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SPECIALTY & SUBSPECIALTY FRAMEWORK OF MINISTRY OF HEALTH HOSPITALS UNDER 11TH MALAYSIA PLAN (2016-2020)

Specialty & Subspecialty Framework Of Ministry of Health Hospitals Under 11th Malaysia Plan (2016-2020)

Medical Development Division
Ministry of Health Malaysia
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ACKNOWLEDGEMENT

It is with great pleasure that we present the Specialty & Subspecialty Framework of Ministry of Health Hospitals under 11th Malaysia Plan (2016 – 2020). The framework was developed consistent with our mission to ensure comprehensive quality and safe healthcare services to the people of Malaysia.

We are particularly pleased that the plans mapped out in the Specialty & Subspecialty Framework of Ministry of Health Hospitals under 11th Malaysia Plan (2016 – 2020) will not only act as a framework for the policy makers at the ministerial level in planning future service and facility developments but will also act as a guide to the national advisors in planning and coordinating their services to increase healthcare accessibility to the communities.

We would like to acknowledge and thank everyone involved in the development of this book for the experience; expertise and wisdom shared in making this book a reality.

DATIN DR NOR AKMA BT YUSUF

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Note:

1. *The information published was correct at the time of publication and may change over time.*

FOREWORD

Medicine is an evolving field with dynamic changes. The advancement of technology and scientific breakthroughs brought about significant changes in the system of healthcare delivery. Over the years, patient care has become more refined and comprehensive, while specialized services is now more focused and detailed.

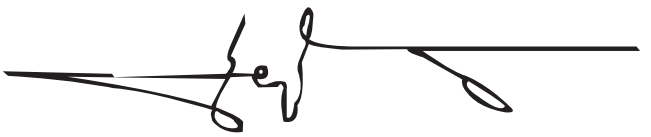
Ideally, all specialty and subspecialty services should be available at all the major Ministry of Health facilities in the country. However, some specialties require substantial amount of resources to be set up. Not only we face a shortage of the number of specialists trained in the field, but some specialties require sophisticated machines and equipment which will be very expensive to procure and maintain.

In a challenging economic time, a strategic planning is vital in ensuring efficacy and efficiency of the healthcare services delivery. Hence, the Specialty & Subspecialty Framework of Ministry of Health Hospitals Under 11th Malaysia Plan was developed with the focus on optimizing available resources while expanding accessibility to the public.

The preparation of the book involved numerous discussions at the ground level involving National Advisor and their respective specialists as well as within the ministry in order to identify the most practical and feasible way to expand the services in the country.

Therefore, I sincerely hope that the various divisions and units within the ministry who are responsible in planning and monitoring the development of specialized medical care such as the Planning Division, Human Resource Division and the Medical Development Division would fully utilize this book as a framework in planning and executing future expansion plans.

Last but not least, I would like to thank the editorial, the authors and the contributors on their hard work and commitment in developing this book.



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INTRODUCTION

The specialty and subspecialty framework was designed as a guideline for Ministry of Health in planning nationwide specialty and sub-specialty services over 5 years period in each Malaysia Plans. It began as the *Specialty and Sub-specialty Services Blueprint, 9MP (2006-2010)* which was revised, updated and expanded based on clinical needs and demand to become the *Specialty and Subspecialty Framework of Ministry of Health Hospitals 10 MP (2010 – 2015)*. This framework provides a strategic direction for infrastructure development as well as resource management and allocation for MoH Hospitals.

Therefore, this book will serve as an important tool in the nationwide planning and development of clinical services for Ministry of Health (MoH) Hospitals with regards to specialty and sub-specialty services development and expansion under the 11th Malaysia Plan. The scope of the framework is hospital based services, encompassing inpatient and outpatient specialist services as well as ambulatory and clinical support services.

History of MoH strategic plans

3rd Malaysia Plan (1976 – 1980)

- Level I: Basic specialties
- Level II: Additional specialties
- Level III: Hyperspecialties
- Started the concept of regionalisation of services in planning and development of a comprehensive range of specialist and subspecialist services to optimize resource utilization while providing high-quality care in the most efficient manner possible.

6th Malaysia Plan (1991 – 1995)

- 7 basic secondary level specialist services identified to be developed in all state hospitals and selected district hospitals (General medicine, general surgery, paediatrics, obstetrics & gynaecology, anaesthesiology, pathology and radiology)

7th Malaysia Plan (1996 – 2000)

- 15 specialty and subspecialty services at all state hospitals and major district hospitals
- 7 Basic secondary level specialist services plus additional services (orthopaedics, ENT, ophthalmology, psychiatry, emergency medicine, rehabilitation medicine, dermatology & geriatrics)

8th Malaysia Plan (2001 – 2005)

- 45 hospitals in the country shall provide at least 5 basic specialist services (general medicine, general surgery, paediatrics, obstetrics & gynaecology and anesthesiology)
- 19 of them will develop the 15 specialty / subspecialty services identified under the 7 MP
- Provision of tertiary level specialist services was regionalised according to 6 care-network zones (North, Central, South, East, Sabah & Sarawak)

9th Malaysia Plan (2006 – 2010)

- Functional classification of hospitals as State Hospitals, Major Specialist Hospitals, Minor Specialist Hospitals, Medical Institutions and Non-specialist Hospitals
- 35 state & major specialist hospitals: minimum of 15 resident specialty & subspecialties (general medicine, general surgery, paediatrics, orthopaedics, O&G, anaesthesiology, radiology, pathology, ophthalmology, ENT, emergency medicine, psychiatry, dental (oro-maxillo-facial, paediatric), dermatology, nephrology).
- 18 minor specialist hospitals: minimum of 6 resident specialty services (general medicine, general surgery, paediatrics, orthopaedics, O&G, anaesthesiology)
- 7 medical institutions: specific identified specialties
- 26 identified subspecialty services to be provided in each region

10th Malaysia Plan (2011 – 2015)

- 14 state hospitals with a target of
  - 20 specialties: general medicine, general surgery, paediatrics, orthopaedics, O&G, anaesthesiology, radiology, anatomical pathology, chemical pathology, lab haematology, microbiology, ophthalmology, ORL, emergency medicine, psychiatry, oral surgery, paediatric dental, forensic medicine, rehab medicine, transfusion medicine
  - 25 subspecialties: dermatology, nephrology, gastroenterology, respiratory medicine, infectious diseases, endocrinology, cardiology, rheumatology, urology, neurosurgery, plastic surgery, trauma surgery, colorectal surgery, paeds surgery, maternal-fetal, gaynae-oncology, spine ortho, joint arthroplasty, adult intensive care, pain medicine, paeds intensive care, neonatology, vitreo-retinal, glaucoma, child psychiatry.
- 27 minor specialist hospitals with a target of 10 identified resident specialty services: general medicine, general surgery, paediatrics, orthopaedics, O&G, anaesthesiology, radiology, clinical pathology, emergency medicine, psychiatry.
- 11 medical institutions: specific identified specialties
- 26 identified subspecialty services to be provided in each region.

OUR PREVIOUS PLANS : INCREASING NUMBER OF SERVICES IN EACH SUCCESSIVE MALAYSIA PLANS
(1976-2015)
3 MP
• Level 1-111 Services (Basic, Additional.
7 MP
• 15 services in State
9 MP
• 15 services in SS state & Major Hosp;
• 5 basic services in 18 minor hospital;
• 7 basic services in State
• + bigger dist hosp
• 15 services in 19 hosp
• 5 basic services in 45 hosp
• 45 services in 14 state hosp/HKL
• 20 services in major Hosp
• 10 basic services in 27 Hosps
• 26 regional services

ACHIEVEMENT UNDER 10th MALAYSIA PLAN

The key drivers under the 10th Malaysia Plan were:

- Health system transformation
- Improve quality, capacity and coverage of services
- Strengthen health promotion and prevention
- Enhance quality of health human capital

The aim under Specialty and Sub-specialty Services Framework 2011-2015 was to provide 10 basic specialty services in minor specialist hospitals, 20 specialties in major specialist hospitals and 45 specialties and sub-specialties in the state hospitals. We also targeted 26 specific subspecialty services in each of the 6 zones in Malaysia.

From the targets set, 74.4% of the regional centres have achieved the target of providing the 26 subspecialty services listed in the framework while 79% of the state hospitals are providing the 45 specialties and subspecialties listed. However, only 65.7% of major specialist hospitals and a mere 31.85% of minor specialist hospitals managed to reach the targets.

Minor specialist hospitals

Under 10th Malaysia Plan, 12 hospitals were identified to be upgraded from a non-specialist hospital to a minor specialist hospital (Gerik, Kuala Kangsar, Tampin, Kota Tinggi, Bentong, Pekan, Gua Musang, Dungun, Mukah, Limbang, Beaufort, Kota Marudu) making a total of 27 hospitals under minor specialist hospital category.

As a minor specialist hospital, 10 basic specialties (general medicine, general surgery, O&G, paediatrics, orthopaedics, anaesthesiology, radiology, pathology, psychiatry, emergency medicine) were identified to be provided as resident services. By the end of 2015, 9 of the 12 hospitals planned for upgrade to a minor specialist hospital have not managed to provide resident specialist care while another hospital was proposed to be upgraded as well (Besut).

TABLE 1: List of minor specialist hospitals with specialist services provided in 2016

No	Hospitals	Disciplines									
		General medicine	General surgery	O&G	Paediatrics	Orthopaedics	Anaesthesiology	Radiology	Pathology	Psychiatry	Emergency med
1	Labuan	✓	✓	✓	X	✓	✓	✓	X	X	✓
2	Langkawi	✓	✓	✓	X	✓	✓	✓	X	X	✓
3	Bukit Mertajam	✓	X	X	X	X	✓	X	X	✓	✓
4	Kepala Batas	✓	✓	✓	✓	X	✓	X	X	X	✓
5	Seri Manjung	✓	✓	✓	✓	✓	✓	✓	X	✓	✓
6	Slim River	✓	X	✓	✓	✓	✓	X	X	✓	X
7	Banting	✓	X	X	✓	✓	X	X	X	X	✓
8	Port Dickson	✓	✓	✓	✓	✓	✓	X	X	✓	✓
9	Kluang	✓	✓	✓	✓	✓	✓	✓	X	✓	✓
10	Kuala Lipis	✓	✓	✓	✓	✓	✓	X	X	✓	✓
11	Bentong	✓	X	X	X	✓	X	X	X	✓	✓
12	Pekan	✓	X	✓	X	✓	X	X	X	X	X
13	Lahad Datu	✓	✓	✓	✓	✓	✓	✓	X	X	✓
14	Keningau	✓	✓	✓	✓	✓	✓	✓	X	✓	✓
15	Kapit	✓	X	X	✓	X	X	X	X	X	X
16	Limbang	X	X	✓	X	X	X	X	X	X	X
17	Sarikei	✓	✓	X	✓	✓	✓	✓	X	✓	✓
18	Sri Aman	✓	X	X	X	X	X	X	X	X	X
19	Gerik	X	X	X	X	X	X	X	X	X	X
20	Kuala Kangsar	X	X	X	X	X	X	X	X	X	X
21	Tampin	X	X	X	X	X	X	X	X	X	X
22	Kota Tinggi	X	X	X	X	X	X	X	X	X	X
23	Dungun	X	X	X	X	X	X	X	X	X	X
24	Gua Musang	X	X	X	X	X	X	X	X	X	X
25	Beaufort	X	X	X	X	X	X	X	X	X	X
26	Kota Marudu	X	X	X	X	X	X	X	X	X	X
27	Mukah	X	X	X	X	X	X	X	X	X	X
28	Besut	X	X	X	X	X	X	X	X	X	X

Major specialist hospitals

10th Malaysia Plan targets the following 20 resident services in each major specialist hospitals:

1. General medicine
2. Nephrology
3. Dermatology
4. Respiratory medicine
5. Infectious diseases
6. General surgery
7. Paediatrics
8. Neonatology
9. Orthopaedics
10. Obstetrics & gynaecology
11. Maternal-fetal medicine
12. Anaesthesiology
13. Emergency Medicine
14. Radiology
15. Pathology
16. Psychiatry
17. ORL
18. Ophthalmology
19. Paediatric dental
20. Oral surgery

Over the years, the Ministry has changed the strategy in services delivery. Instead of rigidly focusing on developing these 20 services in the major specialist hospitals, the Ministry has embarked on developing other specialties or subspecialties listed in the target for state hospitals or even regional services. Therefore, even though none of these hospitals have reached the target of providing resident specialty services as listed, they may have been recognized as the referral centre for specific specialties for the region.

By the end of 10th Malaysia Plan, two new major specialist hospitals (Hospital Queen Elizabeth II & Pusat Jantung Sarawak) began operations, making the total number of major specialist hospitals 28.

TABLE 2: List of major specialist hospitals with the specialty services provided in 2016 (major specialist hospital targets)

No	Hospital	Anaesthesiology	Emergency Med	General Medicine	Dermatology	Infectious Disease	Nephrology	Respiratory	General Surgery	O&G	Maternal Fetal	Ophthalmology	ORL	Orthopaedic	Pathology	Paediatrics	Neonatology	Psychiatry	Radiology	Dental Oral Surgery	Paediatrics Dental
1	HSAH	✓	✓	✓				✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	
2	Kulim	✓	✓	✓			✓		✓	✓		✓		✓	✓	✓		✓	✓	✓	
3	HSJ	✓	✓	✓			✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	
4	Taiping	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
5	HTI	✓	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
6	HSAS	✓	✓	✓						✓		✓	✓	✓	✓	✓			✓		
7	Selayang	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	Serdang	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	Ampang	✓	✓	✓	✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	HSgB	✓	✓	✓		✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	Kajang	✓	✓	✓			✓		✓	✓				✓	✓	✓		✓	✓	✓	✓
12	HPJ	✓	✓	✓	✓					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	
13	HTAN	✓	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
14	HSI	✓	✓	✓					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15	HPSF	✓	✓	✓			✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	
16	HSNI	✓	✓	✓			✓		✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	
17	Segamat	✓	✓	✓					✓	✓		✓	✓	✓		✓		✓	✓	✓	✓
18	HoSHAS	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
19	Kemaman	✓	✓	✓					✓	✓			✓	✓	✓	✓		✓	✓		
20	Kuala Krai	✓	✓	✓					✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		
21	HTM	✓	✓	✓					✓	✓				✓	✓	✓		✓	✓		
22	HQE II		✓											✓	✓				✓		
23	HDOK	✓	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	
24	Tawau	✓	✓	✓				✓	✓	✓		✓	✓	✓		✓		✓	✓	✓	
25	Bintulu	✓	✓	✓					✓	✓		✓		✓		✓		✓	✓		
26	Sibu	✓	✓	✓					✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	
27	Miri	✓	✓	✓			✓		✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓

TABLE 3: List of major specialist hospitals with the number of specialty services provided in 2016

No	Hospital	Total Specialties	Basic 10 Specialties	Major Specialist Hosp (20)	State Hospitals (45)	Regional Services
1	HSAH, Sg Petani	23	10	15	22	0
2	Hospital Kulim	15	10	12	14	0
3	Hospital Seberang Jaya	22	9	14	20	1
4	Hospital Taiping	24	10	15	22	0
5	Hospital Teluk Intan	17	9	11	13	1
6	Hospital Shah Alam	14	9	11	14	1
7	Hospital Selayang	42	10	16	34	6
8	Hospital Serdang	34	10	16	27	5
9	Hospital Ampang	24	10	14	21	1
10	Hospital Sungai Buloh	34	10	14	29	3
11	Hospital Kajang	15	9	10	11	0
12	Hospital Putrajaya	22	10	14	20	2
13	HTAN, Kuala Pilah	16	10	12	14	0
14	HSI, Johor Bahru	37	10	13	27	7
15	HPSF, Muar	19	10	14	18	0
16	HSNI, Batu Pahat	17	10	13	15	1
17	Hospital Segamat	15	9	11	13	0
18	HoSHAS, Temerloh	20	10	15	18	0
19	Hospital Kemaman	13	10	11	13	0
20	Hospital Kuala Krai	14	10	13	14	0
21	Hospital Tanah Merah	11	5	5	6	0
22	Hospital Queen Elizabeth II	10	9	9	13	2
23	HDOK, Sandakan	15	10	12	14	0
24	Hospital Tawau	13	9	12	12	0
25	Hospital Bintulu	10	9	10	10	0
26	Hospital Sibu	17	10	12	16	0
27	Hospital Miri	16	4	7	8	0

State hospitals

There were 45 specialty & subspecialty services identified to be provided at state level under the 10th Malaysia Plan.

1. **General medicine**
2. Nephrology
3. Dermatology
4. Respiratory medicine
5. Infectious diseases
6. Endocrinology
7. Cardiology
8. Gastroenterology
9. Rheumatology
10. **General surgery**
11. Neurosurgery
12. Plastic surgery
13. Urology
14. Trauma surgery
15. Colorectal surgery
16. **Paediatrics**
17. Neonatology
18. Paediatric surgery
19. Paediatric intensive care
20. **Orthopaedics**
21. Spine orthopaedics
22. Joint arthroplasty
23. **O&G**
24. Maternal fetal
25. Gynae-oncology
26. **Anaesthesiology**
27. Adult intensive care
28. Pain medicine
29. **Emergency medicine**
30. **Radiology**
31. Pathology – Anatomical pathology
32. Pathology – Chemical pathology
33. Pathology – Microbiology
34. Pathology – Haematology
35. **Psychiatry**
36. Child psychiatry
37. **ORL**
38. **Ophthalmology**
39. Vitero-retinal
40. Glaucoma
41. Dental – Paediatric dental
42. Dental – Oral surgery
43. **Forensic medicine**
44. **Rehabilitation medicine**
45. **Transfusion medicine**

TABLE 4: List of state hospitals with specialty services provided in 2016

DISCIPLINE		HOSPITAL													
		HTF	HSB	HPP	HRPB	HTAR	HKL	HTJ	HMelaka	HSA	HTAA	HSNZ	HRPZ II	HQE I	HUS
Anaest	Anaesth	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Intensive care	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Pain medicine	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Emergency medicine	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Forensic		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Medicine	General med	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dermatology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
	Infectious diseases		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
	Nephrology		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Respiratory		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
	Cardiology		✓	✓	✓					✓	✓	✓	✓	✓	✓
	Endocrinology		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Gastro	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	
	Geriatrics					✓	✓			✓					✓
	Neurology		✓	✓			✓			✓		✓	✓	✓	✓
	Palliative care		✓	✓	✓	✓									
	Rheumatology			✓	✓		✓	✓	✓			✓	✓		✓
Surgery	General surgery	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Burn			✓	✓		✓		✓	✓		✓			
	Trauma					✓				✓					
	Colorectal		✓				✓	✓		✓	✓		✓		✓
	Neurosurgery		✓	✓	✓		✓	✓		✓	✓	✓		✓	✓
	Paeds surgery		✓	✓	✓		✓		✓	✓	✓		✓		✓
	Plastic surgery		✓	✓	✓		✓		✓	✓		✓	✓	✓	✓
	Urology		✓	✓			✓			✓	✓		✓	✓	✓
O&G	O&G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Maternal fetal		✓	✓	✓	✓		✓		✓	✓	✓	✓		✓
	Gynaeonco	✓	✓	✓			✓				✓	✓	✓		✓
	Urogynae		✓		✓	✓	✓	✓			✓	✓	✓		
Opthal	Ophthal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Glaucoma	✓	✓	✓			✓		✓	✓	✓		✓		
	Vitreo-retinal		✓	✓	✓						✓	✓	✓	✓	

DISCIPLINE		HOSPITAL													
		HTF	HSB	HPP	HRPB	HTAR	HKL	HTJ	HMelaka	HSA	HTAA	HSNZ	HRPZ II	HQE I	HUS
	ORL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ortho	Orthopaedic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Joint arthroplasty	✓	✓	✓	✓	✓		✓			✓		✓		✓
	Spine surgery			✓	✓		✓	✓		✓		✓	✓		✓
Pathology	Haematology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Histopatho	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Microbiology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Chemical pathology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Paeds	Paediatric	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Neonatology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Paeds intensive care	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Psy	Psychiatry	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Child & adolescent psy			✓			✓		✓	✓	✓	✓			✓
	Transfusion medicine	✓		✓	✓			✓	✓			✓	✓	✓	✓
	Radiology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Rehabilitation		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Dental	Dental oral surgery	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Paeds dental	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Also target for minor specialist hospitals

Also target for major specialist hospitals

Regional services

Certain specialty and subspecialty services require substantial amount of resources or have a very limited number of specialists. To cater to the needs of the population, 26 services were identified to be available at regional level.

TABLE 5: List of sub-specialty services provided as regional services in 2016

DISCIPLINE		REGIONS					
		North	Central	South	East	Sabah	Sarawak
Medical	1. Hepatology		Selayang				
	2. Haematology	HSB HPP	HRPB HTAR Ampang IKN Putrajaya	Melaka HSA	HTAA HRPZ II	HQE I	HUS
	3. Oncology	HPP	IKN HKL	HSI		HWKKL	HUS
Surgical	4. Upper GI	HSB HPP	HSgB HTJ				
	5. Hepatobiliary	HSB HPP	Selayang	Melaka			HUS
	6. Breast & endocrine	HPP	HRPB HKL HPJ Selayang	HSI	HSNZ HRPZ II	HQE I	
	7. Vascular		HKL Serdang	HSA	HTAA (UIA)	HQE I	
	8. Cardiothoracic	HPP	Serdang	HSA	HTAA HRPZ II	HQE II	HUS
Anaes	9. Cardiac anaesth	HPP	Serdang	HSA	HTAA HRPZ II	HQE II	HUS
O&G	10. Reproductive medicine	HTF HSB HPP	HRPB HTAR HKL		HSNZ, KT (trainee)		HUS
Paediatrics	11. Cardiology	HPP	Serdang IPHKL	HSA	HTAA HRPZ II	HQE II	HUS
	12. Endocrinology	HPP	HKL HPJ			HWKKL	
	13. Haemato-oncology	HPP	HRPB HKL HSAS	HSI	HSNZ	HWKKL	HUS
	14. Nephrology	HPP	HKL HTJ Selayang	HSI	HTAA		
	15. Neurology	HPP	HKL	HSI	HRPZ II	HWKKL	HUS

DISCIPLINE		REGIONS					
		North	Central	South	East	Sabah	Sarawak
Radiology	16. Interventional radiology		HKL Selayang HSgB				
Dental	17. Oral path / med	HSAH	HRPB	HSI	HTAA HRPZ II	HQE I	HUS
	18. Forensic dental		HKL				
	19. Dental special care		HKL				
Others	20. Nuclear medicine	HPP	HKL IKN	HSA		HWKKL	HUS
	21. Sports medicine		HRPB HTAR HKL HTJ Selayang Serdang HSgB HRC	Melaka HSI HPSF	HRPZ II	HQE I HQE II	
	22. Genetics		HKL				
Specialties moved to state hospital level in RMK-11	23. Geriatrics	Taiping	HTAR HKL Selayang HSgB				HUS
	24. Uro-gynae	HSB	HRPB HTAR HKL HTJ Selayang		HTAA HSNZ HRPZ II		
	25. Neurology	HSB HPP HSJ	HKL HSgB	HSA	HSNZ HRPZ II	HQE I	HUS
	26. Palliative care	HSB HPP	HRPB HTAR Selayang IKN				

CURRENT STATUS

At the moment, there are 145 hospitals under the Ministry of Health with a total capacity of 41,389 beds. These facilities consist of:

- 14 state hospitals
- 45 hospitals with specialist
- 75 hospitals without specialist
- 10 special medical institutions

Classification of MoH Hospitals

For the 11th Malaysia Plan strategic framework, MoH hospitals will continue to be classified into 4 major categories:

- State hospital
- Hospital with specialist
- Hospital without specialist
- Special medical institution

State hospital

A state hospital is the main hospital for each state in Malaysia. It is usually physically the largest hospital with the highest bed capacity in the state and offers various subspecialty services which may also serve as the regional referral centre. Every state would only have ONE state hospital.

Under the 11th Malaysia Plan, each state hospital has a target of 49 specialty and subspecialty services to be offered in the hospital. However, the ministry's way forward is to avoid duplication of services in the same geographical location and therefore if a nearby hospital with specialist has a resident specialist offering a subspecialty service, the state hospital may not offer the same service especially if there is a constrain on resources.

Hospital with specialist

Hospital with specialist is further divided into major specialist hospital and minor specialist hospital only for administrative purposes.

The definition of a major specialist and a minor specialist hospital is not limited to the number of beds or the list of specialties or subspecialty services being offered at the hospital. Instead, it takes into account various aspects involving the medical services provided such as:

- Location of the hospital
- Physical capacity of the hospital
- Population coverage and demographics
- Accessibility of specialized care to the public

Hence, even though a hospital with a large number of beds are usually assumed to be a major specialist hospital, it may not be classified as such and a comparatively smaller hospital may be officially recognized as a major specialist hospital if there is a need for the hospital to be classified as such.In conjunction with the current health transformation programme, clustering of services is the way forward for the Ministry. Under this initiative, specialized care may be offered by any hospital within a cluster regardless of the status of the hospital.

A minor specialist hospital which has been offering a number of specialized care may be upgraded into a major specialist hospital upon recommendation by the state health department and agreed upon at the ministerial level.

Network regions

Clinical services which require a substantial amount of financial resources or with limited number of specialists will be developed on a regional basis where resident specialists may be posted to any of the hospitals in that region.The zones are divided based on geographical location of the hospitals and existing referral and networking systems.

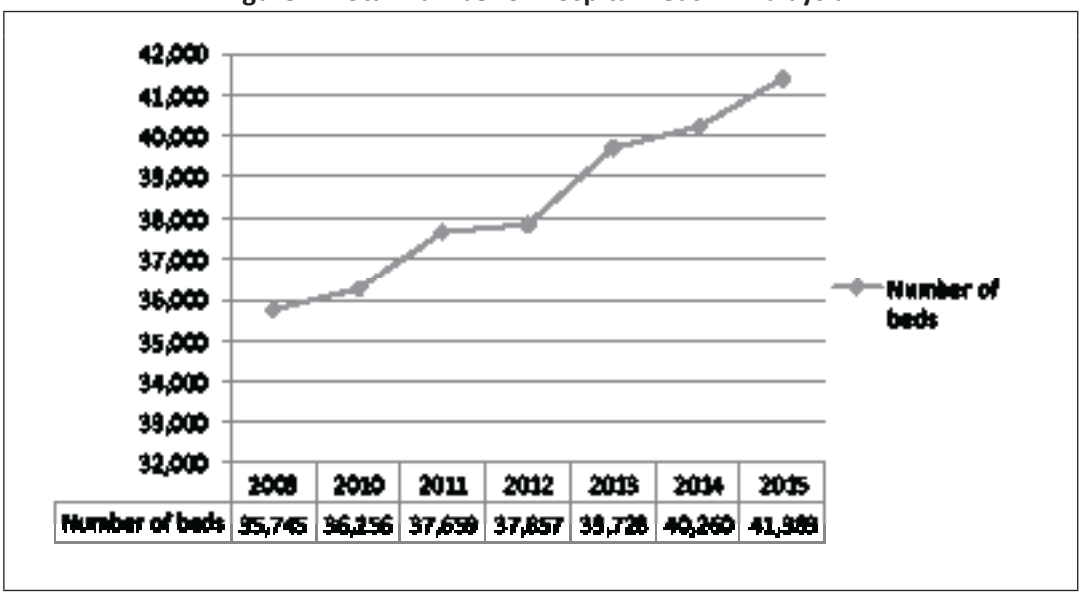
- North
  - Perlis
  - Kedah
  - Pulau Pinang
  - Part of Perak (Taiping, Parit Buntar, Selama, Kuala Kangsar)
- Central
  - Part of Perak (Ipoh, Teluk Intan, Seri Manjung, Slim River, Batu Gajah, Changkat Melintang, Kampar, Gerik, Sungai Siput, Tapah)
  - Selangor
  - Federal territories of Kuala Lumpur & Putrajaya
  - Negeri Sembilan
- South
  - Melaka
  - Johor
- East
  - Pahang
  - Terengganu
  - Kelantan
- Sabah
- Sarawak

However, this regional networking system only act as a basic guide and the dynamics may change according to the requirement and demands of the services.

Facility development

In view of the challenging economic period, the 11th Malaysia Plan focuses on expansion of services by optimizing available resources. However, several facility development plans are already in progress as the government strives to reach the target of 2.3 beds for every 1000 population.

Figure 1: Total Number of Hospital Beds in Malaysia



Source: Health Informatic Centre, MoH

TABLE 6: List of Current Hospitals under the Ministry of Health (145 HOSPITALS)

State	SPECIALIST HOSPITALS / SPECIAL MEDICAL INSTITUTIONS				NON-SPECIALIST HOSPITALS
	STATE HOSPITALS	MAJOR SPECIALIST HOSPITALS	MINOR SPECIALIST HOSPITALS	SPECIAL HOSPITALS / INSTITUTIONS	
	14	28	28	10	65
Wilayah Persekutuan	HKL	Putrajaya	Labuan	IPR HRC IKN * PDN	
Perlis	Kangar				
Kedah	Alor Setar	Sg Petani Kulim	Langkawi		Baling Sik Jitra Yan Kuala Nerang
Pulau Pinang	Pulau Pinang	Seberang Jaya	Bukit Mertajam Kepala Batas		Balik Pulau Sg Bakap
Perak	Ipoh	Taiping Teluk Intan	S. Manjung Slim River *** Gerik *** K. Kangsar	HBUK	Batu Gajah Parit Buntar Changkat Melintang Selama Kampar Sg Siput Tapah
Selangor	Klang	Ampang Kajang Selayang Serdang Sg Buloh Shah Alam	Banting	** PKKN	Kuala Kubu Baru Tg Karang Sabak Bernam Hosp. Orang Asli Gombak
Negeri Sembilan	Seremban	Kuala Pilah	Port Dickson *** Tampin		Jelebu Jempol
Melaka	Melaka				Alor Gajah Jasin
Johor	Johor Bahru	Batu Pahat Muar Sultan Ismail Segamat	Kluang *** Kota Tinggi	Permai	Kulai Mersing Pontian Tangkak
Pahang	Kuantan	Temerloh	Kuala Lipis Bentong Pekan		Jerantut Cameron Highlands Jengka Muadzam Shah Raub Rompin
Terengganu	Kuala Terengganu	Kemaman	*** Besut *** Dungun		Setiu Hulu Terengganu
Kelantan	Kota Bharu	Kuala Krai Tanah Merah	*** Gua Musang		Jeli Pasir Mas Machang Pasir Puteh Tumpat

State	SPECIALIST HOSPITALS / SPECIAL MEDICAL INSTITUTIONS				NON-SPECIALIST HOSPITALS	
	STATE HOSPITALS	MAJOR SPECIALIST HOSPITALS	MINOR SPECIALIST HOSPITALS	SPECIAL HOSPITALS / INSTITUTIONS		
	14	28	28	10	65	
Sabah	HQE I, KK	Sandakan Tawau HQE II, KK	Lahad Datu Keningau *** Beaufort *** K. Marudu	Mesra Women & Children Hospital, Likas	Beluran Kota Belud Kuala Penyu Kudat Kunak Papar Pitas	Kinabatangan Ranau Semporna Sipitang Tambunan Tenom Tuaran
Sarawak	Hospital Umum Sarawak	Miri Sibu Pusat Jantung Sarawak **** Bintulu	Kapit Limbang Sarikei Sri Aman *** Mukah	Sentosa	Bau Betong Daro Dalat Kanowit Lawas	Marudi Saratok Serian Simunjan RCBM Lundu

* *Pusat Darah Negara, unlike other hospitals or institutions, has no bed.*

** *PKKN, although not yet officially de-gazetted as a leprosarium, is now part of Hospital Sungai Buloh for administrative matters.*

*** *Upgrading of non-specialist hospital to minor specialist hospital yet to be achieved*

**** *Upgrading of minor specialist hospital to major specialist hospital yet to be achieved*

Human resource

As we plan for service expansion, the focus will not only be on available equipment and facilities but also on development and deployment of specialists. Table 7 illustrates the latest figures of the number of specialists as well as subspecialists under each discipline.

TABLE 7: Number of Specialists & Subspecialists in MoH (As of June 2016)

No	Disciplines	Number Of Subspecialities	Specialists (Generalists)	Subspecialists	Trainees	Total No.
1	Internal medicine	14	369	317	210	896
2	Surgery	13	195	107	48	350
3	Paediatrics	19	258	153	52	463
4	Orthopaedics	8	184	59	42	285
5	O&G	4	204	77	27	308
6	Psychiatry	7	126	48	16	190
7	Ophthalmology	7	156	59	29	244
8	Anaesthesiology	8	368	87	35	490
9	ORL	4	98	38	19	155
10	Radiology	11	217	33	25	275
11	Pathology		306			306
12	Forensic Medicine		28			28
13	Radiotherapy & Onco		33			33
14	Emergency Med		212			212
15	Rehab. Med		53			53
16	Sports Med		19			19
17	Nuclear Med		21			21
18	Transfusion Med		34			34
19	Neurosurgery*		49			49
20	Plastic Surgery *		26			26
21	Paediatric Surgery*		28			28
Total			**2984**	**978**	**503**	**4465**

Source: Medical Professionals Development Section, Medical Development Division

MOH HOSPITALS UTILISATION REVIEW

Changing population & demography

The changing demographics of Malaysian population and epidemiology of diseases pose a challenge for the healthcare system in coping with the increasing demands.

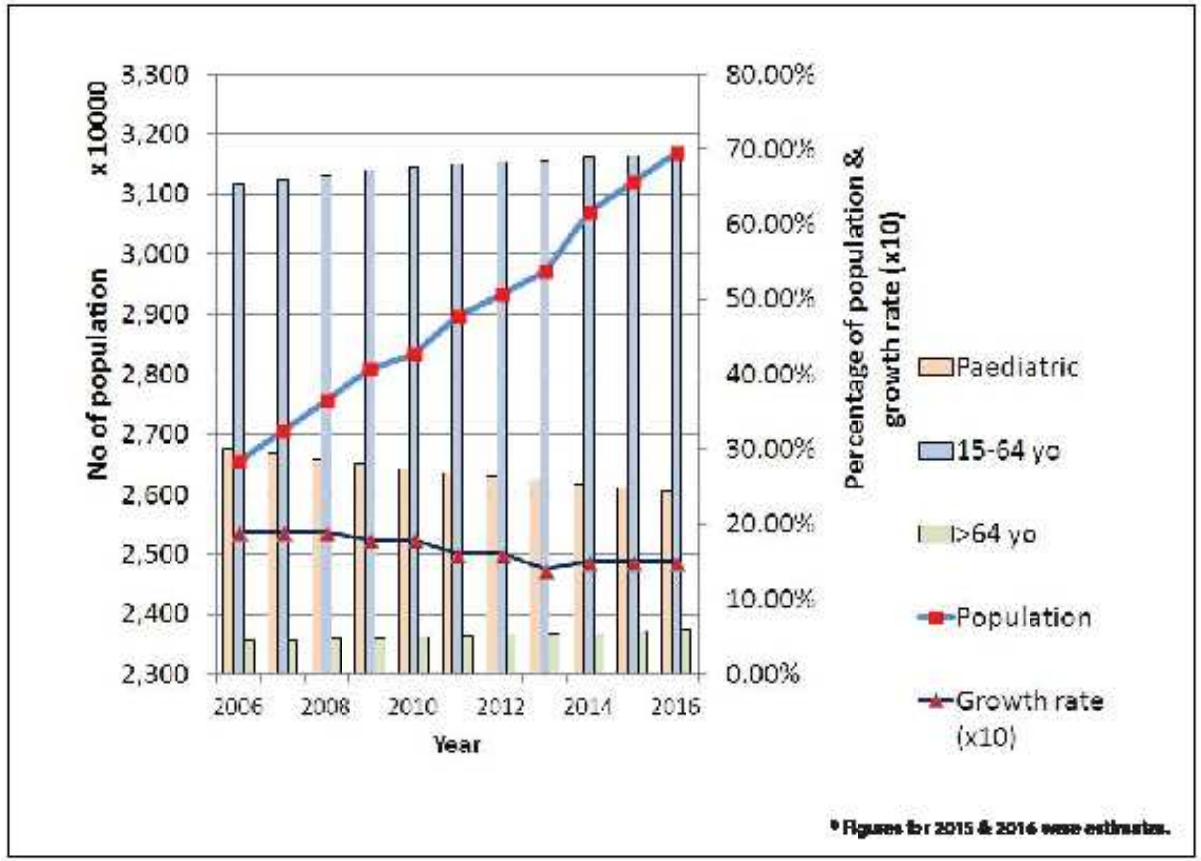
Over the years, statistics show a steady incline in the number of population with a decline in population growth rate, leading to an increase in the percentage of middle age and elderly population (Fig 2).

Increased urbanization which is related to sedentary and unhealthy lifestyle combined with the increasing life expectancy results in an increasing burden of non-communicable diseases such as diabetes, hypertension and cardiovascular diseases.

Therefore, Ministry of Health has taken an active approach to the dynamic change of epidemiology by focusing on strengthening the primary care sector to control the increasing incidence of such diseases.

In meeting the demand of services in the future, MoH hospitals have to play an active role in expanding accessibility and improving quality of care especially to the patients with non-communicable diseases to reduce the rate of morbidity and mortality.

Figure 2: Malaysian Population & Demographics



Source: Department of Statistics Malaysia

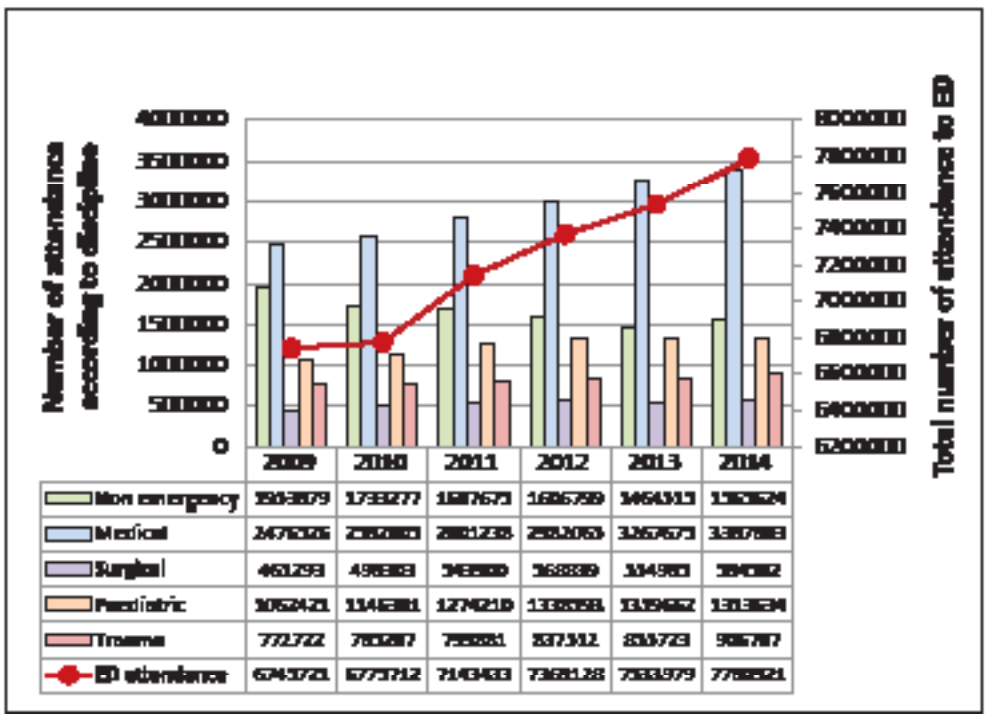
Emergeny Department

With an increasing number of Malaysian population in general, it is not surprising that the number of attendance to the Emergency Department of MoH hospitals also showed a steady increase (Fig 3).

However, as a result of continuous public education on emergency and non-emergency cases, there has been a steady decline in the percentage of non-emergency cases seeking treatment at the Emergency Department.

The increasing incidence of non-communicable diseases may be reflected by the increasing number of medical cases attended in the Emergency Department.

Figure 3: Number of Attendance to Emergency Departments in MoH Hospitals

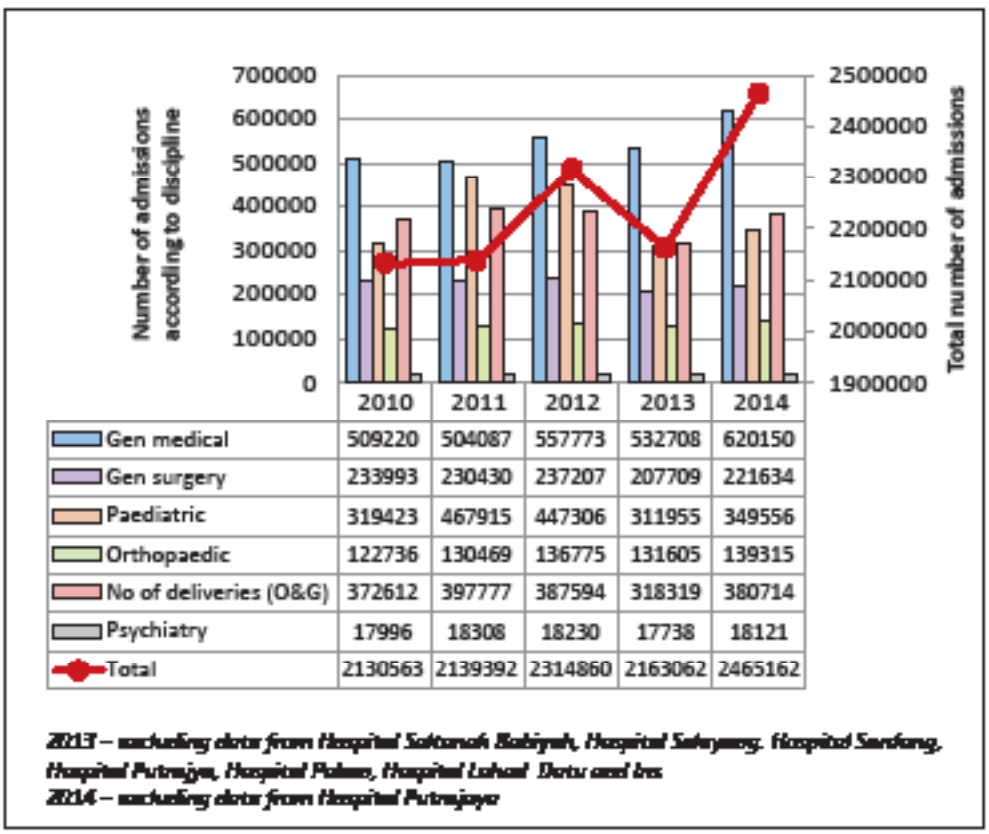


Source: HIMS Annual Report

Inpatient services

The burden of inpatient workload may be represented by the number of admissions to the hospitals and by measuring *bed occupancy rate* (BOR) which calculates the percentage of bed occupied in the hospital. In general, the number of admission has increased from 2010 to 2015 by 15.7% with admissions to general medicine showing the largest increase of 21.8% during the same period (Fig 4).

Figure 4: Number of Admission to MoH Hospitals



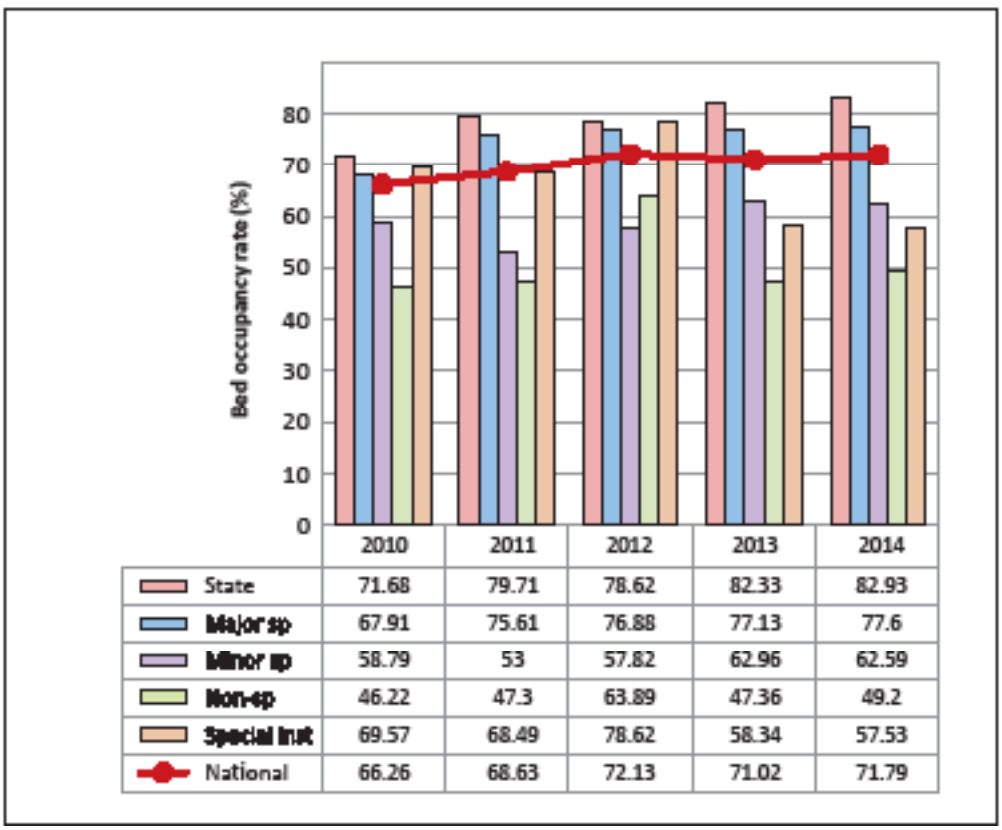
	2010	2011	2012	2013	2014
Gen medical	509220	504087	557773	532708	620150
Gen surgery	233993	230430	237207	207709	221634
Paediatric	319423	467915	447306	311955	349556
Orthopaedic	122736	130469	136775	131605	139315
No of deliveries (O&G)	372612	397777	387594	318319	380714
Psychiatry	17996	18308	18230	17738	18121
Total	2130563	2139392	2314860	2163062	2465162

2013 – excluding data from Hospital Sultanah Bahiyah, Hospital Selayang, Hospital Sandakan, Hospital Putrajaya, Hospital Pulau, Hospital Labuan Data used for
2014 – excluding data from Hospital Putrajaya

Source: HIMS Annual Report

The specialist hospitals in general have higher workload compared to other type of hospitals. However, major specialist hospitals showed highest increase in BOR of 14.3% followed by state hospitals at 13.6% from 2010-2014(Fig 5). Bypassing of the populations served by minor specialist hospitals and non specialist hospitals is still persistent contributed partly by patients' expectations and their demand for hospitals that have more specialty care. Increase accessibility to Community Psychiatric Care together with downsizing of Special Institutions for Psychiatric care has contributed to the reduced BOR of 17.3% during the same period.

Figure 5: Bed Occupancy Rate of MoH Hospitals According to Hospital Types

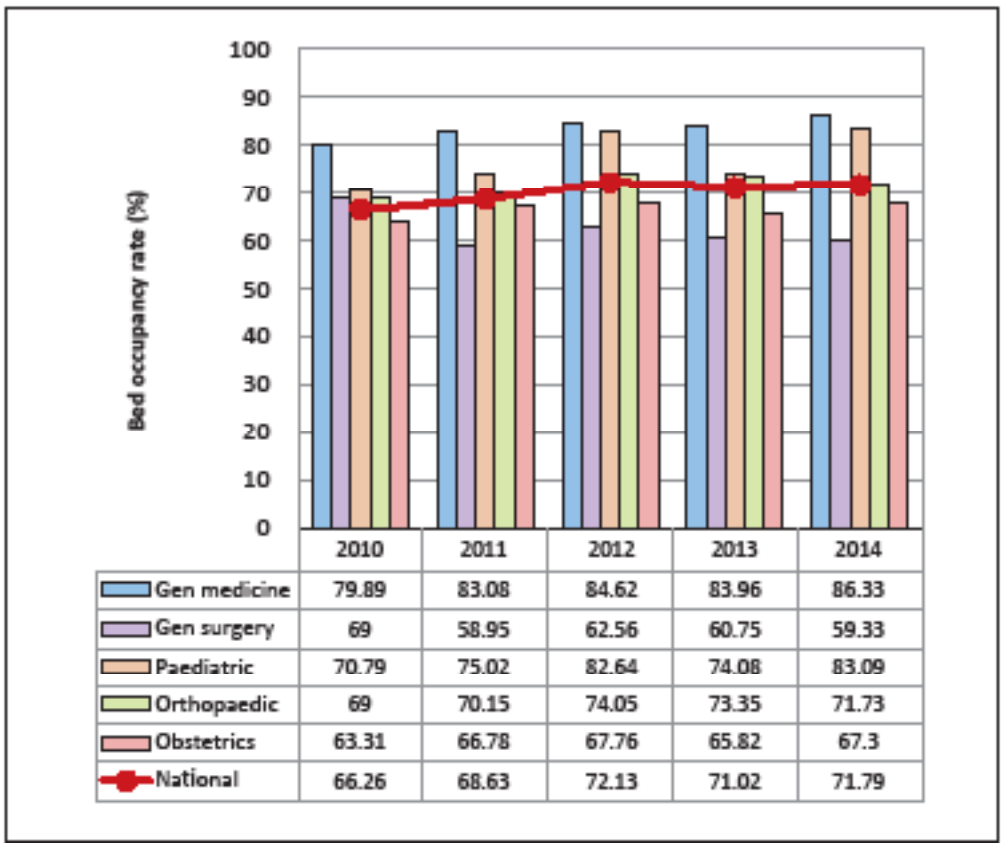


	2010	2011	2012	2013	2014
State	71.68	79.71	78.62	82.33	82.93
Major sp	67.91	75.61	76.88	77.13	77.6
Minor sp	58.79	53	57.82	62.96	62.59
Non-sp	46.22	47.3	63.89	47.36	49.2
Special Inst	69.57	68.49	78.62	58.34	57.53
National	66.26	68.63	72.13	71.02	71.79

Source: HIMS Annual Report

By discipline, both General Medical and Pediatric showed the largest increase in workload from 2010-2014, with an 8.1% and 14.8% increase in BOR respectively (Fig 6). Thus these specialties need strengthening in terms of resources to meet current and future demand.

Figure 6: Bed Occupancy Rate (BOR) According to Discipline



	2010	2011	2012	2013	2014
Gen medicine	79.89	83.08	84.62	83.96	86.33
Gen surgery	69	58.95	62.56	60.75	59.33
Paediatric	70.79	75.02	82.64	74.08	83.09
Orthopaedic	69	70.15	74.05	73.35	71.73
Obstetrics	63.31	66.78	67.76	65.82	67.3
National	66.26	68.63	72.13	71.02	71.79

Source: HIMS Annual Report

While the BOR looks at the utilization rate of inpatient beds, the average length of stay (ALOS) and turnover interval (TOI) indicates the efficiency and effectiveness of the treatment given at the hospital. The longer length of stay for special medical institutions is heavily influenced by the long term stay of psychiatric cases.

Table 8: Performance of MoH Hospitals According to Hospital Types

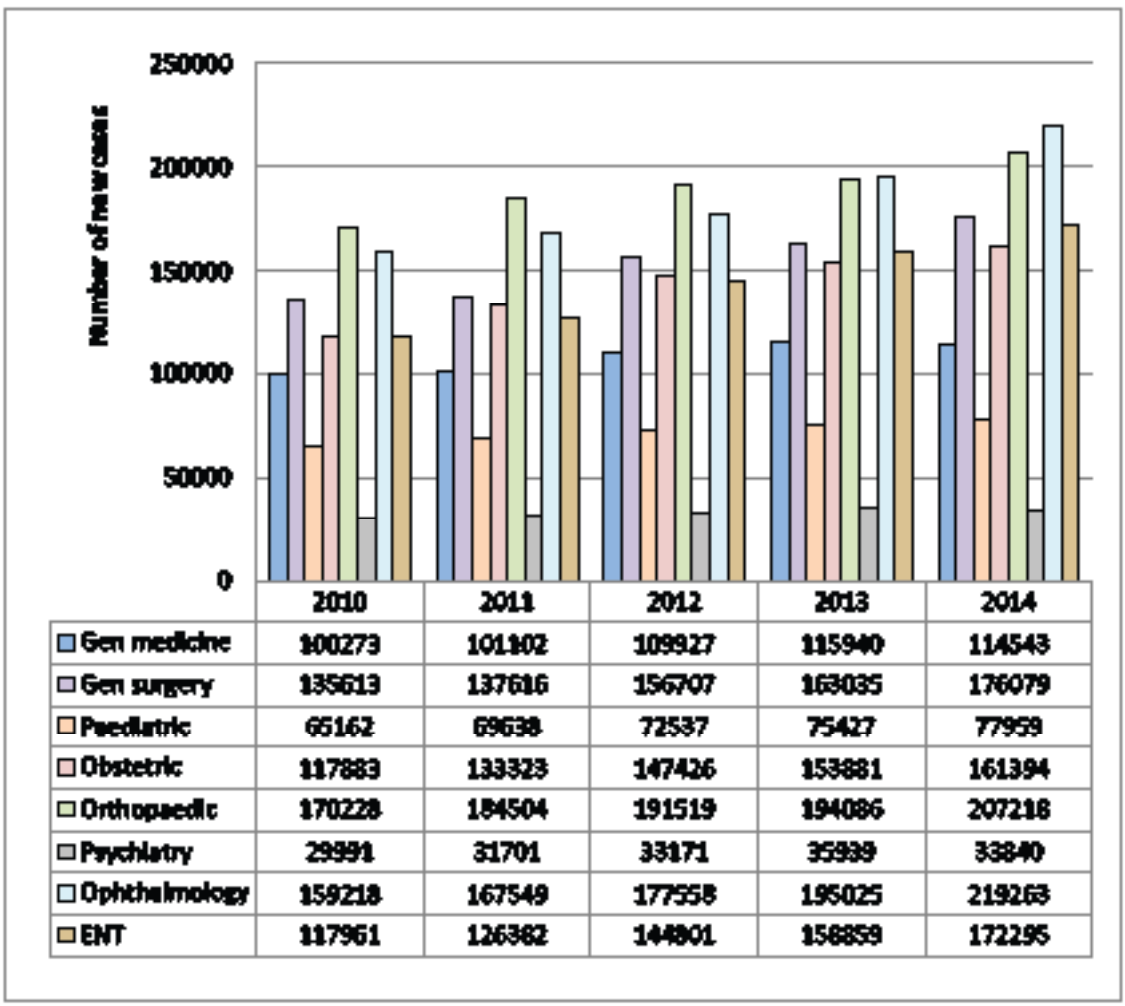
Indicators / Hospital type			National average	State hospitals	Major specialist hospitals	Minor specialist hospitals	Non specialist hospitals	Special medical institutions
Bed Occupancy Rate (BOR)	%	2012	72.13	78.62	76.88	57.82	63.89	78.62
		2013	71.02	82.33	77.13	62.96	47.36	58.34
		2014	71.09	82.93	77.60	62.59	49.20	57.53
Averagge Length of Stay (ALOS)	days	2012	4.22	4.28	3.82	3.08	3.8	23.9
		2013	4.19	4.33	3.69	3.11	2.7	23.36
		2014	4.11	4.2	3.75	3.14	2.69	20.92
Turnover Interval (TOI)	Days	2012	1.62	1.6	1.28	2.25	2.15	6.5
		2013	1.71	1.33	1.31	2.18	3.13	9.48
		2014	1.62	0.89	1.19	2.9	2.85	9.91

Source: HIMS Annual Report

Outpatient services

Looking at number of new attendances to specialist clinics, in general the volume has increased for all disciplines (Fig 7) during the period of 2010-2014. The top 3 disciplines that had the largest increase of new attendances were ENT at an increase of 46% followed by Ophthalmology and Obstetrics at 38% and 37% respectively.

Figure 7: Number of Attendance to Specialist Clinics in MoH Hospitals (New Cases)

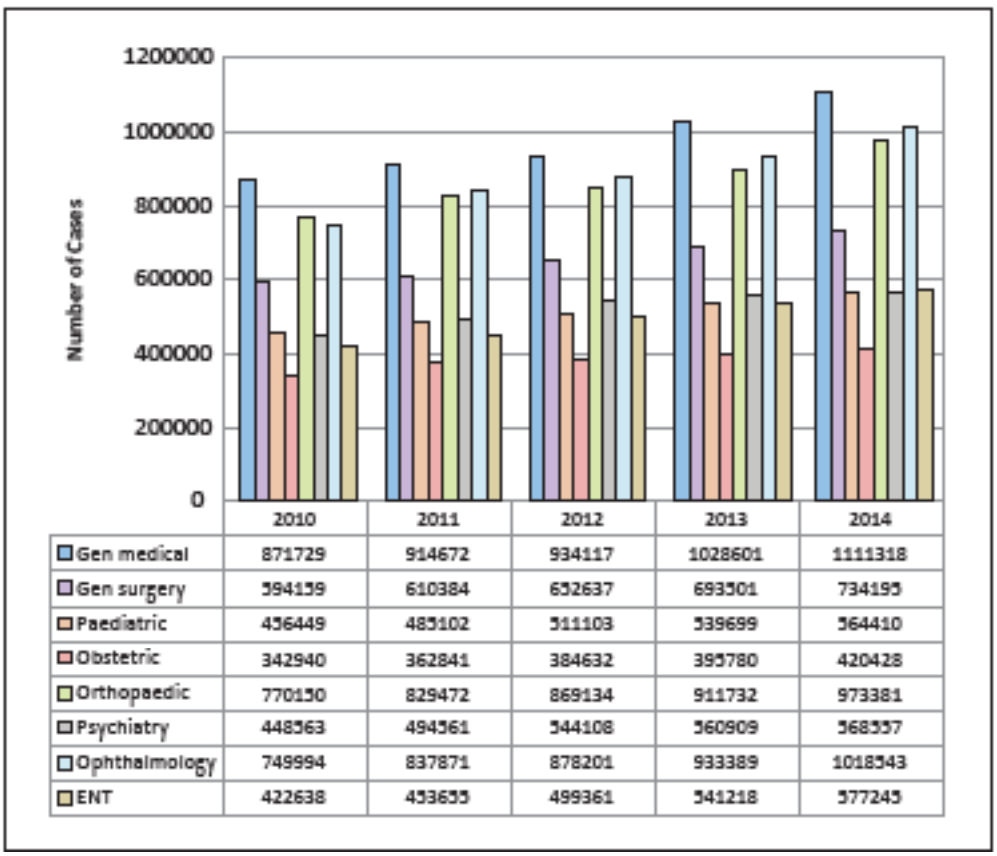


	2010	2011	2012	2013	2014
Gen medicine	100273	101802	109927	115940	114543
Gen surgery	135613	137616	156707	163035	176079
Paediatric	65162	69638	72537	75427	77959
Obstetric	117883	133323	147426	153881	161394
Orthopaedic	170228	184504	191519	194086	207218
Psychiatry	29991	31701	33171	35939	33840
Ophthalmology	159218	167549	177558	195025	219263
ENT	117961	126382	144801	156859	172295

Source: HIMS Annual Report

Based on total number of cases seen at Specialist Clinics during 2010-2015 as in Fig 8, all disciplines showed an increase in patient load. Similarly, to Fig 7, ENT had the highest increase of the workload i.e. 28% when compared across specialties. Both Psychiatry and Ophthalmology had an increase of 25% of the workload while all other disciplines had increased workload of about 15%-18% from 2010-2015.

Figure 8: Number of Attendance to Specialist Clinics in MoH Hospitals (Total Number of Cases)



	2010	2011	2012	2013	2014
Gen medical	871729	914672	934117	1028601	1111318
Gen surgery	594139	610384	652637	693501	734195
Paediatric	456449	485102	511103	539699	564410
Obstetric	342940	362841	384632	395780	420428
Orthopaedic	770150	829472	869134	911732	973381
Psychiatry	448563	494561	544108	560909	568557
Ophthalmology	749994	837871	878201	933389	1018543
ENT	422638	453655	499361	541218	577245

Source: HIMS Annual Report

The ten principal causes of hospitalization and death in MoH hospitals are depicted in Table 8 and Table 9, respectively.

While pregnancy-related conditions remain the most common cause of hospitalization throughout the years, the percentage is steadily declining and in tandem with decreasing growth rate of Malaysians.

Meanwhile, even though the percentage of admissions due to diseases of the circulatory system were consistently less than 10%, they accounted for over 20% of causes of death, indicating significant mortality rate.

Table 9: Ten Principal Causes of Hospitalizations in MoH

Year / No	2005	2010	2015
1	Normal deliveries (single spontaneous delivery) 15.18%	Pregnancy, childbirth and the puerperium 25.72%	Pregnancy, childbirth and the puerperium 23.85%
2	Complications of pregnancy, childbirth and the puerperium 12.03%	Diseases of the respiratory system 9.56%	Diseases of the respiratory system 12.34%
3	Accidents (accidental injury) 8.93%	Injury, poisoning and certain other consequences of external causes 8.98%	Certain infectious and parasitic diseases 9.28%
4	Diseases of the circulatory system 7.07%	Certain infectious and parasitic diseases 8.29%	Certain conditions originating in the perinatal period 8.38%
5	Diseases of the respiratory system 6.98%	Certain conditions originating in the perinatal period 7.35%	Injury, poisoning and certain other consequences of external causes 7.64%
6	Certain conditions originating in the perinatal period 6.25%	Diseases of the circulatory system 6.88%	Diseases of the circulatory system 7.29%

Year / No	2005	2010	2015
7	Diseases of the digestive system 5.11%	Diseases of the digestive system 5.09%	Diseases of the digestive system 4.52%
8	Diseases of the urinary system 3.73%	Diseases of the genitourinary system 4.95%	Diseases of the genitourinary system 4.21%
9	Ill defined conditions (symptoms and signs) 3.34%	Neoplasms 3.62%	Neoplasms 4.09%
10	Malignant neoplasms 3.00%	Factors influencing health status and contact with health services 3.54%	Factors influencing health status and contact with health services 3.55%

Source: Health Indicators, Planning Division MoH

Table 10: Ten Principal Causes of Death in MoH

Year / No	2005	2010	2015
1	Septicaemia 16.54%	Diseases of the circulatory system 25.35%	Diseases of the circulatory system 22.77%
2	Heart diseases & diseases of pulmonary circulation 14.31%	Diseases of the respiratory system 18.46%	Diseases of the respiratory system 18.54%
3	Malignant neoplasms 10.11%	Certain infectious and parasitic diseases 17.81%	Neoplasms 13.56%
4	Cerebrovascular diseases 8.19%	Neoplasms 11.87%	Certain infectious and parasitic diseases 13.20%
5	Accidents 5.67%	Injury, poisoning and certain other consequences of external causes 5.35%	External causes of morbidity and mortality 9.74%

Year / No	2005	2010	2015
6	Pneumonia 5.30%	Diseases of the digestive system 4.76%	Diseases of the digestive system 4.82%
7	Diseases of digestive system 4.45%	Diseases of the genitourinary system 4.67%	Diseases of the genitourinary system 4.32%
8	Certain conditions originating in the perinatal period 4.37%	Certain conditions originating in the perinatal period 3.87%	Certain conditions originating in the perinatal period 3.16%
9	Nephritis, nephritic syndrome and nephrosis 3.89%	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified 1.84%	Endocrine, nutritional and metabolic diseases 2.08%
10	Ill defined conditions (symptoms and signs) 2.82%	Endocrine, nutritional and metabolic diseases 1.72%	Disease of the nervous system 1.51%

Source: Health Indicators, Planning Division MoH

11th MALAYSIA PLAN

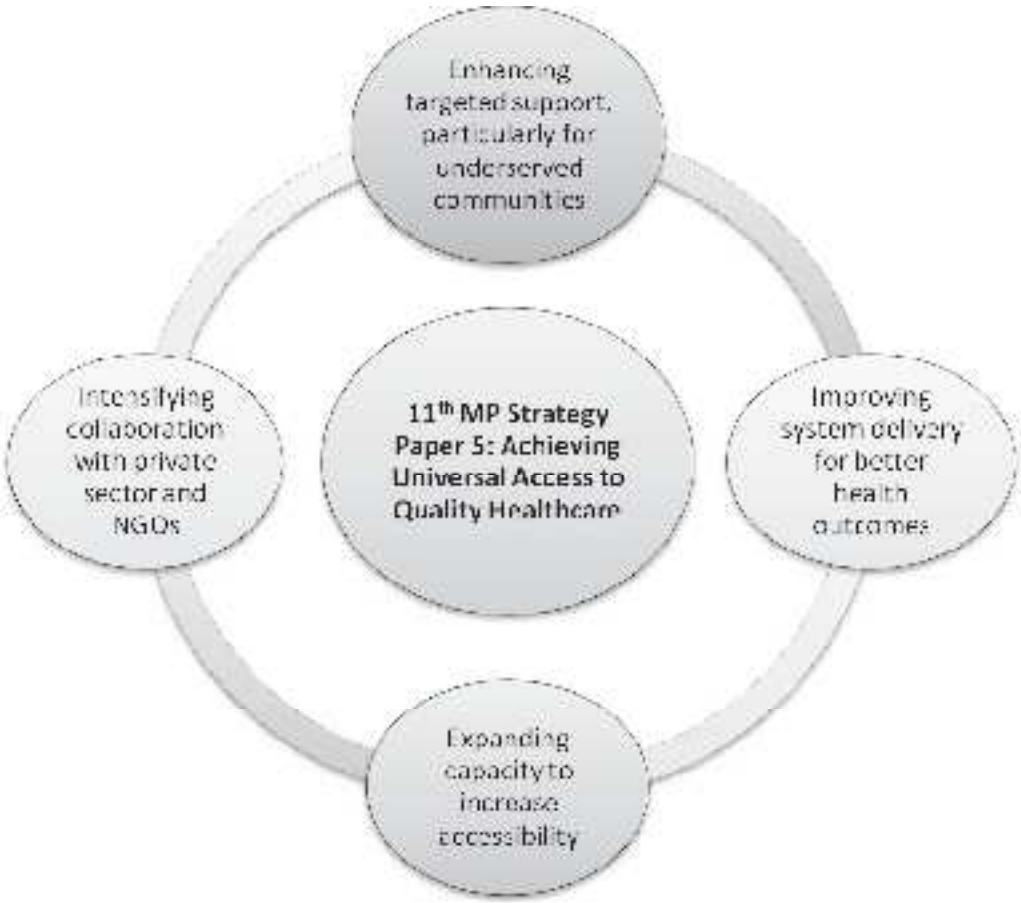
During the period of 10th MP, medical services faced multiple pressures which include changing patterns of diseases, advent of new knowledge and technology as well as rising public and political expectations on outcomes of medical care. Recognizing these pressures and the need to ensure continuity and quality of services, efforts were made to promote health; strengthen clinical services with new technology, upgrade of facilities with services made available in more hospitals, enhancing institutionalization of quality care and improved organization of hospitals through provision of information and communications technology.

Workforce issues were a major constraint and addressed more in terms of looking at future requirements, retention plans with benefit / retention packages, more training opportunities and networking. Quality initiatives were noted to be fragmented while telehealth services were hampered with the lack of adherence to telehealth standards that facilitates the establishment of an integrated health information system. A range of issues involving ICT, workforce and training opportunities, lack of integration between providers, equipments and maintenance, and budget were common across many Divisions. Many objectives were unmet due to these issues.

Moving towards 11th MP, these pressures are likely to remain. Focus will continue on ways to reduce the burden of diseases and improve medical services performance. Rising demand for intensive care and emergency care requires strengthening of these services. As cost of care is rising, ambulatory care will be strengthened to reduce hospitalization. ICT will be the prime mover to improve organization of the system with establishment of robust clinical systems and patient management systems to support administrative and clinical management of care. Work towards establishing an integrated health information system will be enhanced. The framework of clinical governance and performance measurement to ensure acceptable standards will be vital as care becomes more intensive.

It is clear that future sustainability of the services require investment of more resources. Other than optimizing current resources available by improving our technical efficiency we take cognizant of resources available in the private sector. One of the ways is to transform medical care services to an integrated public: private delivery services with key aims being improvement in access and quality of care. Greater efforts therefore need to be in place to ensure the building blocks for integrated care is available towards better patients' outcomes. The building blocks entails a whole set of rules and laws for changes in the delivery system, financing mechanism, and common standards that must be laid down clearly before any transformation can occur. These need major commitments from all concerned.

Hence, the 11th Malaysia Plan Strategy Paper 5 which focuses on "Achieving Universal Access to Quality Healthcare" outlines the following strategies as the way forward.



Indicators and targets for 11MP Indicator	Target
Doctor to population ratio	1:400
Hospital bed to population ratio	2.3:1,000
Waiting time to receive outpatient treatment in public hospital	15 minutes

Source: 11th Malaysia Plan Strategy Paper 5

Guiding principles

MoH will continue to use the guiding principles outlined in the strategic planning under the 10th Malaysia Plan with several additional guiding principles.

1. Where there are enough specialists / subspecialists in a particular clinical discipline, the relevant resident specialty / subspecialty services will be developed in all states and the Federal Territory at identified hospitals.

2. Where there are not enough specialists / subspecialists in a particular clinical discipline, the relevant resident specialty / subspecialty services will be developed on a regional basis in at least one hospital in each of 6 care-network zones.

3. Where there is no specialist / subspecialist to provide a critically needed service, services may be procured from the private sector, universities, medical colleges or the non-MOH sector on a contract (outsourced), sessional or honorarium basis.

   The Medical Advisory Committee of the relevant hospital will identify the need for such procurement and make recommendations to the respective State Health Department or the MOH for approval.

4. Human resource allocation for specialty / subspecialty services development will start with the minimum necessary, and based on a multi-tasking and incremental approach.

   This will assist in ensuring a realistic development of specialty and subspecialty services yet allow expansion of specialty services to meet the needs of the local population.

5. Short training in relevant subspecialty areas will continue to be given to general specialists to enable them to provide these services in places where there are no subspecialists, and they will be privileged to do so.

   This will provide the rural and underserved populations with some degree of equity and accessibility to some common subspecialty services.

6. The development of a subspecialty within a specialty or further sub specialization within a subspecialty will only be allowed when there are adequate numbers of general specialists or subspecialists in that discipline and if it is in line with the needs of the country.

   This will help to rationalize the development and use of manpower as well as provide a better focus for the development of specialists and subspecialists in the country.

7. Subspecialty services will be initially developed under the wing of the general specialty department and will expand to become a full fledged subspecialty department when there are sufficient resources to deliver services adequately and effectively

   This will help to ensure that resources are utilized optimally while improving accessibility to subspecialty services to the local population.

8. This blueprint will not preclude the flexibility of the MOH to deviate from the general plan in specific instances in order to accommodate special needs that may arise from time to time.

   In line with efforts for the restructuring of the public health system in Malaysia in the near future, plans for specialty and subspecialty development may be reconfigured within the general framework to meet the needs of the local population in each region.

Hospital Cluster

Considering the limited resources during this difficult economic period, the hospital cluster concept has been identified in the 11th Malaysia Plan Strategy Paper 5 as a mechanism in improving system delivery. On top of that, it will also play a major role in expanding specialised services.

The hospitals within the cluster will provide a range of secondary and tertiary services with network and linkages for patient centred and seamless delivery of care and follow up, integrating with the primary care services of the area. Where the services are not available in public hospitals such services will be sourced from private hospitals within the cluster area or state. Services will be sought outside the state if such services are not available within the state.

Integration and coordination strategies shall include the following:

a. Hospital cluster will provide a comprehensive range of specialist services (secondary and tertiary) as envisaged by MOH.

b. The service delivery shall balance clinical outcomes and service viability with care closer to home through better collaboration across hospitals and services, including those provided in the community, and greater use of multidisciplinary teams to increase equity of access to safe and quality care.

c. Service delivery shall take into account inter relationships and dependence on other services, known bed constraints and known facility constraints. Concurrently, there shall be innovation through non-inpatient care aims to improve hospital capacity to make room for those most in need of hospital care and enable timely provision of care to those of greatest need.

d. The range of specialist services will be distributed and be graded for complexity between the hospitals (rationalization of services i.e. mapping according to needs, scope level and standard, availability of appropriate manpower and resources and actual need for example in Sabah where there is unavailability of outsource services). Small hospitals will have a narrow range of basic services while the larger hospitals will have a range of services to complement and meet the needs of the cluster wide region, as planned by the MOH Specialty and Subspecialty Services Development Framework.

e. Minimum services for acute emergencies shall be established in which a minimum of 7 basic specialty services shall be provided in the pilot Hospital Cluster. The services are General Medicine, General Surgery, Pediatrics, Orthopedics, Obstetrics & Gynecology, Emergency Medicine and Anesthesiology.

f. Coordination of hospital transfers for acutely ill patients shall be strengthened with provision of adequate number of functioning ambulances and trained human resource as there is expected increases of patient movement for inter hospital transfer for step up/step down care.

g. Referral pathways for the various clinical service deliveries shall be establish for Hospital Cluster. This shall include referral criteria and scope of care. Hospital Cluster shall develop pre-existing transfer arrangements between the facilities and pre-transfer communication between appropriate responsible persons to facilitate efficient flow of continuum of care to the patient.

Service Development

As we moved into the 11th Malaysia Plan, many of the objectives set under the 10th Malaysia Plan were yet to be achieved, most notably were the upgrading plans of non-specialist hospitals into minor specialist hospitals. Hence, the target specialties for minor specialist and major specialist hospitals will remain the same, focusing on basic specialties and those specialties with high demands.

TABLE 11: Specialties for Minor Specialist Hospitals

MINOR SPECIALIST HOSPITALS (10 SERVICES)	
1. General medicine	6. Emergency medicine
2. General surgery	7. Anaesthesiology
3. Paediatrics	8. Psychiatry
4. O&G	9. Radiology
5. Orthopaedics	10. Pathology
HOSPITALS: Labuan, Langkawi, Bukit Mertajam, Kepala Batas, Sri Manjung, Slim River, ***Gerik, Kuala Kangsar,*** Banting, Port Dickson, ***Tampin,*** Kluang, ***Kota Tinggi,*** Kuala Lipis, Bentong, Pekan, ***Besut, Dungun, Gua Musang*****,** Lahad Datu, Keningau, ***Beaufort, Kota Marudu,*** Kapit, Limbang, Sarikei, Sri Aman, ***Mukah***	

TABLE 12: Specialties & Subspecialties for Major Specialist Hospitals

MAJOR SPECIALIST HOSPITALS (20 SERVICES)	
1. General medicine 2. Nephrology 3. Dermatology 4. Respiratory medicine 5. Infectious diseases	13. Emergency medicine 14. Radiology 15. Pathology
6. General surgery	16. Psychiatry
7. Paediatrics 8. Neonatology	17. ENT
9. Orthopaedics	18. Ophthalmology
10. O&G 11. Maternal fetal 12. Anaesthesiology	**Dental** 19. Paeds dental 20. Oral surgery
HOSPITALS: Putrajaya, Sg Petani, Kulim, Seberang Jaya, Taiping, Teluk Intan, Ampang, Kajang, Selayang, Serdang, Sg Buloh, Shah Alam, Kuala Pilah, Batu Pahat, Muar, HSIJB, Segamat, Temerloh, Kemaman, Kuala Krai, Tanah Merah, Sandakan, HQE II, Miri, Sibu, Bintulu, Pusat Jantung Sarawak	

However, in view of ageing population, 4 regional services have been identified to be offered at state hospitals to enhance coverage and accessibility. They are geriatrics, uro-gynaecology, neurology and palliative care.

TABLE 13: Specialties & Subspecialties for State Hospitals

STATE HOSPITALS (49 SERVICES)		
1. GENERAL MEDICINE 2. Nephrology 3. Dermatology 4. Respiratory medicine 5. Infectious diseases 6. Endocrinology 7. Cardiology 8. Gastroenterology 9. Rheumatology	**23. O&G** 24. Maternal fetal 25. Gynae-oncology	**37. ENT**
10. GENERAL SURGERY 11. Neurosurgery 12. Plastic surgery 13. Urology 14. Trauma surgery 15. Colorectal surgery	**26. ANAESTHESIOLOGY** 27. Adult intensive care 28. Pain medicine	**38. OPHTHALMOLOGY** 39. Vitreo-retinal 40. Glaucoma
16. PAEDIATRICS 17. Neonatology 18. Paediatric surgery 19. Paediatric intensive care	**29. EMERGENCY MEDICINE**	**Dental** 41. Paediatric dental 42. Oral surgery
20. ORTHOPAEDICS 21. Spine orthopaedics 22. Joint arthroplasty	**30. RADIOLOGY**	**43. FORENSIC MEDICINE**
	Pathology 31. Anatomical pathology 32. Chemical pathology 33. Microbiology 34. Haematology	**44. REHABILITATION MEDICINE**
	35. PSYCHIATRY 36. Child psychiatry	**45. TRANSFUSION MEDICINE**
		Additions in 11MP (previously under regional services) 46. Geriatrics 47. Uro-gynaecology 48. Neurology 49. Palliative care
HOSPITALS: HTF, HSB, HPP, HRPB, HKL, HTAR, HMelaka, HTJ, HSAJB, HTAA, HSNZ, HRPZ II, HUS, HQE		

TABLE 14: Regional Services

REGIONAL SERVICES (22 SERVICES)	
MEDICINE 1. Hepatology 2. Haematology 3. Oncology	**RADIOLOGY** 15. Interventional radiology
SURGERY 4. Upper GI surgery 5. Hepatobiliary surgery 6. Breast & endocrine surgery 7. Vascular surgery 8. Cardiothoracic surgery	**ANAESTHESIOLOGY** 16. Cardiothoracic anaesthesiology & perfusion
PAEDIATRICS 9. Paediatric cardiology 10. Paediatric endocrinology 11. Paediatric haemato-oncology 12. Paediatric nephrology 13. Paediatric neurology	**DENTISTRY** 17. Oral path / med 18. Forensic dental 19. Dental special care
O&G 14. Reproductive medicine	**OTHERS** 20. Nuclear medicine 21. Sports medicine 22. Genetics

Facility development

Even though the Ministry has shifted focus from new facility development to service expansion, the Planning Division, Ministry of Health has outlined a projection of facility development plans until the year 2030.

11th Malaysia Plan facility development plans would further be divided into

- Upgrading of current facilities
- Building new facilities

Upgrade plans would focus on the 10 hospitals without specialist which were planned to be upgraded to minor specialist hospitals but have yet to provide specialist services in the hospitals (Gerik, Kuala Kangsar, Tampin, Kota Tinggi, Dungun, Besut, Gua Musang, Beaufort, Kota Marudu, Mukah).

Meanwhile, new hospitals that have been identified to be built or continue construction (construction was started under previous Malaysia Plans) under the 11th Malaysia Plan are:

- Major specialist hospitals
    1. Hospital Kapar, Selangor
    2. Hospital Pasir Gudang, Johor
    3. Hospital Petrajaya, Sarawak
- Minor specialist hospitals
    1. Hospital Pendang, Kedah
    2. Hospital Cyberjaya, Selangor
- Non-specialist hospitals
    1. Hospital Seri Iskandar, Perak
    2. Hospital Rembau, Negeri Sembilan
    3. Hospital Maran, Pahang
    4. Hospital Bera, Pahang
    5. Hospital Bachok, Kelantan
- Special medical institutions
    1. Institut Perubatan Forensik
    2. Women & Children Hospital

While the priority may not be in building special medical institutions, the long term plan is to have 5 regional centres for Pusat Darah Negara as well as 5 regional centres for Institut Perubatan Forensik.

TABLE 15: Projection of Hospital Planning by Types Under 11th Malaysia Plan (160 hospitals)

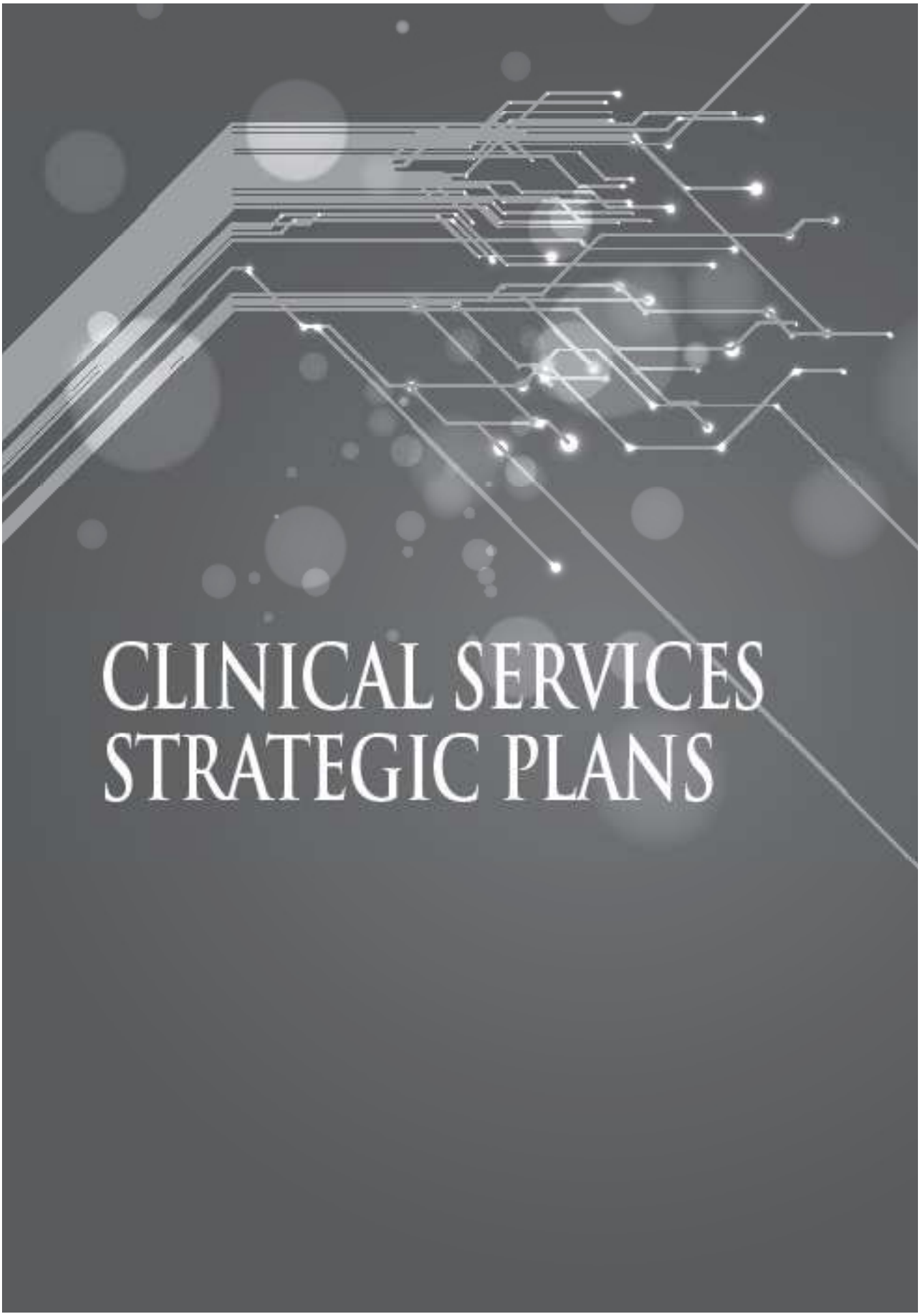
	SPECIALIST HOSPITALS / SPECIAL MEDICAL INSTITUTIONS				NON-SPECIALIST HOSPITALS
	STATE HOSPITALS	MAJOR SPECIALIST HOSPITALS	MINOR SPECIALIST HOSPITALS	SPECIAL HOSPITALS / INSTITUTIONS	
	14	30	32	13	71
Wilayah Persekutuan	HKL	Putrajaya	Labuan	IPR * PDN *(+5 regional centres)* HRC IKN *** Women & Children* *** Forensic (+5 regional centres)*	
Perlis	Kangar		****Padang Besar*		
Kedah	Alor Setar	Sg Petani Kulim	Langkawi Baling ****Pendang*	*** Pusat Kanser Wilayah Utara*	Jitra Sik Yan Kuala Nerang
Pulau Pinang	Pulau Pinang	Seberang Jaya	Bukit Mertajam Kepala Batas		Balik Pulau Sg Bakap
Perak	Ipoh	Taiping Teluk Intan	S. Manjung Slim River Gerik K. Kangsar	HBUK	Selama Sg Siput Tapah Kampar Bt. Gajah Ct. Melintang Parit Buntar ****Seri Iskandar*
Selangor	Klang	Ampang Kajang Selayang Serdang Sg Buloh Shah Alam ****Kapar*	Banting ****Cyberjaya*	** PKKN	Kuala Kubu Baru Tg Karang Sabak Bernam Hosp. Orang Asli Gombak
Negeri Sembilan	Seremban	Kuala Pilah	Port Dickson Tampin		Jelebu Jempol ****Rembau*
Melaka	Melaka				Jasin Alor Gajah
Johor	Johor Bahru	Batu Pahat Muar Sultan Ismail Segamat ****Pasir Gudang*	Kluang Kota Tinggi	Permai	Kulai Mersing Pontian Tangkak

	SPECIALIST HOSPITALS / SPECIAL MEDICAL INSTITUTIONS				NON-SPECIALIST HOSPITALS	
	STATE HOSPITALS	MAJOR SPECIALIST HOSPITALS	MINOR SPECIALIST HOSPITALS	SPECIAL HOSPITALS / INSTITUTIONS		
	14	30	32	13	71	
Pahang	Kuantan	Temerloh	Kuala Lipis Bentong Pekan		Jerantut Jengka Raub Rompin	C. Highlands Muadzam Shah ****Maran* ****Bera*
Terengganu	Kuala Terengganu	Kemaman	Besut Dungun		Setiu	Hulu Terengganu
Kelantan	Kota Bharu	Kuala Krai Tanah Merah	Gua Musang		Jeli Machang Tumpat	Pasir Mas Pasir Puteh ****Bachok*
Sabah	HQE I, KK	Sandakan Tawau HQE II, KK	Lahad Datu Keningau Beaufort K. Marudu	Mesra Women & Children Hospital, Likas	Beluran Kudat Kunak Papar Pitas Ranau	Semporna Sipitang Tambunan Tenom Tuaran Kinabatangan Kota Belud Kuala Penyu
Sarawak	Hospital Umum (+ Pusat Jantung Sarawak) Kuching	Miri Sibu Bintulu ****Petrajaya*	Kapit Limbang Sarikei Sri Aman Mukah	Sentosa	Bau Betong Daro Dalat Kanowit Lawas	Marudi Saratok Serian Simunjan RCBM Lundu

* Pusat Darah Negara, unlike other hospitals or institutions, has no bed.

** PKKN, although not yet officially de-gazetted as a leprosarium, is now part of Hospital Sungai Buloh for administrative matters.

*** *New hospital*



CLINICAL SERVICES STRATEGIC PLANS

EMERGENCY MEDICINE & TRAUMA SERVICES

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Available in all hospitals with specialist and without specialist.	1. Resident Emergency Physicians in all major specialist hospitals with 24 hours active coverage. 2. Regional subspecialty emergency medicine services for; a. Clinical Toxicology b. Paediatric Emergency Medicine c. Prehospital care and Disaster Medicine 3. Subspecialty services of Emergency Critical Care, Emergency Trauma Care, Paediatric Emergency Medicine and Prehospital care in all State/ Major Specialist Hospitals supported by adequate structures and equipment
Where previous services available but now not	Nil	N/A
Networking / Outreach	Visits of specialists to hospital without specialists on a regular basis. More regular visits by specialists involved in the cluster hospitals i.e. Hosp Temerloh, Melaka and Tawau	
Outsourcing/ Purchase of Services	1. MRCS and St Johns Ambulance Malaysia for Prehospital care Service in designated centre in Klang Valley 2. Water ambulance (Kedah / Langkawi) 3. Air ambulance in Sabah and Sarawak	Outsourcing based upon evidence / cost effectiveness of the following service in selected centres; 1. Air Ambulance 2. Critical Equipment Rentals for Emergency Critical equipment such as portable ultrasound machine, ventilators, vital sign monitoring equipment 3. Access to Emergency (Primary) PCI for STEMI patients

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies / Universities	1. JBPM (however via regional initiatives at Melaka and Hospital Kuala Lumpur) 2. With Universities for undergraduate training (decided by KKM)	1. Pre hospital Care and Disaster Medicine – network with other government agencies – JPAM/ JBPM and NGOs such as Malaysia Red Crescent Society (MRCS) and St John Ambulance Malaysia for Ground and Air Ambulance 2. MOU with external training bodies (Royal College of Emergency Medicine) to conduct examinations at MOH Hospitals/ facilities

Major gaps / issues / challenges

1. Human Resources & Training
    - Inadequate numbers specialists to provide active 24 hours a day cover in all hospitals
    - Limited training places (only 60 candidates per year)
    - Inadequate numbers of allied health professionals namely AMO and nurses
    - Limited area for training (skill labs)
2. Infrastructure and equipment
    - Inadequate biomedical equipment especially for emergency critical care services
    - Limited budget for reagent for point-of-care testing and consumables
    - Limited clinical space for Observational Medicine Services especially for State / Major Specialist Hospitals contributing to overcrowding
    - Limited numbers of ambulances and personnel for pre hospital care services
3. Scope of service
    - Inadequate knowledge and skills in management of Emergency Critical Care
    - Gaps in provision of pre hospital care services
    - Development of subspecialty services still at infancy stage.
4. Hospital-wide issues of access block that leading to overcrowding in the ED.

Proposals

New programmes / services	1. Clinical Toxicology Regionally 2. Emergency Critical Care 3. Enhancement of Observational Medicine Services – Establishment of chest pain unit 4. Emergency trauma care inclusive of trauma audit and registry 5. Geriatric emergency medicine services as area of interest 6. High altitude and aviation medicine as area of interest
Projects approved RMK11	1. Upgrading of Emergency Department (HKL) – phase 1 (2016-2018) 2. Upgrading of Emergency Department (Tawau Hospitals)
Proposed projects – RMK11 mid term	1. Structural Upgrading for Emergency Critical Care, Observation Medicine Services, Trauma Services in Major Hospitals 2. Enhancement of Pre hospital Care Service – non hospital based ambulance dispatch centre before separation of the PHC unit with the ETD 3. Increasing consumable and reagent budget to RM5 per patient. 4. Electronic Medical Records in Emergency Departments 5. Skill labs with equipment 6. Isolation / negative pressure rooms for infectious disease 7. Geriatric emergency medicine as a subspecialty
Replacement/ procurement equipment	1. Procurement of land ambulances, Patients Transport Service Vehicles, Off Road / FWD Ambulances and Rapid Response Vehicle 2. Replacement / enhancement of emergency critical care equipments
Training	1. Overseas courses and short term attachments for doctors area on interest in the following area • Pre hospital Care and Disaster Medicine/ Emergency Preparedness/ Retrieval Medicine • Emergency Critical Care • Clinical Toxicology and Envenomation • Emergency Trauma Care 2. Enhancement of subspecialty training in Malaysia, namely for Emergency Critical Care, Trauma Care and Pre hospital Care and Disaster Medicine 3. Increase the numbers of intake for M Med Programme in EM and also creating alternative pathways for others legible candidates 4. Bringing in external accreditated examinations to Malaysia e.g MRCEM 5. Increase intake of candidates (AHP) for specialization in Emergency Medicine and Trauma Service
Recommended staff: workload	1. Specialist: Population = 1: 166,000 or 1 Specialist to 10,000 Emergency Department Attendance per year (following Australian Norms) 2. See appendix 1
Other proposals	Nil

APPENDIX I
EMTS RECOMMENDED STAFF WORKLOAD

2014 Workload Data for all Emergency Departments in KKM Hospitals

2014	Total hospitals	Critical	Semi-critical	Non-critical	Total
State hospitals	14	88, 116	405, 411	1, 015, 647	1, 509, 174
Major Spec Hosp	18	65, 188	324, 885	1, 039, 663	1, 429, 736
Minor Spec Hosp	24	33, 760	308, 571	786, 035	1, 128, 366
District Hospitals	75	39, 838	536, 824	1, 524, 268	2, 100, 930
Sub-total	131	226, 902	1, 575, 691	4, 365, 613	6, 168, 206

Number of staff needed	Total hospitals	MO UD44 – 52	PPP U29	SN U29	PPP PHC
State hospitals	14	555	615	591	187
Major Spec Hosp	18	455	490	532	180
Minor Spec Hosp	24	324	355	426	-
District Hospitals	75	523	609	663	-
Total	131	1857	2069	2212	367

This is summarized from the WISN calculator using workload conditions based on major specialists and state hospitals. It is therefore most accurate relating to these hospitals.

It is much less accurate with regards to district hospitals without specialists because some of these hospitals, there must be minimum staffing to ensure a “state-of-readiness”, although their actual workload may not justify the number of staff. This is particularly pertinent in district hospitals in rural areas, Sabah and Sarawak. For these hospitals, the minimum number of staff required per shift is a better measure of staff needed.

GENERAL MEDICINE

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• All state hospitals (14) • All major specialist hospitals (27) • Minor specialist hospitals (14) 1. Langkawi 2. Bukit Mertajam 3. Slim River 4. Seri Manjung 5. Banting 6. Labuan 7. Kluang 8. Pekan 9. Bentong 10. Kuala Lipis 11. HQE II, Kota Kinabalu 12. Keningau 13. Lahad Datu 14. Bintulu	To ensure all patients get the necessary specialist care wherever they are by formalizing cluster hospital concept throughout the country.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	All hospitals with resident specialists provide visiting specialist services to nearby hospitals without specialists.	The formalized cluster groups: • Pahang : Temerloh, Jengka, Jerantut. • Melaka : Melaka, Alor Gajah, Jasin • Sabah : Tawau, Kunak, Semporna

	CURRENT STATUS	PROPOSED EXPANSION
	Examples are : **<u>Penang</u>** **General Medicine outreach** - HPP to HBP - HSJ to HKB - HBM to Sg Bakap 1. Island cluster (HPP & HBP) Hospital Pulau Pinang covers Hospital Balik Pulau 2. Mainland cluster (HSJ, HBM, HKB, Sg Bakap) HOD of Medicine in HSJ in-charge of island cluster Hospital Bukit Mertajam physician visits and covers Hospital Sungai Bakap **Sub-specialty outreach** • **HPP outreach** - Nephrology: HBP - Haematology: HSJ, HKB - Infectious Diseases: HSJ, Kulim - Rheumatology: HSJ, HSB - Gastroenterology: HSJ - Palliative: HSJ, HBM - Cardiology: HKB • **HSJ outreach** - Geriatrics: HPP - Nephrology: HKB, HBM, Sg Bakap - Endocrinology: HKB, Sg Bakap - Respiratory: HKB - Neurology: H. Taiping **<u>Perak</u>** **Internal Medicine:** • Taiping – Kuala Kangsar, Selama, Parit Buntar. • Ipoh – Gerik, Batu Gajah, Sg Siput, Kampar, Tapah, Cameron Highlands • Teluk Intan – Changkat Melintang	**Proposals :** Pahang: • Bentong + Raub + K Lipis • Pekan + Muadzam + Rompin Kelantan: • HRPZ + Geriatric and stroke rehab in H P Mas. • HRPZ + Tumpat for ID. • K Krai + Gua Musang + Machang Negeri Sembilan: • HTJ + Jelebu • HTAN + Jempol + Tampin Melaka: General & Nephro + Alor Gajah + Jasin Penang: • HPP + Balik Pulau + Sg Bakap + HBM • HSJ + Kepala Batas. Perak: • HTI + HTAJ (Selangor) • HRPB + Sg Siput + Batu Gajah + Kampar + Gerik + Tapah • Taiping + K Kangsar + Selama + Parit Buntar • Manjung + Changkat Melintang

	CURRENT STATUS	PROPOSED EXPANSION
	Subspecialities: • Endocrine: HRPB – Taiping, HTI • Infectious Disease: HRPB – Taiping, HTI, HSM • Nephrology: HRPB – HTI, HSM • Hematology:HRPB – Taiping • Cardio:HRPB – Taiping, HTI, HSM • Rheumatology: HRPB– Taiping • Geriatric: Taiping – HRPB, Sg Siput **<u>Terengganu</u>** • Hospital Besut covered by - General physician, nephrologist, cardiologist and Respiratory physician • Hospital Setiu – General physician, Respiratory physician, and Nephrologist • Hospital Hulu Terengganu – General physician, Respiratory physician and Nephrologist • Hospital Kemaman – Infectrious disease physician and Respiratory physician • Hematologist from Hospital Ampang to Hospital Sultanah Nur Zahirah, Terengganu. **<u>Johor</u>** **General medicine:** • HSA to Kulai and Pontian and Hospital Permai • HSI to Mersing and Kota Tinggi • Muar to Tangkak **Subspecialties:** • From HSAJB – Nephro: to Pontian, HSI, Mersing, Kota Tinggi, Bandar Mas, Simpang Renggam, Kluang, Kulai, – ID: to Muar – Endocrine: to HSI, Muar, Batu Pahat, Kulai – Neuro: to Batu Pahat, Segamat and Muar – Haematology: to Batu Pahat • From Batu Pahat – Nephro to Muar, Tangkak, Segamat	Johor: • HSAJB + Kulai + Pontian + Kota Tinggi + Mersing + Permai • Muar + Tangkak + Segamat Selangor: • HTAR + HTAJ • HSgB + HTK • Selayang + HKKB + HOAG Terengganu: • HSNZ + Besut + Setiu + H Hulu Terengganu Kedah: • HSB + Jitra + Kuala Nerang

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Cardio in Hospital Sultanah Bahiyah, Alor Setar is engaging a private cardiologist on a sessional basis.	To procure services of private physicians on a sessional basis whenever needed in particular cardiologists.
MOU with External Agencies/ Universities	**Johor:** • HSA with Newcastle and Monash • HPSF with Melaka Manipal, Metropolitan University • Batu Pahat with IMU **Perak:** • HRPB with UniKL • Taiping with Penang Medical College and UniKL • HTI with UKM • HSM with UiTM **Selangor** • HSerdang and HKL with UPM • HSelayang with UITM • HTAR and HBanting with University Malaya **Melaka & Johor** • HMelaka and HPSF with Melaka Manipal Medical College **Negeri Sembilan** • HSeremban with IMU **Terengganu** • HSNZ with University Sultan Zainal Abidin (UNISZA) Kuala Terengganu	

Major gaps / issues / challenges

1. Congestion in medical wards
2. Level of care after office hours and weekends
3. Specialist input for patients in localities outside of major hospitals
4. Shortage of generalists. Need to have generalists / subspeciality numbers to population ratios to be worked out to plan manpower needs
5. Fragmentation of care / Optimal use of limited personnel and budget
6. Wide difference in specialist / work load ratio
7. Lack of ultrasound machines as a basic investigative tool in medical wards

Proposals

New programmes / services	Basic ultrasound training for all medical physicians and MOs – for setting invasive lines, basic echo, basic ultrasound of lungs pre biopsy, gross liver and renal pathology.
Projects approved RMK11	ACC in HSA
Proposed projects – RMK11 mid term	To request again the 'one off 'budget for a ultrasound machine in every acute medical ward – ratio of one machine for every 10 acute admissions a day.
Replacement/ procurement equipment	All medical departments to have adequate echo, ultrasound, holter, stress tests, endoscopes.
Training	1. Introduction of new system of specialization pathway for medical officers who are interested in the field. Personal Development Plan for MO Rotation already available. 2. Encourage more to take up Advanced Internal Medicine Subspeciality. (Had supported a major conference on Acute Internal Medicine in April 2016 in Kuala Lumpur to encourage young specialists to take up the above speciality)
Recommended staff: workload	1 gazetted specialist / consultant per 1250 man hours
Other proposals	1. To introduce new and attractive incentives for specialists to provide service after normal working hours. 2. To continue the development of a point-based system to determine the placement of placement of specialists. 3. To implement a monitoring system in order to have a database of the placement of qualified specialists throughout the country. 4. To implement and improve the training, mentoring and evaluation of trainees using the Personal Development Plan and by having formal 'training the trainers' workshops 5. Publication of medical e-book which would include – Differential diagnoses for a common set of clinical presentation – Algorithm of management

CARDIOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Ten (10) hospitals; 1. HSB 2. HPP 3. HRPB 4. H. Serdang 5. HSA 6. HRPZII 7. HSNZ 8. HTAA 9. PJHUS 10. HQE	New KKM Heart Centres: 1. HMelaka (RMK11) 2. HTJ (RM K 11) 3. All other major district state hospitals (RMK12) esp in East Malaysia, Klang Valley.
Where previous services available but now not	Nil	N/A
Networking / Outreach	1. HPP to HTF, HSB, Taiping, HRPB (Telecardiology) 2. H. Serdang to HKL, Selayang, HTAR, Ampang,HRPB, HTJ, Melaka 3. HSA to Batu Pahat, 4. HUS to Miri 5. HTAA to HoSHAS 6. HQE II to HQE1, HDOK,Tawau,Lahad Datu (Telecardiology)	1. HSNZ to district hospital in Trengganu 2. HRPZ II to district hospitals in Kelantan 3. HTAA to district hospitals in Pahang 4. HRPB to district hospitals in Perak
Outsourcing/ Purchase of Services	1. HPP to private hospitals in Penang 2. HSA to Johor Specialist centre 3. Rarely except only when ICL breakdown	1. HRPB with Ipoh Specialist Centre 2. HQE with KPJ/GMC KK Cardiology services when needed
MOU with External Agencies/ Universities	1. Hospital Serdang with UPM / IJN / UMMC 2. HTAA with UIA,Kuantan 3. HRPB, KPJ Ipoh 4. HQEII KK with KPJ / GMC KK (Cardiology coverage when needed)	Nil

Major gaps/ issues/ challenges

1. Brain drain to the private sector
2. Transfer / Promotion of trained paramedics to other discipline, needs to create promotional post within the discipline
3. Needs to upgrade and improve skill, providing more scholarship for attachment and specific program for specialists and paramedic
4. Breakdown of equipments due to poor maintenance
5. Inadequate budget for consumables and List A drugs
6. Revival and expansion of Paediatric Cardiology services; there is inadequate Paediatric cardiologists, trainees and paramedic
7. Inadequate working area at HPP and HSAJB; requires expansion of clinic and wards

Proposals

New programmes / services	• **HPP** – replacement of 1st ICL (BER), PACS/CCIS/Network, Tilt table, Cardiac MR, MSCT , Electrophysiology services, Peripheral vascular intervention • **HSA** – replacement of 1s ICL (BER), PACS/CCIS/Network, Tilt table, Cardiac MR, MSCT ,Electrophysiology services, Peripheral vascular intervention, Telecardiology • **HUS** – Electrophysiology services, Telecardiology Peripheral vascular intervention • **HSerdang** – Electrophysiology services, Telecardiology, Peripheral vascular intervention • **HQEII –** Electrophysiology services,Peripheral vascular intervention • **HTAA**– Electrophysiology services, Telecardiology Peripheral vascular intervention • **HRPB**– Electrophysiology services, Telecardiology Peripheral vascular intervention • **HRPZII**– Electrophysiology services, Telecardiology Peripheral vascular intervention • **HSNZ –** Telecardiology Peripheral vascular intervention • Primary PCI for STEMI in all KKM Heart centres. Now only at HSerdang in Klang Valley, network with IJN and UMMC and all KKM Hospitals in KL and Selangor and HTJ

Projects approved RMK11	• 3rd ICL HSerdang • 3D Echo in all KKM Heart ctrs • Cardiology services with 1st ICL at HRPB • 1st ICL at HRPZII • 2nd ICL at HTAA • 2nd ICL at PJHUS • Adv Dip CVH (with BPL and KSKB) for Paramedics
Proposed projects – RMK11 mid term	Replacement of 1st ICL at HPP and HSA , 1st and 2nd ICL at HSerdang
Replacement/ procurement equipment	Propose replacement of BER equipments; • HPP – 1st ICL, Stress Test, CRW telemetry • HSA – 1st ICL , CRW telemetry • HSerdang - Replacement of 1st and 2nd ICL • State Hospitals - Echo, Telecardiology • District Hospital – Echo , Stress Test,Telecardiology
Training	New training proposal; 1. Expansion of Adv CVH for paramedics in East Malaysia (Pusat Jantung Samarahan Sarawak and HQE II KKinabalu 2. Peripheral Endovascular Intervention for Cardiologists/ Paramedics 3. Electrophysiology/RFA for Cardiologists/ Paramedics 4. Structural Heart Diseases Intervention for Cardiologists/ Paramedics
Recommended staff: workload	For Heart centre requirement ; • NICL/ Clinic : Cardiologists 3, Trainee 3 • CCU (8-10beds): Cardiologist 1, Trainee 2 • CRW 26-30 beds: Cardiologist 1, Trainee 2 • Invasive CVS Lab: Cardiologists 2, Trainee 2 • Electrophysiology/RFA: Cardiologist 1, Trainee 1 • Peripheral Endovascular Intervention : Cardiologist 1, Trainee 1 • Structural Heart Diseases Intervention: Cardiologist 1, Trainee 1 • Cardiac Ward: Cardiologists 2 Trainee 4 • Nuclear Cardiology: Cardiologist 1, Trainee 1 • Multislice CT Scan: Cardiologists 1, Trainee 1 • Cardiac MR: Cardiologists 1, Trainee 2, Radiologist 2 • CRC: Cardiologists 2, Trainee 2 *Refer Cardiology Blueprint for detail of recommended staff for Heart Centre.*

Other proposals	1. FPP services in all KKM Heart Centres 2. To include and approve Cardiology services in performing interventional procedures with long waiting time on Saturday to clear the backlog. At present our Cardiothoracic Surgeon has managed to reduce waiting time and given incentives with this program, but Cardiologist are not given similar privileges for performing angioplasty, pacemaker implant etc which also equivalent to surgery. 3. Time-based promotion for Specialist, ie C on being gazette as Cardiologist, later B, A and if possible Turus every 4-5 years (supported by their SKT and contributions) to curb brain drain.

RESPIRATORY MEDICINE (PULMONOLOGY)

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Seventeen (17) hospitals: • HSB • HSAH • HPP • HSJ • H. Serdang • IPR • HRPB • H. Taiping • H. Melaka • HTJ • HSA • HTAA • HSNZ • HRPZ II • HQE, • Hospital Tawau • HUS Hospital Serdang and IPR are the main pulmonology centres in Klang Valley. Hospital Serdang is also a 'Centre of Excellence' for cardiothoracic surgery and cardiology' in the Ministry of Health. Pulmonology services at Hospital Serdang started on 1st November 2011.	1. A Department of Respiratory Medicine (Pulmonology) needs to be established at Hospital Serdang. i. Hospital Serdang is a 'Centre of Excellence' for cardiothoracic surgery and cardiology for the Ministry of Health and has good anaesthesiology backup. ii. Acute respiratory cases can be managed at Hospital Serdang. iii. Lung transplantation program (currently based in IPR) can be moved to Hospital Serdang without relying on IJN. This will save cost. iv. A 'heart centre' is going to be built at Hospital Serdang and patients with heart and lung problems (e.g. pulmonary hypertension) can be co-managed by cardiologists and pulmonologists under one roof without relying on IJN. This will save cost. Currently, there is no Department of Respiratory Medicine in any hospital in Klang Valley (c.f. nephrology department exists in Hospital Serdang, Hospital Selayang and HKL) 2. Divide the services provided by Hospital Serdang and Institut Perubatan Respiratori. Hospital Serdang (invasive services) i. Interventional pulmonology ii. Pulmonary hypertension iii. Lung transplantation iv. Interstitial lung disease v. Critical care vi. Pulmonary physiology vii. Basic services (tuberculosis, asthma, COPD, lung cancer) Institut Perubatan Respiratori (non-invasive services) i. Tuberculosis ii. Sleep medicine iii. Interstitial lung disease iv. Advanced lung cancer v. Basic services (pneumonia, asthma, COPD) vi. Quit smoking services vii. Institut Perubatan Respiratori shall function as the National Centre for TB Control Program.

	CURRENT STATUS	PROPOSED EXPANSION
		3. All state hospitals and major district hospitals will have resident pulmonologists. 4. All state hospitals will have at least 2 resident pulmonologists. 5. All major hospitals shall provide basic thoracic endoscopy, sleep medicine and pulmonary physiology services. 6. Regional Interventional pulmonology services i. HSB ii. HRPZ II iii. HUS iv. HQE
Where previous services available but now not	HTAR	N/A
Networking/ Outreach	State respiratory specialists visit district hospitals with and without specialist and health clinics	Nil
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	IPR with IJN for cardiothoracic services	• HRPZ II with USM • HTJ, Seremban with IMU • HTAA with UIA

Major gaps/ issues/ challenges

1. Manpower

    - Shortages of specialists in pulmonology:

      Currently there are only 27 respiratory physicians (pulmonologists) in the Ministry of Health. Although every state (except Perlis) has at least one pulmonologist, more are needed in every state to consolidate the services.

    - Lack of trainees:

      Pulmonology is getting more popular and many specialists have applied to do pulmonology fellowship but their applications have been turned down.

    - Losing trained new specialists to private hospitals. In 2007 lost 3, in 2008 lost 1, in 2015 lost 2 and in 2016 losing 1.

2. Development of 'niche' areas in pulmonology

   Besides tuberculosis, asthma, COPD and lung cancer, pulmonology has

   grown as a subspecialty and there are many 'niche' areas including:

    a) Interventional pulmonology
    b) Critical care
    c) Pulmonary hypertension
    d) Lung transplantation
    e) Sleep medicine
    f) Pulmonary physiology
    g) Interstitial lung disease (ILD)

   Therefore, the country needs to produce more pulmonologists to developthese 'niche' areas.

Proposals

New programmes / services	In all state hospitals: 1. Pulmonary Physiology 2. Sleep Laboratory 3. Lung Cancer Chemotherapy And Palliative Management 4. Pulmonary Rehabilitation 5. Ambulatory Care Centre (ACC) 6. Interstitial lung disease
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	1. Upgrading of Respiratory Services at Hospital Serdang to a full Department 2. Setting up a 'Northern Territory Respiratory Centre' based at Hospital Sultanah Bahiyah to cover Kedah, Perlis, Northern Perak and mainland Pulau Pinang 3. Upgrading of IPR laboratory to fulfill requirement of Level 3 Lab 4. Renovation of IPR diagnostic areas to become ACC housing all diagnostic activities 5. Lung cancer ward to be established in IPR 6. Upgrade of medical wards in state hospitals for isolation of TB patients 7. Lung transplant (for Hospital Serdang) 8. Pulmonary hypertension (for Hospital Serdang)
Replacement/ procurement equipment	All state hospitals should have: 1. Complete video-bronchoscopy system complete with teaching scope for training 2. Comprehensive lung function equipment with facilities for cardiopulmonary exercise testing 3. Polysomnography machine 4. Non-invasive ventilation (NIV) 5. TB isolation wards

Training	1. Complex tuberculosis 2. Critical Care 3. Interstitial lung disease 4. Oncology 5. Lung transplant (for Hospital Serdang) 6. Pulmonary hypertension (for Hospital Serdang)
Recommended staff: workload	Nil
Other proposals	1. Training Division MOH to give priority for fellowship training in Pulmonology in keeping with the increasing number of 'niche' areas 2. To make the pulmonology services Hospital Serdang as part of the 'Heart and Lung' Centre of Excellence and upgrade it into a full department 3. To make IPR a Centre of Excellence in tuberculosis 4. To change the discipline name of respiratory medicine to 'Pulmonology' to standardize with other internal medicine subspecialties (cardiology, nephrology, hepatology, haematology, rheumatology, dermatology, gastroenterology, etc)

NEPHROLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Twenty-three (23) hospitals have resident consultant nephrologists (adult) and they provide coverage within the states and interstate • HSB, HSAH, H. Kulim • HPP, HSJ • HRPB, H. Taiping • HTAR, H. Selayang, H. Serdang, H. Kajang • HKL • HTJ • H. Melaka • HSA, HSNI • HTAA, HoSHAS • HSNZ • HPRZII • HQE • HUS, H. Miri	1. HAmpang (2018) 2. HSibu (2019) 3. HSungai Buloh (2019) 4. HKemaman (2019) 5. HKuala Pilah (2019) 6. HPort Dickson(2020) 7. HTeluk Intan (2020) 8. HPutrajaya (2020) 9. HShah Alam (2020) 10. HDOK (2021) 11. HTawau (2022) 12. HPSF (2022) 13. HKuala Krai (2022)
Where previous services available but now not	• HPSF • HDOK (Due to resignations)	N/A
Networking/ Outreach	All State and Major Specialist Hospitals with resident nephrologists provide cover and clinics for all other hospitals within their respective States.	Regional Interventional Nephrology Suites (Vascular / Peritoneal Access Surgery) at RM1.5 million each • HPP • HSA • HSNZ • HUS • HQE • HSerdang

	CURRENT STATUS	PROPOSED EXPANSION
	There are a total of 134 Hospital and 14 Health Clinics with HD Units throughout the country *(refer to appendix I for full list of coverage).* 1. HSB to HTF 2. HKL to Sabah: 3 monthly visits to HTawau, HDOK, HLabuan 3. HSerdang to HPJ 4. Vascular access service: Some states refer to HKL, HSelayang, H Serdang and private surgeons 5. Vascular team from HKL goes to HUS, HoSHAS, HPP and HKB 6. Peritoneal access surgery: Some states refer to HKL, HSelayang, HSerdang and private surgeons 7. HSerdang does parathyroidectomies for patients from Selangor, Negeri Sembilan and Malacca (team from HPutrajaya) 8. HKL does parathyroidectomies for patients from Kedah 9. Nephrologists from UPM provide some services in HSerdang 10. HKL and HSelayang do renal transplantation for patients referred from all States.	

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	In some States vascular and peritoneal access surgery is periodically referred to private surgeons to overcome long waiting time for surgery. A private transplant surgeon assist and support renal transplant surgery in HSelayang.	Purchasing vascular access surgery from private hospitals periodically when required. To recruit more private or expatriate transplant surgeons to assist with transplant program
MOU with External Agencies/ Universities	ISN-TTS Sister Transplant Center – Malaysia and Australia sister twinning program between HKL and Royal Prince Alfred Hospital, Sydney under the auspices of The Transplant Society / International Society of Nephrology.	Greater networking and collaboration with the Universities especially in the area of research and training.

Major gaps/ issues/ challenges

1. Increasing demand for renal replacement therapy especially dialysis.
2. Many older dialysis units have reached maximum capacity and need upgrading/ expansion.
3. Many machines need to be replaced.
4. The rapid growth of Private and NGO dialysis centers have resulted in greatly increased dependence of their problematic patients on KKM Nephrologists and facilities. A substantial amount of workload is used to provide support services to these patients, thusimpacting on financial and human resources in MoH facilities.
5. Shortage of trained paramedics due to increased workload, expansion and opening of new MoH dialysis units, lack of posts and transfer out upon promotion.
6. However, the operational budget and human resource allocations do not increase in tandem with the increasing patient workload and demand for renal replacement therapy services.
7. Dialysis treatment rates varied from 97-135 per million population in economically underdeveloped states (Sabah, Kelantan and Perlis) to >200 per million in the more economically advantaged states (22nd MDTR Report, 2014).
8. Dialysis patients are older, often diabetic and require greater medical and nursing care.

9. Alarming trend in incidence of diabetic nephropathy as a cause of ESRD (61% of new patients; 22nd MDTR Report, 2014).
10. Vascular & peritoneal access surgery: less than optimal with long waiting time to intervention.
11. Stagnant kidney transplantation program and no dedicated transplant surgeon/ teams.

Challenges

Human resource development

1. To achieve 10 nephrologists per million population and have at least 3-5 MOH nephrologists in every state by 2020.
2. To train more nephrologists in special fields e.g. renal transplantation, interventional nephrology etc.
3. To correct shortage of trained manpower in dialysis units by increasing in-house promotions through creation of new posts.
4. To develop social workers, dietitians, renal pharmacists, transplant coordinators, clinical research assistants and nurse educators specialized for CKD patients.
5. To have dedicated transplant surgeons (fully dedicated teams).
6. Attrition of Specialists; losing specialists to the private sector.

Haemodialysis

1. Hospitals in major towns need second centres due to increasing demand for HD every year.
2. New centres should have Ultrapure water treatment system.
3. Many older centres need upgrading and expansion and replacement old HD machines, Reprocessor and RO machines.
4. All 4 – 6 station units to be expanded to 10 station units.
5. All units still operating on 2 shifts to run three shifts.
6. All units to achieve dialysis station patient ratio of 1:6.
7. All State and Major Specialist Hospitals should have a dedicated acute HD unit that may operate 24 hours a day.
8. To increase the use of haemodiafiltration (HDF) for selected patients by increasing the number of HDF machines.
9. Regional interventional nephrology suites needed to optimize dialysis access care.

10. To develop greater expertise in water treatment in haemodialysis to optimize water quality, RO design and maintenance.
11. To improve standard of care with revision of manual (Mutu Piawaian / National HD Quality Standards) and performing regular national audits.

Peritoneal Dialysis

1. Must increase utilization as still less popular although excellent home based program
2. Should have a panel of suppliers instead of monopoly by single vendor. Competition will reduce cost
3. Need to upgrade old PD Units in KKM Hospitals
4. To train more nephrologists to insert PD catheters and manage PD catheters related complications
5. To develop a MOH Automated PD program
6. To increase public awareness about this type of dialysis
7. To improve quality of care with the development of PD standard operating procedure and regular outcome audits

Transplantation

1. Kidney Transplantation Program is stagnant and needs rejuvenation
2. Improve the rate of transplants (both deceased and living donors)
3. Dedicated transplant teams with full-time transplant surgeons, nephrologists and support teams.
4. To set up dedicated National Kidney Transplant Centre (based at HKL)
5. To develop and expand existing transplant immunology and other laboratory support services
6. To work with National Transplant Resource Centre to develop policies and guidelines and implement strategies to improve deceased kidney transplantation rates

Chronic Kidney Disease (CKD)

1. Requires concerted effort in early detection and prevention program
2. Increase public awareness and treat to target (DM/BP/Lipids/Obesity)
3. To implement a National CKD Prevention Plan – to reduce the number of ESRF through a network of CKD Prevention Clinics in major KKM Health Clinics and all Hospitals
4. To train more CKD Nurse Educators

Proposals

New programmes / services	1. Regional Interventional Nephrology suites (see above) 2. Establishment of second HDUs in bigger towns with current units at maximum capacity (Kangar, Taiping, Telok Intan, Muar, Batu Pahat, Kuantan, Melaka, Miri, Sibu, Tawau, Sandakan) at cost of RM 3 million each 3. Establishment of Integrated Renal Replacement Therapy centres with acute HDUs, ultrapure water, fully automated reprocessing system and dialysis clinical info system linked to national database in 6 hospitals: Klang, Pulau Pinang, Ipoh, Johor Bahru, Kuching costing RM 5 million each 4. Establishment of a National Kidney Institute in the Klang Valley (similar to National Heart Institute and National Cancer Institute)
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	1. RM 50 million for replacement of HD machines, HDF machines, Reprocessor machines, SLEDD machines, CRRT machines, upgrading old RO systems, purchase of PD cyclers, peritoneoscopes, ultrasound machines for vascular access 2. To upgrade all uncompleted upgrading of HDUs as listed below: • HKuala Nerang • HYan • HJitra • HBukit Mertajam • HTaiping • HTeluk Intan • HKajang • HSaratok • HSerian • HSimunjan • HKanowit 3. To upgrade old PD Units in MOH Hospitals 4. Establishment of second HDUs in bigger towns with current units at maximum capacity (Kangar, Taiping, Telok Intan, Muar, Batu Pahat, Kuantan, Melaka, Miri, Sibu, Tawau, Sandakan) at cost of RM 3 million each 5. Establishment of Integrated Renal Replacement Therapy centers with acute HDUs, ultrapure water, fully automated reprocessing system and dialysis clinical info system linked to national database in 6 hospitals: Klang, Pulau Pinang, Ipoh, Johor Bahru, Kuching costing RM 5 million each 6. Regional Interventional Nephrology Suites (Vascular / Peritoneal Access Surgery) at RM1.5 million each • HPulau Pinang • HSA Johor Bahru • HKuala Terengganu • H Kuching • HQE Kota Kinabalu • HSerdang

Replacement/ procurement equipment	To refer to above item • RM 50 million for replacement of HD machines, HDF machines, Reprocessor machines, SLEDD machines, CRRT machines, upgrading old RO systems, purchase of PD cyclers, peritoneoscopes, ultrasound machines for vascular access
Training	Short to mid-term attachment at Overseas Centers of Excellence in: • Renal transplantation • Interventional Nephrology • Critical Care Nephrology • Glomerular Disease • Chronic Kidney Disease • Health System Management • Health Economics
Recommended staff: workload	Nephrologists: 10 per million i.e. **1:100,000** Paramedic : HD patient ratio is **1:5** Paramedic: Self-care HD patient ratio is **1:10** Paramedic : CAPD patient ratio is **1: 15-20**
Other proposals	1. Strategies in Early Detection and Prevention of CKD • Establishment of dedicated CKD Prevention Clinics • Development of close liaison and interaction with primary care to optimise management of Diabetes, Hypertension and early CKD • Adequate provision of renoprotective drugs and diagnostic services • Establishment of Registry of Chronic Kidney Disease • Dedicated CKD Nurse Educators and other support team members • National CKD Prevention Plan 2. Research and Audit • Establishment of a National KKM Nephrology Research Committee to promote, coordinate and facilitate research activities • Perform audit and research to optimize outcome in renal replacement therapy. • Promote involvement in national & international studies on kidney disease 3. Quality Improvement Initiatives • Surveillance and early intervention of: vascular access problems cardiovascular disease renal bone disease nutritional problems 4. Implementation of KPI for Nephrology Services

APPENDIX I
LIST OF HAEMODIALYSIS UNIT & NEPHROLOGIST IN CHARGE

NO	HOSPITAL	NEPHROLOGIST
1	HTF	Dr Ching Chen Hua
2	Hospital Kulim	Dr. Leong Chong Men
3	HSB	Dr Ching Chen Hua
4	HSAH	Dr. Eason Chang
5	Hospital Sik	Dr. Eason Chang
6	Hosp Baling	Dr. Leong Chong Men
7	Hosp Langkawi	Dr Ching Chen Hua
8	Hosp Yan	Dr Ching Chen Hua
9	H. Kuala Nerang	Dr Ching Chen Hua
10	Hospital Jitra	Dr Ching Chen Hua
11	Komuniti Kodiang	Dr Ching Chen Hua
12	HPP	Dato' Dr Rozina Ghazalli Dato' Dr. Ong Loke Meng
13	HBP	Dato' Dr Rozina Ghazalli Dato' Dr. Ong Loke Meng
14	HKB	Dr. Anita Bhajan Manocha
15	HSJ	Dr. Anita Bhajan Manocha
16	H. Sungai Bakap	Dr. Anita Bhajan Manocha
17	HBM	Dr. Anita Bhajan Manocha
18	H. Taiping	Dr. V. Indralingam
19	HRPB	Dr. Loh Chek Loong
20	HTI	Dr. Lim Wei Mei
21	H. Parit Buntar	Dr. V. Indralingam
22	HDU Tanjung Malim	Dr. Sredhar Ramanaidu
23	Hospital Selama	Dr. V. Indralingam
24	H. Changkat Melintang	Dr. Lee Yee Yan
25	Hospital Sungai Siput	Dr. Thong Kah Mean
26	Hospital Seri Manjung	Dr. Sredhar Ramanaidu
27	Hospital Kuala Kangsar	Dr. V. Indralingam
28	Hospital Batu Gajah	Dr. Loh Chek Loong
29	Hospital Tapah	Dr. Lee Yee Yan
30	Hospital Grik	Dr. V. Indralingam
31	Hospital Kampar	Dr. Loh Chek Loong

NO	HOSPITAL	NEPHROLOGIST
32	HDU Pangkor	Dr. Sredhar Ramanaidu
33	HTAR	Dr. Shahnaz Shah FK Dr. Norleen Zulkanain Sim
34	Hospital Sabak Bernam	Dato' Dr. Tan Chwee Choon
35	Hospital Tanjung Karang	Dato' Dr. Tan Chwee Choon
36	Hospital Banting	Dr. Shahnaz Shah FK
37	Hospital Ampang	Dr. Sardanah Aqashiah Mazlan
38	Hospital Selayang	Dr. Wong Hin Seng
39	Hospital Sungai Buloh	Dr. Suryati Yakob
40	Hosp Kuala Kubu Baru	Dr. Bee Boon Cheak
41	Hospital Serdang	Dr. Goh Bak Leong Dr. Fairol Huda Ibrahim
42	Hospital Kajang	Dr. Sardanah Aqashiah Maslan
43	KK Bistari Jaya	Dato' Dr. Tan Chwee Choon
44	Hospital Ashah Alam	Dr. Shahnaz Shah FK
45	Hospital Seremban	Dr. Lily Mushahar Dr. Sudhaharan Sivathasan
46	Hospital Kuala Pilah	Dr. Lily Mushahar Dr. Sudhaharan Sivathasan
47	Hospital Port Dickson	Dr. Lily Mushahar Dr. Sudhaharan Sivathasan
48	Hospital Jelebu	Dr. Lily Mushahar Dr. Sudhaharan Sivathasan
49	Hospital Tampin	Dr. Lily Mushahar Dr. Sudhaharan Sivathasan
50	Hospital Jempul	Dr. Lily Mushahar Dr. Sudhaharan Sivathasan
51	Hospital Melaka	Dr Korina Rahmat
52	Hospital Alor Gajah	Dr Korina Rahmat
53	Hospital Jasin	Dr Korina Rahmat
54	HSA	Dr. Hooi Lai Seong
55	HSI	Dr. Liu Wen Jiun
56	HPSF	Dr. Yia Hua Jern
57	Hospital Mersing	Dr. Liu Wen Jiun
58	Hospital Kota Tinggi	Dr. Liu Wen Jiun
59	Hospital Keluang	Dr. Chong Wei Seng
60	Hospital Segamat	Dr. Yia Hua Jern

NO	HOSPITAL	NEPHROLOGIST
61	Hospital Batu Pahat	Dr. Chong Wei Seng
62	Hospital Pontian	Dr. Hooi Lai Seong
63	Hospital Kulai	Dr. Hooi Lai Seong
64	Hospital Tangkak	Dr. Yia Hua Jern
65	Klinik Bandar Mas	Dr. Liu Wen Jiun
66	Klinik Simpang Renggam	Dr. Chong Wei Seng
67	HTAA	Dr Mohd Ramli B. Seman Dr. Mohd Kamil Nordin
68	Hospital Pekan	Dr Mohd Ramli B. Seman
69	Hospital Temerloh	Dr Rafidah Bt. Abdullah
70	Hospital Jerantut	Dr Rafidah Bt. Abdullah
71	Hospital Muadzam Shah	Dr Mohd Ramli B. Seman
72	Hospital Kuala Lipis	Dr Faris Safhan B. Mohd Nor
73	Hospital Raub	Dr Faris Safhan B. Mohd Nor
74	Hospital Bentong	Dr Faris Safhan B. Mohd Nor
75	HDU Mentakab	Dr Rafidah Bt. Abdullah
76	Hospital Jengka	Dr Rafidah Bt. Abdullah
77	H. Cameron Highlands	Dr Rafidah Bt. Abdullah
78	Hospital Rompin	Dr Mohd Ramli B. Seman
79	HDU KK Sg Lembing	Dr Mohd Ramli B. Seman
80	HSNZ	Dr. Zaiha Harun
81	HDU Kg Maras (Satelite HSNZ)	Dr. Zaiha Harun
82	Hospital Dungun	Dr. Zaiha Harun
83	RTC (Satelite H. Dungun)	Dr. Zaiha Harun
84	Hospital Kemaman	Dr. Zaiha Harun
85	Hospital Hulu Terengganu	Dr. Zaiha Harun
86	Hospital Besut	Dr. Zaiha Harun
87	HDU Maidam (Satelit H.Dungun)	Dr. Zaiha Harun
88	Hospital Setiu	Dr. Zaiha Harun
89	HRPZ II	Dr. Wan Hasnul Halimi Wan Hassan
90	Hospital Tumpat	Dr. Zuad Firdaus Rapiah
91	Hospital Kuala Kerai	Dr. Zuad Firdaus Rapiah
92	Hospital Pasir Mas	Dr Maznah Yusof
93	Hospital Tanah Merah	Dr Maznah Yusof
94	Hospital Machang	Dr. Zuad Firdaus Rapiah

NO	HOSPITAL	NEPHROLOGIST
95	Hospital Gua Musang	Dr. Zuad Firdaus Rapiah
96	Hospital Jeli	Dr Maznah Yusof
97	Hospital Tengku Anis, Pasir Putih	Dr Maznah Yusof
98	KK Chiku 3 Gua Musang	Dr. Zuad Firdaus Rapiah
99	UDK Mahligai, Bachok	Dr. Wan Hasnul Halimi Wan Hassan
100	Hosp Queen Elizabeth, K.K	Dr.Wong Koh Wei Dr. Pang Hoong Chee
101	Hosp Queen Elizabeth II, K.K	Dr. Pang Hoong Chee
102	Hospital Likas	Dr.Pang Hoong Chee
103	Hosp Duchess Of Kent, Sandakan	Dr. Mohamad Zaimi (dari HKL)
104	Hospital Tawau	Dr. Mohamad Zaimi (dari HKL)
105	Hospital Lahad Datu	Dr. Wong Koh Wei
106	Hospital Keningau	Dr. Wong Koh Wei
107	Hospital Beufort	Dr. Wong Koh Wei
108	Hospital Sipitang	Dr. Wong Koh Wei
109	Hospital Kudat	Dr. Wong Koh Wei
110	Hospital Ranau	Dr. Wong Koh Wei
111	Hospital Tenom	Dr. Wong Koh Wei
112	Hospital Marudu	Dr. Wong Koh Wei
113	Hospital Kota Belud	Dr. Pang Hoong Chee
114	Hospital Semporna	Dr. Mohamad Zaimi (dari HKL)
115	Hospital Papar	Dr. Pang Hoong Chee
116	Hospital Beluran	Dr. Mohamad Zaimi (dari HKL)
117	Hospital Tambunan	Dr. Wong Koh / Wei
118	Hospital Kinabatangan	Dr. Mohamad Zaimi (dari HKL)
119	Hospital Kuala Penyu	Dr. Wong Koh Wei
120	Hospital Tuaran	Dr. Pang Hoong Chee
121	Hospital Pitas	Dr. Wong Koh Wei
122	Hospital Kunak	Dr. Mohamad Zaimi (dari HKL)
123	HUS, Kuching	Dr Clare Tan Hui Hong
124	KCH-SGHHC	Dr Clare Tan Hui Hong
125	Hospital Miri	Dr Koh Keng Hee
126	Hospital Bau	Dr Clare Tan Hui Hong
127	Hospital Lundu	Dr Clare Tan Hui Hong
128	Hospital Serian	Dr Clare Tan Hui Hong

NO	HOSPITAL	NEPHROLOGIST
129	Hospital Kapit	Dr Lawrence Hii
130	Hospital Betong	Dr Clare Tan Hui Hong
131	Hospital Seri Aman	Dr Clare Tan Hui Hong
132	Hospital Lawas	Dr Koh Keng Hee
133	Hospital Marudi	Dr Koh Keng Hee
134	Hospital Saratok	Dr Lawrence Hii
135	Hospital Simunjan	Dr Clare Tan Hui Hong
136	Hospital Limbang	Dr Koh Keng Hee
137	Hospital Daro	Dr Lawrence Hii
138	Hospital Bintulu	Dr Clare Tan Hui Hong
139	Hospital Sarikei	Dr Lawrence Hii
140	Hospital Sibu	Dr Lawrence Hii
141	Hospital Mukah	Dr Lawrence Hii
142	Hospital Dalat	Dr Lawrence Hii
143	Hospital Kanowit	Dr Lawrence Hii
144	HDU Klinik Kesihatan Song	Dr Lawrence Hii
145	KK Batu Niah	Dr. Koh Kheng Hee
146	Hospital Kuala Lumpur	Datuk Dr. Ghazali Ahmad
147	Hospital Putrajaya	Prof. Dr. Christopher Lim (UPM)
148	Labuan	Dr. Wong Koh Wei / Dr.Mohd Zaimi

ENDOCRINOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	**17 hospitals** **32 endocrinologists (2016)** **<u>CENTRAL</u>** 1. HPJ(4) 2. HKL (3) 3. HTAR(1) 4. H. Selayang (1) 5. H. Ampang (1) 6. HSAS (1) 7. HTJ (2) 8. HRPB (3) **<u>SOUTH</u>** 9. Hospital Melaka (2) 10. HSA (3) **<u>NORTH</u>** 11. HPP (4) 12. HSB (1) **<u>EAST COAST</u>** 13. HRPZII (1) 14. HSNZ (1) 15. HTAA (1) **<u>EAST MALAYSIA</u>** 16. HUS (2) 17. HQE (1)	**24 hospitals** **50 endocrinologists (2020)** 1. HPJ (5) 2. HKL (3) 3. HTAR (3 – 2019) 4. H Selayang (2 – 2018) 5. H Ampang (2 – 2018) 6. H Serdang (1 – 2018) 7. HSgB (1 – 2017) 8. HSAS (1) 9. HTJ (3 – 2018) 10. HRPB (2) 11. Hosp Taiping (1) 12. Hosp Melaka (2) 13. HSNI (1 – 2018) 14. HSA (3) 15. HSB (2 – 2019) 16. HTF (1 – 2020) 17. HSAH Petani (1 – 2018) 18. HRPZ II (2 – 2018) 19. HSNZ (2 – 2019) 20. HTAA (2 – 2019) 21. HoSHAS(1–2019) 22. HUS (3) 23. Hospital Miri (1 – 2017) 24. HQE (2) **2. Endocrine Complex in Hospital Putrajaya –** *tentatively ready 2018* • To provide adult endocrinology, pediatric endocrinology, surgical endocrinology and neuroendocrinology outpatient and inpatient services as tertiary referral centre • To provide postgraduate endocrinology training • Centre for diabetes education services and training of diabetes nurse educators

	CURRENT STATUS	PROPOSED EXPANSION
Where previous services available but now not	HSgB – Resident services ceased in 2015 as endocrinologist transferred to HSAH *- Will resume resident services in 2017*	N/A
Networking/ Outreach	**HPP** • HSJ (monthly) • HBP (2 monthly) **HRPB** • HSM (2 monthly) • HTI (monthly) • H. Taiping (monthly) **HTAR, Klang** • H. Bintulu (4 monthly) **HKL** • HoSHAS **HTJ Seremban** • HTAN (2 monthly) • HPD (3monthly) • KK Seremban (monthly) **HSAJB** • HSNI (2 monthly) • HPSF (2 monthly) – *will stop in August 2016 and taken over by Hospital Melaka* • Hosp Kulai (monthly) • HSI (monthly) **HTAA** • KK Paya Besar, Balok, Bukit Goh, Indera Mahkota (monthly) **HQE** • HDOK (3 monthly)	1. Endocrinologists to provide outreach services to surrounding Klinik Kesihatan to improve management of diabetes and thyroid disorders in community 2. Endocrinologists in state hospitals to provide visiting consultancy to smaller hospitals within the state

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Purchase of consultant service by • HPP from Penang Medical College Laboratory support for certain hormonal tests not available in MOH Hospital Endocrine labs • UMMC / UKMMC Endocrine Lab for Urine metanephrines • IMR for insulin autoantibodies / Type 1 diabetes Screen	Necessary to complement and strengthen the current service: • Chemical Pathology / Endocrine Laboratory Service - certain test to obtain from academic institution or private laboratories • Endocrine Histopathology
MOU with External Agencies / Universities	HPJ with UiTM for undergraduate medical students to undergo 2 weeks Endocrine Attachment at Endocrine Unit HPJ.	

Major gaps/ issues/ challenges

1. The need to recognize endocrinology subspecialty as an independent department and activity (separate from General Internal medicine) at center of excellence and regional centers to enable progressive development of the subspecialty
2. Need to develop areas of interest and expertise within Endocrinology subspecialty,
    - Diabetes
    - Obesity
    - Calcium disorders and Metabolic Bone disease
    - Pituitary / Adrenal (neuroendocrine)
    - Thyroidology
    - Reproductive Endocrinology
    - Endocrine Oncology
3. Need for a separate budget for endocrine laboratory services and endocrine drug budget.

4. Inadequate support and development of associated and supporting specialties and subspecialties in the regional centres i.e. Pathology (Chemical Pathology, Endocrine Histopathology / Cytopathology), Radiology (interventional), Neurosurgery and Endocrine Surgery.
5. Need to incorporate technology in Diabetes Management and Support – insulin pumps, Continuous Glucose Monitoring, glucose monitoring software, telecommunication for patient support

Proposals

New programmes / services	Some of these services have been started in some regional centres but need to be initiated and expanded in future 1. Obesity Multidisciplinary Management Service 2. Neuroendocrine services 3. Osteoporosis and Metabolic Bone Disease Service 4. Endocrine Oncology 5. Intensive Diabetes Management – insulin therapy, insulin pump service 6. Diabetes Foot Service 7. Combined Diabetes – Renal Services 8. Radioiodine Therapy Service 9. Multidisciplinary Thyroid Cancer Service
Projects approved RMK11	1. Endocrine Complex in HPJ (to be built by 2018) and initiate pituitary service with pituitary surgery and radiosurgery services available 2. "Dasar Baru" Management of Acromegaly proposed in 2014 – received RM 1.7 mil in 2015 3. National Acromegaly Registry initiated – registered with NMRR and supported by Malaysian Endocrine and Metabolic Society (MEMS) 4. Industry Sponsored Research (ISR) in Pituitary disease management initiated and ongoing • use of Pasireotide LAR in Treatment resistant Acromegaly – HPJ and HPP • use of s/c Pasireotide in treatment of Cushing's disease - HPJ • use of Longacting weekly Growth hormone therapy in patients with hypopituitarism – HPJ, HPP, HUS 5. Investigator Initiated Research (IIR) for Insulin Pump Therapy in Type 2 Diabetes approved in 2015 and supported by Malaysian Endocrine and Metabolic Society (MEMS) and MEDTRONIC USA - HPJ

Proposed projects – RMK11 mid term	Dasar Baru" Insulin Pump Therapy – proposed in 2015 to fund insulin pump therapy for patients with Type 1 and type 2 diabetes experiencing poor disease control on intensive insulin therapy.
Replacement/ procurement equipment	Diabetes Care: • Fundal photography cameras for diabetes clinics in regional centers, separate form ophthalmology Department • Continuous glucose monitoring system (CGMS) for regional centers for assessment of poor blood glucose control
Training	1. Advanced training for Endocrinologists: • Diabetes - foot care, diabetes in pregnancy, intensive insulin therapy (pumps) Neuroendocrinology • Obesity management • Osteoporosis and metabolic bone disorder • Thyroidology • Endocrine oncology 2. Specific training for Paramedic and support staff: • Diabetic care team • Obesity care team • Endocrinology
Recommended staff: workload	• HPutrajaya (as centre of excellence) : 5-6 Consultant Endocrinologists for Endocrine Complex with fellowship trainees(1-2 trainees per trainer) • Regional centers : 3-4 Consultant Endocrinologists with fellowship trainees (1-2 per Consultant) • State hospitals : 2-3 Consultant Endocrinologists / state • Other hospitals with multidisciplinary sub specialty service: 1-2 Consultant Endocrinologist
Other proposals	Nil

GASTROENTEROLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Twelve (12) hospitals ; • HKL • HSelayang • H Ampang • HSB • HTF • HRPB • HSA • HRPZ II • HTAA • HSNZ • HQE • HPP	1. HSJ – 2018 2. HSAH – 2017 3. H Serdang – 2017 4. HoSHAS– 2020 5. HTJ – 2018 6. HMelaka – 2020 7. HUS – 2018 8. HSgB– 2018 9. HTAR– 2017 10. H K Krai – 2020 11. H Kulim– 2020 12. H Taiping– 2020 13. H Kajang – 2020 14. HSNI – 2020 15. HPSF – 2020 16. H Sibu – 2020 17. HDOK– 2020 18. H Tawau – 2022 19. H Kenigau – 2022 20. H Miri – 2020
Where previous services available but now not	• H. Melaka • HUS	N/A
Networking/ Outreach	1. HPP with HSJ and HBM 2. HKL with HTJ and HPJ 3. HSB with HSAH, HKulim, H Taiping 4. HRPZ II with HKuala Krai, HTanah Merah, HUSM 5. HQE with HDOK, HTawau, HKeningau 6. HRPB with HTI and HSM 7. H. Selayang with HTAR, HSgB 8. HTAA with HoSHAS 9. HSA with HUS 10. H Ampang with Melaka and Serdang	• HKL with Hyderabad team India and also Shanghai University Hospital on Therapeutic endoscopy • H Ampang and HSB will continue networking with CRM/public university and some international collaborators for research development both ISR and IIR • Identifying some centres in overseas for our trainees training centres
Outsourcing/ Purchase of Services	Nil	Nil

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies/ Universities	Conjoint training Board Gastroenterology and Hepatology fellowship program between university (UMMC, UKM, USM), society MSGH, Academy of Medicine, chaired by head of service in KKM.	

Major gaps/ issues/ challenges

1. Need to develop subspecialty niche areas
    - Advanced Therapeutic Endoscopy
    - Advanced Luminal Endoscopy
    - Advanced GI Physiology
    - GI Nutrition
    - For a start I suggest we focus few established hospital HKL and Selayang with main focus on theraupeutic luminal endoscopy
2. Gastroenterologist throughout nation to run colorectal cancer screening with colonoscopy. Aim is to place at least one gastroenterologist at major hospital including district.
3. Incentive for gastroenterologist to retain them in public service, eg running endoscopy over the weekend, with incentive like the surgeons are doing over Saturday locum with lucrative rate
4. To ensure endoscopist assistant (GIA-nurses and MA who obtained post endoscopy basic training) to remain in endoscopy, eventhough they have been promoted.
5. To establish another centre apart from KK to train GIA, planned in 2017, together with Bahagian Latihan have agreed to start the first intake 2018. This is as part of measures to equip all the endoscopy centres with trained nurse/MA in endoscopy.
6. Need for equipment in all major referral centres with areas of priority; upgrading and replacement of equipment yearly & introduction of new services i.e. Capsule endoscopy, PH monitoring, manometry, fibroscan and lithotripsy services. We have series of discussion with surgeon to combine ther endoscopy service together with surgical units. Hence purchasing of equipment is well coordinated between surgery and gastroenterology. Form committee consists both gastro and surgeon.
7. To create a dedicated endoscopy suite at major gastroenterology units/hospital/ centres.

8. Need to develop GI Pathology alongside with other support services like radiology. In places where the service is already well established, there is a need to form MDT, multideciplinary team which consists of gastroenterology, GI and hepatobiliary surgeons, pathologist of GI interest, radiologist preferably IR and oncologist.
9. Secretariat for the Fellowship program gastroenterology and hepatology. My suggestion is to get Academy of Medicine to be actively involved in this.
10. Gastroenterology and Hepatology have combined under one umbrella, gastroenterology. We need to formulate our concerted effort as one unit and plan important issues eg viral hepatitis screening as one of the major agenda,

Proposals

New programmes / services	To enhance and consolidate the basic endoscopy services. To create EUS services in every region then to make the service available in every state. Fibroscan to make it available in all gastro centres
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	1. Endoscopy Equipment for Gastroenterology Unit. 2. Use of Biological Agents / Anti-TNF in Inflammatory Bowel Disease Patients 3. Implementation of Colorectal Cancer Screening Program - IFOBT stool test kit to conduct a national colorectal cancer screening.
Replacement/ procurement equipment	Endoscopy Equipment (Refer Gastroenterology Blueprint for detail)
Training	*Refer to our Malaysia Gastroenterology and Hepatology Training Module* – conjoint effort by KKM, University, Private, society and Academy of Medicine.
Recommended staff: workload	1. Generally a staffing ratio for Endoscopy is a minimum of 7 qualified staff 2. Endoscopy Nurses requirement per unit; • *Endoscopy Room* – Minimum of 2 staff per room at least one of which should be an Endoscopy nurse • *Recovery Area* – – 1-6 patients : 1 Endoscopy nurse – 7-12 patients : 2 Endoscopy nurses – 13-18 patients : 3 Endoscopy nurses • *Admission area* – 2 Endoscopy Nurses 3. Endoscopy Technicians – 6 Endoscopy Technicians / Scientific officers
Other proposals	1. National strategic planning (NSP) for viral hepatitis B and C 2. Colorectal cancer screening guideline and implementation 3. To strengthen research and development in GI and Hepatology

NEUROLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Neurology Services **available presently** in **ten (10)** hospitals :- 1. HSB 2. HPP 3. HSJ 4. HSgB 5. HKL 6. HSA 7. HSNZ 8. HRPZ II 9. HUS 10. HQE I	1. Strengthening regional centres e.g. HPP, HSNZ, HSA & HUS with the posting of at least 2 - 3 neurologists each, during 2016 - 2020. 2. Posting of resident neurologists to HTAA, HTJ, Melaka & HRPB as the current trainees complete their training during 2017 – 2020. 3. Neurophysiology Services : EEG machines are to be possibly made available by 2017 in Dungun, HPSF and Langkawi [*when Paediatric Institute moves to the Women's & Children's Hospital (WCH) and their equipment becomes available*]. 4. Thrombolysis Stroke services in HUS.
Where previous services available but now not	Resident Neurology Services are **no longer available** at: 1. HRPB 2. Hospital Melaka 3. HTAA (*since mid-January 2016 with the UIA neurologist leaving*)	N/A
Networking/ Outreach	In 2016, outstation visits by neurologists are from :- • HSB to HTF (6x/year) • HSB to HSAH (6x/year) • HSJ to HKB (1x/mth) • HSJ to Hospital Taiping (6x/year) • HKL to HTAR (monthly) • HKL to HTJ (monthly) • HKL to HRPB (April – December 2016 : 5X/year) • HKL to H. Sibu (4x/year)	1. HRPZ II to H. Kuala Krai in 2017/2018 2. HoSHAS to be eventually covered by HTAA and/or HSNZ in 2017/2018

	CURRENT STATUS	PROPOSED EXPANSION
	• HSgB to HTAR (monthly) • HSA to HPSF (1x/mth) • HSA to HSNI(4x/year) • HSA to H. Segamat (4x/year) • HSNZ to HTAA • HUS to H. Miri (3x/year) • HUS to H. Bintulu (3x/year) • HQE I to HQE II (SMC), KK (weekly to see referred inpatients) • HQE I to H. Tawau & HDOK (4x/year)	
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

Neurological Disease Management

1. An ageing population with increased incidence of non-communicable diseases, a greater awareness of neurological disorders and better diagnostic capabilities are leading to a larger pool of patients requiring neurology services at the public hospitals e.g. strokes, Parkinson's disease & dementia.
2. Shortage of neurologists are leading to longer waiting times for consultation or neurophysiology procedures & reporting, especially in remote parts of the country.
3. There is an increasing demand for medications, both generic & patented by a public who are choosing to save on health expenditure by turning to public hospitals for care e.g. epilepsy, multiple sclerosis.
4. Financial support is lacking for the initiation & maintenance of disease registries e.g. stroke, epilepsy & Parkinson's disease, which would provide vital information for future planning of services.

Neurologists

1. Delayed promotions for those professionals in Grade UD54 & Jusa 'C' has had a demoralizing effect & discouraged many committed professionals with regard to career pathway development in the public sector, leading to a 'brain drain'. For some, their last promotion was in 2009/2010.
2. Lack of a committed budget at the local/state level and no national neurology budget to source funds for the appropriate medications for patients, lends to frustration among the neurologists managing patients.

Neurophysiology

1. Moving assets where there is underutilization of existing equipment because there is no resident neurologist e.g. Segamat has been challenging with the red tape involved.
2. Insufficient Assistant Medical Officers (AMOs) being posted to run neurophysiology services e.g. Sibu, Teluk Intan, Seberang Jaya, Sg. Buloh.
3. No feedback from KKM regarding the loss of senior AMOs when promoted but transferred out of neurology resulting in loss of trained & experienced manpower for the neurophysiology services.(*Awaiting reply to letter from Y. Bhg KPK to Y. Bhg KSU, KKM sent on 30.08.2015*)

Proposals

New programmes / services	Stroke Ward in Hospital Queen Elizabeth I, Kota Kinabalu
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Many of the machines at hospitals with resident neurologist present are more than 7 – 10 years old. Also, those hospitals where there is a visiting neurologist, are in need of equipment replacement. The following hospitals in need of replacing their equipment as a priority are as follows: 1. HSB : EMG / NCS Desktop 2. HPP : • EEG Desktop • EMG / NCS & EP Desktop 3. HKL : • EMG/NCS Portable • EEG Portable 4. HSA • EEG Desktop • EEG Portable • VTR / PSG Desktop 5. HoSHAS: EEG Portable 6. HSNZ: EEG Desktop 7. Hospital Miri,: EEG Desktop 8. HQE I: • EEG Desktop • EEG Portable • EMG / NCS & EP Desktop 9. Hospital Tawau : EEG Portable

Training	1. Subspecialty training guidelines is overdue for a review with new centres & neurologists being identified as training centres and trainers respectively (Training duration remains 3 years) 2. Exit Viva examination to be held 2 – 3x/year with a panel of 2 academician neurologists and 1 senior government neurologist 3. Advanced Diploma in Neuroscience Care course for both Nursing & Neurophysiology Assistant Medical Officers (Duration : 1 year) to commence in 2017
Recommended staff: workload	**Ratio of Neurologist : population** Malaysia – 1 : 150,000 *(~ 200 neurologists required*) • However, **at present the ratio is 1 : 428,571** (i.e. 70 Adult neurologists for an estimated 30,000,000 population). The distribution being unequal as follows :- ✓ West Malaysia >> East Malaysia ✓ West Coast > East Coast
Other proposals	1. A National Neurology Drug Budget is urgently required that can be distributed among hospitals with resident neurologists to enable better delivery of service at their sites e.g. for treatment of Acute Thrombolysis in Stroke, Epilepsy, Parkinson's disease & Multiple Sclerosis. 2. Those doctors who have successfully obtained their M.Med or MRCP specialization should be rotated through a neurology department or unit, where available during gazettement, for exposure & the possibility of 'sparking their interest' to consider neurology subspecialization as the next step in the career pathway. 3. Specialists (M. Med / MRCP) interested in further subspecializing in Neurology should be allowed a 'fast track' entry into the training programme compared to procedural subspecialties e.g. cardiology or gastroenterology. 4. Scholarships for overseas Fellowship training in the third year of neurology subspecialization should continue to be maintained for a duration of one (1) year, as the exposure overseas for such a period of time, will benefit the neurology services. A serious review of the contractual bonding with the federal scholarship should be carried out to discourage early resignations on return from overseas training.

	5. Promotional aspects for neurologists serving the government hospitals must be looked at seriously, every 5 years, if we are to retain these skilled & experienced professionals within the public service sector. 6. Short-term training / attachment (three weeks - three months) be permitted for those neurologists serving 5 years without any break in service (e.g. no paid leave / prolonged medical leave). 7. Assistant Medical Officers (AMOs) who have successfully completed their post-basic training in neurophysiology or Advanced Diploma in Neuroscience Care AND have served a minimum of three (3) years post- training, should be offered the opportunity to seek training attachment abroad for a period of not more than three (3) months to further enhance their neurophysiology skills.

HEPATOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Hospital Selayang	Regional hospitals with Department Of Gastroenterology and Hepatology (Non transplant) • HPP/ HSB • HSA/ H. Melaka • HQE • HUS
Where previous services available but now not	Nil	N/A
Networking/ Outreach	HSelayang is the only tertiary referral centre in the country providing consultation to whole country. Liver clinics • HSgB "Co Infection Clinic" • HTAR	Hospital Melaka
Outsourcing/ Purchase of Services	Nil	• Genetic testing for Wilson's disease • Liver transplant for those who could not be listed in local programme
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Inadequate number of trained Hepatologist and supporting staff
2. Inability to retain trained Hepatologist for service expansion-the ideal situation is to have Hepatologist and Gastroenterologist working together in Dept Of Gastroenterology and Hepatology.
3. Lack of trainees
4. Issues relating to laboratory support – specialized test
5. Cost of treatment
6. Enough trained health care workers to achieve WHO target to eliminate viral hepatitis B and C (*Global health sector strategy on viral hepatitis, 2016–2021)*

Proposals

New programmes/ services	• Liver Care Network – a support network for diagnosis and treatment escalation for patients with viral hepatitis. • Portal Hypertension Clinics and Day Care
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Liver Care Network – a support network for diagnosis and treatment escalation for patients with viral hepatitis.
Replacement/ procurement equipment	Portable US in the ward for hepatobiliary system.
Training	• Training in US • Portal Hypertension
Recommended staff: workload	• 2 to 3 Consultant Hepatologist for Hospital Selayang • 1 Consultant Hepatologist in each non transplant centre
Other proposals	Nil

HAEMATOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	**Major referral centre of excellence:** Hospital Ampang **Regional centres** 1. HPP 2. HUS 3. HQE **State hospitals** 1. HSB 2. HRPB 3. HTAR 4. H. Melaka 5. HSA 6. HTAA 7. HRPZ II	1. Proposed to establish new centres in Hospital Teluk Intan/Taiping, Hospital Batu Pahat/Muar, Hospital Sandakan, Hospital Sibu and Hospital Temerluh 2. Ensure at least two haematologists in each major state hospitals 3. Establishment of stem cell lab in Penang 4. Development of haemophilia centres in each major hospital
Where previous services available but now not	Nil	N/A
Networking/ Outreach	1. Hosp Ampang to HTJ and HSNZ 2. HPP to HSJ and HTF 3. HRPB to HTI and Hosp Taiping 4. HUS to Hosp Miri and Hosp Sibu 5. HQE to HDOK	Nil
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Urgent need for a new location for the centre of excellence in Hospital Ampang in view of lack of transplant and laboratory space. There is an urgent need to expand the molecular and cytogenetic services in Hospital Ampang to cater for the whole country. The major limitation is lack of lab space in Hospital Ampang. Also need to expand the number of transplant rooms as well as stem cell lab to cater for whole country.
2. Urgent need to develop the stem cell lab in Hospital Pulau Pinang as the next centre for transplant excellence.
3. A dedicated vote is needed for haematology activity to ensure continued access for expensive drugs and chronic treatments eg. iron chelation, factor concentrates.

Proposals

New programmes / services	1. Development of haemophilia daycare centres in each major hospital with home visiting teams. 2. Blood Management teams to be set up in every hospital.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Applied for a new building for Hospital Ampang to be sited in Sg Buloh for the purpose of expansion of services in anticipation of the population increase in the next 10 years as well of expanding the lab and transplant service.
Replacement/ procurement equipment	1. Every state hospital should have an aphresis equipment for plasma exchange. 2. Every state hospitals should have adequate infusion pumps and syringe drivers.
Training	1. Increase number of trainee slots for haematology to 5 each year. 2. Provide scholarships for transplant training to doctors and nurse. 3. Overseas attachment for scientific officers. 4. Postbasic training for haematology nurses started in 2015.

Recommended staff: workload	Current norm for clinical haematologist is 1:1 000 000 Proposed norm is 1.2: 1 000 000
Other proposals	1. Dedicated budgeting for haematology cancer, transplant, haemophilia and iron chelation drugs. 2. Promoting scientific officers who have undergone overseas attachment at the same hospitals to ensure no loss of skilled staff. 3. Promotions for clinical haematologists.

DERMATOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Resident Dermatologists available in all state hospitals except HSNZ. Resident Dermatologists also available in certain major hospitals: • HSelayang • HSgB • HPSF • HSI • HSerdang • HAmpang • HPJ	To post dermatologists in identified Major hospital with specialists services: HSJ, HKulim, HTaiping, HKajang, HSibu, HSAH.
Where previous services available but now not	HTF(no more resident dermatologists – now only visiting)	N/A
Networking/ Outreach	• HPP to HBM, HSg Bakap, KKButterworth • HSB to HTF, HKulim, HSAH, HLangkawi, HBaling, HSik, HYan, HKuala Nerang, HJitra, KKPendang • HRPB to HTaiping, HSM, HTI • HTAR to HKajang, HBanting • HTJ to HTAN, HPD, HJempol, HJelebu • HJohor to HKluang • HPSF to HSNI • HRPZ II to HTM, HKuala Krai, HPasir Mas, HTumpat,HPasir Putih, HJeli, HGua Musang, HMachang • HTAA to HoSHAS • HUS to HSibu, HMiri, HBintulu • HQE to HKeningau, HDOK, HTawau, HLahad Datu	• HKulim to HSAH and subsequently (with more dermatologists): • HSAH to HBaling & HSik; HKulim to HYan • HSerdang to HKajang • HJohor to HSegamat • HUS to HPetra Jaya • HQE to HBeaufort, HMarudu • H Taiping to have a Resident Dermatologist

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	• Direct Immuno-fluorescence for Immunobullous disorders • Herpes IF & PCR (HUmum Sarawak) • Leprosy PCR to MKAK Sg Buloh	Training of Aesthetic Dermatology (For Dermatologists and Trainee Dermatologists) to Private Dermatologists To provide Aesthetic Dermatology services for private paying patients
MOU with External Agencies / Universities	Network with UM, UKM, UPM, IMU, UNIMAS, PMC, Monash Malaysia, PUGSOM, MAHSA, UITM, Newcastle Univ., AIMST, Insaniah College Univ.,	

Major gaps/ issues/ challenges

1. To train and retain critical mass dermatologists in government service.
2. Training more dermatologists to fulfill aim of having resident dermatologists in identified hospitals (state and major specialist hospitals) to reduce inequality of care for dermatology services.
3. To encourage subspecialisation.
4. Training of paramedics.
5. Research in dermatological services.
6. To provide postbasic nursing in dermatology.They are to provide nursing dermatology services & supervise dermatology skin nursing in non-dermatology wards especially in intensive care areas to reduce delayed / inadequate care and prolonged.
7. Inability to provide adequate treatment for common diseases (for scabies, acne and superficial cutaneous infections, psoriasis etc.) in minor Hospitals and polyclinics because it lacks or inadequate common essential topical medications resulting in dermatology clinics having to manage primary care conditions instead of concentrating in provision of secondary and tertiary care.
8. Inadequate / no resources in many state / major hospitals to provide basic patch test investigation for potentially avoidable contact / occupational dermatitis which has resulted in prolonged morbidity.

Proposals

New programmes / services	To expand services to certain regional state hospital in the field of: 1. Dermato Pathology 2. Pigmentary Disorders 3. Photobiology & phototherapy 4. Hair & Nail Disorders 5. Post Basic Nursing in Dermatology 6. Dermatosurgery by Dermatosurgeons 7. Laser 8. Aesthetic Dermatology 9. Dermato-oncology 10. Autoimmune Disorders 11. Allergy in skin and contact dermatitis 12. Dermatology Registrar (medical officers UD44-54). Criteria: Obtain certificate of Diploma in Dermatology & had trained under Government Consultant dermatologist for at least 3 years. However they will not be acknowledged as a Dermatologists during service and upon retirement
Projects approved RMK11	Dermatology Dasar Baru was brought forward to 2017 and only approved for Sarawak via the JKN Sarawak 2016
Proposed projects – RMK11 mid term	1. Pigmentary Disorders (HRPB) 2. Phototherapy and Photobiology (HSB) 3. Dermatosurgery and Laser (HPP & HUS) 4. Dasar Baru for Biologic Treatment for severe and difficult to treat Psoriais Patients 5. Renovation work for Department of Dermatology HPP 6. New Resident Dermatology Service in HKulim, HKajang and HSJ
Replacement/ procurement equipment	1. Phototherapy Machines: Hospital Serdang, Hospital Pulau Pinang 2. Lasers – CO2, Pigmentary, Vascular 3. Non Ablative Fractional Resurfacing Laser (NFR)
Training	1. Attachment at recognized centres overseas for 2 nursing tutor duration of 3 months to become 'trainers' 2. Overseas short term subspecialisation training: i. Phototherapy and Photobiology ii. Dermatosurgery and Laser iii. Allergy and Contact Dermatitis iv. Hair and Nail 3. Scheduled training workshops and courses locally

Recommended staff workload	Dermatologist requirement according to level of care: 1. Tertiary Centre (Institute of Dermatology HKL) – 10 consultants 2. Regional centres –3 each 3. All state Dermatology Dept. – 2 each 4. Major hospitals with Dermatologist – 1 each
Other proposals	1. To address WHO Global Leprosy Strategy 2016-2020: targets envisaged by 2020: • Zero Grade 2 disabilities among paediatric leprosy patients. • Reduction of new leprosy cases with Grade 2 disabilities to less than one case per millionpopulation. • Zero countries with legislation allowing discrimination on basis of leprosy. 2. To address STIs among MSM 3. To provide optimum services in Allergy and Immunology, Phototherapy, Laser subspecialty in regional centers (north, south, east, Sabah & Sarawak) 4. To provide common essential dermatology topical medications (for scabies, acne and superficial cutaneous infections, psoriasis etc.) in all hospitals especially Minor hospitals

GERIATRICS

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• HKL • H. Selayang • HSgB • HTAR • H.Taiping • HUS	This will depend on the number of geriatricians available. Recently started –but designated beds for geriatrics unavailable. • Hospital Seberang Jaya (22/1/16 – Dr Alan Ch'ng reported duty) • Hospital Sultan Aminah JB (23/11/15 – Dr Goh Cheng Beh reported duty) To develop at least one referral centre for each state. • H. Melaka • HSB • HRPZ II • HUS Expected date start of service • HSI JB: Nov 2015 (Dr Goh Cheng Beh) • HMelaka: Aug 2016 (Dr Nor Hakima bt Makhtar) • HSB: Aug 2016 (Dr Teh Hoon Lang) • HRPB: Jan 2018 (Dr Nor Azlina bt Abu Bakar) • HoSHAS: Jul 2018 (Dr Aruna A/P Karthigayan) • HRPZ II: Jan 2019 (Dr. Yusliza Azreen bt Hj Mohd Yusoff)
Where previous services available but now not	• H. Melaka (and outreach to H. Jasin) – Geriatrician left • HQE – 2 geriatricians left this year	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	Outreach program :- 1. Hospital Kuala Lumpur • Hospital Seremban • Hospital Banting • Hospital Rehab Cheras 2. Hospital Taiping • Hospital Sungai Siput 3. Hospital Seberang Jaya • Hospital Pulau Pinang (will start) 4. Hospital Selayang • Hospital Termeloh 5. Hospital Umum Sarawak • Hospital Sibu	This will depend on the number of geriatricians available. Outreach hospitals (geriatric units) :- Once each referral hospital is established, then outreach program will set in. Planned for :- 1. Hospital Kota Bharu – outreach program to Hospital Tanah Merah/ Machang 2. Hospital Melaka – outreach program to H Jasin Outreach services :- 1. Liason services including liaison/ case manager – preferable an advanced diploma geriatric trained nurse to coordinate patient with all others services (including NGOs) encompassing health, social, financial, and environmental modification. 2. Community support: - Home Visit Nurses & Support nurses (including online/telephone support) to provide advice and monitoring to patient at home. 3. Day Hospital 4. Linkage with Transport Organizations/ councils to provide transportation facilities with capacity to manage wheelchairs, elderly patients.
Outsourcing/ Purchase of Services	Nil	1. Private Geriatricians to provide Clinic and patient consultation service on sessional basis where there are insufficient resources. This has been explored in Kota Kinabalu but uptake is poor due to commitments of geriatricians in private practice.

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies / Universities	Nil	

Major gaps/ issues/ challenges

1. Human resource
    - Insufficient number
        - Brain drain to the private sector
        - Transfer / Promotion of trained support staff to other discipline, needs to create promotional post within the discipline so as not to lose this group.
    - Needs to upgrade and improve skill, providing more scholarship for attachment and specific program for specialists and all categories of members of interdisciplinary team. Training all interdisciplinary staff – must be in tandem with development of services and resources.
    - To train and retain critical mass in government service
    - Interdisciplinary staff must be dedicated full time to the geriatric unit – currently staff are part time as they cover other areas/wards)
        - Nurses (male & female)
        - Physiotherapist
        - Occupational therapist
        - Pharmacist
        - Dietician
        - Speech Therapist
        - Medical Social Worker
        - Dental,
        - Psychogeriatric,
        - Clinical Psychologist (for Memory work)
        - Neuroradiologist (for memory work)
2. Equipment
    - Breakdown of equipment due to overused equipment.
3. Consumables / Drugs
    - Inadequate budget for consumables and List A drugs

4. Organisation
    - Poor record keeping and retrieval – an IT system is required as relevant, on-time retrieval is required due to multiple healthcare providers, comorbidities, and polypharmacy. This is a safety issue for patient care.
5. Structure
    - No structure available upon transfer of new geriatrician. This delays service provision. E.g. Hosp Sultan Aminah JB, Penang,
    - In places where established services are provided other services encroach into designated areas.
    - For example : - 2 centres providing geriatric service for more than a decade.
        - Hospital A – Designated ward area is being taken up by surgical / orthopedics leading to crowding and nosocomial infections and difficulties in rehabilitation. Staff was utilized for other work other than geriatrics. No dedicated therapist or staff.
        - Hospital B – No dedicated therapist or staff. Wards keep changing from one ward to another and now to another ward with inadequate space and toilet facilities.

Challenges

1. Human resource development
    - To achieve capacity of a referral centre for each state with at least two geriatricians per centre by 2020
    - To produce / develop a career pathway for clinical nurses and therapist to U41 and above – currently one U41 nurse is available for clinical guidance of junior staff but there is no career scope for clinical nurse other than administration for this person.
    - Retaining skilled personnel as trainers for junior staff.
    - To develope skilled expertise for members of the multidisciplinary team in unison and not piecemeal.
    - To have dedicated support staff (interdisciplinary team members) to geriatric

units / departments so that geriatric service may move forward.

- Improper organization of manpower - To curtail loss of trained manpower by transferring out due to promotions.

2. Structure
    - Inadequate facilities – e.g. no geriatric ward, rehabilitation area, high-low beds
3. Equipment
    - Timely and regular replacement of compromised equipment for proper and safe provision of geriatric services.
        i. E.g pressure relieving mattresses. non-adjustable unsafe beds increasing risk of falls
4. Pharmaceutics
    - No dedicated geriatric budget for medications - dependent on medical department budget
5. New institutions – capacity of service
    - Cheras Rehabilitatiton Hospital has good rehab facilities but – require improvement of support service for it to be developed further. The inavailability of emergency acute care facilities make managing older patients difficult as they have to be transferred out to other hospitals (e.g HKL) should events occur.

Proposals

New programmes/ services	Programmes planned will depend on site and availability of resources:- • Geriatric rehabilitation (subacute ward and day hospital) • Stroke Service • Delirium (acute service with delirium room) • palliative
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	All Dasar Baru request have been submitted for above centres
Replacement/ procurement equipment	Propose replacement of BER equipment 1. Hospitals with Resident Geriatricians 2. Hospitals initiating Geriatric Service 3. Outreach Program • H. Banting (no replacement since 2000) – Hoist, beds, Rehab equipment, walking aids • HTJ (no replacement for past 10 years) – tilting table, hoist, beds, pressure mattresses, rehab equipment, etc (both ward and at day rehab center) Geriatric Units with Resident Geriatricians :- • HKL – equipment since 2003 not replaced. • HTAR, H Selayang, HSgB – need additional equipment and resources (as per dasar baru) New Units with Resident Geriatricians currently – In need of equipment - Hospital Seberang Jaya - Hospital Taiping - Hospital Melaka - Hospital Sultan Aminah - HTAR

<table>
<tr><td>Training</td><td>Local courses
• For geriatricians – fellowship training (in progress) geriatrics in general medical practice
• For interdisciplinary team members – course/ workshop)
Overseas training
Program: for doctors, nurses, pharmacists, physiotherapists, occupational therapists and speech therapists
• Falls,
• Memory,
• Incontinence,
• Geriatric Rehabilitation,
• Dysphagia
• Geriatric Pharmacy
• Dietetics for elderly care
• stroke care</td></tr>
<tr><td>Recommended staff: workload</td><td>The Ideal norm for geriatricians is 1:50,000 population (British Geriatric Society). This would mean 500 to 600 geriatricians are required. Taking into account the capacity for resource capacity building and service requirement, the following is a compromise for service provision.
As capacity increase, the requirement for the number of geriatricians in regional and tertiary centres will increase in tandem.

Workload (figures below refer to full time staff dedicated to geriatric unit) :-

<u>Posts</u> — <u>Ratio</u>
Consultant Geriatrician — 1:20
Geriatrician / Clinical — 2:24
Specialists — 1:12
MO — 1:12

<u>Posts</u> — <u>Ratio</u>
Pharmacist — 1:4 beds
Nurses — 1:4 beds
Occupational therapist — 1:8 beds
Physiotherapist — 1:100 beds
Speech therapies — 2:100 beds
Social worker</td></tr>
</table>

Other proposals	• IT based record archiving system; • Posts for nurse clinical specialists (cognition, falls & fractures, incontinence, pressure ulcers) with further career option for promotion while in situ. • Posts for physiotherapist, occupational therapist, speech therapist with career option as above for nurses. • Ambulatory Geriatric centre – Daycare offering multidisciplinary input including medical, nursing and rehabilitative interventions • Subacute ward (for short course rehabilitation -2 weeks) • Delirium room • Community hospitals (for inpatient rehabilitation >2 weeks) • Dementia day hospital • Dementia nursing home • Respite care • Home geriatric services – physiotherapy, occupational therapy, home hazard assessment and modification, nursing (pressure ulcer dressing, feeding tubes and catheter change) • Support services (wheelchair accessible vehicle;assistants (sitters) for delirious patients; home assessment and modifications services)

RHEUMATOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Sixteen (16) Hospitals : 1. H. Selayang (2001) 2. HSgB (2016) 3. H. Serdang (2006) 4. HPJ (2001) 5. HKL (2012) 6. HRPB (2005) 7. HPP (2006) 8. HSI (2007) 9. H. Melaka (2009) 10. HPSF (2015) 11. HTJ (2001) 12. HRPZ II (2011) 13. HSNZ (2009) 14. HUS (2006) 15. H. Sibu (2014) 16. HSB – monthly visit by Penang Rheumatologist	1. Re-establish service at HQE Kota Kinabalu. 2. Re-establish service at HTAA by 2018. 3. State hospitals should have established rheumatology services. 4. To increase the number of rheumatologists per state hospital so that it can function as a tertiary & training centre for the state. 5. To expand resident rheumatology service to other major hospital in the state once state hospital has adequate number to run the service.
Where previous services available but now not	1. Hospital Taiping; monthly visits by HRPB. Resident rheumatologist will be posted toTaiping after October 2016. 2. Hospital Kuantan – service covered by UIA 3. HQE – plan for monthly visits by H Selayang or HPJ(alternately) and University Malaysia Sabah	N/A
Networking/ Outreach	1. HSB with HPP 2. Hospital without Rheumatology Service will network with the nearest hospital with Rheumatology service 3. State Hospitals without Rheumatology services will be serviced by visiting Rheumatologist	continue with present arrangement

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Nil	1. Musculoskeletal Radiologists 2. Pathologists specialising in Muscle biopsy 3. To hire rheumatology physician who has retired/ private rheumatologist to do locum at state hospitals run by lone rheumatologist
MOU with External Agencies/ Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Inadequate rheumatologists to manage cases especially in states other than Selangor.
2. Inadequate support staff including physiotherapists, occupational therapists, podiatrists, specialised nurses.
3. Inadequate laboratory services especially in immunology.
4. Need for incentives for subspecialists including promotion and opportunities for training and advanced courses.
5. Equipment for rheumatology services.
6. Budget for rheumatology drugs.
7. No prevalence data for our rheumatological disease due to limited human resource to collect data.

Proposals

New programmes / services	1. Musculoskeletal Ultrasound, bone density measurement for osteoporosis to be developed at regional centres 2. Setting up of Biologic registry 3. Setting up of SLE registry
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	1. Polarised light microscopy 2. Ultrasound machine (for musculoskeletal system) 3. Bone densitometry machine: for hospitals without bone density machine and to replace old machine (>10 years)
Training	<u>Rheumatologists</u> • At least 4 specialists per year for subspecialty training • To develop further training for areas of special interest in rheumatology such as SLE, systemic sclerosis, etc • 3 scholarships per year for short courses overseas <u>Specialist Rheumatology Nurses</u> Presently there are no Specialist Rheumatology Nurses. Initial training for core team should be done overseas. Training period 1 year. 2 scholarships per year <u>Courses for doctors and other support staff</u> Other training needs include budget for books and on line journals to encourage and facilitate publication and research
Recommended staff: workload	The rheumatologists who are doing general medical work as well should be allowed a few months per year off from gen medical ward work to concentrate on developing rheumatology eg – research, publications which takes a lot of time.
Other proposals	1. Incentive for subspecialists. • Promotion. To create adequate promotional posts • Opportunities for further training in areas of interest in rheumatology 2. To collaborate with Epidemiology unit in MOH to collect prevalence rate of chronic rheumatological diseases in Malaysia.

INFECTIOUS DISEASE

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	**All state hospitals including HKL (except HTJ* and HTF*)** have resident infectious disease services. ** both these hospitals already have ID trainees identified to be posted there in the next 2 years*	ID Units to be set up in HTJ and HTF within the next 2 years. ** Designated specialists currently still undergoing training*
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• **HSgB** : H. Selayang & H. Kajang • **HRPZ II** : H. Tumpat • **HRPB** : H. Taiping & HSM • **HPP** : HSJ • **HSA** : HPSF & HSNI • **HSB** : HTF • **HUS** : H. Sibu & Miri • **HQE** : HDOK	With new trainees joining the ID Fellowship program, ID services will be expanded to some Major Specialist hospitals (eg. Selayang, Serdang) and some large district hospitals (eg. HSAH, HSJ, Taiping and HPSF)
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	HSgB and HKL: runs ID consulting services at Institut Jantung Negara (IJN)	Nil

Major gaps/ issues/ challenges

1. Lack of a purpose built **high-level isolation facilities** at **national** and **regional level** in managing outbreaks involving highly infectious pathogens including novel infections.
2. Lack of proper isolation rooms in many of the **older hospitals.**

Proposals

New programmes/ services	**1.** **Out-Patient Antibiotic Therapy (OPAT)**: where patients requiring parenteral antibiotics can be treated on an out-patient basis. This involves forming a specific team of doctors, pharmacists& paramedics as well as the usage of continuous infusion pumps at home. **2.** **Antimicrobial Stewardship (AMS) Program**: to be scaled up in all state, major and district hospitals throughout the country by 2017.
Projects approved RMK11	Reburbishment of **wards 48 and 49 in the Pusat Kawalan Kusta Negara (PKKN), Sungai Buloh with the installation of high-level isolation facilities with negative pressure capabiltiy**. This will function as the national center for isolation in the control of outbreaks involving serious infectious agents.
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Nil
Training	Infectious Diseases Fellowship training programme for physicians; at least 2 slots per year.
Recommended staff: workload	Currently we have **21 trained ID physicians** distributed to all states (except Perlis & Negeri Sembilan). We have now **15 ID trainees** doing their respective 1st, 2nd (local) and 3rd (overseas) year Fellowship Programme either in Malaysia or overseas. All these trainees are expected to complete their training by 2018 / 2019.
Other proposals	Nil

PALLIATIVE MEDICINE

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Palliative medicine is available at: • Hospital Selayang • HTAR • HRPB • Hosp Batu Gajah • HPP • HSB • IKN All other state hospitals and some minor specialist hospitals have palliative care services of variable standards and activity run mainly by medical officers without formal training.	Develop new centres with resident palliative medicine specialists: • HKL • HQE • HUS • HSA • HTJ • H. Melaka • HPRZ II • HSNZ • HTAA Major cancer treatment centres • HSI • Hospital Likas
Where previous services available but now not	Nil	N/A
Networking / Outreach	1. Visiting specialist clinics in • HKL • HTJ 2. Direct link to Malaysian Hospice Council and NGO hospice groups networking in service provision, education and public awareness 3. Currently also networking with Bahagian Kesihatan Keluarga on palliative care domiciliary programme	1. Expand visiting specialist services in major specialist hospitals where resident specialists are already existing • HSgB • Hosp Ampang • Hosp Serdang • Hosp Kajang • Hosp Shah Alam • HSJ / HBM • HSAH • Hosp Taiping 2. Develop network with domiciliary care teams in states with resident palliative care specialists. • Selangor • Perak • Kedah • P.Pinang

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Nil	To develop larger grant support to hospice NGOs with strict criteria for standards of care. Suggest 1:1 matching grant for every ringgit raised from public donations.
MOU with External Agencies/ Universities	Nil	Develop smartpartnerships with the members of Malaysian Hospice Council to enhance community palliative care services.

Major gaps/ issues/ challenges

1. Still lacking in numbers of subspecialists in palliative medicine.
2. Lack of support from hospital administrators to recognise the need for palliative care and support development of the field in the state hospitals.
3. Lack of trained human resource in the field of palliative care – doctors, nurses, physio, OT
4. Lack of public awareness on the importance of palliative care in an ageing population
5. Lack of budget for special palliative care drugs and to develop proper palliative care units

Proposals

New programmes/ services	Development of bereavement counselling and psychosocial services in palliative care.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Development of new specialist palliative care units in HSB, HTAR and HKL.
Replacement/ procurement equipment	1. Renovation of palliative care units in Hospital Pulau Pinang – equipment still lacking 2. New ripple mattresses, syringe pumps and oxygen concentrators for all existing palliative care units.

Training	1. Advanced Diploma in Palliative care for all nursing staff of existing palliative care units and proposed palliative care units. 2. Subspecialty training for at least one physician in each state hospital. 3. Development of certificate training for medical officers working in palliative care units and hospitals without specialists in palliative care.
Recommended staff: workload	1. At least 2 consultants in each state palliative medicine unit and 4 medical officers. • estimated workload > 600 new cases per year • At least 1 visiting clinic on weekly basis per consultant with workload of > 200 cases per year 2. Main training centres should have at least 3 consultants and 6 medical officers. • Estimated workload > 900 new cases per year • At least 1 visiting clinic on weekly basis per consultant with workload of >200 cases per year 3. 1 consultant in major specialist hospital units and 3 medical officers • Estimated workload > 300 new cases per year • At least 1 visiting clinic with workload > 150 cases per year. 4. At least 50% of nursing staff in specialised units to have advanced diploma in palliative care .
Other proposals	1. Development of and institute of palliative medicine as a centre for training and research in the field of palliative medicine and end of life care as well as ethics. 2. Incorporate Paediatric Palliative medicine as part of subspecialty development plan. 3. Development of palliative care units in Hospital Ipoh & Hospital Pulau Pinang.

GENERAL SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Available in all: • State hospitals • Federal Territory hospitals • New specialist hospitals • District hospitals with specialists' services (Including Breast & Endocrine Surgery, HPB Surgery, Vascular Surgery, Upper GI Surgery, Thoracic Surgery & Colorectal Surgery) **Breast & Endocrine Surgery:***Refer Breast & Endocrine Surgery blueprint* **HPB Surgery:***Refer HPB Surgery blueprint* **Vascular Surgery:***Refer Vascular Surgery blueprint* **Thoracic Surgery:***ReferThoracic Surgery blueprint* **Upper GI Surgery:** HSeremban, HSelayang **Colorectal Surgery:** HSelayang, HSB	To expand the resident specialist service to at least another 4 district hospitals by 2020. Propose: 1. HKapit 2. Hospital Besut 3. HLimbang 4. H Slim River General surgery service at District Hospitals with Specialist Services must be further consolidated and developed in terms of human and infrastructural resources.
Where previous services available but now not available	Hospital Kapit	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	This generally involves the tertiary specialties. **HPB Surgery:***Refer HPB Surgery blueprint* **Vascular Surgery:***Refer Vascular Surgery blueprint*	1. Networking & outreach services involving tertiary / subspecialty services under General Surgery will be further enhanced. 2. Networking between the state & district hospitals will be further improved and enhanced so as to provide a seamless service.
Outsourcing/ Purchase of Services	There are no specific general surgery services that are purchased or sourced from the private sector. Universities using public hospitals for teaching do provide some clinical service; UPM in Serdang IMU in HSeremban.	1. The hiring of private surgeons & anaesthetists on a **sessional basis** to provide general surgery services in some of the public hospitals must be considered especially for subspecialty areas. 2. Theatres &infrastructure are available but are under-utilised in view of lack of anesthetists / anesthetic time. 3. Some of the subspecialty services & support services (Histopathology / Cytology) can be outsourced to private hospitals or the universities wherever available
MOU with External Agencies/ Universities	There are MOUs between the universities and the Ministry of Health Malaysia to use public hospitals for teaching purposes.	Nil

Major gaps/ issues/ challenges

Major Gaps:

1. Shortage of general surgeons in view of high attrition due to the perceived poor promotional/professional development prospects.
2. Mal-distribution of surgeons throughout the public hospitals. Many surgeons refuse to be posted to East Malaysia and to district hospitals for various reasons.
3. Limitation of funds, resources & infrastructural facilities has to some extend contributed to the disparities in the development of general surgery services throughout the country.
4. Old Surgical equipment fail and need urgent replacement.

Issues / Challenges

1. The most pressing challenge is to train committed, dedicated, knowledgeable & skillful surgeons for the future.
2. To retain surgeons in service
3. Subspecialty training is draining general surgery during the training period and affecting distribution
4. The need to credential & privilege surgeons to perform procedures beyond their core competency.

Proposals

New programmes/ services	• **Surgical Critical Care** to be developed in all hospitals with General Surgery Services so that critically ill surgical patients are better managed. • **Trauma Surgery** to be developed as a subspecialty in Hospital Sungai Buloh. • **Surgical Palliative Care** to be developed within the General Surgery Service so as to cater to the needs of the terminally ill.
Projects approved RMK11	Nil

Proposed projects – RMK11 mid term	Upgrading of general surgery services, facilities & infrastructure in all hospitals where necessary. Replacement of old equipments especially scopes and lights
Replacement/ procurement equipment	1. All surgical equipment & instruments must be replaced pre-emptively based on the recommended usage / life span and not only when they have totally broken down. 2. Replacement of these equipment are a priority: Operating tables and theatre operating lights, diathermies, surgical suckers, laparoscopic surgery systems and surgical equipments 3. The maintenance & servicing of all high-end electronic / digital equipment must be outsourced to the vendors who have the necessary expertise. Despite having privatized the maintenance & servicing of equipment in public hospitals the extent of equipment breakdown is still unacceptably high.
Training	1. **Entrance examination** (pre-selection) for all aspiring surgical trainees so that only committed doctors are accepted for training as surgeons. This exam could be MRCS Parts A & B. 2. **Surgical Masterclass** (management of acute surgical conditions) for junior surgeons. 3. **Advance Trauma & Life Support Course** forsurgical trainees and junior surgeons. 4. **In-service training & courses** for specialists and paramedics in all hospitals.
Recommended staff: workload	Operative Surgery Workload for Surgeons : At least **200 major surgeriesper surgeon per year.** Each surgeon must have an up-to- date operative surgery log book.

Other proposals	**1. Continuous upgrading of general surgery facilities & services** must be undertaken uniformly throughout the country in a planned manner. **2. Human resource planning & development** must be undertaken accordingly in-line with the development of advanced surgical services. 3. Develop an effective mechanism of **networking** between all public hospitals so that services not available in one hospital can be provided by another where such services are available. 4. objectively on: • operative surgery log book • research & publications(at least 2 publications in peer reviewed journals or at least 2 presentations at a national level scientific meeting) **5. Restructuring of Surgical Services :** • all hospitals with specialist services must provide a 24 hour critical care & emergency surgery service. • different levels of intensive care service (anaesthetic service) must be provided by all hospitals depending on the nature of surgery being done. • tertiary level / specialized surgeries must be undertaken by credentialed sub-specialist surgeons at designated hospitals with adequate facilities & resources. **6. Surgical Services need to be categorized for ease of distribution** **Primary :** available at all hospitals with specialist services and must be capable to handling acute surgical emergencies. **Secondary :** available at all state hospitals and capable of handling complex general surgical cases. **Tertiary :** available at designated hospitals with adequate infrastructural facilities & multidisciplinary support. 7. Credentialing process for surgeons to perform high-end, complex surgeries must be effectively developed. Currently most surgeons perform any surgery even though they lack the appropriate training & skills. Credentialing of surgeons & accreditation of institutions can be outsourced to the College of Surgeons.

	8. The **Ministry of Health must work with the College of Surgeons**,Malaysia and related professional bodies to deliver the highest quality surgical services. The ministry could provide the resources & infrastructure facilities while the College could assist in improving / maintaining surgical standards and training of surgeons. 9. An **evaluation / auditing system** with measurable indicators should be developed and put into place so as to effectively & objectively monitor the standards of surgical service. The College of Surgeons could monitor the performance of surgeons through peer-review auditing and provide the Ministry with the necessary feedback on the performance of each surgeon. **10. Professional Disciplinary Committee** must be appointed to investigate complaints of incompetence or negligence against surgeons.This committee, chaired by the Head of General Surgical Services,Ministry of Health must include at least 2 senior surgeons from the Ministry of Health and 2 surgeons from the college of surgeons.

OBSTETRIC & GYNAECOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	54 hospitals with specialists services	• At least 2 resident O&G Specialists for hospital providing O&G specialist services (for initial commencement of service) • At least 5 resident O&G Specialists for hospital providing O&G specialist services (to ensure resident specialists services in labour ward on a 24hour basis.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	All state hospitals with resident specialist on monthly or 2 monthly visits to hospitals without resident specialists.	• Outreach specialty services to be initiated where appropriate • Concept of cluster hospitals to be enhanced • To work with institutions of attached higher learning to enhance service, esp subspeciality. • Sabatical leave for senior O&G consultants as incentives for retaining specialists
Outsourcing/ Purchase of Services	1. Radiotherapy services for northern region (Perlis, Kedah, Pulau Pinang, Northern Perak) Gynae-Oncology cases purchased from Mount Miriam Hospital 2. Radiotherapy services for Negeri Sembilan for Gynae-Oncology cases purchased from Nilai Cancer Institute & Cancer Hospital 3. Radiotherapy services for southern region (Johor and Melaka) Gynae-Oncology cases purchased from Mahkota Medical Centre	1. Embryology services in identified ART centres 2. Clinical & Surgical Oncology in appropriate areas

	CURRENT STATUS	PROPOSED EXPANSION
	4. Radiotherapy services for eastern region (Kelantan, Terengganu, Pahang) Gynae-Oncology cases purchased from HUSM Kubang Kerian 5. Radiotherapy services for Sabah Gynae-Oncology cases purchased from Sabah Medical Centre	
MOU with External Agencies / Universities	1. HTF with ACMS/USU 2. HSB& HSAH with AIMST 3. HRPB with Royal College of Medicine Perak, Quest Medical College 4. HPP with Penang Medical College 5. HSerdang with UPM 6. HSgB with UiTM, MAHSA 7. HSelayang with UITM, 8. HMelaka & HPSF with Melaka Manipal Medical College 9. HTJ&HSNI with IMU 10. HUS with UNIMAS 11. HAmpang, HTAN, HTampin with USIM 12. HTAA with UIA 13. HTAR with UM, MUST 14. HSA with Monash University, NuMed 15. HSI with NuMed 16. H Likas with Universiti Sabah 17. HSNZ with UNIZA 18. HKL with MAHSA, USIM, UiTM	

Major gaps/ issues/ challenges

1. Lack of centre of excellence for special skill development.
2. Lack of specialized nurses in O&G subspecialty
3. BER equipment not replaced in 5 years
4. Increase in medico-legal case with increasing quantum of payouts both ex gratia and court ordered
5. The lack of the practice of evidence based medicine
6. Increasing number of specialists leaving to the private
7. Inadequate staff: patient ratio in critical care area
8. Non availability of second OT's for obstetric emergencies within acceptable norms for waiting time.
9. Inadequate operative time for gynaecology (especially for oncology and miscarriages)
10. Inadequate availability of Ambulatory Care Services
11. Rising LSCS rate
12. Clinical governance

Proposals

New programmes / services	1. Subspecialty services- • Maternal Fetal Medicine • Gynae-Oncology in all state hospital (except – HKangar) • Uro-Gynaecology • Reproductive Medicine in all state hospital (except HKangar) • ART services in identified regional centres 2. EPAU- Early Pregnancy Assessment Unit in all hospitals with specialists services 3. PAC- Patient Admission Centre Unit in all hospitals with specialists services 4. New Services: • Uro-Gynaecology: – Urodynamic assessment Services – Definitive uro-gynaecological surgey • Maternal Fetal Medicine – Prenatal diagnosis – Fetal therapy services – Laser Therapy

	• Reproductive Medicine – Adolescent gynaecological service – Comprehensive contraceptive services – Menopause services • Gynae-Oncology – Colposcopy – Office Hysteroscopy – Comprehensive Gynae-oncology services (clinical and surgical oncology
Projects approved RMK11	1. Establishment of low risk centres to decrease hospital congestion (Seberang Jaya Hospital, cluster services to include O&G) 2. Women and Children's Hospital, HKL
Proposed projects – RMK11 mid term	1. Women and Children's Hospital in Kedah, Pulau Pinang and Kelantan – pending approval from EPU 2. To have Women and Children's Hospital for state hospitals with more than 15,000 deliveries/year 3. Create centre of excellence for specialized skills in minimal invasive surgery (laparoscopy)* 4. Research (specialists to collaborate with other agencies/bodies at local/international level)
Replacement/ procurement equipment	1. Replace BER equipment >10 years old and outdated equipment 2. Review of standard specification and norms for equipment 3. Review and updating existing O&G SOP manual 4. Review Perinatal Care Manual with BPKK
Training	**Special skills in O&G:** 1. Laparoscopic Surgery (MIS) 2. Office Hysteroscopy 3. Colposcopy 4. Obstetric Ultrasound for doctors 5. Family Planning 6. Specialised skills training for nurses (Diabetic Clinic, Bereavement counseling and EPAU) 7. Report writing for medico-legal cases 8. Role of the expert witness Formalise the O&G Training Calendar

Recommended staff: workload	**O&G Specialist workload norm** • 2 specialist : 2000 deliveries per year / 60 O&G bed • 3 specialist : 2000 deliveries per year in 5 years time/ 60 O&G bed • 4 specialists : 2000 deliveries per year in 10 years time / 60 O&G bed *Specialists norms to be attained in 10 years* **Nurses** • Increase the number of midwifery trained nurses in O&G to at least 80% • Nurse:patient in Labour Wards is 1:1 Shift system to MO & Specialists in Labour Wards
Other proposals	1. Implementing Clinical Risk Management Strategies 2. Optimising Evidence Based Practice through KPIs 3. National Training Calendar 4. Increase manpower supply to Labour Wards 5. Attaining specialist norms 6. Implementing Shift System in labour wards 7. Development of Obstetrics Skill Lab in all state hospitals 8. Enhance research culture and capacity 9. Create centre of excellence for specialized skills 10. Sabatical leave for senior O&G consultants as incentives for retaining specialists in MOH hospitals

GENERAL PAEDIATRICS

	PRESENT STATUS	PROPOSED EXPANSION
Availability of services	Currently available in all state and most district hospitals	This must be preceded by up grading of wards, laboratories and clinics. • Hospital Machang • Hospital Gua Musang • Hospital Besut • Hospital Gerik • Hospital Tampin • Hospital Kulai • Hospital Balik Pulau
Where previous services available but now not	Kuala Lipis, Bentong	N/A
Networking/ Outreach	Cluster Hospital concept in Pahang, with Temerloh covering Kuala Lipis and Bentong. Not adequate for Kuala Lipis	To expand cluster hospital concept to cover all hospitals with pediatric wards.
Outsourcing/ Purchase of Services	Nil.	NIL
MOU with External Agencies / Universities	• UPM – Hospital Serdang • UNIMAS – Hosp Umum Kuching • UIA – HTAA Kuantan	

Major gaps/ issues/ challenges

Sustaining adequate staffing in peripheral hospitals like Keningau, Sandakan, Tawau, Limbang, Kuala Lipis, Langkawi etc. Currently these hospitals are staffed by junior specialists or those undergoing gazettement with a high turnover rate.

Proposals

New programmes / services	Retrieval services to cover all hospitals without PICU and NICU.
Projects approved RMK11	Upgrading pediatric and neonatal wards in the following hospitals: 1. Hospital Tanah Merah 2. Hospital Kemaman 3. Hospital Balik Pulau 4. Hospital Sungai Bakap 5. Hospital Kudat.
Proposed projects – RMK11 mid term	Replace all beyond economic repair (BER) equipment in all pediatric departments.
Equipment replacement / procurement	Replacement of all equipment that is more than 10 years old. Automatic replacement of equipment beyond economic repair. Aim to achieve the equiping of pediatric departments according to Department Operational Policy
Training	Increase number of pediatricians training in General Pediatrics and Child Health
Recommended staff workload	As per Department Operating Policy
Other proposals	Nil

NEONATOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Neonatal services available in all state and major hospitals provided by neonatologists, paediatricians and allied health staff. Currently 33 neonatologists in 19 MOH hospitals, 2 in UMMC, 2 in HUSM, 1 UTAR, 3 PPUM (and 15 – 20 in private hospitals) Paediatric subspecialty services and paediatric surgical for neonates provided in: • HKL • Alor Setar • Kota Bharu • Johor Bahru • Kuching • Kota Kinabalu • Pulau Pinang • Ipoh (paeds surgical only) Neonatal and paediatric retrieval services in Sabah, Perak, Kedah , Kelantan and sponsored start up in HSB Selangor	All hospitals with resident Obstetric services should have resident Paediatrician and SCN to ensure safe care of newborn e.g. Hospital Kepala Batas
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• Networking with maternal and child services (and social services) at state level to improve antenatal and postnatal care • Outreach to parents on newborn care – recognition of danger signs, early presentation for NNJ, breastfeeding • Visits to district hospitals without specialists by rotating paediatricians	• To work with public health to have ambulatory phototherapy centres in KK where there are insufficient SCN beds • To have universal newborn hearing screening in the newer Klinik Kesihatan centers

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Nil	• Paediatric Cardiothoracic services • NICU/SCN beds in Tengku Mizan Hospital (Proposal)
MOU with External Agencies/ Universities	Wherever there are existing MOU between hospitals and Universities in the use of MOH facilities	Nil

Major gaps/ issues/ challenges

1. Constraints in manpower, space and consumable budget is one of the factors for death from neonatal sepsis in the preterm infants,
2. Inadequate number of Neonatologists and Paediatricians to meet the current & future needs of the country (MRCPH/Masters of Paediatrics).
3. Severe shortage of NICU nursing staff in terms of numbers – require another 3000 nurses. Apart from not meeting nursing norms for patient nursing (presently 1:4 ratio for NICU), select nurses are also required to provide support in breastfeeding, family support, developmental care, bereavement support and palliative care, newborn hearing screening.
4. Post basic training for neonatal nursing care cannot meet our needs especially if it is again compulsory for nurses to do midwifery for promotion
5. Insufficient NICU beds especially in KL and Selangor where there are 130000 livebirths. Private hospitals do not provide much care for the high risk newborns in view of costs for parents. NICU beds are occupied longer than necessary due to long waiting time for operative procedures for congenital heart disease.
6. Most paediatric departments do not have a dedicated budget for consumables used in NICU or PICU as the equipment are bought as “one off” and not “dasar baru” leding to disposable items being recycled
7. Development of Paediatric cardiothoracic services not in tandem with adult services. This long waiting list for cardiac surgery in newborns has resulted in added morbidity if not mortality – 50% of babies with congenital heart disease die if they are ventilated in the newborn period (from MNNR data)

8. To optimise networking with primary health care in the care of newborns post discharge especially management of NNJ
9. The need to continuously upgrade Neonatal ICU infrastructure and equipment
10. There is a need for evidence based decision in areas that absorb a lot of resources eg. genetic/metabolic services, home ventilation, ICU beds and retrieval services
11. Many of Under5 deaths are related to lack of access to medical care in a timely manner due to parental ignorance or neglect. Enhance work with primary health staff to reduce morbidity and mortality due to parental and antenatal issues

Proposals

New programmes/ services	Neonatology services should be available in all hospitals with more than 5,000 deliveries.
Projects approved RMK11	1. New NICU / SCN at Hospital Tuanku Jaafar and Hospital Kajang, Hospital Perlis 2. WCHKL 3. Neonatal Retrieval Services Kedah and Kelantan
Proposed projects – RMK11 mid term	1. Upgrading of NICU in HTAA Kuantan, HSAJB, Hospital Kuala Pilah, Hospital Tawau, (Reserve list – Melaka & Sultanah Bahiyah) 2. Upgrading of level 2 nurseries in district hospitals to allow step down care
Equipment replacement / procurement	All neonatal and paediatric equipment >10 years old should be replaced
Training	1. Strengthening of neonatology training by establishing international networking and benchmarking 2. To continue current practice of sending 1-2 Paediatricians overseas annually to complete this subspecialty training 3. To increase the number of neonatologists by having alternative not requiring full scholarship as we have at least 10 training centres for full 3 year training (in 2 centres per trainee) and there are paid jobs overseas. Study leave for 2 years should be allowed to facilitate entry into structured training programs overseas 4. Training of specialists as educational trainers

	5. Number of Neonatal and Paediatric post basic nursing and medical courses should increase. 6. Update on Paediatrics and Neonatal courses at regional centres. A 2 day course for all Medical Officers at least once a year in Paediatrics. 7. Upgrading of resuscitation training equipment in hospitals with specialists – All HO, Paediatric MO, neonatal and delivery room staff need to be trained so training needs to be in-house
Recommended staff: workload	1. Neonatologists for hospitals with >5,000 deliveries per year. Norm for Neonatologists/ Paediatrician is 1: 3000 livebirths with at least 1 Neonatologist in smaller hospitals and 2-4 per Level IV hospital 2. Medical officers and allied health staff – to refer department operating policy
Other proposals	1. Career pathway and Training of Specialised Assistant Medical Officers in respiratory therapy, echocardiography and ultrasonography in NICU 2. Career pathway for Clinical Neonatal Specialist for being the mentor for in house neonatal nurse training and supervision 3. Implementing Clinical Risk Management 4. Optimising Evidence Based Practice by updating current national protocol book 5. Training on use of CPAP in delivery room and STABLE (stabilisation course post resus) courses

PAEDIATRIC INTENSIVE CARE SERVICES

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	With Intensivist • Institut Pediatrik Hospital Kuala Lumpur (Currently under Anaesthesia Department but will be hand-over to Paeditric Department once move to WCH,KL) • Hospital Serdang • HPP • HSB • Hospital Likas, KK • HUS • Hospital Malacca Without intensivist • HRPZII • HTAA • HTAR • HRPB • HSNZ • HSA • HTF • HTJ	1. All state hospitals should have a designated PICU with Paediatric Intensivist 2. Only selected District Hospitals need to have PICU as this will be more cost effective and provide a better outcome. 3. Increase number of PICU beds in state/ major specialist hospitals in all regions and have their own networking for their region so that all PICU bed will be fully utilized. • North: HSB, HPP, HRPB • Central: HTAR, HSerdang, Institut Paediatrik • Mid-south: Seremban, Melaka • South: HSA, HSI • East: HRPZ II, HSNZ, HTAA • Sabah: HLikas • Sarawak: HUS 4. Paediatric Intensive Care Services need to be developed in the following hospitals due to the area that they present(high demand of PICU bed or very far from a tertiary centre) • HTAR • HSI • HoSHAS • HSibu • HMiri 5. The major centres with PICU bed more then 12 and referral centre for major subspeciality should have at least 4 paediatric Intensivist and at least two in the state hospitals. * Please refer to Dasar Baru 2016

Where previous services available but now not	NIL	N/A
Networking/ Outreach	Phone consultations from all other hospitals based on regions.	Networking with UMMC, HUKM, WCH,KL and Serdang for better bed utilization for all paediatric patients that require PICU care in the Klang Valley
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	Wherever there are existing MOU between hospitals and Universities in the use of MOH facilities (i.e: Selayang)	

Major gaps/ issues/ challenges

1. **Manpower**
    - Shortages of Paediatric Intensivists in all major states.ie, WP, Selangor, Kelantan, Johor Bahru, Terengganu, Ipoh, Melaka, Kedah, Pulau Pinang, Sabah and Sarawak.
    - Currently the existing centres only have one Paediatric Intensivist while demand and patient load require a minimum of 3-4 persons to run the service.
    - Wide gap between senior and second layer of specialists
    - High attrition rate as this field has a highest demand physically and emotionally.
    - More Ex-premature babies with Chronic Lung Diseases survives due to better NICU care that require PICU care but the funds provided for PICU is much less compared to NICU
2. **Equipment**
    - More funds are required to buy and replace equipment in all states as most of the equipment (such as ventilators, NIV, monitors and ultrasound machines) are more than 10 years old and inadequate.
    - No funding was obtained despite dasar baru which was forwarded in 2016.

3. Support Staff

- The service requires support staff to run the Respiratory Haemodynamic Unit which is very lacking. Usually these services are provided by Medical Assistants (MA) who were trained and credentialed by their respective units. However in many of the units only have one or two staff and does not meet the number requested in the Dasar Baru. The unit need to compete for the numbers from the general pool posted to the the hospital and the subspecialty unit may not be of the utmost priority of the posting compared to Emergency Department or Anesthesiology. With promotion, these trained staff may be transferred out to another hospitals leaving for an untrained person to fill in.
- Lack of career pathway for support staffs in the subspeciality areas
- Inadequate Nurses:Patient ratio to meet the standard for patient care in PICU and PHDU

Proposals

New programmes / services	1. Paediatric Retrieval Services for paediatric patient in Klang Valley who require PICU/ NICU care • based in the Woman and Children Hospital Kuala Lumpur involving Neonatologist and Paediatric Emergency Medicine 2. To establish the Medical Emergency Team (MET) once numbers of Intensivist and supporting staff are adequate 3. To have all the PICU nurses to go through Diploma of Intensive Care Nursing which will increase the standard of PICU care in Malaysia
Projects approved under RMK-11	**Upgrading PICU in the following hospitals:** • HTAR • HSA • HSNZ • HUS **PICU/ PHDW development/ upgrade plans under Dasar Baru 2016** • 2017 – 2021: All state hospitals • 2017 – 2018: HTAR, HoSHAS, HSelayang • 2018 – 2019: HSI • 2018 – 2020: HSibu, HMiri • 2019 – 2021: HRPZ II

Proposed projects – RMK11 mid term	Upgarding PICU/HDU for: • Hospital Melaka • HTAA
Equipment replacement / procurement	All regional centres should have; All PICU equipment more than 10 years old should be replaced
Training	1. Strengthening the current sub-speciality training with international networking and having proper assessment 2. Training of assistant medical officers in areas of respiratory heamodynamic unit by encouraging them to apply for advanced training at diploma level 3. Training of specialized nurses in paediatric critical care medicine.
Recommended staff workload	The major centres with more than 12 PICU beds & referral centres for major subspeciality services should have at least 4 paediatric Intensivist and at least two in the state hospitals. 1 subspecialist for every 100,000 children PICU: One nurse to one patient PHDW: One nurse to two patients Allied Health: refer to department policy
Other proposals	To create Evidence Base Practice Guidelines in Paediatric Critical Care one the numbers of Intensivist are adequate

PAEDIATRIC CARDIOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Present availability of services	Paediatric Cardiology Sub-Specialty services are provided in : • HPP • HSerdang • HSAJB • HTAA • HPRZ II • HQE II • HUS • IPHKL (only non-invasive)	All centres with Paediatric Cardiology Services must be improved and expanded in terms of infrastructures, equipments, facilities, manpower and operating financial support.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• Specialists visit to Hosp Seb Jaya, Penang, Hospitals in Sabah and Sarawak. • HUSM for HRPZII	Paediatric Cardiology Centres should be considered as regional centres and progress as such.
Outsourcing/ Purchase of Services	• Referrals to IJN • Referrals to Hosp. Narayana Bangalore India for open heart surgeries under the Paediatric Cardiothoracic Surgery programme.	Paediatric Cardiothoracic services either locally (private hospitals with cardiothoracic services) or at renowned centres in nearby countries.
MOU with External Agencies/ Universities	NIL	

Major gaps/ issues/ challenges

1. Limited number of Paediatric Cardiologists.
2. Development of Paediatric cardiothoracic services not in tandem with adult services resulting in long waiting list for cardiac surgery in children.
3. New group of patients Adults with CHD or GUCH (grown-ups with CHD) is appearing that need treatment and care.

Proposals

New programmes / services	Each centre must have an independent location/buildings or labs, clinics, wards, PCICU with the basic facilities to provide services, in the form of invasive and non-invasive investigations, treatment and care and also follow-ups of patients.
Projects approved under RMK-11	Awaiting for the new multi- storey building to be built at SJH where Paediatric Cardiology Service is incorporated into. Despite being approved the construction has not yet taken off.
Proposed projects – RMK11 mid term	Nil
Equipment replacement / procurement	1. All equipment >10 years old should be replaced (e.g echo machines, Holter). 2. Cardiac MRI must be compatible to paediatric patients 3. ICL must always be biplane with low dose radiation capability. 4. Better off to have independent paediatric dedicated equipments rather than always share with adults cardiology.
Training	1. Strengthening of basic specialty training by establishing international networking and benchmarking 2. Prioritize Paediatric Cardiology Subspecialty Training with at least1-2 slots annually. 3. Further training in subspecialty of paediatric cardiology must be encourage especially in invasive transcatheter interventions. 4. Training for nurses and paramedics also must take into account so that staff and patients ratio is appropriate.
Recommended staff: workload	Refer to Appendix I
Other proposals	

APPENDIX I

MANPOWER REQUIREMENT FOR PAEDIATRIC CARDIOLOGY UNIT IN MOH CARDIAC CENTRES

	GRADE	SHORT TERM				LONG TERM					
		PCICU	Clinic	Echo	ICL	PCICU	Clinic	Ward	Echo/ Stress/ EP room	HDA	ICL
Cardiologist	UD54 and above	2(1)				4 – 6					
Fellow trainee	UD48 – UD54	4 (2)				6					
MO	UD41 – UD44	2 (1)				4	3	3	4	1	–
MA	U41					1	1	1	2	1	3
	U36						1				
	U32	1(1)	–	–	–	–	1		1	–	1
	U29	2(1)	2(1)	2(0)	2(0)	3	2	1	8	1	8
Nurses	U41					30	1	8	2	4	3
	U36						1				
	U32	–	–	–	–	1	1	1	–	1	1
	U29	25(7)	2(2)	–	2(0)	90	4	24	8	12	8
	U19	–	2(1)	1(0)	–	–	3	10	8	–	–
Others	U3	3(0)	1(0)	–	–	6	2	10	3	4	3
	N17	–	1(0)	–	–	1	1	1	1	–	–

** Numbers in brackets () denote current existing number*
*** These numbers need to be each multiplied by the number of Paediatric Cardiology Centres to be developed in the country (tentatively 7 centres)*

PAEDIATRIC RESPIRATORY MEDICINE

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Six (6) hospitals ; • Institut Pediatrik Kuala Lumpur • Hospital Serdang • HPP • HRPZ II • HTAA • HTAR • HUS: Paediatric Respiratory Physician sessional	1. Major Paediatric Respiratory service in all regions • North: HPP, HSB • Central: Institut Pediatrik, Hospital Serdang & HTAR • South: HSA • East: HRPZ II & HTAA • Sabah: Hospital Likas • Sarawak: Hospital Umum Sarawak. 2. The service in these hospitals will provide all major services in paediatric respiratory medicine. All major respiratory units will have a sleep diagnostics, General respiratory including Respiratory High Dependency Ward (RHDW), laboratory diagnostics (lung function, bronchoscopy, Cardiorespiratory laboratory) and ambulatory services. 3. Pediatric respiratory service in other state hospitals such as HRPB, HMelaka, HTJ, HoSHAS, HDOK and HMiri. These centres will not provide sleep diagnostics. 4. The major regional centres will have at least 4 pediatric respiratory physicians and at least two in the state hospitals.
Where previous services available but now not	NIL	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	Scheduled visits by Paediatric Respiratory Physician 1. Institut Pediatrik to • HLikas • HDOK • HSA • HSI • HSNI • HPSF • HUS • HSibu 2. HTAA to HoSHAS 3. HPP to HSB 4. HRPZ II to HSNZ 5. Hospital Serdang/ HTAR to Hospital Selayang Combined Respiratory Cinic for transitional care of respiratory patients in IPR. once a forthnight Phone consultations from all other hospitals based on regions.	• HRPZ II with USM • H TJ with IMU • HTAA with UIA • HTAR with Hospital UITM • Institut Pediatrik And Hospital Serdang with HUKM
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	• Wherever there are existing MOU between hospitals and Universities in the use of MOH facilities • Provide training in Paediatric Respiratory subspeciality to specialists from HUKM and UITM	

Major gaps/ issues/ challenges

1. **Manpower**
    - Shortages of paediatric respiratory physician in major states.ie, Johor Bahru, Terengganu, Ipoh, Melaka, Sabah and Sarawak.
    - The proposal forwarded for pediatric respiratory development in 2020 was not met due to small number of training applicants.
    - Currently the existing centres with paediatric respiratory physicians are only managed by one person whereas the demand and load of patients require a minimum two persons to run the services.
    - Wide gap between senior and second layer of specialists
2. **Equipment**
    - More funds are required to buy and replace equipments in regional centres such as NIV, bronchoscopy, lung function tests. Hospital Tengku Ampuan Rahimah started pediatrics respiratory service in 2015 and requires funding for important equipments for the service.
    - No funding was obtained despite dasar baru which was forwarded in 2016.
3. **Support Staff**
    - Support staff is needed to run the lung function lab, Sleep laboratory, Bronchoscopy and Non-invasive ventilation. Usually these services are provided by Medical Assistants (MA) who were trained and credentialed by their respective units. However in many of the units only have one or two staff and does not meet the number requested in the Dasar Baru. The unit need to compete for the numbers from the general pool posted to the the hospital and the subspecialty unit may not be of the utmost priority of the posting compared to Emergency Department or Anesthesiology. With promotion, these trained staff may be transferred out to another hospitals leaving for an untrained person to fill in.
    - Lack of career pathway for support staffs in the subspeciality areas .
4. **The need to work closely with the primary care physician and community nurses**

Proposals

New programmes/ services	1. Paediatric Airway service in the Woman and Children Hospital in Kuala Lumpur which involves a multidisciplinary team. 2. Establishing A Long term ventilation team in all regional centres. 3. Establishing Respiratory High Dependency Ward in all regional centres. 4. Establishing a Transitional Care Policy for paediatric respiratory patients turning into adulthood. 5. introduction of advance paediatric training in Paediatric respiratory medicine or support staff
Projects approved RMK11	Dasar Baru Paediatric Respiratory Medicine Dasar Baru for Home ventilation
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	All regional centres should have; • Complete video-bronchoscopy system complete with teaching scope for training • Comprehensive lung function equipment with facilities for cardiopulmonary stress testing • Polysomnography in all regional centres • Replacement of equipments more than 10 years. • Hospital based continuous positive airway pressure (CPAP) and BiPAP machine and oxygen concentrator machines
Training	1. Training of a paediatric airway team comprising of paediatric respiratory physicians, paediatric surgeons, anaesthetists and OT nurses. 2. Advanced training on sleep-related respiratory medicine
Recommended staff: workload	The major regional centres will have at least 4 paediatric respiratory physicians and at least two in the state hospitals. 1 subspecialist for every 100,000 children RHDW: One nurse to two beds ratio Allied Health: refer to department policy

Other proposals	1. Training of assistant medical officers in areas of lung function, sleep technologist, non invasive ventilation and related areas of respiratory pediatrics 2. Training of specialized nurses in paediatric respiratory medicine. 3. To develop smart partnership between universities, IJN and MOH in paediatric respiratory medicine. 4. To credential all the sleep laboratories according to the international standards.

PAEDIATRIC NEPHROLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Resident paediatric nephrology services available in: • HKL, • Hospital Selayang, • HTJ • HSI • HPP • HTAA	Hospital Likas and Hospital Umum Sarawak
Where previous services available but now not	Hospital Likas, Sabah	N/A
Networking/ Outreach	• Outreach, to Perak Kelantan, Sabah and Sarawak by specialists from HKL. • Outreach to regional areas by the regional centres eg specialist from Seremban covers Melaka, Kuantan covers Terengganu, P Pinang covers Kedah and Perlis	Outreach to all district hospitals with resident paediatric services.
Outsourcing/ Purchase of Services	In centres without resident paediatric nephrologists but with resident adult nephrologists, adult nephrologists also assist in the care of paediatric patients especially those on dialysis.	Suggest to purchase of services of paediatric kidney transplant surgeon and other surgical services like arteriovenous fistula creation and other dialysis access services.
MOU with External Agencies/ Universities	Paediatric nephrologist from HUSM help run the paediatric nephrology clinic in HRPZII and care for children with kidney disease.	

Major gaps/ issues/ challenges

1. Over the next 4 years, 4 (out of 10) paediatric nephrologists in KKM will be retiring.
2. Children and adolescents comprise only about 1% of all dialysis patients. Hence the numbers in each paediatric nephrology centre are insufficient to have separate paediatric dialysis centres, particularly hemodialysis centres. These children are cared for in adult units under the care of paediatric nephrologists.
3. Although children and adolescents on dialysis comprise only about 1% of all dialysis patients, resource allocations for dialysis in this group can sometimes be challenging. More than 95% of funding for dialysis in children are from the government unlike in adults where the government funding comprised only about 60%. There is no separate allocations for dialysis in children. This has sometimes caused problems in dialysis slots for children as funding for dialysis is under adult nephrology.
4. Children who require automated peritoneal dialysis may not be able to receive this therapy. Currently, most of funding for afre from pensions fund, Baitumal and occasionally charity organisations
5. The waiting list for live related transplant is rather long. Vascular access surgery for children is very challenging. Most surgeons are not keen to perform these procedures. Some of the parents of children who require AVFs have resorted to have their AVFs done in private and paying out of their own pocket because of better success rate.

Proposals

New programmes / services	1. Funding for dialysis in children be separated out from adults. 2. Automated peritoneal dialysis programme and funding for paediatric patients
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Replacement of Peritoneal dialysis cyclers /CRRT machines

Training	Continue intake of paediatric nephrology trainees to replace those retiring and to increase the number to man the newer centres and increase services in existing centres. Except for HKL, all other paediatric nephrology centres have only one consultant paediatric nephrologist. Three paediatric specialists have expressed interest in specialising in paediatric nephrology – • one from Hospital Likas, • one from HUS Kuching and • one from Johor Bahru. Priority should be given particularly to the two from East Malaysia as they will then be able to provide resident paediatric nephrology services to the children from East Malaysia. It takes at least 3 years to train a paediatric nephrologist. Nurses and PPPs to receive training in dialysis if they serve in paediatric dialysis units. Staff to HD patients about 1:2 for children.
Recommended staff: workload	Hemodialysis nurse/PPP: child on HD = 1:2
Other proposals	Nil

PAEDIATRIC ENDOCRINOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	<u>MoH hospitals (4):</u> • Paediatric Institute, HKL • HPJ • HPP • HWKKL *Currently there are 6 paediatric endocrinologist & 5 paediatric endocrine trainees in various years of training in MoH hospitals. It has been planned that they are placed according to the northern region, central, south and east coast of Peninsular Malaysia and in East Malaysia (Sabah and Sarawak).* <u>Non-MoH hospitals</u> • PPUKM (2) • PPUM (2) • HUSM (1) • UPM (1) • UiTM (1) • Private hospital (1)	All state hospitals should have at least one paediatric endocrinologist to manage children and adolescents with various endocrine disorders and the increasing number of non-communicable diseases such as childhood obesity and type 2 diabetes mellitus.
Where previous services available but now not	Nil	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	• Networking and collaboration with the local universities i.e PPUM and PPUKM for the training of paediatricians under the Paediatric Endocrinology Subspecialty Training Program. • Visiting paediatric endocrinology clinic services provided by HPJ to other MOH hospitals upon request, which include HSA, HSI, HPSF, HMelaka, HSibu and HUS. • Visiting paediatric endocrinology clinic services to HSB by paediatric endocrinologist from HPP. • Constantly providing consultation via telephone calls and e-mails from doctors/ paediatricians in Malaysia including Sabah and Sarawak.	• To work with public health in detection of non-communicable diseases among children and adolescents. • To collaborate with primary health care in the care of patients with childhood obesity. • Newborn Congenital Hypothyroidism Screening Program : For missing cases, the health clinics can assist to do thyroid function test on day 3-5 of life and start treatment timely for babies with abnormal results before urgently referring such babies to the hospitals for further management and follow up.
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Wherever there are existing MOU between hospitals and Universities in the use of MOH facilities.	Nil

Major gaps/ issues/ challenges

Major issues include constraints in manpower, space, drugs and consumable/reagent budget.

1. Endocrine funding in general has been very much focused on adult discipline. Paediatric endocrine subspecialty needs a separate budget regularly from MOH.
   - Not enough budget provided for treatment of patients who require growth hormone therapy, LHRH agonists to arrest puberty, insulin analogues where there are drug quota by the hospital/pharmacy. This will limit the number of patients that can be treated.
   - Not enough budget for Pathology Department to procure certain reagents to conduct tests in endocrinology. We need to resort to the private laboratory such as the Gribbles Lab.
   - Not enough budget for a good stadiometer for accurate height measurement in growing children and orchidometer to monitor puberty in boys.
   - No budget for HbA1c point of care and reagents.

2. Availability of glucose and ketone testing strips continued to be a challenge in diabetes self-care leading to poor glycaemic control among paediatric diabetic patients. It is hope that glucose and ketone testing strips can be either heavily subsidized or given freely to paediatric patients. This is going to reduce diabetes related complications in adulthood and is cost effective in the long run.

3. Inadequate number of paediatric endocrinologists to meet the current and future needs of the country.

4. Currently there are inadequate personnel to form a diabetes care team in centres with paediatric endocrinologists.
   - No trained paediatric diabetes educators. At present we depend on diabetes educators for adult patients to counsel paediatric patients.
   - No dietitian specially designated to paediatric patients with diabetes and obesity
   - No child psychologist to cater for the needs of the patients with diabetes
   - No physiotherapist specially dedicated to diabetes and obese paediatric patients

5. Endocrine trained nurse is needed to conduct various endocrine dynamic testing and to administer certain endocrine therapeutic agent. Currently there is no endocrine trained nurse to deal with patients who require various endocrine testing and this will expose the patients to higher risk of error.

6. To optimise networking with primary health care in the care of patients with childhood obesity.

Proposals

New programmes/ services	1. To ensure that the KPI for paediatric endocrinology is carried out successfully in hospitals with paediatric endocrinologists. 2. Diabetes camps should be a yearly activity to promote optimal diabetes self-care practice among patients with diabetes in hospitals with paediatric endocrinologists. As a support for this acitivity, MOH can provide adequate funding yearly.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	1. Endocrine Complex Project under RMK11 : It is a RM350 million project at Hospital Putrajaya that will be built tentatively at the end of 2016 and will be completed in 2018. 2. The endocrine complex will encompass the following disciplines: adult endocrine, surgical endocrine, neurosurgery and paediatric endocrine. 3. There will be 2 paediatric endocrine wards (30 beds each), paediatric endocrine HDU (10 beds), ICU (6 beds) and 10 consultation rooms at Paediatric Endocrine Clinic. 4. A number of beds/cubicles/consultation rooms have been identified to cater for bariatric inpatients and outpatients.
Replacement/ procurement equipment	Procurement of equipment : • Stadiometer (standing and sitting) • Orchidometer • POCT HbA1c machine and reagent
Training	1. To strengthen paediatric endocrinology training by establishing international networking and benchmarking. 2. To continue current practice of sending 1-2 paediatricians annually for subspecialty training in renowned centres abroad. 3. To increase the number of paediatric endocrinologists by having more training centres in MOH hospitals. 4. To identify nurses to be trained as paediatric diabetes educators and endocrine trained nurse. 5. To organise updates/courses on paediatric endocrinology at regional centres : a 1-2 day course for medical officers at least once a year

Recommended staff: workload	1. At least one paediatric endocrinologist per state hospital. In bigger states as Sarawak, more than 1 paediatric endocrinologist can be advocated. 2. Medical officers and allied health staff – to refer to department operating policy 3. For centres with paediatric endocrinologists: - Diabetes care team should be formed, which include psychologist dedicated to paediatrics, paediatric diabetes nurse educator, dietitian dedicated to paediatrics. - Obesity care team should be formed, which include the personnel's from diabetes care team, with an addition of physiotherapist dedicated to paediatrics. 4. For the future endocrine complex at Putrajaya, at least one paediatric intensive specialist and adequate ICU nursing staff should be made available to provide optimal service to the post-operative patients (neurosurgical) and endocrine emergency cases. 5. For the future endocrine complex at Putrajaya, 2 endocrine trained nurses should be available to perform endocrine related dynamic testing and medication administration.
Other proposals	1. Career pathway and training of paediatric diabetes educators. 2. Career pathway for training for paediatric endocrine nurses by having post basic training in paediatric endocrine.

PAEDIATRIC NEUROLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of resident services	Paediatric Neurology services are currently available at • HKL • HPP • HWKKL • HUS • HRPZ II • HSI	1. Expansion of services at WCHKL as a national referral center 2. At least two paediatric neurologists in other regional centers 3. Five state hospitals • HSB, • HRPB • HTAR • HTAA • Hospital Melaka
Networking / outreach	Scheduled visits by current paediatric neurologists to hospitals without resident paediatric neurologists:- **HKL**: HTAR, HTAA HoSHAS, HMelaka, HPSF, HSNI, Segamat, Kluang, HSI, HSA, Kluang, HSB, HTF, HSNZ, Sabah, Sarawak **Penang Hospital**: HSJ, HSB **HWKKL** → HDOK, HTawau, HLahad Datu, HLabuan **HUS:** Sibu, Miri **HRPZ II:** HSNZ, HKuala Krai, HTM	Rescheduled to:- • **HKL**→HTAR, HTAA, HoSHAS, Melaka • **Penang Hospital**→ HSJ, HSB, HTF, HRPB • **HWKKL** → HDOK, Tawau, Lahad Datu, Labuan • **HUS** → Sibu, Miri, Bintulu • **HRPZ II**→ HSNZ, HKuala Krai, HTM • **HSI** → HPSF, HSNI, Segamat, Kluang In addition:- • **HKL**→HTJ

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Service	1. No clinical psychology services except HKL and HPP 2. Orthotic services by employing private orthotic specialist on sessional basis in HKL. 3. Many epilepsy surgical patients still need to have the surgery done at private hospital (SDMC) 4. Old and limited neuroimaging services (only has one 1.5 Tesla MRI scan in HKL). Need a 3.0 Tesla MRI, functional MRI, PET or SPECT scans.	1. Clinical Psychology services in all regional centers (Penang, Kota Bharu, Johor Bahru, Kuching, Kota Kinabalu) 2. Orthotic services (sessional or full time) in all regional paediatric centers as above. 3. Creation /expansion of neurosurgical services for paediatric epilepsy patients at WCHKL (as National Epilepsy Surgery Center) 4. Upgrade the neuroimaging services at WCHKL with 3.0 Tesla MRI
Collaboration with Universities / Other agencies	1. Heavy workload in EEG reportings for all current MOH paediatric neurologists 2. EEGs done at Melaka Hospital is reported by paediatric neurologist at Manipal Medical Center 3. Only HUSM, HUKM and UMMC currently have paediatric neurology services	1. Paediatric Neurologists at private practice should be encouraged to provide on part time basis (sessional) paediatric neurology services in MOH hospitals facing acute shortage (eg Ipoh) 2. Strengthening research collaboration with the Universities and IMR.
No. of Specialists (& trainees in brackets)	10 (1)	Projection by end of 11th MP: 14 (6)

Major gaps/ issues/ challenges

1. The number of paediatric neurologists (both in MOH as well as in the universities) is currently far too few to cater for the rapidly increasing number children with neurological disorders leading to overworked and 'burnt-out' phenomenon. (Norm: 1 Paediatric Neurologist per 100,000 children, hence **we need 100 in Malaysia**)
2. Too few training post for paediatric neurology though we have capacity of training at least 4 in a year
3. The expansion of paediatric neurology services lacks the concomitant expansion of essential supporting services in neurophysiology, neuropathology, epilepsy neurosurgery, functional neuroimaging, neuropsychology, neurodisability and neurorehabilitative services.

Proposals

New programmes / services	Nil
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Nil
Proposed training	1. MOH should provide better promotion prospect for middle rank paediatric neurologists to retain them in MOH. 2. MOH should consider fast tracking the applications from young paediatricians for this subspecialty, create enough number of scholarships and equitable placement once they have completed their training. 3. Alternate pathways of training that do not require scholarships need to be explored. 4. Encourage and facilitate overseas Malaysian paediatric neurologists to return and work in MOH.

	5. The minimum number of paediatric neurologists required by end of 11th MP is 20 (At least 4 paediatric neurologists for WCHKL, 2 per regional centers for the rest, one each for Klang, Ipoh, Kuantan, Melaka, Alor Star) 6. MOH should ensure these supporting services also develop in all the regional hospitals. It is also essential to further develop/ upgrade the neuropathology, functional neuroimaging and epilepsy neurosurgery in WCHKL.
Recommended staff: workload	Projection by end of 11th MP: 14 (6) Currently: 10 (1) ** number in brackets represent trainees*
Other proposals	Dasar Baru for 2010-2011 on 'Upgrading of Paediatric Neurophysiology Services' in six regional centers was submitted in RMK 10 but was not approved. Paediatric Neurology Unit is currently under Paediatric Department. Its requirement in term of physical facilities and equipment, budget and human resource development (paediatric neurologists, other supporting professionals and allied health staff) to meet the service demands are often not recognized at MOH central agencies. Currently, there is no Child Development Center (CDC) in MOH hospitals. The only one in Malaysia is at HUKM and hopefully one soon at WCHKL. 1. Will resubmit a Daru Baru in 2018-2019 on 'Upgrading of Paediatric Neurology Services' in six regional centers and five state hospitals to enable proper functioning of Paediatric Neurologists posted or currently available at these six regional centers. (HKL, Penang, KB, JB, Kuching, KK) and five State hospitals (Alor Star, Ipoh, Klang, Melaka, Kuantan) 2. To build Child Development Centers at the five regional centers in 11-12th MP. (Penang, KK, Kuching, KB, and HSIJB)

	3. To upgrade Paediatric Neurology Unit at WCHKL to Division of Paediatric Neurosciences to better reflects its service scope. The Units under Division of Paediatric Neurosciences should include:- • General Paediatric Neurology Unit • Paediatric Neurophysiology Unit • Comprehensive Epilepsy Program Unit • Neonatal Neurology Unit • Paediatric Neuromuscular Unit • Child Development Center 4. Community Neurodisability and Palliative Care Unit

PAEDIATRIC INFECTIOUS DISEASE

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Available in nine (9) hospitals: 1. Institut Pediatrik (2) 2. HPP (1) 3. HTJ (1) 4. HRPZ II (1) 5. HSNZ (1) 6. HRPB (1) 7. HSAH (1) 8. HWKKL (2)	Hospitals to have PID specialist: 1. HSA 2. HSgB 3. HSB 4. HMelaka 5. HUS 6. HTAA 7. to have new PID specialists. Existing services in Institut Pediatrik Kuala Lumpur , Kota Bharu , Penang and Seremban to have one additional PID specialists. Projection for 10 additional PID specialist posts to be created over the next 5 years
Where previous services available but now not	Nil	N/A
Networking/ Outreach	**Institut Pediatrik**: HAS, HSI,HMelaka, HSNI, HKluang, HMuar, HSegamat, HTAR, HSgB **HWKKL**: HDOK, HTawau & HLahad Datu **HSAH**: HSB, HLangkawi **HRPB:** covering 3 district hospitals in Perak	Nil
Outsourcing / Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Nil	Nil

Major gaps/ issues/ challenges

Inadequate number of ID Physicians. Currently 10 PID specialists in the specialty with 3 currently under training(including one overseas)

Proposals

New programmes/ services	One Transplant Infectious Diseases in HKL and one in HSelayang , Infectious Disease Genomics in HKL
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	NIl
Training	To increase number of Paeds ID training posts from one per year to two per year over the next five years.
Recommended staff: workload	2 Paeds ID specialist in every state & 3 in HKL
Other proposals	To increase overseas fellowship scholarship to 2 per year

PAEDIATRIC DERMATOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Available in three (3) hospitals; • HKL • HPP • Hospital Melaka	• To have Paediatric Dermatologists in all state hospitals • To have minimum 4 consultant at the tertiary center (HKL) to develop new sub specialty within Paeds Dermatology, e.g Skin allergy, Genodermatoses, Vascular Anomalies clinic and Laser services
Where previous services available but now not	Nil	N/A
Networking/ Outreach	HKL • HSelayang, HAmpang (2 monthly) • HSB, HRPB (4 monthly) • HoSHAS, HSA (6 monthly) • HUS, HQE, HMiri (6 monthly) • HRPZ II, HSNZ (6 monthly)	To provide budget for the paeds dermatologist to cover other hospitals 1. HPP to cover the Northern region 2. H.Melaka to cover the Southern region 3. HKL to cover east Malaysia/ east coast
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Only one Paediatric Dermatologist in Private sector None in the Universitie	Nil

Major gaps/ issues/ challenges

1. Need to train more Paediatric Dermatologists, currently only 5 trained Paediatric Dermatologist for whole country
2. Need to further develop the services under Paeds Derm like, skin allergy, genetic testing for genodermatoses, paediatric dermatophatology and vascular anomalies services
3. To prevent transfer / promotion of trained paramedics in Paeds Derm to other discipline, needs to create promotional post within the discipline
4. Need to upgrade and improve skill, providing more scholarship for attachment and specific program for paramedics like nurses, dietician and pharmacists
5. Lack of community Skin Nursing services
6. Inadequate budget for consumables and List A drugs
7. Inadequate laser facilities (minimum vascular laser) in major hospitals outside HKL
8. Lack of research activities in Paediatric Dermatology

Proposals

New programmes/ services	1. To develop regional centers in Pulau Pinang, Johor Baru, Kota Baru, Kuching and Kota Kinabalu, to provide wider access to tertiary care outside the Klang Valley 2. To further develop the services under Paeds Derm like, skin allergy, genetic testing for genodermatoses, paediatric dermatophatology and vascular anomalies services, pigment lasers 3. Improve the multidisciplinary service with radio-intervention for patients with vascular anomalies 4. Melanocytic cell transplant for vitiligo 5. Community Skin Nursing services
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Dasar Baru for the following services • Epidermolysis Bullosa consumables for whole country • Skin Allergy services –with provision of special formula • Vascular laser services at regional centers • Provision for genetic analysis for genodermatoses at central region

Replacement/ procurement equipment	Nil
Training	**Paediatric Dermatologist** 1 scholarships per year for overseas subspecialty training **Specialist Nurses in Paeds Derm** Presently there are no Specialist Nurses in Paediatric Dermatology. Initial training for core team should be done overseas. Minimum training period of 6 months. With 2 scholarships per year **Overseas sub specialisation training for a team of specialists and paramedic:** • Allergy - food challenges • Vascular anomalies service • Melanocytic cell transplant for treatment of vitiligo • Paediatric hair & nail disorders
Recommended staff: workload	Dermatologist requirement according to level of care: • Tertiary Centre (Paediatric Dermatology HKL) – 4 consultants • Regional centres (6 centres.) - 2 Consultants @ 2 each • State Hospital – 1 consultant @ each hospital • 2 trained nurses for each state hospital • 2 trained medical assistants for each state hospital • One trained dietician at tertiary center (HKL) • One trained psychologist at tertiary center (HKL) • One trained pharmacist at tertiary center (HKL)
Other proposals	• Posts for nurse clinical specialists in eczema, birthmarks, laser therapy and allergy. • Incentive for subspecialists • Promotion - To create adequate promotional posts

PAEDIATRIC RHEUMATOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Paediatric Rheumatology subspeciality services are available only in Hospital Selayang	1. To strengthen and consolidate existing services in Hospital Selayang to become a centre of excellence for Paediatric Rheumatology. 2. To start paediatric resident Paediatric Rheumatology services in 1 other state hospital once numbers are adequate
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Paediatric Rheumatologist visit the following hospitals: • HRPZII • HRPB • HSA	To expand outreach clinics to include Sabah and Sarawak
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Severe shortage of Paediatric Rheumatologist to meet the current & future needs of the country resulting in suboptimal care for these patients. In Malaysia, there are currently only 3 paediatric rheumatologist (1 civil service, 2 in private practice). Comparing with Singapore – 6 paediatric rheumatologist for a country with only 5 million population versus Malaysia, 3 for almost 30 million population.
2. No dedicated Ultrasound machine (for Musculoskeletal) even though the service has been in existence for the last 13 years (since 2003). Ultrasound is now considered a vital diagnostic and therapeutic tool for management of arthritis.
3. Inadequate or lack of exposure of undergraduate and postgraduate doctors in the field of paediatric rheumatology causing major delays in recognition and diagnosis
4. Lack of trained support staff – paediatric specialist nurse, occupational therapist, physiotherapist, podiatrist, clinical psychologist

Proposals

New programmes/ services	Nil
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	To have a dedicated Dasar Baru for biologic drugs as these drugs are currently not supported by existing budget due to cost
Replacement/ procurement equipment	1. To purchase a new ultrasound machine dedicated for the purposes of scanning musculoskeletal and cardiac systems. 2. To purchase equipment for ensuring safety of patients during procedures (under sedation) and infusion of drugs including biologics in Hospital Selayang (2 cardiac monitors, 2 pulse oxymeters, 1 BP measuring machine, 4 infusion pumps)

Training	1. Strengthening of paediatric rheumatology training by establishing international networking and benchmarking 2. Prioritize Paediatric Rheumatology Subspecialty Training with minimum of 1 slots annually 3. To conduct continuous training and offer opportunities for attachment to medical officer from other hospitals to allow exposure and seeding of interest in paediatric rheumatology, and to encourage junior specialist to take up the subspeciality 4. To train selected nurses as dedicated clinical nurse specialist in paediatric rheumatology 5. To train other allied health professionals like Occupational Therapist & Physiotherapist in the subspeciality of paediatric rheumatology
Recommended staff: workload	1 staff nurse to 4-6 paediatric rheumatology patients
Other proposals	1. Career pathway for Clinical Nurse Specialist in Paediatric Rheumatology for being the mentor for in house staff nurse training and supervision 2. Implementing Clinical Risk Management 3. Optimising Evidence Based Practice by updating and introducing new protocols in current national protocol book

PAEDIATRIC HAEMATOLOGY & ONCOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Ministry of Health: 1. Institut Pediatrik HKL (IPHKL) – 1980 previously in main block & Wisma Kayu of HKL. Moving to new facility at Hospital Wanita & Kanak-kanak, Kuala Lumpur @ April 2017 2. HPP– 2008 3. HRPB – 2012 4. HSI – 2006 5. HSNZ– 2014 6. HUS – 2006 7. HWKKL – 2009 *IPHKL remain as the National referral centre with the other Hospital being regional centres. Comprehensive services including Malignant & non-malignant Paediatric Haematology & Oncology cases with Haemopoietic Stem Cell Transplant (HSCT) services – 16 beds in HWKKKL* *HWKK, Likas however also provide 3-bedded (HSCT) services since 2014*. Universiti Hospitals: 1. UMMC – 1980s 2. HUSM, Kubang Kerian, Kelantan – 1980s 3. HUKM Private Hospital providing paediatric Haematology & Oncology Services & Paediatric HSCT is Ramsay Sime Darby Medical Centre, Subang Jaya, Selangor	1. The new HWKKKL would need more sub-specialist to cater for the expanded services in the new Hospital. This would include provision of dedicated sub-specialist in the following – Malignant Haematology & Oncology (Leukaemia& Lymphoma, Solid Tumours, Brain Tumours) – Non-malignant Haematology (Thalassaemia & Haemoglobinopathy, Bleeding & Thrombotic disorders) – Haemopoietic Stem Cell Transplant (HSCT) – Immunotherapy/Cell-based therapy – Long term follow-up programme including transition care for chronic diseases 2. All regional hospitals with resident Paediatric Haematologist & Oncologist to have at least a minimum of 3 sub-specialist to provide optimal care

Where previous services available but now not	Nil	N/A
Networking/ Outreach	1. Scheduled visits by IPHKL Consultants to Sabah & Sarawak occasionally to review difficult cases or long term follow-up issues of HSCT case 2. Regionalisation of sub-specialty services with the regional specialist covering the neighbouring states 3. Paediatric Haematologist & Oncologist from HUSM still provide coverage for cases within Kelantan. 4. For specialised radiological or nucelar medicine investigations only in certain tertiary centres (e.g. PET scans or IMRT available only in IKN) 5. Specialised laboratory investigations only available in HKL or IMR	To develop the regional centres in Pulau Pinang, Ipoh, Johor Bharu, Kuala Terengganu, Kuching and Kota Kinabalu to provide wider access to tertiary care outside the Klang Valley. Need to align with the plan for cluster Hospital framework of the Ministry.
Outsourcing/ Purchase of Services	1. Specialised Diagnostic test would be outsourced to the Universiti or private labs. A few test would be occasionally couriered to some overseas centre. 2. Radiotherapy service in regional centres are out-sourced to private centres where services not readily available in the MOH facility.	Some specialised radiotherapy services would need to be developed.
MOU with External Agencies / Universities	Wherever there are existing MOU between hospitals and Universities in the use of MOH facilities	

Major gaps/ issues/ challenges

1. Inadequate number of Paediatric Haematologist & Oncologist to meet the current & future needs of the country. Most regional centres are solo practices with very high work load.
2. The services would need to be differentiated into
    - Malignant Haematology & Oncology (Leukaemia& Lymphoma, Solid Tumours, Brain Tumours)
    - Non-malignant Haematology (Thalassaemia & Haemoglobinopathy, Bleeding & Thrombotic disorders)
    - Haemopoietic Stem Cell Transplant (HSCT)
    - Immunotherapy/Cell-based therapy
    - Long term follow-up programme including transition care for chronic diseases
3. Inadequate overseas training scholarship to expose our fellows to best practices at international centre of excellence
4. Inadequate specialised laboratory support for therapeutic (Stem cell lab facillities), diagnostic, prognostic and follow-up of minimal residual disease to complement the needs of the rapidly expanding paediatric haematology, oncology & HSCT services
5. New clinical areas to be developed: Immunology & Allergy, Genetics (Oncology), Paediatric Palliative Care, Adolescent Medicine
6. Other paediatric surgical subspecialty to be developed further like neurosurgery, limb sparing orthopaedic surgery, maxilo-facial surgery, reconstructive surgery and non-invasive surgery.
7. To optimise networking with district level paediatricians and also family physicians in the care of children with chronic illness
8. Newer expensive therapies would require value-based economic assessment. There is a need for evidence based decision in areas that require resources like newer immunotherapy, gene therapy and cell-based therapy etc for cancer and haematological disorders.
9. Lack of post-basic paramedical staff e.g. in paediatric oncology nursing & stem cell transplant and paediatric haematology (Thalassaemia & Haemophilia) to handle specialised areas that require multi-disciplinary chronic care.
10. Unavailability of adequate Paediatric Ambulatory Care services in all Tertiary, Major & Minor Specialist Hospitals to be efficient in handling paediatric haematology & oncology cases

11. Policy issues

- Threshold of age of admission to Paediatric wards (12 years, 15 years, 18 years)
- Blood transfusion services on weekends and after normal hours for e.g. Thalassaemia patients (suggest begin in Hospitals with more than 50 transfusion dependent Thalassaemia (TDT) patients)

12. Transition to adult speciality services not covered by primary care physicians.

- Active cases e,g, Haematology (Thalassaemia & Haemophilia, leukaemia, lymphoma, solid tumours)

13. Long term survivors of cured diseases (Çhildhood cancer, Post-HSCTs)

Proposals

New programmes / services	1. Services will move to the new HWKK, Kuala Lumpur in 2017 2. Paediatric Haematology/Oncology in Institut Kanser Negara (IKN), Putrajaya 3. The old IPHKL site will be upgraded to include ambulatory care centre and also another haematology & Oncology ward to cater to the growing population and also need of specialised services
Projects approved RMK11	HWKKKL ready in 2017
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	
Training	1. Strengthening of basic specialty training by establishing international networking and benchmarking 2. To continue current practice of sending Paediatricians overseas annually to complete subspecialty training 3. Number of Paediatric post basic courses should increase.

Recommended staff: workload	1. 1 general paediatrician for every 10,000 children in population. 2. 1 Paediatric Oncologist sub-specialist for every 50000 children in population 3. 1 Paediatric Haematologist sub-specialist for every 50000 children on the population 4. 1 Paediatric HSCT specialist per every 100,000 children in the population 5. Allied health staff – to refer department operating policy
Other proposals	1. Making paediatric research part of the core business of the Paediatric Services 2. Harmonising and Consolidating of the paediatric specialty and sub-specialty programme. 3. Training of Specialised Assistant Medical Officers in Paediatric Haemopoietic Stem Cell Transplant especially in apheresis unit and in non-malignant haematology services 4. Implementing Clinical Risk Management 5. Optimising Evidence Based Practice by updating current national protocol book 6. Develop IT system for clinical (Disease registry) and administrative needs of clinical departments in the MoH (Human resource management software including posting, training, transfer)

DEVELOPMENTAL PAEDIATRICS

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Available in three (3) hospitals; • HKL (2) • HPP (1) • HSI (1) 2 Developmental Paediatric Clinical Fellow currently doing their training at Institut Pediatrik, HKL.	• To have Developmental Paediatricians in 6 regional centres across the nation – WPKL, Penang, Johor, East Peninsula, Sarawak and Sabah. • To have a minimum of 3 consultants serving at the Child Developmental Centre, WCHKL.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Referrals from government as well as private hospitals and clinics throughout the nation.	To provide budget for the Developmental Paediatric fraternity to cover other hospitals based on region. 1. HPP to cover the Northern region 2. HSI to cover the Southern region 3. HKL to cover Central region 4. HUS to cover Sarawak Additionally, Sabah and the east coast of Peninsula Malaysia require at least one Developmental Paediatrician to be based there.
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	One at PPUKM (training for Clinical Fellows). None in the private sector.	Nil

Major gaps/ issues/ challenges

1. There are currently only 3 trained Developmental Paediatricians in MOH. There is a need to train more Developmental Paediatricians and this should include the provision of 2 scholarships per year for fellowship.
2. Urgent need to provide throughout the country:
    - Specialist diagnostic services and assessments for complex neurodevelopmental problems
    - Coordination of effective interventions and family support as well as monitoring developmental outcomes from these interventions.
3. Highly insufficient allied health staff to support and complement services related to developmental disorders, especially clinical and educational psychologists and paediatric-trained occupational therapists/ speech therapists.
4. Funding for clinical attachments and specific training programs for allied health staff.
5. Severe shortage of clinical psychologists, social workers and counsellors.
6. Inadequate budget for List A drugs (eg. neuroleptics), standardized assessment tools and consumables.
7. Lack of research activities in Developmental Paediatrics

Proposals

New programmes / services	1. To develop regional centers in Sabah and East Peninsula. 2. To provide Multidisciplinary Clinics that will include Developmental Paediatrician and other specialties for example Child and Adolescent Psychiatrist,Clinical Psychologist, Speech Therapist or Occupational Therapist. 3. Outreach programs in collaboration with MOE to schools for specialist assessment of school-aged children with learning issues identified through the LINUS program. 4. To provide new clinic services at the WCHKL - Feeding clinic, Sleep clinic, Behaviour clinic, School Function Clinic, Developmental Vision clinic, Cochlear Implant clinic
Projects approved RMK11	Nil

Proposed projects – RMK11 mid term	1. Funding to provide outreach specialist clinics and training for general paediatricians, including in district hospitals. 2. Funding for parent training for prevalent disorders such as autism, which should be conducted regularly throughout the year. 3. Funding for setting up a national registry for Autism Spectrum Disorder. There is no accurate and reliable clinical data available locally collated by clinicians so far. This database would provide explicit information in terms of policy making and service provisions.
Replacement/ procurement equipment	Nil
Training	**Developmental Paediatrician** -2 scholarships per year for subspecialty training which should include 1 year overseas. **Paediatric-trained specialist nurse in Child Development** Currently there are no Specialist Nurses in Developmental Paediatrics. Initial training for core team should be done overseas, in a range of special needs (eg. autism spectrum disorder, feeding disorder). Minimum training period of 6 months, with 2 scholarships per year
Recommended staff: workload	According to level of care: 1. Tertiary Centre (Developmental Paediatricians, HKL) – 3 consultants 2. Regional centres (6 centres – WPKL, Penang, Johor, Sarawak, Sabah and East Peninsula) - 2 consultants based at each centre 3. At least 1 trained nurse for each regional centre 4. At least 1 Clinical Psychologist for each regional centre 5. At least 2 trained Paediatric Speech therapists at regional centres, 1 for each state hospital and 1 at district hospital with a paediatrician. 6. At least 2 trained Paediatric Occupational therapist at regional centres, 1 for each state hospital and 1 at district hospital with a paediatrician. 7. At least 2 Social Worker at regional centres, 1 for each state hospital and 1 at district hospital with a paediatrician.
Other proposals	1. Posts for Clinical Psychologist and specialist nurse. 2. Incentive for subspecialist - promotion (to create and offer promotion in a timely manner)

ADOLESCENT MEDICINE (PAEDIATRICS)

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Adolescent Medicine Sub-Specialty services are provided in: • HKL • Hospital Selayang, • HRPB • HSB	All State hospitals in major regions(North, Central, East, South and East Coast) should have resident Adolescent Specialist to ensure training and service to teen population of the region.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• Scheduled visits by Adolescent Specialists for some specialized clinics ie HIV clinic, STD clinic by invitation • Outreach service to Klinik Remaja Tanglin monthly. • Active participation with NGOs ie Adolescent Committee of MMA and MAAH(Malaysian Association of Adolescent Health) • Teaching of Undergraduates and Masters Students (UITM, HUKM. UM, USM) • Networking with PDRM, JKM, MOE for Adolescent Abuse cases	To develop regional centres in • Pulau Pinang, • Johor Baru • Kota Bharu • Kuantan • Malacca • Kuching • Kota Kinabalu to provide wider access to tertiary care outside the Klang Valley
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Wherever there are existing MOU between hospitals and Universities in the use of MOH facilities eg, UITM undergraduate teaching with HKL and Hospital Selayang Adolescent Units.	Nil

Major gaps/ issues/ challenges

1. Number of Adolescent Specialist still small.
2. New trainees to be trained in the next few years-funding needed
3. To optimise networking with primary physicians in the care of children with chronic illness
4. Infrastructure to be improved to make services Adolescent Friendly

Proposals

New programmes / services	1. Adolescent Services to be expanded. 2. Proposed common user adolescent wards in Pulau Pinang, Johor Baru, Kota Bharu, Kuching, Kota Kinabalu.
Projects approved RMK11	Dasar Baru for Adolescent services
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Nil
Training	1. Strengthening of basic sub specialty training by establishing international networking and benchmarking 2. To send 1 to 2 Paediatricians overseas annually to complete subspecialty training in Adolescent Medicine 3. Update on Adolescent Paediatrics courses at regional centres. A 2 day course for all Medical Officers at least once a year in Adolescent Medicine
Recommended staff: workload	1. 1 subspecialists for every 300,000 teens 2. Allied health staff – to train nurses, medical assistants etc
Other proposals	1. Implementing Clinical Risk Management 2. Optimising Evidence Based Practice by updating current national protocol book 3. National Training Calender

ORTHOPAEDICS

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• All State hospitals, • Federal Territory hospitals HKL, and HPutrajaya • All Specialist hospitals **except** HKepala Batas, HBukit Mertajam, HKapit, HSri Aman, HSerian	• H. Cameron Highland • H. Banting • H. Pendang (New Services) • H. Baling (New Services) • H. Besut • H. Setiu, • H. Dungun • H. Hulu Terengganu
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Available within all states. 53 Ortho departments in State, Major and minor hospitals service other non specialist centers Some Examples : • HRPB to K.Kangsar, Sg.Siput, Batu Gajah, Kampar, Camerons • HTAA – Rompin, Muadzam Shah and Pekan • HoSHAS – Jengka, Jerantut • Lipis – Raub, Bentong • Kedah : HYan,HKuala Nerang,HJitra, HBaling, HSik • Melaka to Jasin and Alor Gajah • HSgB – Tanjong Karang • HSNZ – HDungun,HHulu Terengganu,HSetiu, HBesut • HTAN – Jempol	• HRPZ II to HBachok • HQE to HBeaufort and HRanau • HRPB to HKampar • HUS to HLundu, HBintulu and KKBelaga ▪ Bintulu to KK Tatau • HSAH to HYan, HBaling & HSik • Melaka: Alor Gajah • Taiping: H. Parit Buntar, H. Gerik, H. Selama, H. Kuala Kangsar & Larut Matang
Outsourcing/ Purchase of Services	Nil	Nil

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies/ Universities	• HRPB with UniKL Royal College Medicine of Perak (RCMP) & Kolej Sains Kesihatan Bersekutu Sultan Azlan Shah • HTAA with Shah Putra university and UIA • HSB with AIMST University & Kolej Universiti Insaniah (KUIN) • Melaka with Manipal • HSNZ with UNISZA,UCSI	Nil

Major gaps/ issues/ challenges

1. Lack of asset money to replace worn out / broken asset
2. Inadequate fund for Implant- patient needs to top up
3. Human resource limitation – high resignation, urban based
4. Lack of OT time and beds
5. Lack of clinic space and storage facility
6. Lack of POP room in some district hospital casualty dept
7. Dampening R&D
8. Slow pace of supporting services
9. Some wards in district hospitals have common wards for male and female
10. Inadequate subspecialists training facility and distribution – high resignations in those who finish.
11. Poor library facilities and journal access
12. No wall oxygen supply in wards
13. Air conditioning system breakdowns
14. Poor vascular surgery support outside of Klang valley

Proposals

New programmes/ services	Subspecialty services in regional centres • **Paediatric Orthopaedic** in HSB, HSI, HUS, HTF, HSgB, Taiping, HSNZ, HRPB • **Spine Surgery** in HTJ, HSA, HRPZ II, HQE, Melaka • **Ortho. Oncology** in HPJ, HTAA • **Sports orthopaedic** in HTJ, HSerdang, HSI, Melaka, HSgB • **Gen. Ortho and Advanced Musculoskeletal Trauma** in HSJ, HTAA and HSgB • **Upper Limb and Hand** in HUS, Kedah, Penang, JB, HTAA, HRPZ II • **Foot and Ankle** inHQE, HTF, HPP & HRPZ II, HSNZ • **Arthroplasty** in HKL, Terengganu and Melaka
Projects approved RMK11	• Kelantan – upgrading Orthopaedic Services (RM 1 million) • Kuala Pilah - Building of new 6-floored hospital block (28 hectares) in HTAN
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	1. Image intensifier – replacement for hospitals 2. OT tables – replacement – preferably radiolucent 3. SSEP / MEP machine – for hospitals with spine services 4. Hand piece power tools for all state hospitals 5. Arthroscope replacements
Training	1. Overseas and local training. 2. Short courses or attachment overseas. 3. Nomination for HLP & CBBP only for those in the Fellowship programmes and have passed the 1st part Ortho fellowship examination. 4. More post basic posts to be made available for post basic OT and Orthjo training 5. Creation of promotional posts for post basic holders within specialty to retain their services and not go on transfer to admin positions – [eg PPP to penyelia] 6. Propose subspecialty training without the need for overseas attachment
Recommended staff: workload	Nil

Other proposals	1. Review R&D programmes. 2. Proposed under RMK 11 • Kelantan: Spinal & Amputee Rehabilitation • HSlim River Perak: Rehabilitation Services, Sports Injury and Sports Medicine • HPulau Pinang: Bone Banking Services, Artificial Limb Centre • HUS Kuching: Sports Injury and Sports Medicine 3. Improve the supporting services, eg anesthesia, radiology to shorten patients' waiting time for surgery and investigation

OTORHINOLARYNGOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Available in these hospitals: 1. All State hospitals including HKL (14 hospitals) 2. All major specialist hospitals **except** HKajang, HKemaman, HTM (22 hospitals) 3. Hospital Bukit Mertajam 4. Hospital Likas, Sabah. <u>Hospital with audiologist services without ORL:</u> 1. Hospital Kemaman 2. Hospital Rehabilitasi Cheras 3. Hospital Kuala Lipis <u>Hospital with speech LT without ORL:</u> 1. Hospital Kemaman 2. Hospital Rehabilitasi Cheras	To place ORL specialist in : 1. H. Keningau 2. H. Bintulu 3. H. Slim River 4. H. Seri Manjung 5. H. Alor Gajah 6. H. Kluang 7. H. Kemaman 8. H. Tanah Merah 9. H. Labuan 10. H. Langkawi
Where previous services available but now not	Hospital Slim River, Perak	
Networking/ Outreach	Available within all states Specialist from hospitals with ENT surgeons going to other specialist hospital without ENT surgeon and non-specialist hospitals in all states. **1. HSB** to HLangkawi, HSik, H Jitra, HKuala Nerang **2. HSAH** to HBaling and HYan. **3. HBM** to Hospital Kepala Batas **4. HTaiping** to HParit Buntar, HKuala Kangsar dan HSelama	**<u>ORL</u>** 1 Training and research in Hearing aids and implant surgery and technology- Macquarie University 2 Parallel pathway collaboration and networking with College of Surgeon Glasgow, Edinburgh, Ireland 3 Outreach programme with NGO for early intervention and rehabilitation for communication disorders and hearing impaired.

	CURRENT STATUS	PROPOSED EXPANSION
	5. HRPB to HSlim River **6. HTAR** to HTanjung Karang **7. HTJ** to Hosp Port Dickson **8. HMelaka** to HJasin **9. HSA** to HKluang **10. HSI** to Hospital Mersing. **11. HTAA**to HMuadzam Shah, HRompin **12. HoSHAS** to HJerantut, Hraub, HKuala Lipis, Hjengka, HBentong. **13. HSNZ** to Hdungun, HKemaman, HHulu Terengggganu, HBesut **14. HRPZ II** toHTumpat,HPasir Mas, HTanah Merah, HPasir Putih, Hmachang, HJeli **15. Hospital Kuala Krai** to Hospital Gua Musang **16. HUS** toHbintulu, Hserian, Hlundu, HSri Aman. **17. HQE** to : - Hospital Ranau - Hospital Kudat - Hospital Keningau - Hospital Beaufort **18. HDOK** to Hbeluran, HKinabatangan. **19. Hospital Tawau** to Hkunak, Hsemporna, HLahad Datu.	4 To collaborate with District Hospital/Klinik Kesihatan to create and train a Liason Officer in each centre • to handle ENT cases and expediate referrals • creating awareness and early diagnosis of head and neck cancers. • Mobile team for home management of airway cases (tracheostomy or T-tube) care. • Expansion of hearing screening service to peripheral centres without audiologist through supervision and training of local staff. • Expansion and strengthen cochlear implant pre and post rehabilitation services to non-satellite centres with audiologists and speech therapist with supervision and close periodic monitoring by satellite centres. • Allocation for regular subspecialty visits (clinic and operating theatre session) in centres that lack the specific subspecialty service.

	CURRENT STATUS	PROPOSED EXPANSION
		Audiology 1. To collaborate with UKM, USM, IIUM of setting up a conjoint board for postgraduate training in audiology program: - Tinnitus Master Class - APD Master class - Vestibular & Balance Master class 2. To collaborate with KEMAS/ Jabatan Perpaduan for pre-school hearing screening program 3. To collaborate with private hosp/ institution and NGO's in continuous profesional development programs. **Speech** 1. SLT profession is collaborating with UTM, Johor for developing apps for language training for aphasia in Malay. 2. Collaborating with University of Philippines, Manilain training the SLT professional in Philippines on Augmentative and Alternative Communication (AAC).

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Cochlear implantation programme by networking with HUKM, PPUM, HUSM for surgical and audiological training. Visiting Professors from University Malaya and Universiti Kebangsaan Malaysia are invited for complex otologic/cochlear implant/skull base procedures. Complex procedures are sometimes referred to those centers if warranted. Hospital Kuala Lumpur with - UKM for Laryngology, Otology & Neuro Otology Service - UM for Otology /Otoneurology & Skullbase Surgery Services	**ORL** **Outsourcing from Private and Universities the below services:** - Oncology Service - Interventional Radiologist - Nuclear Medicine - Allergy testing and Immunotherapy **Speech** 1. Outsource freelance/private SLT to provide services to area of needs such as Cochlea implant patients or special needs children. 2. Outsource professionals locally or abroad (e.g. lecturer/clinician) for improving clinical management and training for certain period of time for certain specific goal. 3. Outsourcing service for child renrelated speech communication development disorder such as Parent-Child Interaction by Hanen Program, Applied Behaviour Analysis (ABA), and Alternative Therapy (Music Therapy, Animal Therapy and etc.) **Audiology** Nil

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies/ Universities	MoU with local universities: 1. HSgB – UiTM 2. HSerdang – UPM 3. HAmpang – USIM 4. HSNZ – UNISZA 5. HTAA – UIA 6. HRPZ II – USM 7. HPD – IMU 8. HUS – UNIMAS Networking with foreign universities: 1. Harvard University (Dr Ramon Franco Jr) 2. University of California (Dr Lindsey Reder) 3. Monash University (Dr Paul Paddle) 4. Shin Kong Wu Ho-Su Memorial Hospital Taiwan (Prof Sheng Po Hao) 5. Prof Shyan Shunmuganathan, Princess Margaret Children Hospital, Perth 6. Dr Alan Cheng, Westmead's Children Hospital, Sydney. 7. Prof Raphael Urquiza, Malaga, Spain	Nil

Major gaps/ issues/ challenges

Otorhinolaryngology

1. Inadequate allocation
2. Loss of institutional expertise to Universities and Private Institutions due to:
   - suboptimal remuneration
   - Job placement
   - No acknowledgement and no special monetary allowance / promotion for high skilled MOH specialist eg: Subspecialty and Special training that definitely comes with increase workload, increase in responsibility and expectation in managing challenging cases
   - Delay in promotion eg : automatic Jusa C promotion for Subspecialist and specialist in Specially Trained Areas.
   - discrepancies in training opportunities abroad as compared to university setting
3. Experience & skill gap discrepancy in between hospitals.

   There is a big discrepancy and mismatch of experience and skill gap between senior consultants and young specialist. This occurs in both minor and major hospitals. Main factor is due to high percentage of resignation among senior specialist. New specialists are positioned as Head of Departments in major and district hospitals which consequently result in lack of experienced surgical training and suboptimal management of challenging cases.
4. Insufficient equipment in hospitals;
   - General ORL Service : some are still not equipped with the basic instruments for ORL procedure
   - Hurdle to progress in subspeciality service due to lack of instruments
5. Lack of budget for disposable equipments and implants eg. as Botox injections, Juvederm / Radiesse Goretex , t-tubes
6. Lack of diagnostic facilities – For head and neck service to expand, need to have CT scan, MRI, interventional radiologist, nuclear imaging, frozen section
7. Lack of supporting service – eg oncology distant and inadequate
8. Lack of training and educational support
   - Lack of opportunities to attend international conference and develop international networking
   - Limited funding / scholarship for overseas training, unfavourable deal
9. Lack of research – interest, funding and time allocation

Speech Language Therapist

1. Profession Head noted 20 awaiting candidates for SPA intake however 14 position of U41 SLT have been traded off for Dental Officers by the Human Resource, MOH without the knowledge of service and profession Head.
2. No senior post for Speech Language Pathologist in ORL – majority promoted to U48 will be sent to Rehabilitation Hospital
3. No acknowledgement or privileging specific toMasters degree obtained by SLT in MOH.
4. Resignation rate of nearly 10 percent in total since 2001 which considered high and significant for speech therapy service.
5. Study leave extension affecting MOH SLT Service
6. Provision of intensive therapy for client in needs of SLT services only available for certain cases but scattered around the country resulting in suboptimal outcome
7. More numbers of SLT needed not only to fulfill ORL services but also to support pediatricians, neurologist, rehabilitation medicine or psychiatrist.
8. No speech therapist with postgraduate training in voice & not enough swallowing therapist.

Audiology

1. Human resources :
   - inadequate number of audiologist
   - unequal distribution (Semenanjung, Sabah & Sarawak)
2. Training: rapid development in audiology technology requires more updated specialized training
3. Facilities:
   - old & outdated equipment to be replaced
   - Need for facilities of diagnostic equipment
   - limited & inadequate space for clinics in most hospitals
   - hospitals with audiologist but without ORLare not well equipped.
4. Financial issues
   - national level workshops / refresher courses
   - consumables

Proposals

New programmes/ services	**<u>ORL sleep services</u>** • Sleep (ORL related) services to patient with obstructive apnoea - to establish sleep lab in all state hospitals - 14 sleep lab - Each lab- 2 full PSG and 1 partial PSG, SPO2 - 2 CPAP, 1 Bipap - to train Certified Sleep Technician among the Paramedics.- (RSPGT Certified / Locally Priviledged) - At least 2 trained Certified Sleep Technician each Lab • Estimated Cost/centre : RM400k/centre • Number of centres : 20 **<u>Universal hearing screening</u>** • Universal hearing screening in all state hospitals - to establish and equip universal hearing screening team in all state hospitals • Equipment: OAE/AABR/Sound Level Meter • Estimated Cost/centre : RM300k/centre • Number of centres : 23 (HTAN, HSI, HTAA, HTJ, HTawau, HRPB, HKuala Krai, HLikas, HAmpang, HSibu, HSNI, HPSF, HSegamat, HSA,HUS, HTI, HKulim, HSAS, HSNZ, HMelaka, HSerdang, HoSHAS, HKemaman) **<u>Swallowing, airway and voice evaluation clinic</u>** • To establish swallowing clinic in all state hospitals, with team members comprising of : a) Trained ORL Surgeons, Laryngologist, b) Speech Language Therapists c) Paramedics. • To create a working team with Radiologist to provide dysphagia objective test such as Videoflouroscopic Swallowing Study (VFSS) to support evidence-based practice.

New programmes/ services	• To strengthened the service through provision of basic equipments such as: - Spirometry - Videocamera system for Transnasal - Oesophagoscopy, Stroboscopy - Disposables eg * Airway : T-tube, tracheostomy, * Voice : Injection laryngoplasty materials, Thyroplasty, Botox * Swallowing : Pharyngeal tube, Thickener • Estimated Cost/centre : RM600k Number of centres : 7 **Head and Neck Regional Centre** comprising of : • ENT Surgeons trained in Oncology and Reconstructive surgery • Facilities for Diagnosis : Ultrasound, Autofluorescence Imaging • Facilities for minimally invasive surgery eg : sialandoscopy, laser & robotic surgery • Oncologist & Radiotherapist • Interventional Radiologist **Paediatric Airway,And Swallowing Disorders Centre In Every State** To form a dedicated Paediatric ORL Airway team of: – Paediatric ORL surgeons, Paediatrician, Paeds anaesth,Paed Intensivist,Paediatric Pulmonologist and Speech LT, Detician with trained nurses and paramedic etc To also cater the Head and Neck masses / Vascular Malformation andPaediatric OSA **Paediatric Hearing and Implant Centre** For a comprehensive Hearing management including Diagnosis, amplification, surgey (eg :Cochlea implant, Bone Anchored Hearing Aid) followed by Habilitation and rehabilitation services

New programmes/ services	**<u>Allergy Services</u>** • Allergy services for every hospital with ORL service • Equipment: mainly reagents for SPT and IGE testings • Estimated Cost/centre : RM80k • Number of centres : 36 **<u>Vertigo Regional Centre</u>** • To establish vertigo clinic in each region for peripheral vestibular disorders, with team work between ORL surgeons, audiologists, Neurologist, Psychiatrist and physiotherapists. • Equipment: VideoNystagmography – VNG VHIT – Video Head Impulse Testing caloric test chair Estimated Cost/centre : RM 350K Number of centres :7 **<u>Tinnitus Clinic</u>** • To establish tinnitus clinic in each state for tinnitus disorders, with team work between ORL surgeons, audiologists and Psychiatrist. **<u>LASER service with SOP & LASER Safety Committee</u>** • Estimated cost : RM500k • Number of Centres : First Phase 5 Expansion of Database and Research in ORL eg: Hearing / Cochlea Implant, Head and Neck cancer, NPC, OSA, **<u>Rhinology Skull Base</u>** • To strengthened the service through provision of basic equipment needs such as IGS, high definition videoendoscopic system, and surgical instrument • Estimated Cost / centre : RM800k • Number of centres : 7
Projects approved RMK11	Nil

Proposed projects – RMK11 mid term	1. Universal neonatal hearing screening programme 2. ORL sleep service
Replacement/ procurement equipment	**To Replace BER Equipments** Most of the centres has **long BER lists** of surgical, Endoscopy and audiological equipments 1. Paediatric Airway Diagnostic Bronchoscopy 2. Video-Camera System 3. High definition Videocamera system with Endoscopy sets for diagnostic / surgical usage 4. Microscopes 5. Drills and Powered Instruments **To Procure** 1. LASER equipment to be made available in every state hospital / hospital . 2. Drills and Powered Instruments 3. Facial nerve Monitors 4. Flexible Nasopharyngoesophagoscope 5. FEES equipment 6. Microscopes 7. Stroboscopy & spectometry

	Speech language therapist 1. Upgrade visipitch/lingwave and other instrument 2. Assessment tool with maintenance (allocate budget for disposable item in asset maintenance every year) 3. Standard assessment tools that iscrucial for making differential diagnosis that also provide objective outcome measure of speech and language. A. Western Aphasia Battery-Revised and Supplemental forms and test kit. B. Frenchay Dysarthria Assessment 2nd Edition C. Peabody Picture Vocabulary Test (PPVT) 4th Edition D. Expressive Vocabulary Test, Second Edition E. Test of Aided Communication Symbol Performance F. Cognitive Linguistic Quick Test (CLQT) G. Preschool Language Scales – PLS 5 4. High technology Augmentative and Alternative Communication for client and research usage. None is available now. **Audiology** 1. Basic audiology equipment: Clinical audiometer, diagnostic tympanometer, Electrophysiology equipment (AABR / SSEP) 2. Provision to identified hospitals for upgrading of services, replacing existing ones (old / BER). 3. Audio : Screening (OAE / AABR) - in Every ENT centre, to replace every 5 years for hospitals with hearing screening program. In order of priority: i. H Pulau Pinang ii. H Miri iii. H Teluk Intan iv. H Kuala Krai v. H Kemaman vi. H Kulim vii. H Sultanah Bahiyah

Training	1. Once a year local training for all specialists 2. Once in two years overseas refresher courses or exposure for subspecialists 3. Annual workshops / training by foreign experts 4. Short term (1 to 3 months) overseas training 5. Subspecialty training in peadiatric ORL, Rhinology and Head and Neck Surgery to be developed in all state hospitals 6. Otology, Neuro-otology and Skull Base Surgery to be developed in regional basis short term and all state hospitals in the long term. 7. Allergology and immunology and Audiological physician training for senior doctors 8. Paramedic training in audiology, speech, allergy, ORL surgical operations 9. Polysomnography (sleep technician) 10. To set up skill laboratory for training * Temporal bone * FESS * Head and Neck * Larynx Credentialing and Priviledging under the Bahagian Sains Kesihatan Bersekutu had highlighted these areas of training for SLT: 1. SLT will be trained for Root Cause Analysis and Clinical Audit nationwide 2. SLT will be monitored in the use of Standard Operating Procedures (SOP) commanded by Bahagian Sains Kesihatan Bersekutu 3. SLT trained personnel for FEES procedures. 4. SLT trained in VFSS interpretation

	Audiology 1. To increase number of audiologist being accepted into Masters in Audiology program annually; local / overseas. 2. Postgraduate / special training in audiology: In the following areas:- • Pediatric audiology • Vestibular and balance • Tinnitus • Aural rehabilitation • Auditory processing disorders • Cochlear implant • Amplification (HA, FM system)
Recommended staff: workload	• **General ORL** 1:50,000 population • **Subspecialities** 1:700,000 population • **Speech** 1: 30,000 population • **Audio** 1: 30,000 population • Trained Paramedic SLEEP Technician : in every sleep centre • Trained Paramedic LASER Safety Personnel in every centre with laser technology • HEARING Screening Team • Post basic ORL Paramedics in wards and clinics Proposed new posts: • Post Grad Masters ORL officers in eg Vestibular / Hearing and Immunology / Allergy • Medical Lab Technologist for special test eg: Allergy, and maintainance care of High Tech Instrument eg laser,IGS High End Microscope, Powered Instruments And Wet Lab Maintenance • Research Assisstants

Other proposals	Development should be in tandem with the development of other ENT support services like Speech & Swallowing therapy, Audiology and Hearing Rehabilitation Services and Allergology services - Formal E-consultation Services and Videoconference facilities This modality has been successfully used (even among our own ENT fraternity Telegram group) to discuss cases. A formal referral / consultation process between klinik-kesihatan / district hospitals / referral hospitals could save much time and money especially for patients. (decongesting central hospitals and bringing services closer to the patients) Daycare Surgical Services To standardize criteria for daycare surgery criteria and to implement in stages at all specialty hospitals according to National Daycare Surgery Operational Policy

APPENDIX I:

PRESENT AVAIBILITY OF SERVICES

Hospital	ORL	Subspeciality				SLEEP F-Full P-Partial	ALLERGY	Audio	SpeechLT	UNHS
		Head &Neck	PaedORL	Rhino	Oto Skull base					
HKL	10	1		1	2	1 F 1 P		11	6	√
HPJ	5			2		2 F	√	6	2	√
HTAR	5						√	6	5	
Selayang	5	1				1 P	√	4	2	
HSgB	7				2	1 P	√	11	4	√
Serdang	5		1			2 F 2 P		5	3	
Ampang	4						√	3	2	
Shah Alam	1							3	3	
HRPB	5			3	1	1 P		8	3	
Taiping	3	1				1 P		4	3	√
HTI	0							3	2	
HSM	0							X		
HTJ	5				2			5	4	
HTAN	1							3	1	
HMelaka	5	1				1 P		5	3	
HSA	5					1 F		5	4	
HSI	3				1			6	2	√
HPSF	4					1 P		4	3	
HSNI	1							3	2	
Segamat	1							1	1	
Kluang	0							x	1	
HSB	10	2	2	1		1 F 1 P	√	7	4	√

Hospital	ORL	Subspeciality				SLEEP F-Full P-Partial	ALLERGY	Audio	SpeechLT	UNHS
		Head &Neck	PaedORL	Rhino	Oto Skull base					
HSAH	5		1			1 P		4	3	√
Kulim	1									
Langkawi	nil							x	X	√
HTF	4	1				1 P		3	2	√
HPP	5							4	3	√
HSJ	1							1		
HBM	2							3	2	√
HTAA	5		1	1				5	2	
HoSHAS	2					1 F		4	2	
HSNZ	5			1				5	3	
HKemaman	0							2	1	
HRPZ II	5		1	2	1		√	7	3	√
HKuala Krai	1							2	x	
HUS	7							5	4	
HMiri	1							3	1	√
HSibu	1					1 F		2	2	
HQE	7				1			6	1	
HDOK	1							2	1	
HTawau	2							3	x	
HWKKL	1		1					1	1	
HKuala Lipis	0							1	x	
HKemaman	0							1	x	
HRC	0							5	5	
Permata Kurnia	0							x	2	

OPHTHALMOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	**Availability of (43) hospitals: Resident Ophthalmologist with / without subspeciality services.** 1. All state hospitals including HKL (14) 2. All major specialist hospitals **except** HSJ, HKajang, HTM, HQE II, PJHUS (22) 3. Hospital Bukit Mertajam 4. Hospital Sri Manjung 5. Hospital Labuan** 6. Hospital Kluang 7. HWKKL 8. Hospital Bintulu 9. Hospital Sarikei Availability of resident Optometrist to give Primary Eye Care with or without visiting Ophthalmologist on regular basis 1. H. Langkawi 2. H. Slim River 3. H. Kuala Kubu Bharu 4. H. Kluang 5. H. Sri Aman 6. H. Kemaman 7. H. Labuan 8. H. Besut 9. H. Setiu 10. H. Kepala Batas 11. H. Sg Bakap 12. KK Ayer Hitam 13. H.Grik 14. H.Batu Gajah 15. KK Jinjang 16. H. Mersing	The proposed expansion of resident Ophthalmologist: 1. H. Lahad Datu 2. Hospital Labuan 3. Hospital Sri Aman 4. Hospital Tampin 5. H, Keningau** 6. H. Langkawi 7. H. Tanah Merah 8. Kluang, 9. H. Banting 10. H. Seberang Jaya. 11. H. Wanita dan Kanak-kanak Kuala Lumpur 12. H. Gua Musang (To cover Kuala Lipis and Gerik area as well)

	CURRENT STATUS	PROPOSED EXPANSION
	17. H. Muadzam Shah 18. H. Kuala Lipis 19. H. Jengka 20. H. Jerantut 21. H. Gua Musang 22. H. Jeli 23. H. Tanah Merah 24. H.Lahad Datu 25. H. Kudat 26. H. Beaufort 27. H. Mukah 28. H. Limbang	
Where previous services available but now not	1. Hospital Lahad Datu 2. Hospital Keningau (Senior medical Officer- awaiting NSR registration- Foreigner)	
Networking/ Outreach	**Surgical outreach** 1. Hospital Langkawi (Clinic and Cataract surgery) 2. Hospital Tampin (Cataract Surgery) 3. Hospital Keningau (Cataract surgery) 4. Hospital Lahad Datu (Cataract surgery) 5. Hospital Sri Aman (Cataract surgery) 6. Hospital Tanah Merah (Cataract surgery) **Medical Outreach** 1. HKKB 2. H. Banting 3. HOAG 4. H. Raub 5. H. Bentong 6. H. Besut	**Proposed expansion of outreach:** 1. KK1M buses - to go around the Northern Region of Peninsular Malaysia and Sabah State. The buses shall be fully equipped with the instruments to carry our cataract clinic and operations. 2. KK1M transit- to be equipped with cataract surgery facilities (mobile transit instrument) to allow movement of facilities to other rural areas. 8 (eight) transit area has been identified:

	CURRENT STATUS	PROPOSED EXPANSION
	7. H. Hulu Terengganu 8. H. Kuala Penyu 9. H. Sepitang 10. H. Ranau 11. H. Pitas 12. H. Kota Marudu 13. H. Kudat 14. H. Kota Belud 15. H.l Tambunan 16. H. Tenom 17. H. Beaufort 18. H. Sempourna 19. H. Kluang 20. H. Kuala Lipis 21. H. Serian 22. H. Lundu 23. H. Semunjan 24. H. Betong 25. HRC **Subspeciality Outreach :** <u>Medical retina and uveitis</u> 1. HQE 2. HUS 3. HSB 4. H.Ampang 5. HTAR 6. HSA 7. HSNZ 8. HRPB <u>Vitreoretina services</u> 1. HSA 2. H. Melaka 3. HUS 4. HKL	**Sarawak**: Kapit and Kanowit / Limbang and Lawas **Sabah:** Kinabatangan and Beluran / Labuan and Lahad Datu **North:** Baling and Kuala Nerang / Batu Gajah and Gerik **East:** Pasir Puteh and Gua Musang / Hulu Terennganu, Dungun and Rompin. **Proposed expansion of visiting subspecialist services:** 1. Medical retina services- to H. Melaka and HRPB 2. To equipped all hospitals with Ophthalmologist with the basic screening instrument for prevention of blindness due to retina disease (Optical Coherent Tomography machine)

	CURRENT STATUS	PROPOSED EXPANSION
	<u>Cornea</u> 1. HSB 2. HSI 3. HQE 4. HSNZ 5. HUS <u>Oculoplasty</u> 1. HSNZ 2. HUS 3. HSgB 4. HSAH <u>Paediatric Ophthalmology</u> 1. HUS 2. HSNZ 3. HRPB 4. HSI 5. HSAS <u>Glaucoma</u> 1. H. Sibu 2. HSNZ 3. HSAH	**Proposed expansion of visiting specialist services to Hospital with only resident Optometrist:** 1. To do visiting to all Hospital with only resident optometrist at regular basis.
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities MOU with External Agencies / Universities	1. Majlis Agama Islam Wilayah Persekutuan (MAIWP)- donation of the Pusat Pembedahan Katarak MAIWP- H. Selayang under National Blue Ocean Strategy (NBOS) in 2013, and yearly donation of Intraocular lens through the National Lens Implant Bank (BKIOK) since 2015. 2. Standard Chartered Foundation- for the donation of Intraocular lens via National Lens Implant Bank (BKIOK) (2014-2016)- completed in June 2016	

	CURRENT STATUS	PROPOSED EXPANSION
	3. Scope International Standard Chartered for the Retinal Disease awareness program and donation of 2 units of Fundus Camera for the Selangor State. 4. Petronita for annual contributions to the National Lens Implant Bank, KKM and participation of their Welfare Section as Cataract Finders 5. Sabah Mission for Vision- Collaboration with Lions International foundation for the elimination of Blindness in Sabah. 6. Sarawak Rotary Club contributions to National Lens Implant Bank for prevention of cataract blindness in Sarawak. 7. International Agency for Prevention of Blindness(IAPB)- WHO : donating USD5000 for the cataract finders activities- in supporting for KK1M services. The donation is park in HQE for Sabah cataract finders program.	Nil

Major gaps/ issues/ challenges

1. Data from recent 2014, National Eye Survey (NES) 2, states that the prevalence of cataract blindness is significantly high especially in Sabah and Northern zone of Peninsular Malaysia. The Survey indicates a backlog of 600,000 cases of cataract causing visual impairment in Malaysia. Klinik Katarak 1Malaysia (KK1M) Transit system has been established for specific areas with poor access to cataract surgery. The facilities are still under planning and development after having identified areas needing care. Those areas where transit services have been established include H Rompin, H Besut, H Gua Musang, H Sri Aman , H Serian, H Semunjang , H Bau , H Mukah,
2. Two (2) KK1M buses are running covering Southern part of Sarawak and the East coast of Peninsular. However this is insufficient to cover other areas needing the services especially Sabah and the Northern Region.

3. Operational of transit services presently are using the instruments from the mobile bus. This is not ideal as the transit services need their own set of instrumentation. A lot of dependence is put presently on loan of instrumentation from companies.

4. With the increasing aging population and prevalence of Diabetes mellitus, age related macula degeneration and diabetic macula oedema has become major cause of preventable blindness. Does screening need to be improved and it needs the availability of special instrument i.e the Optical Coherent Tomography (OCT). At present the OCT is only available in the hospital with retinal specialist. However it used need to be expanded to all hospital with specialist. (medium range)

5. Shortage of specialist to mend Hospitals which has the potential to run the ophthalmology services such as H. Lahad Datu, Hospital Labuan, Hospital Sri Aman, Hospital Tampin, H. Keningau, H. Langkawi, H. Tanah merah, H. Kluang, H. Banting and H. Seberang Jaya.

6. Critical Shortage of subspecialist especially in the field of medical retina. Vitreoretina, glaucoma and comprehensive ophthalmology. Subspeciality training post is insufficient to cover the demand of services.

7. Upgrading of surgical instruments in certain facilities, in particular surgical microscope, phacoemulsification machine, biometry machine, perimetry machine and OCT in pre-existing retinal service centers.

8. Increasing out patient workload in view of overall aging population in Malaysia. Therefore there is a need of

    - Medical Officer to man the outpatient clinic,
    - Increase for more support staff such as paramedics and optometrists
    - Increase for more working space for outpatient clinic.

Proposals

New programmes / services	1. National Eye Institute in conjunction with development of H. Cyberjaya. (2017-2018)-(Setting up the all ophthalmology subspeciality services under one roof – one stop center, and can be done as part Health tourism center, full paying patient scheme and public cases) 2. National Cataract Finder Program for community empowerment. 3. National Retinal Disease Awareness Program for community empowerment. 4. Parallel Program for postgraduate training in ophthalmology. (2017) 5. Development of ophthalmic oncology services - namely brachytherapy in IKN.- (2017/2018) 6. Development of ophthalmology component in the National Health Training Center in Port Dickson, N. Sembilan. 7. To develop H. Ampang as the National center for refractive surgery by 2020 8. To fully equip the medical retina set up as National Center in H.Shah Alam. 9. To develop the National Reading Center for the diabetic retinopathy screening program as well as national retinal disease awareness program 10. Expansion of Hospital Minor (with Optometrist, without Ophthalmologist) – 20 new placement
Projects approved RMK11	1. Dasar Baru to operate Pusat Pembedahan Katarak MAIWP-H. Selayang. 2. Dasar Baru to purchase medication for the treatment of age-Related macula degeneration. (anti- vascular endothelial Growth Factor) 3. Dasar Baru for vitreoretina services in H. Raja Permaisuri Bainun 4. Dasar Baru to develop complete ophthalmology services in H. Segamat, Johor 5. Dasar Baru to develop paediatric ophthalmology services in H. Likas (H. Wanita dan Kanak-kanak) 6. Upgrading of Eye Clinic, H. Kulim 7. Upgrading of Eye Clinic, H. Labuan 8. KK1M mobile cataract surgical buses- 2 buses operating as transporter in Kuching, Sarawak and East Coast of Peninsular Malaysia.

Proposed projects – RMK11 mid term	1. National Eye Institute in conjunction with development of H. Cyberjaya. (2017-2018)-(Setting up the all ophthalmology subspeciality services under one roof – one stop center, and can be done as part Health Tourism center, full paying patient scheme and public cases) 2. National Cataract Finder (NCF) program for community empowerment 3. National Retinal Disease Awareness Program (RDAP) for community empowerment 4. Expansion of KK1M bus services- to include two(2) more buses to serve for Northern Region of Peninsular Malaysia and Sabah. 5. Upgrading the glaucoma services (diagnostic tools) in • HRPZ II • H. Pulau Pinang • H. Selayang • H. Kuala Lumpur 6. Upgrading the oculoplasty services in • H. Sultanah Bahiyah , Alor Setar • H. Raja Permaisuri Bainun, Ipoh • H. Tengku Ampuan Afzan, Kuantan 7. Upgrading of Medical retinal services (Diagnostic tools) in H. Selayang 8. Upgrading of Vitreoretinal services in H. Selayang 9. Upgrading the anti-VEGF (penambahbaikan) costing for National budget.(Triple the current budget) 10. Expansion of Segamat Eye Clinic, patients' waiting area. 11. Upgrading of H. Kluang Eye department for Ophthalmic Surgical Services.

Replacement/ procurement equipment	1. Vitrectomy machine for those more than 10 years old in the hospital with VR services 2. OCT and angiography system replacement for Medical retina services in H. Selayang (> 10 years old) 3. Procurement of electrophysiology system for H. Shah Alam. 4. Replacement of visual field machine and OCT for those with glaucoma services (in almost all state Hospital with glaucoma subspecialist) 5. Procurement of OCT (middle range) for all Hospital with Ophthalmologist (general) for better evaluation of retina and macula status. 6. Replacement of slit lamps for all Eye clinic with > 10-15 years old 7. Replacement of Phaco Machine in specific hospitals with high volume cataract surgery and outdated machine. 8. Purchasing of KK1M transit instruments: mobile microscope, mobile cataract machine, sets of microinstruments, table top autoclave, mobile operating table
Training	1. Training of supervisor for the Parallel Program 2. Training of trainers for cataract surgery- Phacoemulsification 3. Training the trainer for cataract surgery- manual small incision cataract surgery (MSICS) 4. Training of young ophthalmologist- OCT interpretation 5. Training for examiners (Master program/ Parallel program) 6. Training of subspeciality area locally for specific subspeciality area. 7. Training of surgeon for microincision cataract surgery
Recommended staff: workload	To follow the number of medical officer requirement as per calculation according to the level of hospital (to take the consideration: clinic workload/ subspeciality services/ no. of operation theatre per week/no of specialist/ other special services available.(Laser clinic/ preoperative clinic/post operative clinic/injection clinic and emergency active ophthalmology clinic/ward care, on-call rotation and OT rotation)
Other proposals	1. To develop the post-basic Ophthalmic training available in Sarawak and Sabah- to get more local trainees interested. 2. To develop the clinical optometrist module and courses available for optometrist- going to be posted to the Hospital with no Ophthalmologist. 3. To have a better collaboration with Public Health Division to combat the preventable blindness (cataract and Diabetic retinopathy)

PAEDIATRIC SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	**North:** HSB, HPP **Central:** HRPB**,** HKL**,** Melaka **South:** HSA **East:** HTAA**,** HRPZ II **Sabah:** HWKKL **Sarawak:** HUS **Public universities:** • UMMC (Central) • HUKM (Central) • HUSM (East) **Private University:** • IMU (covering Seremban) **Private centres:** • Gleneagles, KL • Pantai Bangsar, KL • Tawakkal, KL • SJMC, Subang • Damansara specialist • Puteri, Johor Bahru • Kempas, JB • Lam Wah Ee, Penang • Adventist, Penang • Gleneagles, Penang • Perdana, Kota Bharu • Gleneagles Medini, JB	• Hospital Melaka to cover Melaka & North Johor • HTJ to cover N. Sembilan • HSNZ to cover whole of state north of Kemaman & south of Kelantan • HTAR to cover west coast of Selangor • Sibu to cover Sibu, Miri & interior of Sarawak • HDOK to cover East & South Sabah
Where previous services available but now not	Hospital Melaka	

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	• HSB – HTF (monthly) – H. Jitra (weekly, daycare sessions) • HKL – Selayang, Serdang, HTAR, HSgB, HPJ, Ampang (emergency visits for ill cases) – HoSHAS(monthly) – Sibu, Miri (6 visits/ year) • HSA – HSI (weekly) – HSNI (monthly) – Attempting to start services in Kluang • HRPZ II – HSNZ(weekly) – HTM (monthly) • HUS – Sibu, Miri (unscheduled visits for ill cases) • HWKKL – HDOK, Tawau, Lahad Datu, Beaufort (3 visits/ year) In addition, there is an effective cross coverage in the absence of the resident Paediatric Surgeons or emergency cases e.g • HSB to Taiping & HSJ • HKL & HSA to HUS	• HKL to Serdang – Clinic & OT – Twice a month – Expected starting date: 2018 • HKL to Sg Buloh – Clinic & OT – Twice a month – Expected starting date: 2018 • HKL to Kluang – Clinic & OT – Monthly – Expected starting date: 2017 • HSB or HRPB to Taiping – Clinic & OT – Monthly – Expected starting date: 2017 • HRPZ II to Pasir Puteh – Daycare services – Monthly – Expected starting date: 2017

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Mr. Clarence Lei from Normah Specialist Centre, Kuching • Consultations in Paediatric Urology • Covers on call when surgeon away i) Relief sent from HKL if available. ii) Coverage by general surgeons	Nil
MOU with External Agencies / Universities	Training in Masters in Paediatric Surgery (direct entry). Candidates will spend 2 yrs in KKM hospitals (started in 2006) • UMMC • HUKM Issues i) Inadequate trainers in UMMC ii) Quality of output uncertain iii)Trainers in KKM may be too busy with service matters	

Major gaps

	Major Gaps	Possible problems	Solutions
1.	Mal-development of Total Surgical Services in Children esp. in other surgical disciplines eg Paediatric Neurosurgery/ ENT/Vascular/ Cardiothoracic	Total surgical care compromised	• Independent , stand alone Children's Hospital in tertiary and regional centres • Train more local surgeons with special interest in children • Employ overseas experts
2	Absence of separate OT facilities for Surgical Neonates in newly developed Women & children complex	Have to transfer very sick babies to General OT which are far away in a separate building	Build separate OT (from Maternity OT) for needs of Neonates

	Major Gaps	Possible problems	Solutions
3.	Lack of recognition as separate entity	• Poor handling of statistics : Workload not fully appreciated • Stunted development	Create as an activity or sub-activity with separate code number
4.	Lack of consistent funding as shared with General Surgical Activity	Unable to develop fully	------as above-----
5.	Lack of recognition and knowledge amongst junior Paediatricians and General Surgeons of surgical conditions in children esp. neonates	• Wrong diagnosis • Poorer outcome • Medico-legal issues	• Compulsory posting for 3-6 months esp in Neonatal Surgery for Paediatricians and General Surgeons during gazettement period • Paediatric Surgery teaching at undergraduate levels
6.	Management of Paediatric Burns	Haphazard management	Need to develop National Policy on Care of Paediatric Burns

Issues & challenges

Issue and Challenges		Possible problems	Solutions
1.	Shortage of Paediatric Surgeons	• Burn out syndrome and frustration • Migration to private sector	**Short Term** • Compulsory rest period • General Surgeons to spend 6 month rotation in Paediatric Surgery **Long Term** • Promotion of speciality • Develop well planned and comprehensive training program esp. expansion of Fellowship program and extension (to 6 yrs) of Masters in Paediatric Surgery

Issue and Challenges		Possible problems	Solutions
2.	Inadequate staff at all levels:		
	• Trainees & Medical Officers	Solo practice with burn-out syndrome	• Core group of 4-5 medical officers at all times • Masters in Paediatric Surgery
	• Nursing Staff	Overworked nurses	Paediatric Surgery as a separate activity / sub-activity
	• Clerical staff	Paperwork delayed if clinicians busy	-----as above----------
3.	Lack of ventilators/ICU beds/wards in some hospitals esp HKL, JB and Kota Bahru	• Need to send sicker babies further away • Delay of surgery for urgent or semi-urgent conditions • Overcrowding	• Dedicated Neonatal Surgical ICU in all regional centres (as in HKL) • Dedicated Paediatric Surgical ICU/ HDW in all regional centres • Multi-disciplinary surgical wards for children
4.	Poor transport system for sick children esp. in East Coast and East Malaysia	Babies arrive in poor conditions	Implement or improve retrieval system for children (with Paediatricians)
5.	Lack of dedicated Day Care Units for Children	• Long waiting list for operations • Increase nursing workload • Unnecessary admissions	Provision of Child Friendly Day Care Units to all hospitals with Paediatric surgical services
6	Training opportunities for CPD	• Lack of up-to-date knowledge • No career development	• Sabbatical periods in developed centres • Staff exchange with other centres • Compulsory and sponsored attendance of international or regional meetings
7	Credentialling and Privileging Issues esp. in private centres	Medico-legal concerns	Implementation of National Specialist Register

Proposals

New programmes / services	1. Minimally invasive surgery in HKL – Weekly – Need extra budget for consumables 2. Operating & clinic sessions in Serdang & HSgB – Decentralise HKL
Projects approved RMK11	1. National Women & Children Hospital, HKL (2013) 2. Ambulatory Care Centre, HSB Alor Setar – Multidisciplinary (2008)
Proposed projects – RMK11 mid term	1. Upgrading of Paediatric Burns Centre, HKL into National Paediatric Burns Centre – HKL is currently the only referral centre for Paediatric Burns in Klang Valley – Unnecessary if the National Women & Children Hospital can be ready by end of 9th MP 2. Upgrading of Neonatal Surgical ICU, HKL • Systems and equipments has become obsolete • Unnecessary if the National Women & Children Hospital can be ready by end of 9th MP
Replacement/ procurement equipment	< Please refer to appendix I >
Training	**Consultants > 10 yrs** • Sabbatical or attachments (3 months, 5 -yearly) • Attendance to regional and international meets (1 week, twice a year) **Consultants < 10 yrs** • Attachments (1 month, 3-yearly) • Attendance to regional meetings (1 week, 3-yearly) **Trainees in Fellowship program** • Overseas attachment (1 year, once during training period) • Attendance to regional meetings (1 week, once during training period)

	General Surgeons • Attachment in paediatric surgery (3 – 6 months, once before entrance into National Specialist Register) **Paediatricians** • Updates in paediatric surgery (2 – 3 day courses organized by Dept of Paediatric Surgery, yearly) **Nurses** • Trained Nurses with Post Basic in Paediatric Care • Updates in Nursing of Surgical Patients (3 – 4 days, yearly) • Updates in specialised areas e.g Burns, Neonatal Surgery and Bowel management programs (3 – 4 days, yearly)
Recommended staff: workload	**Ideal number of Paediatric Surgeons in KKM:**72 *(please refer to Appendix I)* **Ratio of Paediatric Surgeon to population:** 1: 430 000 **Expected number in University& private sector:**30 **Ratio of Paediatric Surgeon to population**1: 310 000 **Current distribution:** • Consultants: – KKM: 10 (7 will retire by 2021) – Public universities: 7 – Private sector: 16 • Trainees – KKM: 17 – Public universities: 3 – Private sector: none **Priority of placement in descending order:** i) HUS ii) HSNZ iii) H. Melaka iv) HTJ v) HTAR vi) HDOK vii) Sibu viii) HSA ix) HKL
Other proposals	1. Leasing of equipments in order to replace existing equipments. 2. Development of paediatric anaesthesia and paediatric radiology as a speciality. 3. Networking or twinning programs with centres of excellence from overseas.

APPENDIX I

Proposed replacement / procurement of major equipment

	Equipment	Hospital	Quantity	Region	Current existing equipment
1.	Paediatric Ventilators	• HKL • HUS • HSB • HRPZ II • HSA • HTAA • HRPB • HPP	8 4 2 2 2 2 2 2	Central Sarawak North East South East Central North	• Needs upgrading : 15 yrs old • Inadequate numbers
2.	Paediatric Incubators	• HKL • HUS • HRPZ II • HSA • HSB • HRPB • HPP	8 2 2 2 2 2 2	Central Sarawak East South North Central North	Needs replacement
3.	Ultrasound machine – Ward – Intra-op	• HUS • HSB • HRPZ II • HSA • HWKKL	1 1 1 1 1	Sarawak North East South Sabah	New procurement to improve patient care
4.	Operating tables	• HRPB • HPP • HRPZ II • HSA	2 2 2 2	Central North East South	Needs replacement : 15 yrs
6	Paediatric Video Endoscopy System	• HRPB • HPP	1 1	Central North	Not available
7	Endo-urology & rigid bronchoscope systems	• HSB • HRPZ II • HTAA • HRPB • HPP	1 1 1 1 1	North East East Central North	Upgrading Procurement Procurement New New

	Equipment	Hospital	Quantity	Region	Current existing equipment
8	Laparoscopic system	• HSB • HRPZ II • HAS • HTAA • HRPB • HPP	1 1 1 1 1 1	North East South East Central North	Upgrading Procurement Procurement New New
9	Paediatric General surgical set	• HSA • HSB • HRPB • HPP • HRPZ II • HUS	2 1 2 2 1 1	Central South North Central East Sarawak	Upgrading of existing system
10	Microsurgery set	HSB	1	North	New procurement
11	Urodynamic equipment	HSB	1	North	New procurement for management of complex Paediatric Urology cases
12	Diathermy equipment	• HPP • HUS • HSB • HRPZ II • HSA • HRPB	2 2 2 2 2 2	North Sarawak North East South Central	Upgrading and replacement
13	Multi-channel monitors for high risk cases	• HSB • HUS • HSA • HRPZ II	2 2 2 2	North Sarawak South East	New and upgrading
14	Ward equipment • BP monitors • Trolleys • Computers	All centres			Upgrading

APPENDIX II

Ideal distribution of Paediatric Surgical Services in Malaysia based on available facilities

Level	Centre	Region	No. of Consultants	Sub-subspeciality services
Tertiary	National Women & Children Hospital (currently HKL)	Central	10	i) Paediatric Liver Transplantation Surgery ii) Paediatric Oncologic Surgery iii) Complex Hepatobiliary Surgery iv) Complex Reconstructive Urology The centre should have the full complement of Surgical specialities (including Neurosurgery and Cardiac Surgery), support systems and will function as the main training centre.
Regional centres	HSB	North	5	• Complex neonatal surgeries • Complex paediatric urology • Rare conditions e.g Kasai operations *Regional Centres should be equipped with Dedicated Neonatal Surgical ICU, Paediatric Burns Unit and Paediatric Day Care Surgical Services.*
	HRPZ II	East	5	
	HSA	South	5	
	HUS	Sarawak	5	
	HWKKL	Sabah	5	

Level	Centre	Region	No. of Consultants	Sub-subspeciality services
State	**Penang**– to also cover Taiping, HSJ, HKB	North	3	• Basic neonatal surgery • Basic paediatric urology • General paediatric surgery The services provided will complement those from • Paediatrics e.g shared facilities for DayCare services and Neonatal ICU • General Surgery : OT facilities and Burns Unit
	HRPB– to also cover HTI, HSM	Central	3	
	HTAR – to also cover Banting	Central	3	
	HTJ – to also cover HTAN	Central	3	
	Melaka – to also cover HPSF, HSNI	Central	3	
	HTAA – to also cover HoSHAS	East	3	
	HSNZ – to also cover Dungun, Kemaman	East	3	
	Sibu – to also cover Miri	Sarawak	3	
	HDOK – to also cover Tawau	Sabah	3	
TOTAL			**72**	

BREAST AND ENDOCRINE SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Nine (9) hospitals 1. HKL 2. HPJ 3. H. Selayang 4. HRPB 5. HSI 6. HRPZ II 7. HSNZ 8. HPP 9. HQE *Please see Appendix I on further details of services available at each centre*	To start Breast & Endocrine services in: 1. HUS – July 2018 2. HTAR – 2020
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• HPJ to HSerdang for Renal parathyroid surgery (2x/month) • HSNZto HTAA for renal parathyroid surgery (2 monthly) • HPJ to HUS (on request) until **JULY 2016** • Other Hospital to HUS (on request) after **JULY 2016**	Regional Centres for Breast & Endocrine Surgery. • HUS
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Provide training/attachment (6-12mths) to surgeon from UMMC & Other Public Universities	Nil

Major gaps/ issues/ challenges

1. Patients from Sarawak – difficult to reach this service. Due to geography and currently only receiving visiting BE surgeons.
2. Obesity Surgery requires expensive equipment – not affordable by obese patient as most come from poor income group
3. High turnover of BE Subspecialty Surgeons. Between 2014-2015 – 5 surgeons had left MOH. The Subspecialty surgeons should get priority in promotions.
4. Unavailability of Equipment & Facilities needed especially in newly setup centres. No budget was given despite repeated requests submitted via 'Dasar Baru'; 'Peruntukan Khas'; 'Permohonan melalui Ketua Perkhidmatan Pembedahan' and others.

Proposals

New programmes/ services	1. Bariatric and metabolic surgery in HSNZ 2. Sentinel node biopsy in all centres 3. Oncoplastic breast surgery in all centres
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Regional centre for Sarawak. SLNB in all centres Oncoplastic Breast Surgery in all centres
Replacement/ procurement equipment	To equip Breast & Endocrine Unit in the newly setup centres: • HRPB Ipoh – Portable ultrasound; laparoscopic/endoscopic Equipment; bariatric &metabolic surgery equipment • HQE Kota Kinabalu – Portable ultrasound; laparoscopic/endoscopic equipment; bariatric &metabolic surgery equipment • Hospital Selayang - Portable ultrasound; laparoscopic/endoscopic equipment To upgrade/replace current equipment at other hospitals
Training	Ultrasound and mammogram courses for surgeons Oncoplastic breast surgery training via short attachments at recognized centres abroad Bariatric and metabolic surgery training

Recommended staff: workload	Nil
Other proposals	• Increase trained personnel: breast care nurses, breast counselor, physiotherapist (lymphoedema), psychological counselor • good coordination and collaborations with Public Health for prevention and screening &early detection of breast cancer patients • Enhance genetic services for genetically susceptible breast cancer patients – to increase clinical geneticist; genetic counselor

APPENDIX I

TYPES OF SERVICES (SPECIALISED) AVAILABLE AT BREAST & ENDOCRINE SURGERY CENTRES (AS of JULY 2016)

Hospital	Sentinel Lymph Node Biopsy (SLNB)	Oncoplastic Breast Surgery	Endoscopic Thyroidectomy	Intra-Operative Nerve Monitoring (IONM)	Laparoscopic/ Retroperitoneoscopic Adrenalectomy	Bariatric & Metabolic Surgery
HKL	√	√	√ Robotic Thyroidectomy	√	√	√ (UPM)
HPJ	√	√		√	√	(Service is temporarily on hold)
Selayang	Under planning	√		√	√	
HRPB	√		√		√	√
HIS	√	√			√	
HRPZ II		√	√		√	
HSNZ		√		√	√	
HPP	√	√			√	
HQE	√	√			√	√

CARDIOTHORACIC SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Seven (7) hospitals : • HPP • HSerdang • HSA • PJHUS • HRPZ II • HQE II • HTAA	**Hospital Serdang** A new Heart Centre that will have additional theatre complex including a hybrid operation theatre, additional CICU and CCU beds to will help to increase the capacity of work. In addition, the Thoracic Services will be expanded and the scope of service should include Video Assisted Thoracic Surgery and Lung Transplantation. **Hospital Sultanah Aminah** It is recommended that this Hospital's Department of Cardiothoracic Surgery be expanded in view of the increasing workload. A purpose built Heart Centre should be planned to cater for future needs of the population.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Nil	Expansion of current services in the 3 hospitals - Hospital Pulau Pinang, Serdang and Hospital Sultanah Aminah Johor Bharu These include provision of a one stop Heart Centre which include CCU, CICU, PCICU, HDW, operation theatres inclusive of hybrid OT, Cardiology and Cardiac Surgery Wards (male & female).
Outsourcing/ Purchase of Services	Hospital Pulau Pinang : Private specialist providing services on a sessional basis(paediatric cardiac surgery- now patients are being sent to Gleneagles Penang)	Proposed to purchase / outsource services if and when necessary

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies / Universities	**2014** Royal College of Surgeons of Edinburgh to provide and develop a training program leading to a professional qualification for future cardiothoracic surgeons. The Joint Fellowship program shall be a 6 year training program leading to FRCSEd/ AMM **July 2016** The first batch of Fellowship trainees commenced their training program in July 2016 **Paediatric cardiac surgery programme** The US based Children's Heartlink have initiated a move to bring some consultants from the Birmingham Children's Hospital to help the local teams namely from Serdang Hospital to further develop the Paediatric Cardiac Surgery Service and train thelocal surgical team and intensive care staff in the perioperative care of the paediatri cardiac patient. This follows a series of discussion between the team from CHL, IJN and Dato Dr Hamdan and Dato Dr Mohd Hamzah	Nil

Major gaps/ issues / challenges

- High workload
- Stressful working condition and long working hours
- Long training period
- Resignation of senior and experienced specialists
- Sudden growth of Cardiac Centres

Proposals

New programmes/ services	**Hospital Sultanah Aminah** 1. Minimally invasive heart surgery 2. Video Assisted Thoracic Surgery **Hospital Pulau Pinang** 1. Endovascular surgery **Hospital Serdang** 1. Endovascular Surgery 2. Video Assisted Thoracic Surgery 3. Minimally invasive cadiac surgery 4. Lung transplantation
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Replacement of equipment for 3 centres: • Heart Lung machine • Echocardiography machine Procurement of new equipment • VATs equipment • Minimally invasive cardiac surgery • Image Intensifier/Hybrid Theatre system for endovascular surgery • Flow meter measurement • Endoscopic navigational System – for early detection of lung nodule/cancer

Training	**Cardiothoracic surgery** A Fellowship in Cardiothoracic Surgery program has now commenced. It is a collaboration between KKM, Academy of Medicine via the Malaysian Board of Cardiothoracic Surgery, and the Royal College of Surgeons of Edinburgh. It's a 6 year program for candidates who have had a minimum of 2 years surgical experience post graduation of which a minimum of 6 months should have been spent in general surgery and cardiothoracic surgery. They should have also attained the MRCS part A and B and attended an interview by the Malaysian Board for Cardiothoracic Surgery **Paediatric Cardiac Surgery** A collaboration is being planned with the help of Children's Heartlink and the Birmingham Children's Hospital to develop a comprehensive and sustainable program.
Recommended staff: workload	• Consultant Cardiothoracic Surgeon serves a population ratio of 1:250,000 • Current workforce (inclusive of private surgeons, KKM, Universities and IJN): 60, Ratio – 1:500,000
Other proposals	To embark on new technique and technologies: 1. Minimally invasive cardiac surgery 2. Endovascular surgery 3. Video-assisted thoracic surgery 4. Lung Transplantation program

NEUROSURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	In twelve (12) hospitals :- 1. HKL (1965) 2. HSA (1990) 3. HPP (1995) 4. HRPB (1996) 5. HUS (1998) 6. HQE (2004) 7. HTAA (2004) 8. HSgB (2006) 9. HSB (2011) 10. HTNZ (2011) 11. HSibu (2011) 12. HTJ (2016)	The organisation of neurosurgical services in MOH hospitals is currently restructured as follows: • Level 1 - No neurosurgery • Level 2 (Major District Hospitals) – Variable neurosurgery services depending on personnel and resources (e.g. sessional neurosurgeons) • Level 3 (non regional centers state hospitals) – Provide emergency and core neurosurgical services • Level 4 (regional centers state hospital) – provided comprehensive neurosurgical services, core and sub speciality. Expansion is for provision of **neurosurgical emergencies** services to the following hospitals: **Northern region** 1. HTF 2. HSJ 3. H. Taiping **Central region** 1. HTAR 2. HMelaka **Southern region:** HPSF **Eastern region:** HoSHAS **Sarawak:** HMiri**,** HBintulu **Sabah:** HDOK, H. Tawau

	CURRENT STATUS	PROPOSED EXPANSION
Where previous services available but now not	**Hospital Sibu** The resident neurosurgeon contract was not renewed since July 2016. Service currently provided by visiting neurosurgeons from HU Sarawak.	N/A
Networking/ Outreach	**HPP:** Regional center for northern region **HKL & HSgB**: Regional centers for central region **HSA JB:** Regional center for the southern region **HTAA: R**egional center for eastern region **HUS**: Regional center for the state of Sarawak **HQE**: Regional center for the state of Sabah	Overall Description of Current Networking Organisation of Services • Regional State Hospitals – Emergency, Core and Sub speciality neurosurgical services • Non Regional State Hospitals – Emergency and Core neurosurgical services • Major District Hospitals – Emergency neurosurgical services
Outsourcing/ Purchase of Services	The following services are still resourced by some by some of the regional, non regional and districts hospitals from private hospitals: 1. Radiology • CT • MRI • Angiography 2. Interventional neuroradiology 3. Oncology • Radiosurgery • Radiotherapy	The following services are still resourced by some regional, non regional and districts hospitals from private hospitals: 1. Radiology • CT • MRI • Angiography 2. Interventional Neuroradiology 3. Oncology • Radiosurgery • Radiotherapy

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies/ Universities	**HPP:** Penang Medical College **HKL:** USM**,** MAHSA University, National Defence University **HSgB:** USM**,** UiTM, Taylor`s Univ. **HSA :** USM**,** Monash University, New Castle University **HTAA**: UIA **HUS**: USM, Unimas Sarawak **HQE**: USM **HRPB**: Ipoh Royal Perak College of Medicine **HSNZ:** UNIZA Univ**,** UCSI **HSB:** AIMST University	

Major gaps/ issues / challenges

1. Lack of trained staff at all level; neurosurgeons, nurses and other paramedical personnel
2. Lack of neurosurgical beds
3. Lack of ICU/HDU beds for neurosurgical patients.
4. Lack of step-down facilities and rehabilitation centres which result in overstay of patient at referral centers
5. Lack of dedicated neurosurgical theaters resulting in long waiting time for surgery
6. Specialised neuroradiotherapy is not available in some units
7. Monitoring equipment is either inadequate or outdated in many centers. Cannot meet current needs.
8. Operative equipment is either inadequate or outdated in many centers. Cannot meet current needs.
9. Transport and escort of critical patient are presently inadequate
10. Coordination of logistic support services grossly inadequate
11. Appointments of new staff are cumbersome and inefficient
12. Management of equipment is grossly inadequate

In short, the resources at many centers are currently not adequate. There is a lack of designated or dedicated facilities. Accessibility is difficulty. Service is at affordability level only. The gross disparity between accessibility and affordability to the neurosurgery care system has results in the Quality of care becomes the major casualty.

Proposals

New programmes/ services	Overall objectives: To introduce or expand of sub-specialty services in regional centers as:- 1. Pediatric Neurosurgery 2. Spine Neurosurgery 3. Skull Base Neurosurgery 4. Vascular Neurosurgery 5. Functional Neurosurgery 6. Endoscopy Neurosurgery 7. Pain Neurosurgery
Projects approved RMK11	Upgrading of HSA JB & HU Sarawak New sites – HSibu Sarawak
Proposed projects – RMK11 mid term	1. The present structure of tertiary institutions should not be tampered with but should be **improved and strengthened**. 2. The cost of setting up new neurosurgical facilities will be astronomical and also ill-advised, in view of the present lack of dedicated staff to run existing units. 3. All highly specialised tertiary services, such as neurosurgery, should be declared as **national services**. This should be irrespective of where they are situated physically. They should be considered as **national assets.** 4. All state hospitals should have regional services with the ability to refer patients to appropriate tertiary neurosurgery centres, as well as to manage some urgent life-threatening problems, particularly trauma and infection. 5. Rehabilitation centres, like regional hospitals, should also be provided for and run by the provinces.

Replacement/ procurement equipment	The most important shortcomings of the present situation are as follows: • Equipment in terms of availability of ICU beds for neurosurgery patients • Monitoring equipment, as well as operative equipment • Personnel in terms of qualified neurosurgeons, neurosurgeons-in-training, the nurses, as well as the paramedical personnel • Bed space in terms of neurosurgical beds as well as high care beds in neurosurgical wards • Theatre time in terms of lack of dedicated neurosurgical theatres. Here it is important to note that it has already been worked out in the civilized world that a tertiary teaching neurosurgical unit needs about 2 dedicated theatres per day. This will need to be defined specifically in relation to population sizes and services provided
Training	**Post-graduate neurosurgical training** should be undertaken in a tertiary institution. We encourage continuing rotation of registrars training in areas like surgery, intensive care, neurology, and spinal units, as they prepare for their intermediate exams.
Recommended staff: workload	Regional neurosurgical unit should have the following minimum structure: 1 HOD 4 Principal Specialists 5 Specialists 6 Registrars 15 Medical Officers Non regional neurosurgical unit should have the following minimum structure: 1 HOD 1 Principal Specialists 2 Specialists 4 Registrars 8 Medical Officers

Other proposals	Despite all the problems stated, neurosurgical services at all public institutions are not denied to anyone who needs them, even if they don't have money to pay on entry. There are 12 functioning neurosurgical centres in Malaysia and these are our strengths. They are all struggling to survive as they need support. • Under the present circumstance we cannot afford to reduce running costs below the current level. • Presently staffing and facilities is stretched to the limit in many institutions. • Facilities are either in adequate or outdated to meets the current challenges.

UPPER GI SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	***Hospital Sungai Buloh*** – function as central region referral centre and national referral centre ***Hospital Pulau Pinang*** – function as northern referral centre ***Hospital Sultanah Bahiyah Alor Star*** - function as northern referral centre (also covering Perlis, Langkawi and Kedah) ***Hospital Tuanku Jaafar Seremban*** – function as the southern referral centre	<u>Already in the planning</u> (trainess already completed their training and waiting placement) – HUS – HSA <u>Future planning</u> (trainees are in their training at the moment) – HRPB – HTAA <u>Future planning</u> (no trainees yet but awaiting for interested candidates) – HQE – HRPZ II
Where previous services available but now not	***Hospital Pulau Pinang*** – function as northern referral centre ***Hospital Sultanah Bahiyah Alor Star*** - function as northern referral centre (also covering Perlis , Langkawi and Kedah)	N/A
Networking/ Outreach	***Kuala Terengganu*** – on a monthly basis: every Sunday and Monday 1st week of the month – Activity include: Upper GI Surgery referral clinic, endoscopy , manometry assessment, pH and impedance assessment as well as operation ***Hospital Sultanah Nur Zahirah*** Other ad hoc networking – mainly for emergency cases where cases were unstable and cannot be transferred – ***HPJ, HAmpang, HTAA, HUSM Kubang Kerian, HUS, HMelaka, HoSHAS, HKL***	• To continue current networking on monthly basis to Kuala Terengganu • Newly proposed networking – Sabah ***Sabah*** (Hospital Queen Elizabeth Kota Kinabalu)

	CURRENT STATUS	PROPOSED EXPANSION
	Occasionally elective cases also are being done at those hospital when the primary team would like to be involved in the surgery themselves	
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	At the moment with ***PPUKM*** for the ***Upper GI Surgery Subspeciality training*** – 6 months attachment especially in the area of bariatric surgery	Nil

Major gaps/ issues/ challenges

1. To provide nationwide Upper GI Surgeon at least in the major / state Hospital Sungai Buloh.
2. General surgeon still indulging in complicated Upper GI cases – either patient refused to be transferred to the referral centres or the general surgeon thinks they can manage or operate those cases when they are actually not. This resulted in poorly managed cases especially in cancer cases.
3. We need more awareness that Upper GI cases are complicated cases especially cancer cases and proper planning as well as MDT with the oncology unit is important, thus general surgeon cannot and do not have these capability.
4. Development of Upper GI training centres – depending on high volumes which was determined in our Upper GI Surgery programme book. At the moment only ***Hospital Sungai Buloh*** has the volume. Thus we need the referral to from other regions to their specific regional centres make sure that we have more high volume centres.
5. We are still waiting for our Dasar Baru Upper GI Surgery to be approved (supposedly 2016). This is important for our future new Upper GI consultant to be placed in other major / state hospital, to ensure appropriate placement of officer with adequate facility.

Proposals

New programmes / services	Nutrition Support Teams – headed by the Upper GI surgery team • This a long overdue programme, to ensure proper and safe delivery and maintenance of nutrition therapy to the general surgery cases and the rest of other subspeciality which require specific • Currently there are 8 functioning Nutrition Support Team around Malaysia that is active, but we need to create more awareness and establish more nutrition support team to support the critically ill and malnourish patients. • Nutrition Support team will also ensure clinical governance in provision of safe delivery of nutrition therapy in all level of patients' care
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Expansion of Upper GI Surgery centres – as mentioned above
Replacement/ procurement equipment	(as listed in dasar baru Upper GI Surgery) 1. Endoscopic equipment 2. Operating table – to be able to accommodate bariatric cases more than 200 kg 3. All accessories related to the operating table 4. OT light to enhance the view during complicated thoracotomy, node dissection and pedicle anastomosis 5. In dire need for new endoscopy system and the NBI system for proper assessment oesophageal cancer and gastric cancer
Training	(as listed in dasar baru Upper GI Surgery) 1. Anaesthetic team for Upper GI cases 2. Nutrition Support Team
Recommended staff: workload	Sharing with general surgical team Otherwise – 1. Endoscopic nurses with post-basic in Endoscopy is really required 2. Nurses with post-basic Oncology is really required
Other proposals	Nil

COLORECTAL SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Four (4) hospitals 1. Hospital Selayang. 2. Hospital Alor Star. 3. Hospital Seremban. 4. HRPZ ll Hospitals with single Colorectal Surgeon: 1. Hospital Kuala Lumpur 2. Hospital Johor Bharu 3. Hospital Kuantan 4. Hospital Kuching	1. HPP 2. HRPB. 3. HQE
Where previous services available but now not	Hospital Pulau Pinang	N/A
Networking/ Outreach	HRPZ ll to HSNZ Kuala Terengganu	1. Hospital Sandakan 2. Hospital Miri
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Provide training/attachment (6-12 months) to Surgeons from UiTM, USIM and UNIMAS.	Nil

Major gaps/ issues/ challenges

1. Shortage of Colorectal Surgeons due to high attrition.
2. Mal-distribution of Colorectal Surgical services.
3. Budget constraints – for equipment and consumables.
4. Lack of promotion for Specialists.
5. Inadequate anaesthetic time.
6. Insufficient OT beds.
7. Lack of support services in Colorectal surgery - Stoma therapy nurses, Endoscopy trained personnel.

Proposals

New programmes/ services	Robotic surgery in collaboration with Surgical Department, Hospital Kuala Lumpur.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Upgrading of Colorectal surgery services and facilities in Hospital Selayang, Hospital Alor Star and Hospital Seremban.
Replacement/ procurement equipment	1. Replacement of operating tables, theatre operating lights, diathermies, laparoscopic surgery systems and surgical equipments. 2. To replace all surgical equipment & instruments on the recommended usage/life span.
Training	1. Colorectal surgery workshops. 2. In-service training & courses for specialists & paramedic . 3. Overseas courses: – 1 overseas scholarship per year for 1 trainee. – 1 overseas short course/attachment for consultants / year.
Recommended staff: workload	Operative surgery workload for Surgeons: at least 200 major Colorectal surgeries per surgeon per year
Other proposals	1. Surgical audit. 2. Continuous upgrading of Colorectal Surgery facilities & services. 3. Human resource planning and development. 4. Networking between public & private hospitals. 5. Credentialing, accreditation of Colorectal Surgery centres. 6. Continous professional development.

HEPATOPANCREATICOBILIARY SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	5 hospitals 1. H Selayang (Tertiary Level Service including Liver Transplantation,) 2. HSB 3. HPP 4. H Melaka 5. HUS	Resident HPB Surgery Service will be available at Hospitals in Johor Bharu and Kuantan by 2020. (Depends on availability of facilities, anaesthetic & support services)
Where previous services available but now not	Kuala Terengganu	
Networking/ Outreach	HPP& HSB provide coverage for the northern region.	Hospital Kuching will take over management of services in HQE – provide monthly clinic and surgical services.
Outsourcing/ Purchase of Services	Nil	HPB Radiology including Interventional procedures, HPB Oncology, HPB Histopathology / Cytology
MOU with External Agencies/ Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Shortage of HPB surgeons in view of high attrition.
2. Mal-distribution of HPB Surgical Services
3. Limitation of support & anaesthetic services
4. Limitation of funds, resources & infrastructural facilities. There is no dedicated budget.

Issues / Challenges:

1. Training of committed, dedicated, knowledgeable & skillful surgeons for the future
2. Retaining them in service.

Proposals

New programmes/ services	HPB Minimally Invasive & Robotic Surgery will be developed in HSelayang.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	1. Upgrading of HPB Surgery services, facilities & infrastructure in HSelayang, HPP & HSB. 2. The proposal to set up a National Centre for Liver Diseases at HSelayang.
Replacement/ procurement equipment	1. Maintenance & servicing of all high-end electronic / digital equipment must be outsourced to the vendors 2. Replacement of operating tables, theatre operating lights, diathermies, surgical suckers, laparoscopic surgery systems, surgical equipments, ultrasonic liver dissectors, argon beam coagulators, intraoperative ultrasound
Training	1. Entrance examination (pre-selection) for all aspiring surgeons wanting to join the HPB Surgery Fellowship Programme. 2. HPB Surgery Workshops 3. Refreshers Courses / Short Courses / Attachment 4. In-service training & courses
Recommended staff: workload	Operative Surgery Workload for Surgeons: at least **200 major HPB surgeries per surgeon per year**.
Other proposals	1. Regionalisation of HPB Surgery Services 2. Continuous Upgrading of HPB Surgery Facilities & Services 3. Human Resource Planning & Development 4. Networking between all public & private hospitals 5. Continuing Professional Development 6. Credentialing, Accreditation of HPB Surgery Centres 7. Surgical Audit 8. Appropriate promotions for exixting staff to help reduce attrition rates

UROLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Ten (10) hospitals with residential services 1. HKL 2. H. Selayang 3. HPP 4. HSA 5. HUS 6. HQE 7. HTAA 8. HRPZ II 9. HSB 10. Hospital Serdang (service presently provided with collaboration with Universiti Putra Malaysia Urologists)	1. HRPB 2. HSNZ 3. H. Melaka 4. HTJ 5. Pusat Jantung Hospital Umum Sarawak (second residential Urological service in Sarawak)
Where previous services available but now not	Nil	N/A
Networking/ Outreach	**Interstate Urology scheduled Urology visits** 1. H. Selayang & HKL to HRPB – alternate monthly 2. HKL and H.Selayang to H. Melaka – monthly visits 3. HSB to HTF – every 2 weeks 4. HRPZII to HSNZ – monthly 5. HKL to HQE– monthly visit to assist in management of difficult cases. 6. H. Selayang to HSA on PRN basis to assist in management of difficult cases	Further expansion of intra state Urology visit and coverage 1. HRPZII to H Pasir Puteh 2. HTAA to HoSHAS 3. HSA to HSI and HSNI

	CURRENT STATUS	PROPOSED EXPANSION
	Intrastate Urology visits 1. HUS to H Sibu, H Miri and H. Bintulu - monthly visit 2. HQE Kota Kinabalu to HDOK Sandakan and H Tawau – alternate monthly visit	
Outsourcing/ Purchase of Services	On a sessional basis only for renal transplant (for both deceased and living procurement and transplant surgery) (also applies when MOH urologists not available eg conferences, leave) by appointed experienced private urologists and renal transplant surgeons (on recommendation of MOH renal transplant surgeons)	Enhanced government – private urologist partnership in the training of urologists. To facilitate sessional contracts for interested and experienced private urologists in government urological units to teach urologists in training via clinic, teaching rounds and scheduled elective operating lists.
MOU with External Agencies / Universities	• MOU with the Royal College of Physicians and Surgeons of Glasgow for conjoint Malaysian Board of Urology and FRCSG Urology examination held yearly since 2008. 2nd MOU signed last year (2015) for another 5 years. • Collaboration with local Universities – UM, UKM, USM, UIAM and UPM in training of Urologists under the auspices of the Malaysian Board of Urology in teaching, rotation of trainees and joint assessment and examination. • Collaboration in terms of multi centre studies especially in the Klang valley area (HKL, H Selayang, H Serdang with HUKM and UMMC.	Nil

Major gaps/ issues/ challenges

Major gaps:

With exception of HKL, Selayang and Hospital Umum Sarawak, other centres operating with only 1 Consultant Urologist. This has affected efforts to develop regional Urology subspecialization services and expansion of regionalized residential services to services in all states in Malaysia.

Issue:

High resignation rate of Consultant Urologists soon after completion of compulsory 2year experience at consultant level required as prerequisite for Urology NSR.

Challenge:

Retain Consultant Urologist in service in order to maintain services at existing residential centres and expand residential services to new centres and to help further develop subspecialties within Urology. Incentives including promotion to Gred Khas posts and Urology subspecialization training opportunities should be given emphasis.

Proposals

New programmes/ services	1. Introduction of Men's Health programmes – health screening, comprehensive prostate management and andrology services in all MOH Urology centres 2. Maximise the usage of the dedicated Robotic Urological surgery OT in HKL after acquisition of new robot machine for use by interested Urologists from other MOH centres and facilitate training of new robotic surgeons. 3. Complete endourological facilities for comprehensive urinary stone management in all MOH urology centres and female urology (incontinence) services in all regional centres. 4. Facilitate development of advanced uro oncology services at HKL, H Selayang, HUS Kuching and H Pulau Pinang 5. Develop HUS Kuching as a regional centre for laparoscopic / robotic urological surgery 6. Develop 2nd paediatric urology services and training at Hospital Selayang 7. Develop HTAA Kuantan as regional centre for reconstructive urology and urethroplasty 8. Enhance existing renal transplantation surgery services at HKL and H Selayang,

Projects approved RMK11	Replacement of aging (more than 15years) and "beyond economic repair' shockwave lithotripter machines (ESWL) for Hospital Sultanah Aminah Johor Bahru, Hospital Pulau Pinang and Hospital Selayang
Proposed projects – RMK11 mid term	Upgrading of urological services, facilities and infrastructure in all urological centers to incorporate CME / research and dry lab training facilities
Replacement/ procurement equipment	1. Procurement of new lithotripter machines (ESWL) for shockwave stone treatment in the following urological centres: – HTAA (present UIA donated machine is no longer serviceable) – HSB (for Kedah and Perlis patients). Currently services purchased from Kedah Medical Centre and patients also sent to Hospital Pulau Pinang. – HRPZ II (to cater for Kelantan population) 2. Prompt repair and replacement of damaged equipment / endoscope with high workload such as flexible cystoscopes, ureteroscopes (semi rigid and flexible) and nephroscopes. 3. Complete laparoscopic set in all urological centers with energy devices and intraoperative ultrasound facility. 4. All urological equipment and endoscopes should be upgraded using the latest video camera systems with archiving facilities. 5. All urological centres should have holmium laser facility. 6. To equip all networking / outreach urological visiting hospitals with basic urological equipment.
Training	1. Introduction of Parallel Entry Urology Training via MRCS into the existing Malaysian Board of Urology Training programme in 2017 to increase the number of Urologists trained. 2. To maintain the present entry into the Malaysian Board of Urology Training programme post MS which in existence since 2000. 3. To maintain current Conjoint Malaysian Board of Urology / FRCS Glasgow Urology exit examination and certification. 4. MOH to continue to facilitate Malaysian Board of Urology training and to provide partial scholarship for the parallel entry candidates. 5. Consultant level training in new technologies- laparosocopic, minimally invasive and robotic assisted surgery to be available as incentive for all Consultant within the MOH. 6. Training opportunities for interested Urologists and trainees in Renal Transplant Surgery. 7. Regular workshop and in service training for all level of staff. 8. Further consolidation of introduced Urological Nursing programmes i.e peri operative (Urology) and Oncology (Urology) as post basic Urological training opportunities for paramedics.

Recommended staff: workload	• Recommended minimum of 2 Consultant Urologists in each MOH centre with 1-2 Trainee Urologists • Operative workload for each Urologist: at least 100 Urological surgeries performed per year.
Other proposals	1. Fully develop Men's Health as a key service provided by all MOH Urology Departments in line with the demands of increased male life expectancy and the need to promote male healthy lifestyle. 2. Substantial increase in Urology medication / drug allocation in line with increase number of Urology patients requiring medical (non operative) management. 3. Enhance MOH contribution and participation in Urology Training 4. Adequate Human Resources allocation, Planning & Development, Credentialing and Accreditation of Urological centers.

HAND AND MICROSURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	1. Hospital Kuala Lumpur (HKL)-since 2011 2. Hospital Tengku Ampuan Rahimah Kelang(HTAR)-since 2015	1. Hospital Sultanah Bahiyah , Alor Star (2018) 2. Hospital Sultan Ismail, Johor Bahru. (2018) 3. Hospital Queen Elizabeth, KK (2020)
Where previous services available but now not	1. Hospital Selayang 2. HTAA Kuantan Service is under Orthopedic Department (Refer KKM letter: 600-17/1/25(1) Dated 10 June 2016 Service is continued by visiting hand and upperlimb/ microsurgery consultant and hand surgery fellows from HKL INCLUDING on call coverage.	Placement of QUALIFIED hand surgery consultant post completion of hand/ upperlimb and microSurgery fellowship of specialty training program once available.
Networking/ Outreach	Visiting surgeons to 1.Hospital Queen Elizabeth 2.Hospital Pulau Pinang 3.Hospital Miri 4.Hospital Kuantan (HTAA)	Nil
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	1. Hand & Microsurgery clinical rotation for orthopedic masters candidate in HKL from • UKM • UM • USM • UIA 2. Fellowship training of Orthopedic Surgeons in Hand Surgery (HKL & HTAR)	Open fellowship/ clinical attachment for overseas surgeons.

Major gaps/ issues/ challenges

1. Consultants leaving service for various reasons
2. Reinstatement of a service which was poorly maintained with no proper succession plan(Hospital Selayang)
3. Procurement of specialised and expensive precision instruments of microsurgery which needs continuous replacement and maintenance.
4. Training of specialists exclusive to hand and microsurgery and not just a part of clinical rotation in orthopedics or plastic surgery

Proposals

New programmes/ services	Hand transplant services
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	• Refurbishment of the delapitated microsurgery lab lost to poor maintainance and non use. (Hospital Selayang) • Purchasing of precision instrument for neurosurgical work
Training	Continuation of the Hand/Upperlimb and Microsurgery Subspecialty Training Program, Orthopedic Services, MOH. Which is in its 12th year of running.
Recommended staff: workload	Establishing regional hand surgery centres with a minimum of 2 qualified hand / upperlimb and microsurgery consultants per centre supported by a dedicated team of specialists, medical officers and paramedics.
Other proposals	Nil

PLASTIC AND RECONSTRUCTIVE SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Available in 11 hospitals: 1. HSB 2. HPP 3. HRPB 4. HSgB 5. HKL 6. H. Melaka 7. HSA 8. HRPZ II 9. HSNZ 10. HUS 11. HQE	1. Consolidation of present resident services with required financial support for equipments, consumables and training. 2. Recommencing the plastic surgical services in Hospital Selayang – service is required in Selayang Hospital due to the availability of other specialties that require plastic surgical support such as burns surgery, liver transplant, breast reconstruction, colorectal and orthopaedic trauma for wound coverage as well as dermatology referrals for skin malignancies. – Trained plastic surgeon has been identified and ready to provide the service. 3. To start plastic surgical services in Pahang. - Trained plastic surgeon has been identified and ready to provide the service.
Where previous services available but now not	Hospital Selayang	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	Visiting surgeons: • HSB: Kangar, Jitra, Sibu • HPP: HSJ, Sibu • HRPB: Sibu • HSgB: Selayang, Putrajaya, Tawau, HSNZ • HKL: HTAR, HTJ, HoSHAS • H. Melaka: Jasin • HSA: Nil • HRPZ II: Nil • HSNZ: Nil • HUS: Miri, Sibu, Bintulu • HQE: Keningau, Sandakan, Tawau, Labuan, Lahad Datu	Nil
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	• HKL with HUSM • Hospital Sg Buloh with UITM	Nil

Major gaps/ issues/ challenges

1. Specialist resigned from MOH for various reasons.
2. Training programme in plastic surgery

   Issues:

   - Masters program in Plastic Surgery (USM)
     - Limited trainee intake for USM Master programme due to inadequate trainer- trainee ratio.
   - Fellowship training by MOH
     - General surgeons who wish to pursue their career in plastic surgery are required to provide 2 years of service in general surgery before embarking in Plastic Surgical Fellowship Training. This prolongs their training period i.e. 4 years of Masters in Surgery + 2 years of service in general surgery + 3 years of Plastic Surgery Fellowship Training.

Proposals

New programmes / services	Plastic Surgical services in Hospital Tuanku Ampuan Afzan, Kuantan Pahang.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	As proposed by each resident service.
Training	Parallel pathway for specialist Training in Plastic Surgery with RCS (Edinburgh) were proposed but we are still awaiting approval from RCS (Edinburgh).
Recommended staff: workload	• Proposed at least one consultant and one specialist per hospital. • More specialists are required for visiting surgeons to other hospitals.
Other proposals	To shorten the 2 year service for General surgeon who wants to pursue further career in Plastic surgery to 6-12 months after completing Masters in Surgery. There are only a small number of General Surgeons who will be interested in Plastic Surgery and this should not affect the General surgery services.

VASCULAR SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• Hospital Kuala Lumpur • Hospital Serdang • HQE, Kota Kinabalu • HTAA, Kuantan (UIA) • HSA, JB	• Hospital Pulau Pinang • HRPZ II • Hospital Umum Sarawak
Where previous services available but now not	• Hospital Pulau Pinang • Hospital Umum Sarawak	N/A
Networking/ Outreach	• Hospital Pulau Pinang • HoSHAS • HRPZ II • Hospital Seberang Jaya • Hospital Kepala Batas • Hospital Umum Sarawak • Hospital Sultanah Bahiyah – stopped early 2016	• No further plans for vascular surgeons at the present time. • Proposal for general surgeons to do vascular access for hemodialysis at their respective hospitals after training and setting up of the service by the vascular surgeons. This is due to the long waiting time for vascular access and also the large numbers of cases with the increasing number of ESRF patients
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	Training of university surgeons / lecturers in vascular surgery (fellowship program)	NIl

Major gaps/ issues/ challenges

1. **Funds / Resources**
   - Limited funds especially for consumable items, namely the
   - New and replacement of assets.
   - Funds for consumables are especially limited in vascular units in hospitals outside the Klang valley

2. **Manpower**
   - Difficult to get surgeons outside the Klang Valley to be interested in the training and then go back to serve outside the Klang Valley especially for Sabah and Sarawak after completion of their fellowship training.
   - Retention of experience allied health personnel in vascular units. Many are transferred out on promotion or lack of posts in the present unit or hospital.
   - Lack of interventional radiologist outside the Klang valley
   - Need for a dedicated vascular anesthetist service.

3. **Services**
   - Need for support from other relevant departments in the management of vascular patients. Vascular cases usually require heavy use of anesthetic time and ICU beds.
   - Urgent vascular imaging request are required at all times and should be available. It would be good if these services develop specialist interested in vascular diseases.

4. **Networking services**
   - Difficulty in developing further networking services in hospitals due to lack of facilities like OT time and funding for the visiting vascular surgeons. Usually only medical officers are made to be in charge of vascular cases.
   - Furthermore surgeons going for networking services outstation should have a suitable remuneration to encourage them to continue the services with enthusiasm as they have to sacrifice their time and effort going outstation on a regular basis.
   - Funds for allied health/nurses from networking centers to come for attachments in HKL for training and exposure

5. Promotion

Lack of promotion opportunities to Gred Khas for senior clinicians leading to resignation to the private sector.

6. Training

More funds should be made available for training especially for the allied health personnel. Also funding for short term training overseas have to be given for team training for new services that are planned which will include both doctors as well as allied health personnel. Funding should also be made available for KKM staff i.e nurses and assistant medical officers to come to HKL for short attachments to gain experience in vascular OT, endovascular, non-invasive vascular technology and wound care.

Proposals

New programmes / services	• Wound care units in each vascular center/unit • Non-invasive vascular diagnostic laboratory in each center/unit • Vascular & Endovascular Surgical Skills laboratory in HKL • Peri-operative vascular nursing as post basic degree
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	• Replacement of Surgical OT instruments that are worn out or damaged. • Replacement and procurement of non-invasive equipment for vascular laboratories. All vascular units in KKM hospitals should have a vascular lab. • Procurement of vascular C-arms for day care surgery in HKL and also in each unit in other KKM hospitals.

Training	• Training for surgeons both locally and overseas. 1-2 overseas scholarship per year • Advanced training in endovascular surgery for vascular surgeons • Workshops for both doctors and allies health/nursing • Training for Allied Health Personnel - Advanced Diploma in Vascular and Endovascular for Allied health - Allied health personnel training for non-invasive vascular laboratory - Vascular sonography for allied health - Advanced training in wound care
Recommended staff: workload	• Minimum number of vascular surgeon per center should be 2 surgeons as this is the minimum number required to be considered a training center. • Allied health personnel to run the dedicated wound care unit, endovascular unit and vascular laboratories. • Allied health personnel will also be required for the new Surgical Skills lab in HKL.
Other proposals	**Hybrid Operating Suite/Theater for Hospital Kuala Lumpur** This will encompass a full functioning operating suite equipped with wall-mounted bi-planar C-arm. This will enable more complex vascular cases requiring a combination of both endovascular and open surgery to be done within the same OT suite.

TRAUMA SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Trauma Surgery subspecialty is currently available in 1. Hospital Sultanah Aminah, Johor Bahru 2. Hospital Tunku Ampuan Rahimah,Klang, Selangor	In line with the National Trauma Surgical Policy document, **HSA and HTAR** (Level IV Trauma Care Facilities) are currently used as training hospitals due to the large volume of cases, reflected by statistics both from MOH as well as other agencies (i.e PDRM). Both centers also provide clinical care as well as contribute to data acquisition**.** **HPP** will be the next hospital planned for service setup. Thus with this initial structure, the service will be able to have its presence in the central, north and south of Peninsula Malaysia. Further expansion will prioritize **East Malaysia and all tertiary state hospitals (Designated as Level III trauma care facilities).** The staffing of these Level III facilities will be given priority based on the load of trauma faced by specific locales and geographies. By this, it is hoped that regional coverage can be achieved for the entire country, eventually. Each regional service will set up sub systems of trauma care within their respective regions to organize better care which is guided by data analysis from the respective **Trauma Registries**. Linkages and networking of regional Trauma Registries will then help to contribute to an eventual **national database** to provide for, quality improvement and resource optimization for the country.

	CURRENT STATUS	PROPOSED EXPANSION
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• Regional Trauma groupings throughout Southeast Asia and Australasia • Local Universities	Clinical and scientific data sharing with similar groups in Southeast Asia and the Asia-Pacific region. An interest group from within ASEAN countries has recently been proposed and may see Malaysia's participation Sharing of data with and amongst government agencies such as Polis diRaja Malaysia, Jabatan Pendaftaran Negara, Jabatan Pengangkutan Jalan, and others deemed necessary Non-governmental bodies, social and charitable organizations and other such entities, to facilitate placement of the destitute and dispossessed upon successful treatment of their injuries
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Yet to receive "dasar baru" for the subspecialty.
2. Relatively "new and young" subspecialty with very few surgeons trained. Since its inception the subspecialty has received one trainee per year for every year since 2011.
3. Trauma Surgery is a subspecialty which developed from the North American system and is not within the traditional training framework of the Anglo-European system and is a largely unknown concept to the local surgical fraternity. Australasian countries (Australia and N. Zealand) have embraced the system albeit with subtle adaptations to suit local needs. Asian countries such as Singapore, Thailand, Cambodia, Taiwan, Hong Kong and India have developed Trauma Surgery within their jurisdictions.

4. Inculcating the understanding that developing a Trauma Surgical services requires "regionalization" of services as to eventually provide enough coverage for the entire country.
5. Attracting surgeons to train and participate in the care of the injured within the framework of the system remains to be a foreseen future problem as this field is perceived to be less financially lucrative with poor quality of life.

Proposals

New programmes/ services	1. Creation of facilities for Trauma Surgical High Dependency areas in hospitals with Trauma Surgical Services in place or projected. Namely Hospital Sultanah Aminah, Hospital Tunku Ampuan Rahimah and Hospital Pulau Pinang for the next 5 years. Other such facilities should be established for other hospitals once adequate numbers of trauma surgeons can be placed. 2. Establishment of the Trauma Surgical Program (as per the National Trauma Surgical Policy document), in all hospitals in which Trauma Surgery services has been set up 3. Creation of designated positions of **Trauma Nurse Coordinators and Trauma Nurse Practitioners**, both of who are integral to the Trauma Surgical program in hospitals with such services.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Upgrading of facilities and infrastructure in all hospitals where trauma surgery has been setup. This infrastructure upgrade should include **information technology hardware and software** required for gathering, processing and analyzing data procured by local-regional trauma registries. Wherever possible due consideration should be given to providing large data-banks capable of high capacity data storage including radiological imaging data. Establishment of communications networks independent from public networks spanning teams from pre-hospital- to the Emergency Department team and in-hospital definitive surgical teams. Consideration given to the set-up of a surgical retrieval teams in appropriate hospitals, including air mission retrievals.

Replacement/ procurement equipment	All surgical equipment and instruments to be replaced pre-emptively based on the recommended usage / life span Adequate support for procurement of consumable items and equipment in which trauma surgery heavily relies upon, i.e specialized dressings and hemostatic agents, hematological/transfusion equipment such as cell savers and rapid infusion systems etc Consideration given to provide adequate and appropriate beds and equipment for High Dependency Areas for trauma care.
Training	Subspecialty overseas scholarships for Trainee Trauma Surgeons within the MOH training program should be continued as local experience in this field remains scarce Education grants (LDP) for doctors to attend **the Advanced Trauma Life Support (ATLS) course** (which is now available in Malaysia) should be continued and strengthened as to provide adequate training an exposure to front-line doctors caring for the injured. It is hoped that in the future ALL doctors that are surgical or ED based must be ATLS certified. Establishment of overseas scholarships for nurses and paramedics to be trained as **Trauma Nurse Coordinators and Trauma Nurse Practitioners** Education grants for Trauma related courses conducted overseas as recommended by the World Health Organization (WHO) listed as below: • National Trauma Management Course • Definitive Surgical Trauma Care Course • Essential Surgical Skills Course Primary Trauma Care Course • Trauma Nursing Core Course • Trauma Team Training Course * For details and description of each please refer to Guidelines for Essential Trauma Care, World Health Organization, 2004 which is available on the WHO website

Recommended staff: workload	The post of **Trauma Nurse Coordinators and Trauma Nurse Practitioners** be formally designated for hospitals that have Trauma Surgical Services in place. These staff are integral to the upkeep and periodical audit of data from the trauma registry along with other clinical duties. Establishment of the Trauma Service Committee at hospital level where a Trauma Surgeon is available to monitor and oversee in-hospital programs and service delivery. This committee should be surgeon led.
Other proposals	Resource distribution guided by verifiable data of case load and severity stratification Establishment of specific audits to ensure quality of care delivered specifically for injured patients. The benchmarks used must be one that is most prevalent globally and internationally accepted. Revision and/or review of the current insurance coverage for foreign workers engaged in high risk jobs. Trauma care for the severely injured remains to be an expensive and resource intensive field as such that periodical upgrades are required to compensate the system adequately. A solution should be sought for funding the care of patients in the "twilight zone" such as refugees, illegal immigrants, displaced peoples without clear refugee status etc, that in the current time are uncovered by any healthcare financing scheme and cannot afford to pay for services.

BURN SURGERY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Currently available in: 1. HPP 2. HRPB 3. HKL 4. HSgB 5. Hospital Melaka 6. HSI 7. HSA 8. HSNZ Exclusively burn clinics conducted in HKL. For other areas mostly burnclinics is combined with plastic surgery or general surgery clinics.	1. To establish major burn units in south, central and nortern peninsula + 1 each in Sabah and Sarawak. 2. To establish minor burn units, one in each state. 3. To encourage surgeons to take up burn surgery as supspeciality
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Visiting clinics: • HKL (plastic surgery) – Hospital Seremban – HoSHAS, Temerloh – HTAR, Klang • Hospital Melaka (plastic surgery) – Hospital Jasin – Hospital Alor Gajah • In HSA and HSI, burn patients are seen along with plastic or general surgery patients. No visits done. • HSNZ runs weekly burn clinic and organise courses for terengganu state.	• To have networking between burn surgeons and plastic surgeons interested in burns. • To establish networking between major burn and minor units for referrals, advice regarding treatment and trafnsfer of burn patients..

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Burn surgery services in Kelantan is provided by HUSM	• Purchase of cadaver skin from european skin bank , • Organise experts from local universities or foreign countries to teach regarding reconstruction of burn injuries.
MOU with External Agencies / Universities	Nil	

Major gaps/ issues / challenges

Unable to expand services due to no trainees interested in burn surgery.

Burn management is mostly managed by plastic surgeons

Proposals

New programmes / services	To set up a skin bank in KL
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Nil
Training	• Compulsory training of all general surgery trainees in treating burn patients (3-6 months) • To start fellowship programme in burns. • To start short training programmes for medical officers in order to manage minor burns units.
Recommended staff: workload	As in HSI, a 10-bedded unit will require: • 35 staff nurses • 6 ppk • 4medical officers • 1 burns trainee • 1 burn consultant
Other proposals	Nil

GENERAL ANAESTHESIOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	55 hospitals provide resident specialist services • All state hospitals including HKL (14) • HSAH, HKulim, H Langkawi • HSJ, HBM, HKepala Batas • HTI, HTaiping, HSM, HSR • HSg B, HSelayang, HAmpang, HSerdang, HKajang, HSAS • HPJ, IKN, HLabuan • HTAN, HPD • HSI, HPSF, HSNI, HSegamat, HKluang • HoSHAS, Kuala Lipis • HKemaman • HKuala Krai, HTM • Pusat Jantung HQE II, HTawau, HLahad Datu, HSandakan, HLikas, HKeningau • PJHUS, HMiri, HBintulu, HSibu, HSarikei	The anaesthesia service shall be developed in tandem with surgical services based on community needs. To expand service to H.Pendang, HBesut, Hpekan,HSri Aman, HPetrajaya and HCyberjaya
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• HKulim to HBaling • HSJ to HBM, HKepala Batas and HSungai Bakap • HRPB to HBatu Gajah, HKampar, HSungai Siput • HTaiping to HKuala Kangsar, HGerik, HParit Buntar • HTI to HTapah, HSR and HSM • HTAR to HBanting • HSelayang to HKKB • HMelaka to HJasin and HAlor Gajah • HTJ to HPort Dickson and HJelebu	• Hospitals with medical assistant administering Anaesthesia to be replaced by Anesthetic Medical Officer. • Hospitals with Anaesthetic Medical Officer will be covered by respective state hospitals

	CURRENT STATUS	PROPOSED EXPANSION
	• HTAN to HJempol and HTampin • HSA to HKulai, HPontian and HPermai JBahru • HSI to HKota Tinggi and HMersing • HPSF to HTangkak • HTAA to HPekan, HMuadzam Shah • HSNZ to HBesut • HKemaman to HDungun • HoSHAS to HJengka • HKuala Lipis to HBentong, HRaub • HRPZ II to HPasir Mas, HTumpat and HPasir Puteh • HKuala Krai to HTanah Merah, HGua Musang, • HQE I to HQE II, HKota Belud, HPapar, HRanau, HTuaran, HMesra Bukit Padang, HLikas and HLabuan • HTawau to HSemporna & HKunak • HBeaufort to HSipitang and HKuala Penyu • HKeningau to HTambunan & HTenom • HSandakan to HBeluran, HKinabatangan • HKuching to HSerian, HLundu, HBau, HSimunjan, RCBM and HSentosa • HBintulu to HMukah, HDaro and HDalat • HSibu to HKapit, HSaratok and HKanowit • HMiri to HLimbang, HMarudi and HLawas • HSri Aman to HBetong	

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	HKL, HBatu Pahat and HTawau, HSlim River – Contract anaesthetists HKota Bharu and HTAA Kuantan – ICU services	State hospitals where workload exceed staff capability shall engage private anaesthetists / intensivists on sessional basis;
MOU with External Agencies/ Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Human resource shortages
   - Specialist, medical officers, anaesthetic nurses and medical assistants
   - Inadequate secretarial and clerical support
2. Shortage of elective operating time
3. Equipment issues
   - Frequent breakdown of old equipment in OT
   - Shortage of basic equipment for OT anesthetic services
4. Inadequate allocation of consumable budgets;
5. Clinical practice
   - need to extend anaesthetic clinics to all specialist hospital
   - needleless practices
   - lack of patient controlled analgesia (PCA) pumps for pain control
   - Stop practice of medical assistants administering anesthesia in East Malaysia
6. Lack of facilities – which include lack of office space for anesthesia department, lack of storage space for OT equipment and lack of IT facilities
7. Lack of funds for CPR training activities

Proposals

New programmes/ services	1. All hospitals must have Anaesthetic Clinic 2. All hospitals must provide acute pain services 3. State hospitals must provide chronic pain service. 4. Major hospitals to achieve "Pain Free Hospital" status 5. All Ot's must practice "Compassionate List" of Saturdays to help reduce waiting time for elective surgery 6. Elective lists should extend till 9.00pm. 7. Anaesthesia department to promote anaesthesia for day care surgery and day of surgery admissions (DSA) 8. Establishment of PACU (post anaesthesia care unit) in recovery rooms of theatre in hospitals with ICU bed shortage. This is to prevent cancellation of elective surgery due to lack of ICU bed. 9. Post Operative mortality review (POMR) will be done electronically (vPOMR).
Projects approved RMK11	Anesthetic Departments are involved in projects involving the upgrading of ICU facilities, OT facilities and Ambulatory care (refer Anaesthesia Blueprint for details) 1. Development of WCH in HKL, HKota Bharu. 2. Upgrading of HKangar and 3. Multi discipline ward block (satu bangunan 8 tingkat) 4 unit MOT, 20 katil HDW DAN 30 katil NICU, SCN, PICU 4. Upgrade H.Baling: 2 OT 5. Extra 2 OT 6. WCH HPP: 300 beds 7. Hospital Seberang Jaya (Multi storey block) extra 2 OT **PERAK** • WCH and Kardiologi H.Ipoh • Hospital Telok Intan: Extra 2 OT • Hospital Batu Gajah: build 2 OT **SELANGOR** • HTAR: 1 A&E OT • HKajang: 6 OT • Pusat Kardiologi H.Serdang: 4 OT • H.Banting: 2 OT

	JOHOR • Hospital Batu Pahat Upgrade OT • Hospital Segamat: Upgrade OT • Hospital Mersing: Extra 4 OT **PAHANG** • H.Jengka: Renovate 1 OT • H.Kuala Lipis: Build OT **TERENGGANU** • H.Kemaman: New hospital • HSNZ: Build 1 Burn OT) • H.Dungun: New hospital **KELANTAN** • Hospital Tanah Merah: Build OT • Hospital Tumpat: Build 3 OT **SABAH** • Hospital Tambunan: 4 OT • Hospital Tenom: 1 OT • Hospital Papar: 2 OT • Hospital Beaufort: OT **SARAWAK** • Hospital Miri: 2 OT and 2 OT for Day surgery **WILAYAH PERSEKUTUAN** • Hospital Putrajaya: New block
Proposed projects – RMK11 mid term	1. All new operation theatres to have hybrid operating theatres. 2. Hospitals with insufficient operation theatre to have modular operating theatre built.

Replacement/ procurement equipment	1. Anaesthesia work station in all state hospitals 2. Ultrasound machine (portable for nerve-blocks) in all major hospitals. 3. Anaesthesia physiologic monitor and warming devices in various state hospitals and specialists hospitals. 4. PCA pumps (patients controlled analgesia) for post operative pain management. 5. Policy for automatic upgrading of old equipment more than 10 years to be in place. 6. Airway management devices should be available in all hospitals providing anaesthesia. 7. Operation theatre management system in all major hospitals which is compatible with hospital information system. 8. Replacement of the old CPR equipment 9. Crisis simulation training system to be made available in all hospital. 10. Addition of warming devices, target controlled infusion (TCI) pumps, pneumatic calf compression devices, cell scavengers system.
Training	1. Overseas short courses/attachment for specialist in the following areas: • Anesthetic day care surgery • Regional Anesthesia and use of ultrasound techniques • Thoracic Anaesthesia • Simulator course in training of anesthesia crisis management • Obstetric analgesia service • Anesthesia for bariatric surgery 2. Subspecialty training programme (scholarships) for: cardiac and perfusion anaesthesia, pediatric anaesthesia, neuroanaesthesia, obstetric anaesthesia, anaesthesia for transplant surgery, Intensive care and pain management and regional anaesthesia. 3. In-service attachments for specialists U52 and above 4. Post-basic nursing course i.e. Intensive care nursing and peri-anaesthesia course 5. Training for doctors: Basic assessment and support for intensive care (BASIC) course, Safe practice in anaesthesia (SPA) course and Advanced Life Support course (ALS)

	6. Simulation courses for doctors 7. Credentialing and privileging in regional anaesthesia and ultra sound guided vascular access. 8. Win focus
Recommended staff: workload	**No. of specialists** (overall 1 anesthetist to 2.5 surgeons) 1 specialist to 1 elective list for complex surgery 1 specialist to 2 elective list for basic surgery 1 specialist for every 8-10 ICU beds 1 specialist for anesthetic clinic 1 specialist for acute pain clinic **Medical Officers** 1 MO for every 6-8 ICU beds 1 MO for anesthetic clinic (increase by one for every increase of 20 patients / day) 1 MO for acute pain clinic (increase by one for every increase of 20 patient visits / day) **Anesthetic Nurses** 1 Nurse for 1 OR 1 Nurse for every 2 recovery bays 2 Nurses for anesthetic clinic 2 nurses for acute pain clinic
Other proposals	1. To phase out MA based service in East Malaysia; replace them with medical officers trained in anaesthesia. 2. To move towards 'simulation based' training using skill stations, manikins for all level of training especially for MO/trainees. Need to have special allocation to purchase such equipment e.g. smart manikins which can simulate clinical scenarios. 3. To merge the functions of the currently two separate groups of staff in the anaesthetic department i.e. medical assistants and anaesthetic nurses into a single category called "Anaesthetic Assistant' with clear job description and career path. The nurses and MAs must go through the post-basic perianaesthesia course (PAC) to qualify. 4. To increase elective operating time to 9.00 pm on working days. 5. To develop PACU in OT. 6. To increase daycare surgery.

ADULT INTENSIVE CARE

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	As of 2016, 52 hospitals offer adult intensive care service under the anaesthetic departments. Hospitals with Intensivists; • HSB • HPP • HRPB • HKL • HSelayang • HSgB • HTAR • HMelaka • HSA • HSNZ • HRPZ II • HTAA • HUS	• Total critical care beds should be 10% of total hospital beds. • All state hospitals and major specialty hospitals should have at least one resident intensivist per hospital.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• HKulim to HBaling • HSJ to HBM, HKepala Batas HSg Bakap • HRPB to HBatu Gajah, HKampar, HSg Siput • HTaiping to HKuala Kangsar, HGerik, HParit Buntar • HTI to HTapah, HSRand HSM • HTAR to HBanting • HSelayang to HKKB • HMelaka to HJasin and HAlor Gajah • HTJ to HPD and HJelebu	Networking of ICUs (within regions) would only be successful provided: • There are adequate number of ICU beds in the region. • There is a real-time online information system to track the occupied/ vacant beds in each individual ICU.

	CURRENT STATUS	PROPOSED EXPANSION
	• HTAN to HJempol and HTampin • HSA to HKulai, HPontian & HPermai • HSI to HKota Tinggi and HMersing • HPSF to HTangkak • HTAA to HPekan, HMuadzam Shah • HSNZ to HBesut • HKemaman to HDungun • HoSHAS to HJengka • HKuala Lipis to HBentong, HRaub • HRPZ II to HPasir Mas, HTumpat and HPasir Puteh • HKuala Krai to HTanah Merah, HGua Musang, • HQE I to HQE II, HKota Belud, HPapar, HRanau, HTuaran, HMesra Bukit Padang, HLikas and HLabuan • HTawau to HSemporna and HKunak • HBeaufort to HSipitang and HKuala Penyu • HKeningau to HTambunan and HTenom • HSandakan to HBeluran, HKinabatangan • HKuching to HSerian, HLundu, HBau, HSimunjan, RCBM and HSentosa • HBintulu to HMukah, HDaro and HDalat • HSibu to HKapit, HSaratok and HKanowit • HMiri to HLimbang, HMarudi and HLawas • HSri Aman to HBetong	

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Not sure about H. Umum Sarawak	Nil
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Acute shortage of intensive beds. In spite of regional networking and sharing of beds, the ICU capacity in most major hospitals still fall short of the demands;
2. Haphazard development of Intensive Care services. Fragmentation of Intensive Care services e.g. Neuro ICU, Uro ICU. To integrate Intensive Care and High Dependency beds at different locations in the hospital under an intensive care service.
3. Shortage of trained intensivists
4. Lack of trained nurses and other allied health staff
5. The increment in the number of doctors and nursing staff is not in tandem with the increment in the number of ICU beds.
6. Lack of Isolation rooms (positive/negative pressure) in existing state hospital ICU
7. Insufficient funds for consumables; situation worsened by pressure to increase the number of ICU beds
8. Insufficient funding for POCT e.g. reagents for ABG machine.
9. No waiting room for relatives and for counseling
10. Intensivist driven hospital should have increase budget
11. 10% of hospital beds should be critical care beds.

Proposals

New programmes/ services	• Continuous Renal Replacement Therapy with locked-in budget for all state hospitals and major specialty hospitals. • Antibiotic stewardship programme • Practice of withholding / withdrawal of therapy, advanced medical directive and quality end-of-life care • A national centre for Extracorporeal membrane Oxygenation (ECMO). • Teleconsultation by intensivists to ICUs without intensivists.
Projects approved RMK11	PERLIS • Naik taraf GICU: Tambahan 5 katil KEDAH • Hospital Pendang (pakar minor) ; satu bangunan hospital dengan 108 katil,alat dan ICT • Naik taraf H.Baling: 8 katil ICU & 8 katil NICU • Hospital Kulim: Pertambahan 5 katil ICU & CSSD PULAU PINANG • Hospital Seberang Jaya (Multi storey block): GICU, Neuro ICU, CCU & Naik taraf PERAK • WCH and Kardiologi H.Ipoh • Hospital Manjung: 1HDW SELANGOR • HTAR:Tambahan 16 katil GICU • HKjg: Tambahan 10 katil GICU & HDW • Pusat Kardiologi H.Serdang: CCU • H.Banting: CSSD NEGERI SEMBILAN • HTJ: WCH dan Naik Taraf ICU kepada 24 katil • Port Dickson: 1 blok perkhidmatan pakar 4 tingkat dan tambahan katil 54 JOHOR • Hospital Pasir Gudang (pakar major): 383 katil,alat dan ICT • HSNI (blok tambahan): Naik taraf HDW • Hospital Segamat: Naik taraf ICU,HDW

	PAHANG • H.Kuala Lipis: Bina bangunan 7 tingkat (aras 4: ICU) TERENGGANU • H.Kemaman: Bina hospital baru 300 katil • HSNZ: Naik taraf system gas perubatan dan Naik taraf Unit Kebakaran (4 katil Burn ICU dan I Burn OT) • H.Besut: Naik taraf HDW • H.Dungun: bina hospital baru KELANTAN • Hospital Tanah Merah: Naik taraf & tambahan 100 katil , Dewan Bedah & ICU/CCU • Hospital Tumpat: Naik taraf Dewan Bedah kepada 3 OT yang lengkap SABAH • Hospital Tambunan: Tambahan 100 katil, SARAWAK • Hospital Miri: tambahan 300 katil, 2 OT Baru, 2 OT untuk Day surgery • H.Sibu: Naik taraf GICU (tambahan 4 katil) • H.Petra Jaya: Bina hospital baru (major) 300 katil • H.Sri Aman: Bina hospital baru 108 katil (minor) • H.Bintulu: Burn unit WILAYAH PERSEKUTUAN • HKL: Sistem robotic surgery • Hospital Putrajaya: Tambahan blok baru (10 tingkat) termasuk ICU
Proposed projects – RMK11 mid term	Nil

Replacement/ procurement equipment	1. Invasive ventilators 2. Non invasive ventilators 3. Haemodynamic monitors 4. CRRT Machine 5. Ultrasound Machine 6. ABG machine 7. ICU beds (high end) with facilities for tilting, passive leg raising positions etc. 8. Equipment for early mobility : – hoist – chairs – walking frames – cycler 9. Cardiac output monitors 10. Hypothermia cooling devices
Training	To increase number of scholarship for intensivists to 5 per year To increase the number of medical technologist and respiratory therapists in each ICU To ensure at least 60% of staff in ICU are ICU trained
Recommended staff: workload	Category — Staff: patient — Staff: bed Consultant — 1:10 — 1:5 Specialists — 1:8 — 1:4 Medical Officer — 1:6 — 1:2 Nurses — 1:1 — 5:1 Nursing sister — 1:8 — 1: 8
Other proposals	1. Increased budget for the intensivist-led ICUs as complex interventions and monitoring requires costly equipment and consumables. 2. Scheduled replacement of equipment/monitors 3. Clinical information system (CIS) for all ICUs 4. Improved infrastructure when setting up new ICUs: • waiting room for families • staff room • spacious unit that complies to infection control measures • properly fitted positive, negative isolation rooms • chutes for transportation of specimens

PAEDIATRIC ANAESTHESIA

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	1. Women and Children`s Hospital Kuala Lumpur 2. H Selayang 3. H Serdang 4. HTJ 5. HMelaka (paediatric interest) 6. HSA 7. HRPB 8. HRPZ II 9. HSNZ 10. HUS 11. HSB (2017)	1. HTAA 2. HPP
Where previous services available but now not	HWKKL	N/A
Networking/ Outreach	To all hospitals when necessary	Coverage by Paediatric Anesthetists from Regional Centres
Outsourcing/ Purchase of Services	Nil	Propose outsource from private anaesthetists with special training in pediatric anaesthesia when necessary
MOU with External Agencies/ Universities	National University of Malaysia (UKM)-trainee master in anaesthesia do a one month rotation in paediatric anaesthesia and intensive care	Nil

Major gaps/ issues/ challenges

General Issues:

1. Human resource shortages at all level; lack in Paediatric Anesthetists and other paediatric trained support staff
2. Premedication rounds for emergency surgery; all patients must assesed in the ward prior to surgery. This is done only in few hospitals
3. Lack of skill amongst general anesthetists to manage perioperative care in paediatric surgical cases including their post-operative intensive care
4. Lack of training opportunities for Anesthetist, Medical Officers and nurses including refresher for senior anaesthetists.
5. Current operating suites in most hospitals are not child friendly both in terms of practice and infrastructure
6. Paradigm shift towards pain-free hospitals should address procedural pain (both pharmacological and non-pharmacological) in children
7. Lack of anaesthetist who are interested in paediatric anaesthesia as a subspecialty or special interest

Specific to WCH

1. Lack of trained anaesthetist in paediatric surgical work
2. Lack of exposure to paediatric anaesthesia during their training in the Master's programme
3. Lack of trained paediatric support staff

Proposals

New programmes/ services	1. Ambulatory Care to all paediatric surgical based hospitals 2. To develop a Paediatric` Simulator Lab in WCH Kuala Lumpur i.e. resuscitation in the critically ill child, difficult airway, APLS 3. TIVA and TCI training programme in paediatric 4. Ultrasound guided regional anaesthesia in paediatric 5. Ultrasound guided central line cannulation in children
Projects approved RMK11	
Proposed projects – RMK11 mid term	
Replacement/ procurement equipment	All centres with pediatric surgical service to have: - ultrasound machine for nerve blocks - adequate infusion pumps - adequate warming mattress and blanket - adequate overhead radiant warmer - patient controlled analgesia pump (PCA) - TCI pumps with paediatric protocol
Training	Local and Overseas short courses/attachment/conferences for Paediatric Anesthetists and all other categories of staff
Recommended staff: workload	Paediatric Anesthetist : Paediatric Surgeon = 1 : 2 (for all hospitals) Paediatric Anesthetist : Paediatric Surgeon = 1 : 1 (in OT)
Other proposals	1. Child friendly processes should be introduced – parent to accompany child to OT without having to change to OT clothes – parent to be with child in recovery room – children can come with clean street clothes into the operating theatre 2. Child friendly operating rooms and recovery bays 3. The maternity ot should allow emergency operations on newborn and neonate if necessary. 4. All peadiatric surgery inclusive of all specialies should be done in women and child hospitals. 5. Dedicated anaesthesia clinic should be build and become functional in Women and child hospitals. 6. Chronic pain service in peadiatric practice should be addressed.

REGIONAL ANAESTHESIA

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• HKL • HSAH • HSB • HSelayang, Serdang, HTAR • HTAA • HSNZ • HRPZ II • HUS • HQE • HRPB	• Development of regional centres of excellence in RA according to zones – Northern, Central, Southern, East Coast, Sabah, Sarawak. • The regional centres must do the following : Identify local coordinator/trainers, Training of the coordinator/trainers and certification of the coordinators/ trainers. • Subsequently they must Implement the local training program in their zone and finally certify the local basic RA provider.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Nil	• HQE – Tawau, Lahad Datu, Sandakan, Labuan, Likas, Lahad Datu • HUS – Miri, Bintulu, Sibu, Sarikei • HSAH – HTF, HSB, HPP, HSJ, HBM • HKL – HRPB, HTI, Taiping, HSM, HSR, HTAR,HSgB, Selayang, Ampang, Serdang, Kajang, HPJ, IKN • HMelaka – HTJ, HTAN, HSA, HSI, HPSF, HSNI, Segamat, Kluang • HSNZ– Kemaman, HTAA, HoSHAS, HRPZ II, Kuala Krai, Tanah Merah
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

1. To train specialist interested in RA field
2. To promote the development of RA in their own hospital as it is a new developing field.
3. Lack of ultrasound machines for performance of RA (it is the main contributing factor to delay in performance of blocks)
4. To engage / convince surgeon that this mode of analgesia is ideal for early ambulation and postop recovery.
5. Establishments of regional zone for performance of blocks in the main theatre is challenging due to lack of space and equipment. Performance of block is labour intensive and time consuming
6. Funding for disposables is lacking.

Proposals

New programmes/ services	1. Subspecialty training in RA will have to do training 3 months in Pain Medicine &vice versa. 2. Regional zones to be created in OT if infrastructure allows it. 3. The Regional centres have to be strengthened to provide the Training of trainer / credentialing and privileging of doctors under their respective outreach program. 4. Data collection under one common software in the College of Anaesthesiologist website and implementation of national data collection form for the performance of RA. 5. One research study per regional centre.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	3 Regional Anaesthesia Centre of Excellence at 1. HKL 2. HSNZ 3. HSB
Replacement/ procurement equipment	1. Ultrasound machine with 3 probes in each hospital with specialist services. Regional centres may require more machines. 2. Portable Patient Controlled Regional Analgesia (PCRA) pumps. 2 machines per hospital.
Training	To train at least 1 new RA specialist per year and to encourage doctors with special interest to do an attachment in regional centres.

New programmes/ services	1. Subspecialty training in RA will have to do training 3 months in Pain Medicine &vice versa. 2. Regional zones to be created in OT if infrastructure allows it. 3. The Regional centres have to be strengthened to provide the Training of trainer / credentialing and privileging of doctors under their respective outreach program. 4. Data collection under one common software in the College of Anaesthesiologist website and implementation of national data collection form for the performance of RA. 5. One research study per regional centre.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	3 Regional Anaesthesia Centre of Excellence at 1. HKL 2. HSNZ 3. HSB
Replacement/ procurement equipment	1. Ultrasound machine with 3 probes in each hospital with specialist services. Regional centres may require more machines. 2. Portable Patient Controlled Regional Analgesia (PCRA) pumps. 2 machines per hospital.
Recommended staff: workload	Daily RA team comprising of : 1. 1 Specialist 2. 1 MO 3. 1 Staff nurse to do intraoperative block and postoperativedaily follow up. Number of blocks 50 / month. To ensure daily completion of data collection form.
Other proposals	Nil

CARDIOTHORACIC ANAESTHESIOLOGY & PERFUSION

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Seven (7) hospitals : 1. HPP (1994) 2. HSA (1996) 3. PJHUS (2001) 4. HSerdang (2007) 5. HQE II (2009) 6. HPRZ II (2010) 7. HTAA (2012)	NIL Current challenge for expansion is the shortage of trained Cardiothoracic Anesthesiologists as well as trained Cardiothoracic Surgeons in KKM.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Nil	Nil
Outsourcing/ Purchase of Services	Nil	Short term proposal to outsource Pediatric Cardiac Surgical Services to local private pediatric cardiac centers. Long term plan is to train and form KKMPediatric Cardiac Anesthetic and Surgical team.
MOU with External Agencies/ Universities	Collaboration with HUSM, Kubang Kerian, Kelantanin progress.	

Major gaps/ issues/ challenges

Man power :

1. Shortage of cardiac anaesthesiologist despite having trainees every year with intake 2-3 trainees per year) as well as trained nurses and other allied health personnel (perfusionist) due to :
    - Loss to private centers due to lack of financial incentive and long working hours
    - Promotions are frequently linked with intra-hospital transfer or to other departments rather than being retained within the same specialty area.
    - Perfusionists and CICU nurses are also high in demand in private and overseas centers.

- Opening of new heart centres despite shortage of cardiac anesthesiologist resulting in each centre only have one cardiac anesthesiologist and one cardiac surgeon
- Loss of senior cardiac anesthesiologists from retirement – Three(3) in 2016 alone

2. Since Cardiothoracic Anesthesia and Perfusion services was set up by KKM together with Cardiothoracic Surgery as well as Cardiology in 1994 there were no specific posts ('penjawatan') for this services. This causes a lot of setbacks and problem to the service especially in getting new Allied Health staffs reason being there are no available posts. This is further compounded during promotion exercises.

Cardiothoracic Intensive Care (CICU)

1. Currently most of the Cardiothoracic ICU (CICU) in KKM heart centers (except for HPP and HTAA) are administratively under the cardiac surgeon however the way forward, with increasinglysicker surgical population,the CICU KKM Heart Centers should be integratedinto Cardiothoracic Anesthetic and Intensive Care Services , KKM with the support of Intensivist for the betterment of patient care.
2. Shortages of CICU beds resulting in occasional cancellation of elective lists (especially towards the end of the week)
3. Preferably a Cardiac Anesthetist with interest in Cardiac Intensive Care to be in CICU full time managing the increasinglysicker surgical population

Mantenance of Cardiac OT and CICU by Hospital Support Service

Poor maintenance of air-condition, air compressor as well as other equipment may lead to cancellation of cases and wastage of resources.

Challenges in setting up new Heart Centers:

1. Need to avoid duplication of KKM Heart Services within same geographical area.
2. Need to consolidate and not opening new centers with single cardiac anesthesiologist and cardiac surgeon to ensure adequate expertise and patient safety is protected

Proposals

New programmes / services	1. Strengthening and expansion of extra corporeal membrane oxygenation (ECMO) service. 2. Training and formation of KKM Pediatric Cardiac Anesthesiology and Surgical core team, comprising of pediatric cardiac surgeons, anesthesia iologists, intensivists, perfusionists and other allied health personnel. 3. Training programme in Transesophageal Echocardiography for Cardiac Anesthesiologysubspecialty trainees and encouraged them to sit for certification examination (UK, USA, Canada, Australia)
Projects approved RMK11	New heartcenter building for Hospital Serdang.Projected functional for next 15 years. (New 11- Storey Cardiac and Surgical Block, Hospital Pulau Pinang. Plan in RMK 9 Projected useful function for next 20 years- DEFERRED)
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	• HPP &HSA: 1Heart Lung machine each • HPP, HSA, PJHUS: – Intra-aortic balloon pump X 2 each. – CATs System ie cell saver X1 each • HQE2 , HTAA, HPP, HSA – 1 echocardiocardiography machine and transoesophageal echo probes (3D) each(current echocardiocardiography machine and transoesophageal echo probes was purchase in 2007, 2010) • HSA, HQE II and HTAA - 1 ECMO machine each

Training	• Training programmed in Cardiothoracic Anaesthesiology and Perfusion for a total duration of 3 years – 2 years in a recognized local centre and a minimum of 6 months at an accredited overseas centre. • The recognized local training centers are: HPP, HSA, HUS, HSerdang and IJN. • The present overseas training centers are Australia, UK, Netherlands and Saudi Arabia, South Korea, Canada, India. • Resources and funds for short course training in : o Paediatric Cardiac Anaesthesia o Cardiac Intensive Care o Paediatric Perfusion/Cardiopulmonary Bypass o Transoesophageal Echocardiography o Extra Corporeal Membrane Oxygenation (ECMO) • ***Established since 2014for Cardiac Allied Health Personnel training o Advanced Diploma in Cardiovascular Healthcare - PERFUSION o Advanced Diploma in Intensive Care Nursing – Cardiothoracic Intensive Care (Elective): • Established a standard new perfusion chart and TEE chart. • Development of a National Transoesophageal Echocardiography Certification Training programme. • Development of a National Extra Corporeal Membrane Oxygenation (ECMO) Certification Training Programme • Initiate and form Peri-operative Blood Management Team in Cardiac Surgery
Recommended staff: workload	1. Ideal Standard(full workload): CT anesthetist: CT surgeon is 2:1. 2. Based on existing infrastructure: CT anesthetist trainee: CT surgical trainee is 2:1

Other proposals	Future developments: • To establish 2 national referral centers for Paediatric Cardiac Surgical Services in HPP and HSerdang. Efforts must be made to retain and attract local expertise to work for KKM. Temporary measures include purchase of services from local paediatric cardiac surgical expertise to existing KKMHeartCenters or sending cases to private hospitals with pediatric cardiac surgical expertise or overseas centers. • Strenghtening and expansion of place for training in Cardiothoracic Anesthesia and Perfusion, Advanced Diploma in Cardiovascular Health (Perfusion) and Advanced Diploma in Intensive Care (Cardiothoracic Intensive Care) • Integration of Cardiothoracic ICU(CICU) into Cardiothoracic Anaesthetic and Intensive Care Services in all current and future KKM Heart Centers. • Strenghtening and expansionof Extra-Corporeal Membrane Oxygenation (ECMO) services to other KKM cardiac centres (currently ECMO services present in Hospital Serdang and Hospital Pulau Pinang). • Expanding the ECMO services to General Intensive Care for non cardiac cases with • In tandem with development of Cardiology and Cardiothoracic Surgical Services, to: a. Increase level of activity in H Serdang, HQE 2, HTAA, HPRZ II and all other KKM cardiac services :Cardiac OR, CICU etc b. Establishment ofPaediatric Heart Centres in HSJ, HPP c. To incorporate cardiothoracic anesthesia services in an on-line web-based National Cardiothoracic Services Registry (currently only involving the Cardiothoracic surgery services) d. Established an on-line web-based National ECMO Registry.

OBSTETRIC ANAESTHESIA

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• HKL • HTAR • Hospital Selayang • HRPB • HTJ • HTAA • HSNZ • HTAA	All state hospitals must have an Obstetric Anaesthetist. Currently KL, Selangor, Negeri Sembilan, Perak, Pulau Pinang, Terengganu and Pahang are the states with an Obstetric Anaesthetist
Where previous services available but now not	Nil	N/A
Networking / Outreach	Nil	Nil
Outsourcing / Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Lack of Obstetric Anaesthetist due to difficulty in recruiting trainees:
   - Potential trainee's reservations about being transferred to another hospital upon finishing their training.
   - Lack of scholarships available
2. Lack of manpower in some hospitals to run a 24 hour obstetric analgesia service.
3. Lack of funds for equipment such as PCEA, Ultrasound machine, warming devices
4. Busy hospitals with deliveries more than 10000 per year must have at least 2 dedicated OR for LSCS. One OR to function 24 hours as more than half LSCS are emergencies. Cases may be delayed if there is only one maternity OR available.
5. Unavailability of correct formulation of IT morphine, PCM supps

Proposals

New programmes/ services	1. Dedicated anaesthetic clinic for obstetric patients where all patients scheduled for lower segment caesarian section (LSCS) and high risk pregnancies are seen. It should be a combined multidisciplinary clinic. 2. Weekly patient education programme on labour analgesia 3. Obstetric simulator lab for training in obstetric airway, regional techniques, sonography for obstetric anaesthetist, obstetric anaesthesia simulation courses
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	1. Dedicated Ultrasound machine to be placed in a hospitals with an obstetric complex or where the total deliveries exceeds 10000 per year. 2. PCEA pumps X 3 for all state hospitals 3. Warming devices 4. Video laryngoscopic device for difficult airway 5. Troop pillow for obese patients. 6. Point of care coagulation testing (ROTEM) 7. OT tables should cater for more than 250kg patients. 8. Recovery trolleys should also be able to accommodate 250kg patients.
Training	2 years at a local centre and 1 year overseas for fellowship in Obstetric Anaesthesia which must include: • Training in sonography focusing on obstetric anaesthesia • Obstetric anaesthesia simulation workshop • Difficult airway workshop. • Training in autologous blood transfusion

Recommended staff: workload	1 Obstetric anaesthetist. 5 Medical Officers in a pool to run both the OAS and LSCS OT 1 Nursing Sister 3 Staff nurses
Other proposals	1. Mother Friendly Care concept; hospitals without labour suites are finding it difficult to accommodate patient's husbands to accompany them. All labour rooms without such facilities to be upgraded to facilitate this. 2. A dedicated High Dependency Ward for obstetrics is helpful to reduce ICU workload. 3. There must be at least 3 – 4 dedicated maternity obstetric OT's in Women and children hospital.

NEUROANAESTHESIA

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Nine (9) Hospitals • HKL • HSgB • HPP • HSB • HTAA • HSA • HQE • HUS • Hosp. Melaka (New neurosurgical centre)	Neuroanesthetic services must be in tandem with neurosurgical services and their plan for further development. This includes the recognition of regional neurosurgical centres and Neuro-interventional radiology support services.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Nil	Cover by Neuro Anesthetists from regional Centres HPulau Pinang, HIpoh HAS JB, HKL, HSungai Buloh, HUS Kuching and HQE Kota Kinabalu
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies/ Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Human resource shortages at all level; lack in Neuro Anesthetists and other support staff
2. Inadequate operating time for elective Neurosurgery and interventional neuro-radiology
3. Shortage of ICU beds for perioperative management of neuro surgical cases

Proposals

New programmes / services	Nil
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	1. Purchase more target controlled infusion (TCI) pumps to popularize the technique of TIVA (total intravenous anaesthesia) 2. Upgrade monitoring of the cerebral function e.g. BIS monitoring intra-operatively and use of evoked-potential monitoring 3. Development of Post-anaesthetic care Unit (PACU) for post-operative observation of neuro-surgical patients in the recovery area without needing to admit to the ICU 4. High-end anaesthetic workstations with full monitoring facilities for prolonged and complicated surgery.
Training	1. Local and Overseas short courses/attachment/conferences for Neuro Anesthetists and all other categories of staff. 2. Training in organ-procurement programme
Recommended staff: workload	Neuro Anesthetist : NeuroSurgeon = 1 : 2
Other proposals	1. Hospitals identified to become Neurosurgical centres must have adequate operating time for neurosurgical cases including interventional neuro-radiological cases 2. Hospitals with neurosurgical service should have a higher ratio of ICU beds (an additional 6-10 beds in the General ICU are required); this will ensure adequate intensive care support for neurosurgical cases 3. Radiological support, 24 hour CT Scan, MRI and neuro-radiological interventional facilities and expertise.

CHRONIC PAIN

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• All state hospitals • Institut Kanser Negara • Hosp Rehab Cheras	• Specialists for Kota Kinabalu, Kuching and Kuantan are needed. • There must be at least 2 specialists for each Pain clinic • Pain specialist need to train in paediatric chronic pain as well.
Where previous services available but now not	Nil	N/A
Networking/ Outreach	Alor Star covers Kangar Taiping covers Kota Kinabalu	• All State hospitals to attain Pain Free status by 2020 • Networking with primary care physicians is necessary. • District hospital visits – 1-2 times / month by State hospital covering the area including East Malaysia
Outsourcing / Purchase of Services	Nil However, H Selayang and HKL utilise the services of a clinical psychologist from UPM	Nil
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Difficulty in implementing multidisciplinary model of pain management which is the world standard. Require to include the post of clinical psychologist and physiotherapist in Pain management clinic staffing
2. Lack of funds – sharing the anaesthetic allocation; call claim allowances
3. Lack of knowledge regarding chronic pain and its management amongst other specialists. To be taught at undergraduate and masters' students to be posted to Pain clinic where available
4. Pharmacists' involvement still lacking in some hospitals eg preparation of epidurals
5. Paediatric chronic pain – lack of expertise in this area.

Proposals

New programmes/ services	1. invasive therapies for difficult cancer patients 2. to introduce more usage of Acupuncture modality in acute and chronic pain – all state hospitals 3. to introduce the use of hypnotic suggestions as a modality 4. anaesthetic specialists / MOs interested in Pain management to do short attachments
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	1. radiofrequency generators 2. patient control analgesia pumps 3. infusion pumps 4. electro-acupuncture machines
Training	1. To train at least 2 new specialists per year 2. Training in T/CM – acupuncture and medical hypnosis (hypnotic suggestions)
Recommended staff: workload	Each pain specialist – • 1 clinic session per week • 50 new patients per year • 150 follow-up visits per year • 20 consultations per year for cancer/ palliative patients • 30 procedures per year
Other proposals	1. Infrastructure in new hospitals – to ensure a "multidisciplinary pain clinic suite" which should include at least 5 rooms to accommodate the team – pain specialists ,physiotherapist, psychologist, and pharmacists as well as an operating room with image intensifier, radiofrequency generator and ultrasound machines to perform procedures – can all be part of ACC 2. T/CM units in all State hospitals 3. Passive call claim allowances for Pain specialists

RADIOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Resident service now available in 51 hospitals; • 14 State Hospitals • 27 Major Specialist Hospitals • 8 Minor Specialist Hospitals • 2 Special Hospitals/Institutions	1. To develop all fields of subspecialty (interventional radiology, musculoskeletal, neuroradiology, pediatric radiology, uroradiology, gastrohepatobiliary radiology, women's imaging, cardiac radiology) to enhance clinical support and better patient care. 2. Increase training of radiographers/ specialty training 3. To introduce PACS / RIS system
Where previous services available but now not	• Neuroradiology – HSB • Angiography – HQE • Angiography – HTAR	N/A
Networking/ Outreach	• All hospitals with specialists provide radiologist services to all other hospitals and klinik kesihatan in the state by a zoning networking arrangement. • Hospitals and klinik kesihatan without certain radiologic modalities send their cases to the nearest KKM hospital with the particular modality.	1. To place resident radiologists in all specialist hospitals. 2. To place radiologists with subspecialty training in the regional centres beginning with those that have the relevant clinical subspecialties.
Outsourcing/ Purchase of Services	Only during machine breakdown as stipulated in the contract with concession companies.	To develop a system to purchase essential services from private hospitals when services are interrupted due to causes other than what is stipulated in the contract.
MOUwith External Agencies / Universities	Training of Masters of Radiology students,physicists, radiographers and medical students with various hospitals throughout the country:	

	CURRENT STATUS	PROPOSED EXPANSION
MOUwith External Agencies / Universities	**Masters in Radiology** • Universiti Kebangsaan Malaysia(UKM) • Universiti Malaya (UMMC) • Universiti Sains Malaysia (USM) • Universiti Pertanian Malaysia (UPM) – commenced in 2016 • Universiti Islam Antarabangsa Malaysia (UIAM) – commencing 2017. **Radiography** • UKM • UMMC • UIAM • UiTM • UTM • UNISZA • MAHSA • Masterskill • UCSI • UNISEL • Vision College **Medical Students** • IMU • Monash • UniKL • RCMP • PMC • MMMC • Newcastle University (Numed) • CUCMS **Physics degree programs** • Universiti Industri Selangor • Universiti Teknologi Malaysia • Universiti Malaysia Sarawak	

Major gaps/ issues/ challenges

Human Resource (Lacking)

1. Radiologists
    - Inadequate numbers both general and subspecialists. To achieve target of 30 radiologists per million population in the next 5 years (presently 24 per million).
    - Maldistribution. Difficulty posting specialists to hospitals in Sabah and Sarawak. Most will return to Semenanjung hospitals after 1 year.
    - Attrition due to continuous brain drain to private sector.
2. Longer interval to JUSA promotions.
3. Medical Officers
    - Radiology Department is still considered low priority for MO placement.
4. Medical Physicist
    - Not enough numbers as well as those with appropriate training. Many are trained without any exposure to clinical setting.
5. Radiographers
    - Not enough posts for radiographers hence many hospitals are still without adequate numbers to perform shift duty. Adequately as well as to cover mobile fluoroscopy services outside Radiology department after office hours.
    - Promotion always comes with transfers resulting in malplacement of specially trained radiographers.
    - Ned to develop several more advanced diploma courses to ensure the technical skills is on par with the rapidly expanding technology and techniques.
6. Nurses
    - Few departments have posts specific to Radiology Department.
    - In hospitals where the placement comes from a shared pool, Radiology Department is still considered low in priority.
    - The advanced diploma course has yet to start despite the curriculum being completed 2 years ago.
7. Administrative Assistants (Pembantu Tadbir)
    - Very few posts in Radiology Department if any. They are necessary to handle the many counters in the department. Presently radiographers and nurses are doing this job which takes them away from clinical work.

Equipment

1. Essential component of radiology service.
2. However replacement does not happen on time resulting in interruption of services and unnecessary expense when services have to be outsourced.

Operating budget

Financial processes do not facilitate speedy management of the limited funds provided e.g. moving funds from one series to another.

Proposals

New programmes/ services	1. To install PACS and RIS in all radiology departments on a phased basis starting with state hospitals. 2. New hospitals or KK to be equipped with PACS, RIS and CR 3. To place CT scanners in all specialist hospitals. 4. To place MRI scanners in all major specialist hospitals. 5. To place angiography machines in all state hospitals. 6. To accredit more hospitals for open system masters training. 7. Trauma Radiography for radiographers – this will enable radiographers to identify fractures and bleeds and to highlight the trauma clinicians for rapid remedial. 8. Sonography programme for radiographers – this will enable radiographers to perform ultrasound in hospitals without specialists.
Projects approved RMK11	1. Hospital Tengku Ampuan Afzan,Kuantan • CT Scan • MRI • CR • General Radiography 2. Hospital Serdang • The proposed 220 Cardiac Block that includes an imaging unit with general radiography, MRI, CT Scan, mobile services and ICLs.
Proposed projects – RMK11 mid term	1. To replace all BER equipment. 2. To install PACS and RIS in all radiology departments on a phased basis starting with state hospitals. 3. New hospitals or KK to be equipped with PACS, RIS and CR 4. Hospital Tengku Ampuan Rahimah, Klang • Infrastructure : to be upgraded especially the repair of the MRI building. • Breast data management system 5. Hospital Melaka • Second CT Scanner for emergency cases • To renovate and extend the existing Radiology Department • To purchase an MR Breast Compatible biopsy device.

Replacement/ procurement equipment	1. Hospital Batu Pahat • Replacement/additional CT Scan machine with MDCT to manage CTA cases 2. Hospital Queen Elizabeth II • Mammography FFDM • General Xray • CT Scan • MRI • Angiogram machine 3. Hospital Sultan Abdul Halim • OPG machine 4. Hospital Sultanah Bahiyah • Almost all items needs replacement, as it was a turnkey project, most equipments were installed in 2007. 5. Hospital Tengku Ampuan Afzan • Computed Radiography • General Radiography (DDR) • Mobile Xray 6. Hospital Tuanku Ampuan Najihah • Fluroscopy 7. Hospital Tengku Ampuan Rahimah • 2 digital mammograms • Contrast enhanced spectral mammography • MRI dedicated breast biopsy system • New MRI suite with new machine • Fluoroscopy • BMD • Angiogram • Digital Mammography • Digital mobile radiography 8. Hospital Tuanku Fauziah • General Xray machine • CBCT (dental)

	9. Hospital Tuanku Jaafar, Seremban • MRI machine • 2nd CT machine and General Xray for the Klinik Pakar HTJ • Trauma center equipped with MRI, CT Scan, Biplane angiography, general xray, mobile xray and ultrasound machine. 10. IKN • Digital mammography with tomosyntheisis • Fluoroscopy 11. Hospital Kemaman • To replace all old machines 12. Hospital Enche Besar Hajjah Kalsom, Kluang • High End Ultrasound machine • Mobile xray 13. Hospital Wanita dan Kanak-kanak Likas, Sabah • To obtain / replace new ultrasound machine 14. Hospital Melaka • Replacement of existing MRI machine • Replacements of 2 high end ultrasound machines • To obtain a 2nd MSCT to cater for increased workload • Replacement of multipurpose Fluoroscopy to cater to complexity and increasing needs • Replacement of existing mammogram with Tomosynthesis • Purchase 1 mammogram for Hospital Melaka and another for Hospital Jasin • Replacement of 4 general xray machines with Digital Radiography units 15. Hospital Putrajaya • Replacement of 2 general xray machines and a fluoroscopy machine 16. Hospital Sultanah Nur Zahirah • Replacement of all machines that is more than 10 years – General Radiography – Ultrasound – Mobile xray – CT Scan – MRI – Image Intensifier

	17. Hospital Serdang • Replacement the old BER 4slice CT scanner with multidetector CT Scanner with a minimum 64 slice • To procure the following; – To add another 1.5T MRI scanner – Floating radiography table couch for the current DDR general room – 2 units of Mobile Digital radiography • To upgrade the following; – Upgrade current angiography unit to a biplane flat panel – Upgrade reporting room – Upgrade RIS and PACS
Training	Hospital Queen Elizabeth II • CT Cardiac Coronary • MRI Cardiac • Angiography Vascular • MRI Breast HSB, Alor Setar • Advance Diploma training for radiographers in CT / MRI HTAA, Kuantan • Pediatric Radiology • Woman Radiology • Breast Imaging • Interventional Radiology • Uroradiology • MRI Cardiac (radiographers) HTF Kangar • Cardiac CT/MRI • Adv Dip in Cardiac (radiographers) • Adv Dip in Breast Imaging (radiographers) • Adv Dip in Radiology Nursing (nurses) HTF, Seremban • Interventional Radiology • MSK Radiology

	HWKK, Likas • Interventional Radiology • Interventional Radiology for Radipgraphers • Adv MRI training for radiographers Melaka • Cardiac CT for Radiologist and Radiographers once resident Cardiology service commences in Hospital Melaka Hospital Putrajaya • To send staff for intensive short courses sub specialty; Pediatrics, MSK and Urology Hospital Shah Alam • Propose training of radiologist for Level 1 Reporting for Cardiac CT Scan
	Hospital Serdang • Center for the following sub specialty ○ Uroradiology ○ Cardiac Imaging ○ Musculoskeletal Imaging • Modalities inhouse training amongst radiographers are ongoing with the aim all radiographers to have basic skill in performing basic and standard CT scan cases • To actively promote more nurses and allied health personnel to take up radiology nursing and other post basic advance diploma related to radiology.
Recommended staff: workload	Staffing norms for radiologists, radiographers, medical physicists and nurses are being finalized.
Other proposals	Nil

PATHOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Available in 39 state/major specialist hospitals - please refer to Appendix 1	Refer Appendix 2: Expansion of service
Where previous services available but now not	Previously anatomical pathology service was available in H. Kajang, H. Kuala Pilah and H. Kluang but now, the service is consolidated to larger hospitals. For e.g. H. Serdang caters for the anatomical pathology service in H. Kajang, H. Seremban for H. Kuala Pilah and HSAJB for H. Kluang. A Chemical Pathologist was previously posted to H. Likas but there is no replacement after the Pathologist left. All other states have at least one Chemical Pathologist.	N/A
Networking/ Outreach	The four major disciplines of the pathology service i.e. Anatomical Pathology, Chemical Pathology, Haematology and Microbiology have respective network within states and care network zones.	Refer Appendix 3: Regionalisation of service
Outsourcing/ Purchase of Services	Outsource selected services/ tests to: a) Private laboratories e.g. Sime Darby Medical Centre, Gribbles laboratories b) Universities e.g. UMMC, UKMMC, HUSM	Maintenance of current outsourcing arrangements and expand if needed on case by case basis.
MOU with External Agencies / Universities	Based on individual hospital/ institution, wherelse MOU between Universities or private colleges are acscertained and assigned by MOH.	Nil

Major gaps/ issues/ challenges

1. Maldistribuion of pathologists in various specialities especially in Sabah, Sarawak and Johore.
2. Old, unsafe existing infrastructure and space restrictive working environment with outdated facilities especially in HTAR, HKL, HPP, HUS, HQE and HRPZ II
3. Space constraint for expansion of services in tandem with clinical demand.
4. Obsolete existing technology laboratory equipment needs upgrades and automation in many laboratories.
5. Present Laboratory Informtion System is inadequate for efficient and effective networking.
6. No separate allocation for centres offering specialised and centralised services.
7. Scholarships available for subspeciality are limited and should be based on team approach.
8. The personnel trained in specialised areas are not placed in the relevant specialised labs.
9. Coordination issues related to the integration of the pathology service with : a) Clinical programme b) Corporate bodies c) Private bodies
10. Lack of funds or funds coming in late, causing the temporary termination of specialised tests. Occasionally even routine tests are disrupted.

Proposals

1. To review the whole process in the pathology service:
   a) Review the operational policy
   b) Realign the pathology services so that the hospitals cater for only acute tests for patient management and monitoring.
   c) In view of the space constraint within hospital set-up, pathology service design to consider building a centralised specialised laboratory located away from hospital site. This National Specialised Laboratory Centre will consolidate for specialised tests that are low volume, requiring specialised skills, and sophisticated equipment with superior and advanced technology. The centre will also cater for training of various category of staffs and coordination of quality activities for the country. It will also support Research and Development including clinical trials.
   d) Fully integrated LIS automation with excellent connectivity with all the service providers and high security protection.

e) Efficient transport system to cater for coordinated and smooth service networking and interphasing at the pre-analytical and post-analytical stages.
f) Carry out workforce profiling for all category of laboratory personnel to ensure optimal distribution.
g) Service design should also take into consideration the pre-analytical matters such as phlebotomy, pre-analytical processing and off-site testing for outpatient care.

2. To strengthen the existing service:
   a) Integrate the service so that the resources are optimised.
   b) Strengthen the core services and management.
   c) Ensure that all laboratory personnel are well equipped with knowledge and technically competent.
   d) Ensure that all pathology laboratories in the state and major specialist hospitals achieve laboratory accreditation status by 2020.
   e) Upgrade the subspecialty service in tandem with clinical needs.

New programmes/ services	1. Commence molecular histopathology testing service for diagnosis, prognostication and treatment of solid tumours to support the National Cancer Programme. 2. Provide leukaemia cytogenetic service in Penang Hospital for diagnosis, prognostication and monitoring of leukaemia in the Northern states. 3. Strengthen and develop the MOH pathology service to support the National Cancer Program by proteomics testing in Hospital Ampang. 4. Expand the scope of molecular diagnostic microbiology service to support the gastroenterology service and identification of causal organisms for immunocompromised patients such as cancer and transplant patients in HKL, HSAJB, HQEKK and HUS Kuching.

Projects approved RMK11	1. Upgrade immunology service in the East (Terengganu), North (Perlis) and South (Melaka) 2. Start Mycobacterial identification and sensitivity testing for East (Terengganu, Kelantan, Pahang), North (Kedah, Pulau Pinang, Perlis), South (Johor, Melaka) and East Malaysia (Sabah, Sarawak) 3. Upgrade diagnosis and treatment of Hepatitis C in MOH hospitals by having HCV genotyping - awarded RM200,000. 4. Commence molecular microbiology diagnostic testing in the East (Kelantan, Pahang, Trengganu)and South (Johor dan Melaka) - awarded RM 500,000.
Proposed projects – RMK11 mid term	1. Regional Immunology Centres for the North (HTF), East (HSNZ) and South (HMelaka) are able to add on a few new autoimmune serology tests.
	2. Ten hospitals were given GenXpert and consumables to support detection of MDR TB within 2 hours. Existing culture centers were able to sustain the existing services to suport their function as mycobacterial culture centres for the zones covered and their own state. Following WHO recommendation, Mycobacterial tuberculosis identification and sensitivity testing to be offered only by one centres i.e NPHL . Soon this service will be decentralised to the other 4 PHLs to improve efficiency. 3. HKL virology laboratory now has the capability to support HCV treatment with the commencement of HCV genotyping previously outsourced to either to private laboratory or Liver Foundation laboratory. However the fund provided are only able to support genotyping for about 480 patients only. 4. HRPZ II, HTAA, HSNZ, HSA JB and Hospital Melaka are able to optimise the molecular tools provided during the previous HINI pandemic to support molecular diagnosis of pathogens which were unrecoverable by culture.
Replacement/ procurement equipment	1. Scheduled equipment replacement and upgrading every 5-10 years for sensitive laboratory equipment especially those with heavy usage (e.g. clinical chemistry analyser, immunochemistry analyser, hematology analyser and coagulation analyser). This scheduled replacement is important to ensure the proper function of the laboratory equipment for accurate analysis of patients' specimen. Quality laboratory results are of utmost importance for the diagnosis and treatment of patient by clinician.

	2. Laboratory equipment which consume high volume of reagent (e.g clinical chemistry analyser, immunochemistry analyser, hematology analyser, coagulation analyser and blood culture analyser) should be procured through the reagent rental program. This reagent rental program can be carried out by individual hospital orcentralised, depending on the workload. 3. Laboratory equipment which are expensive but do not utilise much reagent and consumable such as GCMS, HPLC, PCR, automated tissue processor etc. and equipment such as microscopes which are needed in large quantities in most hospitals may be procured through leasing to reduce the strain on PK 30000 budget allocation. 4. Procurement or replacement of minor laboratory equipment such as centrifuges, laboratory refrigerators, freezers, water baths, incubators, ovens and many others must be planned for more organised budget allocation.
Training	Refer Appendix 4: Proposed Subspecialty training. Anatomical Pathology - 20 training courses Chemical Pathology - 5 training courses Microbiology - 15 training courses Haematology - 5 training courses
Recommended staff workload	<u>Pathologist:</u> • Anatomical Pathologist (Histo & cyto) 1 : 3,000 cases per year • Chemical Pathologist (routine) 1: 300,000 tests per year • Chemical Pathologist (specialised) 1 : 40,000 tests per year • Haematologist (routine) 1 : 100,000 samples per year • Haematologist (specialised) 1 : 5000 samples per year • Clinical Microbiologist 1: 50,000 samples per year <u>Medical Officer:</u> • Anatomical Pathology (Histo) 1 : 5,000 cases per year • Anatomical Pathology (Cyto) 1: 8,000 cases per year • Chemical Pathology 1 : 300,000 samples per year • Haematology 1 : 50,000 samples per year • Microbiology 1 : 25,000 samples per year

	Scientific Officers (SO): • Anatomical Pathology (Histo) 1 : 5,000 cases per year • Anatomical Pathology (Cyto) 1: 8,000 cases per year • Chemical Pathology (routine) 1 : 40,000 samples per year • Chemical Pathology (specialised) 1 : 5,000 tests per year • Haematology (routine) 1: 25,000 samples per year • Haematology (specialised) 1 : 2,000 samples per year • Microbiology 1 : 25,000 samples per year Medical Laboratory Technologists (MLT): • Anat Patho (Histo - routine) 1 : 3,500 paraffin blocks per year • Anat Patho (Histo - special) 1 : 5,000 tests per year Anat Patho (Cytotechnologist) 1 : 5,000 tests/ year • Anat Patho (Cytoscreeners) 1: 3,000 slides screened per year • Chemical Pathology (routine) 1 : 80,000 samples per year • Chemical Pathology (specialised) 1 : 40,000 tests per year Haematology (routine) 1: 300,000 samples per year • Haematology (specialised) 1 : 1,000 samples per year • Microbiology 1 : 5,000 samples per year
Other proposals	1. Establish an organization for strengtening the mechanism of funding, monitoring and feedback of QAP programme with WHO and Standards Malaysia collaboration (Blue Ocean Strategy) 2. Upgrade BSL 2 facility in a few state hospitals with direct international flights for initial handling of specimens with potential risk of risk group 3 pathogens, priority for Kuching, Penang and Johor Bahru 3. Explore the potential of partnership with other institutions, corporate bodies and private sectors for service improvement. 4. Send staff to world recognised laboratories for working experience on exchange basis. This could allow for transfer of knowledge and expertise in a chosen area.

APPENDIX I

AVAILABILITY OF PATHOLOGY SPECIALTY IN STATE, MAJOR SPECIALIST HOSPITALS & SPECIAL INSTITUTIONS

STATE	HOSPITAL	ANATOMICAL PATHOLOGY	MICROBIOLOGY	CHEMICAL PATHOLOGY	HAEMATOLOGY
PERLIS	KANGAR	√	√	√	√
KEDAH	ALOR STAR	√	√	√	√
	SG PETANI	√	√		√
	KULIM		√		√
PULAU PINANG	HPP	√	√	√	√
	SEBERANG JAYA	√	√		√
PERAK	IPOH	√	√	√	√
	TAIPING	√	√	√	√
	TELUK INTAN	√			√
SELANGOR	KLANG	√	√	√	√
	AMPANG		√	√	√
	KAJANG		√		√
	SELAYANG	√	√	√	√
	SERDANG	√	√	√	√
	SG BULOH		√	√	√
	SHAH ALAM				√
WP	HKL	√	√	√	√
	HPJ	√	√	√	√
NEGERI SEMBILAN	SEREMBAN	√	√	√	√
	KUALA PILAH				√
MELAKA	MELAKA	√	√	√	√
JOHOR	JOHOR BAHRU	√	√	√	√
	BATU PAHAT				√
	MUAR	√	√		√
	S. ISMAIL			√	√
	SEGAMAT		√		
PAHANG	KUANTAN	√	√	√	√
	TEMERLOH		√		√
TERENGGANU	K.TERENGGANU	√	√	√	√
	KEMAMAN		√		√

STATE	HOSPITAL	ANATOMICAL PATHOLOGY	MICROBIOLOGY	CHEMICAL PATHOLOGY	HAEMATOLOGY
KELANTAN	KOTA BHARU	√	√	√	√
	KUALA KRAI		√		√
	TANAH MERAH		√		
SABAH	HQE 1	√	√	√	√
	SANDAKAN				√
	TAWAU				√
SARAWAK	HUS	√	√	√	√
	MIRI				√
	SIBU		√		√
SPECIAL INSTITUTION	IKN		√	√	
	WCH LIKAS				√
	MKAK SG BULOH		√		
	IMR	ORAL PATH	√	√	√
	PDN				√

APPENDIX II

AVAILABILITY & PROPOSED EXPANSION OF PATHOLOGY SPECIALTY IN STATE, MAJOR SPECIALIST HOSPITALS & SPECIAL INSTITUTIONS

STATE	HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HEMATOLOGY
PERLIS	KANGAR	√	√	√	√
KEDAH	ALOR STAR	√	√	√	√
	SG PETANI	√	√	√	√
	KULIM		√		√
	LANGKAWI		√		√
PULAU PINANG	HPP	√	√	√	√
	SEBERANG JAYA	√	√	√	√
	IPOH	√	√	√	√
PERAK	TAIPING	√	√	√	√
	TELUK INTAN	√	√		√
	SRI MANJUNG		√	√	√
SELANGOR	KLANG	√	√	√	√
	AMPANG		√	√	√
	KAJANG		√		?
	SELAYANG	√	√	√	√
	SERDANG	√	√	√	√
	SG BULOH		√	√	√
	SHAH ALAM	√	√		√
WP	HKL	√	√	√	√
	HPJ	√	√	√	√
N. SEMBILAN	SEREMBAN	√	√	√	√
	KUALA PILAH		√		√
MELAKA	MELAKA	√	√	√	√
JOHOR	JOHOR BAHRU	√	√	√	√
	BATU PAHAT				√
	MUAR	√	√		√
	S. ISMAIL	√	√	√	√
	SEGAMAT		√		√

STATE	HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HEMATOLOGY
PAHANG	KUANTAN	√	√	√	√
	TEMERLOH	√	√	√	√
TERENGGANU	K.TERENGGANU	√	√	√	√
	KEMAMAN		√		√
KELANTAN	KOTA BHARU	√	√	√	√
	KUALA KRAI		√		√
	TANAH MERAH		√		√
SABAH	HQE 1	√	√	√	√
	SANDAKAN		√		√
	TAWAU		√	√	√
	KENINGAU				√
SARAWAK	HUS	√	√	√	√
	MIRI		√	√	√
	SIBU	√	√		√
	BINTULU				√
	PETRAJAYA		√	√	√
SPECIAL INSTITUTION	IKN		√	√	
	WCH LIKAS		√	√	√
	WCH KL		√	√	√
	MKAK SG BULOH		√		
	IMR	ORAL PATH	√	√	√
	PDN		√		√

√	EXISTING RESIDENT PATHOLOGIST
√	PROPOSED FOR FUTURE PATHOLOGIST

APPENDIX III

REGIONALISATION OF SERVICES

North

HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HAEMATOLOGY
HTF		Immunology		
HSB	Liver & Git Pathology Uropathology	Mycology Hepatitis Viral Load		Red Cell & Haemoglobin Disorder (Molecular Thalassaemia)
HSAH	Cytopathology	Mycobacteriology		Stem Cell Transplantation
HPP	Renal Pathology Paediatric Pathology Neuropathology	Hiv Viral Load	1. Protein 2. Endocrine Metabolic 3. Drug Testing	1. Hemato-Oncology (Bm Cytogenetics) 2. Hemato-Oncology (Ipt & Molecular)
SJH	Dermatopathology			
TAIPING	Soft Tissue Pathology			

East

HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HAEMATOLOGY
HRPZ II	Cytopathology Dermatopathology Gynaecologic Pathology	Hiv Viral Load	Protein Endocrine Metabolic Drug Testing	Hemato-Oncology (Bm Cytogenetics)
HTM		Mycology		
HSNZ	Breast & Endocrine	Immunology Mycobacteriology	Endocrine Metabolic	
KEMAMAN		Mycology		
HTAA	Neuropathology Renal Liver & Git Pathology			
HoSHAS				

Central

HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HAEMATOLOGY
IPOH	Lymphoreticular Pathology		Endocrine Metabolic	Hemato-Oncology (Ipt)
HKL	1. Paediatric Pathology 2. Neuropathology 3. Neuromuscular Pathology 4. Renal & Transplant Pathology 5. Gynaecologic Pathology 6. Uropathology 7. Bone And Soft Tissue Pathology 8. Dermatopathology	1. Hepatitis Viral Load 2. Mycology 3. Mycology 4. Transplant Related Infection Viral Load 5. Hiv Viral Load 6. Hcv Genotyping	1. Clinical Toxicology 2. Protein 3. Endocrine Metabolic 4. Drug Testing	1. Stem Cell Transplantation 2. Hemato-Oncology (Ipt & Molecular) 3. Red Cell And Haemoglobin Disorders (Molecular Thalassaemia) 4. Red Cell And Haemoglobin Disorders (Red Cells Enzyme & Membrane Disorders)
HPJ	Breast & Endocrine		Endocrine Metabolic	
HSgB		Hepatitis Viral Load Hiv Viral Load		
HTAR	Renal			
AMPANG			Protein Clinical Toxicology	
SELAYANG	1. Liver & Git Pathology 2. Lymphoreticular Pathology 3. Ocular Pathology	Immunology Hepatitis Viral Load	Clinical Toxicology	
SERDANG	1. Cytopathology 2. Respiratory Pathology 3. Molecular Pathology 4. Perinatal Pathology			

South

HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HAEMATOLOGY
JOHOR BAHRU	1. Head And Neck 2. Respiratory 3. Liver & Git Pathology	Mycobacteriology Hiv Viral Load	Drug Testing Protein	Hemato-Oncology (Ipt & Molecular)
MUAR	Breast & Endocrine			
MELAKA	Renal Lymphoreticular			

Sabah

HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HAEMATOLOGY
HQE	Lymphoreticular Dermatopathology Bone And Soft Tissue Pathology Renal	Hiv Viral Load Hepatitis Viral Load Mycology Immunology	Protein Endocrine Metabolic	Hemato-Oncology (Ipt & Molecular)

Sarawak

HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HAEMATOLOGY
HUS	Respiratory Renal Cytopathology Molecular/ Oncopathology	Hiv Viral Load Mycology Immunology	Drug Testing	

Special institutions

HOSPITAL	ANAT PATH	MICROBIOLOGY	CHEM PATH	HAEMATOLOGY
HWKKL			Paediatric Chem Path	
IKN			Clinical Toxicology	
WCH KL			Paediatric Chem Path	Paediatrics Haematology Haemostasis & Thrombosis

APPENDIX IV

PROPOSED SUBSPECIALTY TRAINING PLAN

	2016	2017	2018	2019	2020
ANATOMICAL PATHOLOGY	Cytopathology	Lymphoreticular	Breast & Endocrine Pathology	Uropathology	Breast & Endocrine Pathology
	Lymphoreticular	Liver Git Pathology	Respiratory Pathology	Cytopathology	Molecular/ Oncopatho
	Renal Pathology	Respiratory Pathology	Neuropathology	Liver Git Pathology	Bone & Soft Tissue Pathology
	Perinatal Pathology	Dermato pathology	Paediatric Pathology	Gynaecologic Pathology	Renal Pathology
MEDICAL MICROBIOLOGY	Immunology	Mycology	Mycology	Virology	Parasitology
		Virology	Mycobacteriology	Immunology	Mycology
	Infection Control	Infection Control	Infection Control	Infection Control	Infection Control
CHEMICAL PATHOLOGY	Endocrine Metabolic	Inborn Error Of Metabolism	Toxicology	Endocrine Metabolic	Protein
HAEMATOLOGY	Molecular Thalassaemia	Stem Cells Transplantation	Molecular Haemato-Oncology	Paediatric Haematology	Haemostasis & Thrombosis

TRANSFUSION MEDICINE

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	Transfusion of blood and blood products is one of the most common procedures that are performed daily in almost all MOH hospitals and institutions while the collection of blood from voluntary non-remunerated blood donors takes place in 117 MOH facilities. The blood component processing activity is consolidated to 20 hospital blood banks/blood centre while the screening of donated blood for transfusion transmissible infections as well as ABO and Rh D blood grouping is consolidated in 16 hospital blood banks/blood centre to ensure uniformity of standard and economy of scale. There is an ongoing upgrading project in 22 blood centres that also include the upgrading of Blood Bank Information System that hopefully can be extended to all MOH hospitals. Pusat Darah Negara (PDN) is the national referral centre for Transfusion Medicine Service and also functions as the regional collection, processing and screening centre for Selangor, Wilayah Persekutuan (Kuala Lumpur and Putrajaya), Negeri Sembilan and west of Pahang. Two new regional blood centres have been approved in RMK10 and will be built in Laya-Laya, Tuaran, Sabah and Sungai Petani, Kedah.	The following are the proposed expansion of Transfusion Medicine Service: • Strengthening of the Transfusion Medicine Service particularly in State Hospitals and Major Specialist Hospitals as an independent department with dedicated and adequate financial and human resources. The need for dedicated and adequate financial and human resources is also required at Minor Specialist and District Hospitals • Expansion of the Blood Donation programme through public education, strategic communication, community engagement and enhancement of the blood donor recruitment and retention activities • Improving the safety of the donated blood through universal Nucleic Acid Testing for HIV, Hepatitis B and Hepatitis C as well as other infections as and when required • Strengthening of the immunohaematological services red cells, white cells and platelets including molecular work and development of red cells reagents as well as the other referral laboratory work in PDN • Implementation of the Patient Blood Management programme as part of good clinical transfusion practice to improve patient outcomes and minimize transfusion-related risks through safe and appropriate use of blood and blood products, while allowing for the best use of blood

	CURRENT STATUS	PROPOSED EXPANSION
	The Transfusion Medicine Service in the hospitals is headed either by a Haematopathologist or Transfusion Medicine Specialists. Since its inception in 2005, the Master in Medicine for Transfusion Medicine (M. Med Transfusion Medicine) has produced 36 specialists out of which 33 are currently serving in the KKM facilities. Pusat Darah Negara also provides the transplant related services that include: a) Cord Blood Bank (cord blood collection, processing and storage) b) Histocompatibility and Immunogenetic Laboratory c) Stem cell coordinating activities through the National Stem Cell Coordinating Centre (NSCCC) Transfusion Medicine Service in Hospital Sultanah Bahiyah, Alor Star, Kedah also carries out the Cord Blood Bank activity	• Strengthening the cell therapy programme through expansion of cord blood banking services in transplant and non-transplant areas as well as the HLA typing services • Strengthening the Quality Management System for the Transfusion Medicine Service including Haemovigilance activity
Where previous services available but now not	Nil	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	PDN coordinates the Transfusion Medicine Service at national level while the hospital blood banks in the state hospitals function as the referral and coordinating centres for each state. As blood and blood products are precious national resources, the Transfusion Medicine Service in MOH work together as one network and share the available blood and blood products throughout the country as and when required thus ensuring the accessibility to the blood and blood products at all time.	The following are the proposed networking/outreach activities: a) Collaboration with Public Health programmes to reduce anaemia, improve the awareness the need for blood donation in the community, recognition of the role of Transfusion Medicine Services in emergency and disaster preparedness planning b) Development of intersectoral partnerships with different Ministries and government bodies to harness the existing and new community based activities to improve awareness and blood donation rates in the population c) Establishment of formal working relationship with regional and global professional societies and bodies pertaining Transfusion Medicine
Outsourcing/ Purchase of Services	a) PDN and blood banks in state hospitals provide outsourcing services that include transfusion laboratory services and supply of blood and blood components to private healthcare facilities as well as hospitals that are managed by statutory bodies. b) PDN also provide national referral services for Red Cells and Platelet Immunohaematology laboratory as well as the Haemostasis and Thrombosis laboratory for investigations of bleeding and thrombotic disorders.	It is proposed that the volume of plasma being fractionated to be increased thus maximizing the donated blood and at the same time achieving strategic independence of plasma derived medicinal products, particularly in the production of albumin and intravenous immunoglobulin.

	CURRENT STATUS	PROPOSED EXPANSION
	c) PDN outsource the fractionation of plasma produced by the Transfusion Medicine Service for the production of plasma derived medicinal products to CSL Behring (Australia).	
MOU with External Agencies / Universities	PDN has an MOU with IPPT USM for the following courses: • Masters of Transfusion Science Course for Scientific Officers • Masters of Medicine for Transfusion Medicine.	

Major gaps/ issues/ challenges

The following are the challenges ahead:

a) Maintaining the availability and adequacy of the blood supply in face of changing population demography, changes in disease burden and development in medical and surgical treatment

b) Ensuring the safety of blood supply against existing, new and emerging infectious agents

c) Ensuring patient safety during blood transfusion process and the appropriate use of blood

Proposals

New programme/ services	1. Community based blood donation facilities in strategic location to make it convenient for the public to donate blood 2. Universal leucodepletion and pathogen reduction to improve the safety of the blood supply 3. Use of technology to prevent transfusion error such as barcoding or Radio-frequency identification (RFID) 4. Availability of thromboelastograph (TEG) or rotational thromboelastometry (ROTEM) machine to better guide the transfusion therapy

Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	Establishment of 3 other regional blood centres- Central, Sarawak and Southern region
Replacement/ procurement equipment	It is proposed that systematic review for the replacement or procurement of equipment including vehicles for blood donation drive to be carried at a regular interval, not less than every 5 years period.
Training	1. Ongoing regular in service training including overseas attachment should be provided for all categories of staff that is involved in blood recruitment and retention, collection of donated blood, blood processing, blood screening and blood transfusion process on a regular basis. 2. There is also a need to develop a structured advanced diploma programme for those working in Transfusion Medicine Service such as Nurses and Public Relation Officers. 3. A module for blood transfusion and Patient Blood Management programme for doctors in post-graduate training should also be developed.
Recommended staff: workload	It is proposed that systematic study on Transfusion Medicine Service Workload Indicator for Staffing Need (WISN) Study for all categories of staff and all processes to be conducted in the near future.
Other proposals	Nil

GENETICS LABORATORY SERVICES

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	• Currently Genetics Laboratory Services is only available in Hospital Kuala Lumpur. • At the end of 2016, Genetics Laboratory HKL will be moving to Woman and Children Hospital KL. • Under RMK- 11, the proposed National Genetics Laboratory has been approved and will be established in Sungai Buloh.	To strengthen services available and expand the number of genetics tests in line with the growing demand and advancement of genetics in the medical field.
Where previous services available but now not	• Previously, few hospitals in Malaysia culture blood sample and prepare the slides for cytogenetics tests. Subsequently these slides are analysed and interpreted by Genetics Laboratory HKL. This was however stopped in 2009 as there was inadequate supervision and quality control on the lab processes. • HER2-neu FISH tests for breast cancer was started in Genetics Laboratory HKL. This test was stopped as pathology took over and offered Dual ISH test (Inform Dual In Situ Hybridization). • Previously IMR provided blood cytogenetics and molecular cytogenetics tests however in 2002, Genetics Laboratory HKL took over the entire service.	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	Genetics Laboratory HKL provides services to all clinical disciplines within Malaysia and collaborates with local and overseas universities / institutes. Genetics Laboratory HKL also provides chargeable services to private hospitals and labs.	Once Genetics Laboratory Services in the central region has been strengthened, this will be followed by establishing regional centres in Northern, Southern and East Malaysia.
Outsourcing/ Purchase of Services	Genetic testing is rather expensive. In order for cost effectiveness some tests are outsourced to countries like Australia, UK, US, Canada, Belgium.	If and when necessary when there is with a clinical indication, outsourcing of genetic testing could be to private labs / universities in Malaysia or abroad.
MOU with External Agencies / Universities	Genetics Laboratory HKL has an understanding with USM and UITM for training genetics Pathologists as well as outsourcing of samples.	

Major gaps/ issues/ challenges

1. Insufficient number of Pathologists in Genetics.
2. Inadequate number of trained / skilled scientist and MLT
3. Inadequate scholarship for Allied Health Professionals.
4. Budget constraint to start new genetic tests.
5. Lack of automation in genetics testing.
6. Creating awareness to policy makers and clients regarding the needs of one comprehensive national genetics laboratory for the whole country.

Proposals

New programmes/ services	Genetics Laboratory HKL will be moving to Woman and Children Hospital KL at the end of 2016. New genetic tests will be offered such as Prenatal Cytogenetics (amniocentesis), Prenatal Molecular Thalassemia and expansion in cancer genetics testing.
Projects approved RMK11	Under RMK- 11, the proposed National Genetics Laboratory has been approved and will be established in Sungai Buloh.
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Genetics Laboratory Services HKL intend to venture into the state of the art technique of Next generation Sequencing (NGS), Whole Exome Sequencing and Whole Genome Sequencing which would require procurement of new equipment as well as trained Pathologists, Scientist and MLTs. Currently Genetics Laboratory HKL does NGS by targeted gene sequencing for cancer genetics, BRCA 1&2 and inherited disorders by Ion Torrent.
Training	Genetics laboratory Services KL will require training of staff ie. Pathologist, Scientist and MLTs to keep up with the latest techniques available such as Next generation sequencing, Whole Exome Sequencing and Whole Genome Sequencing as genetic testing is a highly specialised and niche field.
Recommended staff: workload	Annual workload perstaff**:** • 250-350 lymphocytecultures; or • 150-250 bonemarrowcultures; or • 250-350 prenatalcultures; or • 400-500 metaphase/interphase fluores cence *insitu*hybridization(FISH)tests;or • 150-220specializedFISHtests(e.g.multiplesubtelomere) • 50 – 100 solid tissue FISH
Other proposals	Continuous dialogue with Ministry of Health and other stakeholders (Pathology, Family Medicine, Paediatrics, Endocrine, Surgery, Neurology, Psychiatry, Cardiology, Oncology, O&G and Clinical Genetics) towards a most cost effective approach in diagnostic genetics services for both public and private sector in Malaysia. Genetics testing is an expensive, state of the art highly specialised and niche discipline which require appropriate quality control standards that need to be adhered to ensure result of tests is accurate, reliable, reproducible and is medically useful.

PSYCHIATRY

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	4 Institutions HBahagia HPermai HBukit Padang HSentosa Hospitals with specialist: • HTF (1) • HSB, HSAH, HKulim (3) • HPP, HBM (2) • HRPB, HTaiping, HTI, HSM, HSR (5) • HTAR, HSelayang, HKajang, HSgB, HSerdang, HAmpang (6) • HKL, HPJ (2) • HTJ, HTAN, HPD (3) • HMelaka (1) • HSA, HSI, HPSF, HSNI, HKluang, HSegamat (6) • HTAA, HoSHAS, HBentong: HKuala Lipis (4) • HSNZ, HHulu Terengganu; HKemaman (3) • HRPZII, HKuala Krai; HTM (3) • HQE, HDOK, HTawau, HKeningau (4) • HUS, HSibu, HMiri, HBintulu, HSarikei (5)	More resident psychiatric departments to be set up in the major specialist hospitals i.e. HSri Aman HLimbang HKapit HLahad Datu HBeaufort HKota Marudu HPekan HLabuan HBanting HSabak Bernam HTg Karang HShah Alam HGerik HKepala Batas HLangkawi Insufficient numbers of dedicated wards for Psychiatry in-patients in all major specialist hospitals with resident psychiatrists. Setting up of dedicated ward for Psychiatry in-patients in all major specialist hospitals with resident psychiatrists should be a priority.
Where previous services available but now not	Nil	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	The nearest resident psychiatrist visits: - all district hospitals with specialist - some district hospitals without specialists some Health Centres	To collaborate with the Royal College of Psychiatrists United Kingdom (RCPsych UK)to improve the training available to candidates of the parallel pathway for Psychiatry Specialty training in Malaysia. To plan for the setting up of an examination centre in Malaysia for RCPsych UK exams. To continue collaboration with universities in Malaysia to increase the annual intake of Postgraduate Psychiatry trainees.
Outsourcing/ Purchase of Services	Sessional clinical psychologists should be engaged to provide much needed services in those hospitals without clinical psychologists or where workload is too heavy to be managed by existing personnel.	Insufficient resources within the Ministry of Health for Clinical Psychology, Speech Therapy and Psychotherapy services necessitates outsourcing to the universities and/or the private sector to meet the needs of the patients.
MOU with External Agencies / Universities	• Masters Program in Psychiatry in collaboration with the 5 universities i.e. UM, UKM, USM, UITM, UPM. • Training of medical students from IPTA and IPTS • Nursing students attachment in psychiatric nursing from public and private colleges.	

Major gaps/ issues/ challenges

1. Shortage of human and other resources
   - for hospital based community psychiatry services (acute home care and assertive community treatment)
   - to open up psychiatric services in hospitals with specialists
   - for rehabilitative programs in psychiatry
2. No funding of mental health promotion and prevention of mental illness currently being done by staff of departments of Psychiatry in specialist hospitals and mental institutions
3. Insufficient resources and funding at level of mental institutions/departments of Psychiatry for Mental Health and Psychosocial Response / Disaster Management which is essential for the care of distressed victims/survivors of crisis/disasters. The majority of providers of such services are from mental institutions and departments of psychiatry, though the work is done in the community.
4. Insufficient resources and funding for psychiatric rehabilitation, including for activities of daily living, supported employment, social enterprise

Proposals

New programmes/ services	Mental Health Literacy Program for mental health promotion, reduction of stigma of mental illness, prevention of mental illness. This program should utilise resources to reach large sections of the population via information and communication technology e.g. mobile phone applications, artificial intelligence bots, websites, etc. Staff of mental institutions and Departments of Psychiatry in specialist hospitals should be provided with additional resources to do this important work.
Projects approved RMK11	Information Technology System for Community Mental Health Centres (also known as MENTARI ITS). This project should be expanded to cover all the existing and new CMHCs.
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	Electroconvulsive Therapy (ECT) machines are needed for all departments and mental institutions particularly those with dedicated inpatient facilities. Old ECT machines need to be replaced.

Training	Training of postgraduate psychiatry specialty and subspecialty, as well as paramedics and allied health professionals insufficiently supported by appropriate physical infrastructure and human resources. More resources for training of parallel pathway candidates to increase the number of psychiatrists available to serve the Malaysian population. The current psychiatrist to population ratio is 0.28 psychiatrist per 10,000 population which is way below the WHO recommendation of 1 psychiatrist to 10,000 population Training of paramedic staff to increase the percentage of dedicated staff with post-basic psychiatry qualification to better serve the patient population
Recommended staff: workload	Number of Psychiatrists as at 30 June 2016: Ministry of Health = 199 Universities (private & public) = 96 Private = 61 Armed Forces = 4 Total : 360 Staff in mental institutions and psychiatric departments in specialist hospitals should be provided with resources and support to add mental health promotion, reduction of stigma and prevention of mental illness to their workload. This will, of necessity, incur additional human resources to be allocated to Psychiatry services.
Other proposals	1. Psychiatric subspecialties to continue to be developed, particularly in areas where subspecialty services are limited e.g. addiction psychiatry, forensic psychiatry, child and adolescent psychiatry, geriatric psychiatry, community and rehabilitation psychiatry, consultation-liaison psychiatry, neuropsychiatry. More fellows to be identified and sent for training in the subspecialties. 2. Promotion of mental health and prevention of mental illness is poorly resourced. 3. Promotion of mental health and prevention of mental illness through Mental Health Literacy program to be implemented by all departments and hospitals with psychiatry services 4. More Community Mental Health Centres (CMHC) need to be set up in addition to the existing 22 currently available throughout the country. Requirement should be for at least 50 CMHCs to be available by the end of 2020 to improve accessibility to mental health and psychiatry services

	5. As community services increase, the total number of beds in the 4 mental institutions can be reduced progressively. Resources freed up from the mental institutions' bed reduction should be channeled towards improving the community psychiatry services. 6. Government Psychiatric Nursing Homes (PNH), as provided for by Mental Health Act 2001, need to be set up. The first 2 are slated to be in Sungai Buloh, Selangor and Alor Setar, Kedah. There should be a target of at least 1 PNH per region by the end of 2020. 7. Dedicated teams to manage Mental Health and Psychosocial Response for crisis/disasters at all levels, from local, regional or national. 8. Quality improvement, monitoring and service excellence insufficiently supported or facilitated. Setting up of an electronic internet-based database for psychiatric facilities to facilitate quality improvement, monitoring and service excellence. Utilization of WHO QualityRights project as a means to improve quality of service as well as the upholding of human rights of psychiatric patients

FORENSIC

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Forensic Medicine services are available in all state hospitals and some major hospitals with specialists except for Perlis (services provided by Forensic Pathologists from HSB). There are 16 centres: 1. HSB 2. HPP 3. HRPB 4. HSgB 5. HTAR 6. Hospital Serdang 7. Institut Perubatan Forensik Negara, HKL 8. HTJ 9. Hospital Melaka 10. HSA 11. HSI 12. HTAA 13. HSNZ 14. HRPZ II 15. HUS 16. HQE	Capacity and capability building of the existing 16 Forensic Centres in the country
Where previous services available but now not	Nil	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	Forensic Medicine services for all MOH Hospitals without resident specialists are provided by the State Forensic Pathologists when required. IPFN (HKL) will coordinaye and provide nationwide coverage in the event of unavailability of any resident Forensic Pathologist. IPFN will also coordinate the Forensic Pathology Services nationwide in the event of any major incident with many fatalities.	Propose Forensic Information System in all MOH Hospitals for more efficient and quality services.
Outsourcing/ Purchase of Services	Nil	Nil
MOU with External Agencies / Universities	MOU on training aspects; 1. Training medical undergraduates (most IPTA and IPTS) 2. Postgraduate training in Forensic Pathology (MPath "Open-System")	

Major gaps/ issues/ challenges

Administration/Management:

1. Lack of administrative / management personnel to coordinate/monitor services and activities for the whole regional centres. Specialists being burdened with forensic medicine services and frequent travel to provide coverage; will also have to perform administrative responsibilities.
2. At present, the Department of Forensic Medicine HKL has to function as a department as well as IPFN (to coordinate services at national level).The project for IPFN building complex has been approved in 2015 and may take few years to complete.

Services:

1. Lack of trained staff in every category.
2. The need for new Forensic Medicine Laboratories (toxicology, anthropology and hispathology). At present there are 40 Forensic Scientific Officers in IPFN but no adequate forensic laboratories for them to provide forensic science services.

3. The need of Forensic Information System to link all the hospitals to manage all data relating to death cases handled by MOH hospitals.
4. The need for additional budget allocation to cater for the increase burden of workload.
5. Old mortuary building in some hospitals need upgrading or to be replaced.
6. Old/outdated mortuary equipments (body freezers and autopsy tables) need to be replaced.
7. Dedicated transport (4 Wheel Drive vehicle) together with drivers needed for all Forensic centres with specialists to provide coverage for all hospitals requiring specialist services (dead bodies are not advisable to be transported to centres with specialist for postmortem examination).
8. Guidelines and SOP's need to be standardized for the whole country (ongoing effort).
9. Biosafety Level-3 autopsy facility for infectious disease is available only in Alor Star Hospital. All regional Forensic Centres should have a Biosafety Level-3 autopsy facility to cater for infectious disease outbreak e.g SARS, Ebola, etc.
10. Inadequate preparedness to handle mass fatalities in major CBRNE incidents (Chemicals, Biological, Radioactive, Nuclear and Explosive Incidents).

Training

1. Need additional allocation and slots for postgraduate training of Forensic Pathologists locally and abroad

Proposals

New programmes/ services	1. To propose the Drug Lab services under Pathology Services, which handle medico-legal cases, to be transferred to IPFN and 6 regional centres in stages, together with personnel and laboratory equipments 2. To propose capacity and capability building in Major incidents preparedness and management of mass fatalities. 3. To set up more sub-specialty / area of interest in the field of Forensic Anthropology, Clinical Forensic Medicine, Forensic Histopathology, Paediatric Forensic Pathology, Forensic Pathology Imaging and Specialists in Management of the Dead in Mass Disasters.

Projects approved RMK11	"Projek Pembinaan Institut Perubatan Forensik Negara (IPFN)"
Proposed projects – RMK11 mid term	Nil
Replacement/ procurement equipment	1. Replacement of major mortuary equipment (Body freezers, mortuary table, etc) 2. Propose Biosafety Level 3 autopsy facility to be available in at least 4 regional centres.
Training	• Additional quota for specialist training in Forensic Medicine such as the Diploma Medical Jurisprudence Training programme (London) etc to increase capacity building since only UKM locally is capable of offering MPath (Forensic) programme at present • Subspecialty training in the following areas: Paediatric Forensic Medicine, Forensic Toxicology, Mass Disaster and Major Incidents Management, Clinical Forensic Medicine, Forensic Anthropology and Forensic Histopathology.
Recommended staff: workload	Capacity building of Forensic Medicine specialists (within next 5 years); • IPFN: minimum 6 specialists, 12 medical officers • State centres: minimum 3 specialists, 6 medical officers • Selected Major Hospitals: minimum 1 specialist, 2 medical officers
Other proposals	1. To engage consultancy services from the Victoria Institute of Forensic Medicine, Melbourne, Australia to provide a comprehensive future plan for Forensic Medicine Services in Malaysia. 2. Propose Forensic Science Laboratories (Toxicology, Anthropology and Hispathology) for 6 regional centres. 3. To set up dedicated forensic record offices for all Forensic centres together with the forensic record staff

SPORTS MEDICINE

	CURRENT STATUS	PROPOSED EXPANSION
Availability of services	14 hospitals with Sports Medicine Physician: • HQE I (2) • HQE II (1) • HTJ (2) • HKL (2) • HTAR (2) • Hospital Serdang (1) • Hospital Selayang (1) • HSgB (1) • HRC (1) • Hospital Melaka (1) • HRPB (1) • HPSF (1) • HSI (1) • HRPZ II(1) Total number of sports Physicians: 18 5 newly graduated specialists gazettement posting in July 2016 : 1. HKL 2. Hosp Selayang 3. HTJ 4. HSgB 5. HQE	Ongoing Proposed placement of Sports Medicine specialist in regional areas: North: HSB, HPP East: HSNZ, HTAA East Malaysia: HUS The proposed " Expansion" will work simultaneously with the "Strengthening" concept as it is based on the Needs of the Nation
Where previous services available but now not	Hospital Pulau Pinang (started 2007 and vacant in 2008)	N/A

	CURRENT STATUS	PROPOSED EXPANSION
Networking/ Outreach	HQE Kota Kinabalu to Hospital Ranau / KK Tamparuli for Medical team standby for Sports Tourism (depending on operating budget) Hospital Sungai Buloh to Hospital Tanjung Karang	Networking services to : 1. District hospital with specialist: • HTJ to HTAN 2. HTJ with Public Health/ District Health Offices • Health promotion/ active lifestyle • Exercise prescription with respect to NCDs 3. HQE I with JKNS (Public Health division NCDs) 4. HTAR with Hospital Banting/ Hospital Shah Alam Networking with various ISN satellite centres for elite athletes: • Negeri Sembilan: HTJ, Seremban • Melaka: Hosp Melaka • Kota Kinabalu: HQE I & HQE II • Johor: HIS, JB • Perak: HRPB, Ipoh • Kelantan: HRPZ II, KB Conduct Visiting specialist clinic: • Institut Sukan Negara Bukit Jalil

	CURRENT STATUS	PROPOSED EXPANSION
Outsourcing/ Purchase of Services	Nil (Patients purchase sports orthoses and braces from private suppliers)	• Laboratory investigations to be done in Gribbles laboratory relevant to Sports medicine and which are not available in the government hospitals • Radiological investigations in private centres if and when machines break down in hospitals and there is a long waiting time for repair
MOU with External Agencies/ Universities	**University of Malaya** 3 months Rotational attachment for Master trainees at 2 of the following MOH hospitals: • HKL • HTJ • HTAR **Networking:** • HTJ with Negeri Sembilan Sports Council and ISN Bukit Jalil • HQE with Sabah Sports Council /ISN Sabah	Collaboration MOH-ISN : • Research • Co-organizing Sports Medicine Conferences. • Medical team Standby for national & International sport events • Involvement in high performance sports program. Collaboration with state NGOs/ Government agencies: • Medical team standby for Sports Tourism **PREREQUISITE FOR ALL MEDICAL TEAM STANDBY FOR NATIONAL OR INTERNATIONAL EVENTS :** 6mths-1 year notification and planning by the organizers

Major gaps/ issues/ challenges

1. Sports Medicine needs to be given due recognition as a functioning discipline in the respective hospitals as- 'SPORTS MEDICINE UNIT' . The recognition of this unit must also be duplicated in the organization chart of the respective hospitals
2. Sports Medicine Unit must be allocated its own " Operating Budget" to be able to function effectively and separately from the Orthopedic Department. It has existed since 2003 but is still dependent on the Orthopedic department for its day to day running
3. All Sports Medicine gymnasium section must be a standalone service :
   a) separate from the physiotherapy
   b) separate from the Orthopedic clinics .
      This is to enable the clinicians to execute their clinical skills effectively in a more conducive environment and ensure patients receive a holistic approach to understanding and managing their problems
   c) All hospitals must be provided with the same gym equipment
4. All 13 hospitals mentioned above will be strengthened gradually in terms of manpower from 2016-2020
5. There is therefore a dire need to create more specialist postsas new graduates will fill the 13 hospitals as well as other new specialist hospitals according to the Zoning concept – North, South, East coast, East Malaysia
6. To start 'Open system for Master In Sports Medicine' in Hospital Tuanku Ja'afar Seremban & HKL in 2017 without any operating budget specific for Sports Medicine. Meanwhile these hospitals are required to maintain their Accreditation Certification.
7. There are limited seats reserved for the "Closed System" for Post Graduate training in the local University and hence Human Resource development 2016-2020 for Sports Medicine will remain a huge challenge as the ratio is fixed to 1 supervisor: 2 candidates

Proposals

New programmes/ services	To start Open System for Master program in selected hospitals by 2017 : • Hospital Kuala Lumpur • Hospital Tuanku Jaafar Seremban (Hospital Queen Elizabeth & Hospital Tengku Ampuan Rahimah to start only if adequately equipped and hospital achieve Accreditation status) All these facilities require adequate manpower and allocation of funds to run its clinical activities / educational program as well as maintain logistics
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	• Facility development for Sports Medicine clinic and gymnasium in all hospitals with Sports Medicine Specialists • Sub- specialty training/areas of interest and overseas attachment • Annual training programme for Post- basic Medical Assistants (Sports Medicine) and allied health staff at local level • Clinical practice guidelines in Sports Medicine. • Multi centre research projects on Sports Medicine issues - linking with University Malaya
Replacement/ procurement equipment	Basic equipments in each Sports Medicine Unit : Clinic/ward : 1. Knee CPM machine 2. Cryo cuff set 3. Body fat analyser/Bio-Impedance analyzer machine 4. High range Diagnostic/ interventional musculoskeletal ultrasound with printer modalities 5. ECG machine 6. Biofeedback machine 7. Laptop with printer and scanner 8. Vo2max machine

	Sports Medicine gymnasium : 1. Isokinetic machine 2. Automated External Defibrillator (AED) 3. BAPS machine 4. Trampoline 5. Wobble/rocker board 6. Electronic muscle stimulator 7. Recumbent exercise bicycle 8. Upright sitting exercise bicycle 9. Upper body ergometer 10. Pulse oxymetry 11. Ambulatory telemetry 12. Interferential therapy 13. Motorized Treadmill (for testing and rehabilitation) 14. Leg press machine 15. Gym ball sets 16. Medicine ball 17. Exercise mats 18. Dynamap Blood Pressure 19. Emergency trolley 20. Adjustable Examination couch- electric 21. Full length wall mirror 22. Oxygen cylinder with regulator and mask 23. Free weight training set (dumbbell/kettlebell/barbell) 24. Ultrasound therapy machine 25. Agility training sets (ladder/cone) 26. Muscle strength tester machine 27. Flexibility tester set 28. Plyometric box 29. Wall bar 30. Polar watch with chest belt 31. Shoulder pulley set

Training	• Local training (annual sports medicine conference) • Overseas training/attachment : - musculoskeletal ultrasound (diagnostic and therapeutic) - Exercise Prescription for chronic medical diseases - Sports injury rehabilitation. - Cardiac rehabilitation - Sports emergency & trauma. • Annual conjoint meeting/ training with Sports Medicine Department, University Malaya • Attachment to IJN for Cardiac Rehabilitation and Echocardiogram training for screening athletes at risk
Recommended staff: workload	In view of time taken to assess 1 patient per clinic session the recommended staff : workload is as follows: • Sports Medicine Physician- Head Of Unit (U54/U52/U48) • 1 : 10 patients/clinic session. • Medical Assistant/ Staff Nurse (U32/U29) • 1: 5 patients/clinic session (All staff will have their respective scope of work including administrative tasks)

Other proposals	1. To strengthen the link with University Malaya through regular meetings as well as refining the curriculum to meet the Needs of the Nation and pave the Way Forward for Sports Medicine Services in the Ministry of Health Malaysia 2. To establish the link with Sports Institute and Sports Council both at the National level as well as State level in the care of elite athletes both the abled bodied athletes as well as athletes with disabilities. 3. Sports Physicians handling athletes with disabilities must be allowed to go overseas for Continuous Professional development as: • Sports Classifiers • Medical team standby consultants 4. Sports Physicians appointed by World Sports Federationsmust be allowed to go overseas to represent Malaysia as 'Official duty' 5. All Sports Medicine Unit must have a well equipped Sports Medicine Exercise Prescription gym set up;- Obesity; young hypertensives; early diabetics; Post Myocardial Infarct Phase, Post Operative Individualised Rehabilitation. 6. Hospital Tuanku Ja'afar Seremban – January 2016 : opening of the first Sports Medicine Gymnasium in MOH. **LONG TERM GOALS:** 1. Sports Medicine Unit to be upgraded and recognized as a Department 2. Sports Physicians should be allowed to go for Conferences Overseas to present their papers / poster presentation etc as " Official Duty" with paid expenses that is entitled to them . This is especially so when Ministry Of Health links Performances of the Individual Specialist to Research and Paper presentation at local or International level. 3. National Head to be given incentive and permitted to attend 1 World Congress and 1 Conference on latest Equipment Exhibition be it locally or abroad 4. MOH Malaysia needs to look into the General Orders from the Finance Ministry for it is only **NATIONAL** athletes and **NATIONAL COACHES** with guarantee letter from MSN are exempted from paying hospital fees. This also applies to Sports school athletes and OKU- Orang Kurang Upaya 5. The rest of the State / District athletes and those from State Sports Associations are NOT COVERED by this General Order and thus are bound by the Operatonal Policy of the Accounts Division of the respective hospitals in the collection of fees.

REHABILITATION MEDICINE

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	In sixteen (16) hospitals • HRC • HKL • HTAR • HSerdang • HSgB • HTJ • HMelaka • HQE • HUS • HPP • HSB • HRPB • HTAA • HSNZ • HRPZII • HSI	• HSA • Pulau Pinang- Hospital Seberang Jaya (building in progress) • Pahang – Hospital Temerloh • Sarawak- Hospital Sibu, Hospital Miri, Hospital Petrajaya • Sabah – Hospital Sandakan • Kelantan – Hospital Kuala Krai • Terengganu – Hospital Kemaman
Where previous services available but now not	Nil	N/A
Networking/ Outreach	• Hospital Melaka to HAlor Gajah and HJasin. • HSNZ to HSetiu, HDungun and Hospital Hulu Terengganu. • HSI to HSA. • HTAR to HBanting, HKajang, HKKB and HSAS. • HSerdang • HTJ to HTAN and HTampin. • HQE to HBeaufort, HKudat, HKeningau, HSandakan, HLahad Datu, HWP Labuan and HTawau. • HUS to Sarawak Heart Centre, HMiri, HSibu, HBintulu and HSri Aman. • HPP to HSJ and HBalik Pulau	• HRPB to HSM and Hospital Gerik. Increase frequency to other current hospitals in visiting list. • HSNZ – expansion of service in Hospital Setiu

	CURRENT STATUS	PROPOSED EXPANSION
	• HSB to H Jitra • HRPB to H Taiping, HTI and H Batu Gajah • HTAA to HoSHAS • HRPZ II to HPasir Mas, HKuala Krai, HPasir Puteh and HTM.	
Outsourcing/ Purchase of Services	Prosthesis procurement and services in all hospitals. Orthosis procurement and services in some hospitals.	1. Rental Services for rehabilitation equipments 2. Hire Purchase for rehabilitation equipments
MOU with External Agencies/ Universities	Hospital Rehabilitasi Cheras with UKM, UTAR, University Perdana, MSU University, UiTM, Asia Metropolitan University, Universiti Islam Antarabangsa Malaysia and MAHSA	

Major gaps/ issues/ challenges

1. Constraint of space for outpatient clinics in hospitals especially Hospital Melaka and Hospital Terengganu.
2. Constraint of space specifically beds for rehab. Inpatients services are for acute, intermediate and extended rehabilitation care in most Hospitals.
3. Inadequate inpatient facilities leading to medicolegal issues and risk regarding 'inappropriateness of discharge'
4. The need for rehabilitation blocks to meet extended rehabilitation services in major hospitals
5. Continuation of care from specialized rehabilitation services to community rehabilitation care.
6. Refocusing of rehabilitation services in the Health Clinics to support the rehabilitative needs of patients with disability.
7. To enforce the model of good care and service standards established
8. Human resource optimization - need to develop human resource development for rehabilitation medicine including paramedics
9. The need of rehab diagnostic, treatment and prognostic equipment/tools in most hospital e.g: EMG machine, USG machine, direct current stimulation and magnetic stimulation
10. Scarcity of funds to replace damage or / and old therapy equipment.

Proposals

New programmes/ services	1. Videofloroscopic Swallow Study (VFSS) 2. Musculoskeletal Rehabilitation Services 3. Interventional Musculoskeletal Rehabilitation services 4. Pulmonary Rehabilitation 5. Oncology Rehabilitation 6. Intrathecal Baclofen Services 7. Complex care in Pediatric Rehabilitation Service.
Projects approved RMK11	Nil
Proposed projects – RMK11 mid term	1. Rehabilitation Medicine Service building blocks adjacent to identified priority hospitals. 2. Inclusion of Rehabilitation Medicine Facilities in all new hospital Pakar Minor/ Major which comprises of in patient service, out-patient specialist clinics, therapy areas for physiotherapy, occupational therapy and speech therapy. 3. Provision of inpatient rehabilitation facility i.e. dedicated bed, in selected Major District Hospitals (as section a)
Replacement/ procurement equipment	1. Replacement and/or upgrading old equipment. Proposed 3mil annually for this purpose (100k x 16 hospital). 2. Procurement of the diagnostic, prognostic and treatment tools e.g: EMG machine, USG machine, Direct current stimulation and Transcranial Magnetic stimulation
Training	1. Subspecialty Training to continue 2. Advance Diploma Rehabilitation nursing training 3. Overseas attachment program to continue 4. Training for JCI/CARF accreditation and hospital management skills for senior specialists and staff 5. Advance Diploma Rehabilitation paramedic 6. Training for Rehabilitation Technician (Prosthetic & Orthotic)

Recommended staff: workload	Minimum number of staff for Level 4 Rehabilitation service (this ratio is for inpatient only)	
	Rehab Physician	1:16 patients
	Medical Officers	1:12 patients
	Nurses / Medical Assistant (nursing care level)	1:2 patients (level 3 patients) 1:4 patients (level 2 patients) 1:6 patients (level 1 patients)
	Physiotherapists	1:8 patients
	Occupational therapists	1:8 patients
	Speech Therapist	1:6 patients
	Medical Social Worker	1:16 patients
	Clinical Psychologist	1:24 patients
	Rehabilitation Technician	1:16 patients
	PPK	1: 4 patients
	Clerks (PT)	1 per ward 1 per clinic
Other proposals	Training incentives: • Rehabilitation Physicians should be facilitated to attend international conferences. • National Head to attend world congresses and Conferences on equipment display. Research incentives: • Centres that are active in research activities should be rewarded in term terms of sponsorship to conferences or funds to equip resources centre / library.	

NUCLEAR MEDICINE

The nuclear medicine set up under the MoH is categorized into 2-level:

Level 1: Diagnostic & Outpatient Therapy Service

Level 2: Level 1 + Inpatient Therapy Service

Depending on the availability of equipment, the following of service subsets are provided:

Subset s : with SPECT service

Subset p : with PET service

A regional nuclear medicine center should be able to provide level 2sp services. Following map shows the site and the level of service for the MoH nuclear medicine centers.

Level 1; Level 2s; Level 2sp.

There is no MoH nuclear medicine centre at the east coast of the peninsular Malaysia.

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Six (6) regional hospitals/centers • HPP • HKL • IKN • HSA • HUS • HWKKL	To expand and establish new training centers for MMed (Nuc Med) students in: 1. H. Umum Sarawak 2. H. Wanita & Kanak-Kanak Sabah
Where previous services available but now not	Nil	N/A
Networking/ Outreach	The above six (6) centers will cover the services for the following geographic regions: • North: HPP (Level 2sp) • Central: HKL (Level 2s) IKN (level 2sp) • South: HSA (Level 1s) • Sabah: HWKKL (Level 2s) • Sarawak: HUS (Level 2s)	1. Networking PET-CT services between HPP and IKN followed later by HSIJB 2. A new level 2s nuclear medicine center at Kuala Terengganu to provide services to the east coast of the peninsular Malaysia.
Outsourcing/ Purchase of Services	1. IKN and HPP: purchase of FDG (radiotracer) for PET-CT service from Beacon Int. Specialist Centre or Bio Molecular Industries when supply is disrupted. 2. HKL: purchase of services from National Cancer Centre, KL or Sime Darby Medical Centre, Subang Jaya	IKN & HPP: purchase of services from surrounding private hospitals with PET-CT services in case of machine breakdown

	CURRENT STATUS	PROPOSED EXPANSION
MOU with External Agencies / Univrsities	<u>MoU for the training of Masters, Bachelors and Diploma students</u> Training and attachment with the following universities for candidates in MMed (Nuc Med), MBBS, BSc (Medical Physics / Nuclear Physics), and School of Allied Health Sciences for training of radiographers and assistant medical officers in cardiology i. HPP with IPPT/USM, UKM, Penang Medical College, BSKB, MAHSA, UniKL, UiTM & IAEA fellowship ii. HKL with IPPT/USM, UKM, BSKB, MAHSA & IAEA fellowship iii. IKN with IPPT/USM, Pharmacy iv. HSA with IPPT/USM , UTM & BSKB v. HUS with UNIMAS, Asia Metropolitan University, I System College, Kolej Radiografi JB <u>IAEA-ANM-KKM Cooperation on projects:</u> i. Improving Patient Care and Enhancing Government Parties Capacity in Nuclear Medicine Programs in RCA Region (RAS 6083, year 2017): Experts mission: Nuclear neurology imaging for adults and children ii. Country Program Framework (2018-2019): Strengthening the use of radioiodine-based radio-pharmaceuticals in the treatment of non-Hodgkin's lymphoma and differentiated thyroid cancer based on quantification and SPECT & PET dosimetry	Ni

Major gaps/ issues/ challenges

1. Service coverage
    - There is currently no MoH nuclear medicine center at the east coast of the peninsular Malaysia.
    - Not all regional centers are able to provide a wholesome diagnostic, therapeutic and PET scan services (i.e. level 2sp). Out of the 6 regional centers, only 2 are at level 2sp category.
2. Equipment – insufficient in some centers; many are due for replacement
    - H. Pulau Pinang: require replacement of a unit of SPECT-CT machine
    - H. Kuala Lumpur: require upgrading with PET-CT service
    - H. Sultanah Aminah: require replacement of a unit of cardiac dedicated SPECT machine. A level 2sp center will be built at H Sultan Ismail (HSIJB) to replace this grossly inadequate center
    - H. Umum Sarawak: require replacement of a unit of SPECT-CT machine. A new level 2sp center at Pusat Jantung HUS is required to replace the existing poor and congested setup.
    - H. Wanita & Kanak-Kanak Sabah; require upgrading with PET-CT service

RADIOTHERAPY AND ONCOLOGY

	CURRENT STATUS	PROPOSED EXPANSION
Avaiilability of services	Six (6) hospitals • IKN • HKL • HSI • HUS • Hospital Likas, Sabah • HPP	• A new oncology centre in the Northern Region equipped with radiotherapy services. • A new centre in the East Coast likely in Kuantan
Where previous services available but now not	Nil	N/A
Networking/ Outreach	1. HKL to HMelaka, HTAA, HRPB 2. HSI to HSA, HPSF, HSNI 3. HUS to HSibu, HMiri 4. HLikas to HTawau, HDOK. 5. HPP to HTaiping, HSB dan HKelpala Batas	Clinical Oncology Units in tertiary hospitals - HSB (North) - HTAA (East) - HPSF (South) - HDOK or HTawau (Sabah)
Outsourcing/ Purchase of Services	Purchase of service: • HPulau Pinang from Mt. Miriam Hospital, Gleneagles Penang and Pantai Hospital Penang. • HMelaka from Mahkota Medical Centre & HPantai Ayer Keroh • HTAR Klang from Sri Kota Medical Centre	
MOU with External Agencies / Universities	Nil	Nil

Major gaps/ issues/ challenges

1. Rising incidence in cancer overall and move from private to public facilities leading to high workload in all centers.
2. Disaggregated delivery mechanism- lack of oncologists and uneven spread. Only 40% of Clinical Oncologists are in government practice and are concentrated in Kuala Lumpur and Klang Valley. In contrast, one Clinical Oncologist for 3 million population in Johor, and one Clinical Oncologist for 1.5 million population in Sarawak.
3. Manpower shortages esp. Clinical Oncologists. There is also a need to strengthen all other support staff including physicists, radiographers and post-basic oncology nurses.
4. Shortage of radiotherapy treatment machines. Need to purchase new machines to upgrade or replace old ones. This leads to long waiting time for radiotherapy and may compromise therapy.
5. Problems encountered with buying of services.
6. Lack of oncology beds.
7. Ageing equipment. This resulted in frequent breakdowns, inconvenience to patient and compromises on chances for cure.

Proposals

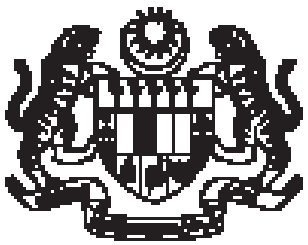
New programmes / services	1. Prostate Brachytherapy 2. Stereotactic Body Radiotherapy 3. Head and Neck Brachytherapy 4. Image guided Brachytherapy
Projects proposed RMK11	Northern Oncology Centre
Proposed projects – RMK11 mid term	Service upgrades at HKL, HUS, HLikas and HSI
Replacement/ procurement equipment	Detailed in Clinical Oncology Blueprint, encompassing; 1. Radiotherapy machine requirement – LINAC, Simulator, CTScan/ MRI, Treatment Planning System, Diagnostic Xray Machine, Brachytherapy system 2. Radiotherapy equipment for replacement 3. Radiotherapy equipment for upgrading Recommended machine norm is: 8 linear accelerators / million population, whereas the current ratio is 1.2 per million (taking in account machines from all sectors)

Training	1. Prostate Brachytherapy 2. Stereotactic Brain & Body Radiotherapy 3. Head and Neck Brachytherapy 4. Image guided Brachytherapy for cervical cancer
Recommended staff: workload	Clinical Oncologists 1.5: 1 million popn. Medical Physicists 0.8: 1 million popn. Therapy Radiographers 4.4: 1 million popn. The Royal College of Radiologists in 1998 recommend that a clinical oncologist sees a maximum of 315 cases per year. With a population of 24 million, Malaysia needs at least 200 clinical oncologists.
Other proposals	1. Leasing of equipment. This will resolve the problem of 'aging' machine. 2. Public-private integration to set up new centres. 3. Strengthen cooperation between oncology and palliative care and public health. 4. Greater input from outcome measurements in guiding and planning of policies and treatment strategies 5. Improve specialist complement; facilitate overseas expatriate doctors while waiting for Malaysians to qualify. 6. Training of doctors for the Master in Clinical Oncology to be given continued support. 7. To continue Oncology Parallel Program (FRCR) as alternative to Master in Clinical Oncology to produce more oncologists. 8. Outsourcing of services to continue until MOH has adequate resources. 9. Location of subspecialties to be carefully planned; e.g. developing stereotactic radiosurgery service at IKN will necessitate Neurosurgeons travelling from HKL to IKN. 10. Comprehensive planning for the whole country with resident oncologists and Clinical Oncology Unit in tertiary hospitals. 11. Need for networking with other centres, local universities, private medical centres and renowned overseas centres

HOSPITAL ABBREVIATIONS

HTF	Hospital Tuanku Fauziah, Kangar
HSB	Hospital Sultanah Bahiyah, Alor Setar
HSAH	Hospital Sultan Abdul Halim, Sg Petani
HPP	Hospital Pulau Pinang
HBP	Hospital Balik Pulau
HSJ	Hospital Seberang Jaya
HBM	Hospital Bukit Mertajam
HKB	Hospital Kepala Batas
HRPB	Hospital Raja Permaisuri Bainun,Ipoh
HTPG	Hospital Taiping
HTI	Hospital Teluk Intan
HSR	Hospital Slim River
HSM	Hospital Seri Manjung
HBG	Hospital Batu Gajah
HCM	Hospital Changkat Melintang
HBUK	Hospital Bahagia Ulu Kinta
HTAR	Hospital Tengku Ampuan Rahimah, Klang
HSAS	Hospital Shah Alam
HSgB	Hospital Sungai Buloh
HKKB	Hospital Kuala Kubu Baru
HTK	Hospital Tanjung Karang
HTAJ	Hospital Tengku Ampuan Jemaah Sabak Bernam
HOAG	Hospital Orang Asli,Gombak
PKKN	Pusat Kawalan Kusta Negara, Sungai Buloh
HKL	Hospital Kuala Lumpur
HPJ	Hospital Putrajaya

IPR	Institut Perubatan Respiratori Kuala Lumpur
HRC	Hospital Rehabilitasi Cheras
IKN	Institut Kanser Negara
PDN	Pusat Darah Negara
HTJ	Hospital Tuanku Jaafar,Seremban
HTAN	Hospital Tuanku Ampuan Najihah, Kuala Pilah
HPD	Hospital Port Dickson
HSA	Hospital Sultanah Aminah,Johor Bahru
HSI	Hospital Sultan Ismail Johor Bahru
HPSF	Hospital Pakar Sultanah Fatimah Muar
HSNI	Hospital Sultanah Nora Ismail, Batu Pahat
HTAA	Hospital Tengku Ampuan Afzan,Kuantan
HoSHAS	Hospital Sultan Hj.Ahmad Shah, Temerloh
HSHK	Hospital Sultanah Hajjah Kalsom, Cameron Highland
HSNZ	Hospital Sultanah Nur Zahirah,Kuala Trengganu
HRPZ II	Hospital Raja Perempuan Zainab II,Kota Bharu
HTM	Hospital Tanah Merah
HQE I	Hospital Queen Elizabeth I
HQE II	Hospital Queen Elizabeth II
HDOK	Hospital Duchess of Kent, Sandakan
HWKKL	Hospital Wanita dan Kanak-kanak, Likas
HUS	Hospital Umum Sarawak
PJHUS	Pusat Jantung Hospital Umum Sarawak
RCBM	Hospital Rajah Charles Brooke Memorial



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