Malaria Eradication Programme which is to be known as the Vector-borne Disease Control Programme will have a national network of laboratories with a central laboratory at the headquarters, 12 state laboratories and 28 district laboratories. The central and state laboratories are already functioning.

Personnel

The following categories of staff service the government clinical laboratories.

Pathologists

After a period of training in the Institute for Medical Research (IMR) and/or state pathology laboratories, medical officers attend the polyvalent-designed DCP course in London or more recently the M. Path. course here at the University of Malaya on the successful completion of which they are gazetted as clinical specialists (Pathology). This polyvalent training is suited to their future roles as state pathologists where they not only actively carry out histopathological and haematological diagnosis but are also responsible for the biochemical and bacteriological services. These pathologists may also attempt to qualify for the MRCPath. of the United Kingdom. This would involve passing 2 examinations of the Royal College of Pathologists, namely the primary and the final. Some may obtain exemption from the first which can only be attempted after 2 years of full time training in Pathology while the latter can be attempted after 5 years. The candidate has to choose one subspeciality of Pathology to be examined on. Obtaining the MRCPath would, apart

from giving the candidate professional satisfaction, also grant him international recognition as a pathologist.

Biochemists and Bacteriologists

These are science graduates who have obtained a recognised BSc(Hons.) degree in the relevant subject. On recruitment they are attached to the IMR for periods ranging from 4 to 6 months to enable them to obtain the appropriate grounding and exposure so that they can take on the responsibilities of biochemist and bacteriologist in the various pathology laboratories. There is as yet no standard or planned programme for post-graduate study and a few of them may obtain fellowships to pursue MSc or PhD degrees.

Medical Laboratory Technologists

After completing the School Certificate Examination, a candidate may be given a place in the School of Medical Laboratory Technology at the IMR where he will undergo a three-year training programme. In the first year there are formal lectures and practicals in the various disciplines of laboratory medicine. In the second year there is rotational bench training in the five main divisions of the IMR, namely Biochemistry, Bacteriology, Haematology, Histopathology and Parasitology. In the third year, the students are posted to the state laboratories where they finish their training before sitting for their certification examinations. Any time after 2 years of obtaining such certification, medical laboratory technologists may apply to undergo advanced training and sit for the Advanced certificate examination (2nd departmental examination), many of them in a special subject.

Assistant Medical Laboratory Technologists

This category of laboratory worker is taken in for a year's training after completing his Lower Certificate of Education. Six months of formal teaching are given in the School of Medical Laboratory Technology at the IMR followed by 6 months of on-the-bench training at the peripheral laboratories.

Current Staffing Position

Pathologists

There are currently 10 pathologists in the state pathology laboratories: 2 in Kuala Lumpur, 2 in Ipoh and 1 each in Alor Star, Penang, Johor Baru, Kuantan, Kota Baru dan Kuching. In addition, there are 2 haematologists in the National Blood Transfusion Centre and the IMR has five medically-qualified microbiologists, a chemical pathologist and a haematologist.

Biochemists

Inclusive of the IMR, there are 39 biochemists in the service. They are based at the IMR, the general hospitals and at some of the larger district hospitals such as in Sungei Patani, Bukit Mertajam, Taiping, Telok Anson, Tanjong Karang, Banting, Muar, Batu Pahat, Kluang, Kuala Lipis, Bentong and Mentakab.

Bacteriologists

There are 14 based at the IMR and at the state pathology laboratories in Kangar, Penang, Ipoh (2), Kuala Lumpur, Seremban, Melaka, Johor Baru, Kuala Trengganu and Kota Baru.

Medical Laboratory Technologists

There are approximately 1,000 medical laboratory technologists in the IMR and in the hospital laboratories.

THE INSTITUTE FOR MEDICAL RESEARCH

In addition to its 3 main roles of diagnosis, training and research, the IMR serves as a central reference laboratory for the Ministry of Health. There are 21 technical divisions in the IMR and apart from carrying out primary diagnostic tests from areas not served by their own laboratories and from private hospitals and clinics, the divisions accept material referred from other laboratories and also carry out various specialised tests which are not performed elsewhere. Examples of tests which are conducted exclusively by the IMR (for the government sector) are virology, phage typing of *S. typhi*, serotyping of *Salmonella*, radio-immunoassay and fluorescence microscopy. The

Institute also conducts two postgraduate courses of 6 months duration each leading to the Diplomas in Applied Parasitology and Entomology (DAP&E) and Medical Microbiology (DMM) respectively.

FUTURE PLANS FOR THE GOVERNMENT LABORATORY SERVICES

The Ministry of Health is taking steps to improve the present laboratory services. The 4th Malaysia Plan has a definite laboratory support programme and has provided for over a 100 projects. This does not include the laboratories for the new hospitals, health centres and the Blood Transfusion Service. The Ministry of Health has also appointed a committee to look into the problems associated with the laboratory services and to come up with immediate and long term recommendations. Subsequent implementation of these recommendations would perhaps help to overcome the present shortcomings regarding shortage of trained manpower and physical facilities and lead to a more co-ordinated and systematic approach towards laboratory services. The latter need could well be served by the establishment of a separate division within the Ministry of Health to look after the laboratory services.

THE MEDICAL FACULTIES

There are three medical schools in Malaysia: the University of Malaya (UM), the Universiti Kebangsaan Malaysia (UKM) and the Universiti Sains Malaysia (USM). The University of Malaya has its own teaching hospital which has just under 1000 beds, while the other two share the facilities of the general hospitals in Kuala Lumpur and Penang respectively. In the medical faculties, laboratory medicine is practised and taught by the departments of Pathology, Microbiology and Parasitology. The USM has, in addition, separate departments of Immunology and Chemical Pathology.

There are 13 pathologists in UM, 10 in UKM and 5 in USM. Medical Laboratory Technologists in the university departments are trained within the respective departments. Basically, they sit for 2 examinations, one at the end of 3 years (certificate) and the other after a further 2 years (advanced certificate in UM and diploma in UKM and USM).

LABORATORIES IN THE PRIVATE SECTOR

There are basically 3 categories of medical laboratories in the private sector:

- (i) independent laboratories
- (ii) large laboratories in private hospitals
- (iii) smaller laboratories including side room laboratories in doctors' clinics or smaller private hospitals.

Independent laboratories

There are 5 such laboratories in the Kuala Lumpur/Petaling Jaya area and 3 in Penang. One of the laboratories based in Kuala Lumpur has branch laboratories in Ipoh, Kuantan, Johor Baru, Penang, Melaka and Kuching. Of the independent laboratories, 3 are run by pathologists. The majority of the others are supervised by biochemists and a minority by medical laboratory technologists. Most of the laboratories perform biochemical, haematological, bacteriological and serological tests. The laboratories with pathologists provide, in addition, histopathological and cytological services. While there are a few trained medical laboratory technologists in some of these laboratories, a fair portion of the technical work is performed by staff trained by the laboratories themselves. These laboratories serve the needs of private clinics as well as private hospitals which do not have their own comprehensive laboratory services.

Laboratories in private hospitals

There is a wide variation in the size and scope of private hospitals registered with the Ministry of Health. A similar variation exists with regards to

the status of laboratories in these hospitals. There is one hospital which has a consultant pathologist on its staff. The larger hospitals have fairly comprehensive laboratories which cater for most of their own clinical pathology needs. Some of the hospitals have arrangements with pathologists of independent laboratories to supervise their own laboratories. Most private practitioners' clinics, whether in lone or group practice, have some sort of laboratory facilities of their own. The range of tests and degree of sophistication of these laboratories vary widely.

An attempt has been made to give a broad overall view of the different agencies that provide the laboratory tests required by the practitioners of medicine in this country. The details of various specialities have been left out as they constitute the subject of the papers that follow.

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