NATIONAL STRATEGIC PLAN FOR CANCER CONTROL PROGRAMME

2016-2020

Ministry of Health Malaysia

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PREFACE

Cancer is one of the leading causes of morbidity and mortality worldwide. The World Health Organisation (WHO) estimated that there were 14.1 million new cases and 8.2 million deaths annually. The incidence is expected to rise due mainly to the increase in elderly population and unhealthy lifestyles.

Like most developed and advanced developing countries, Malaysia is experiencing an epidemiological transition, where diseases related to lifestyle particularly cardiovascular diseases and cancers have progressively become more prevalent. The trend of malignant neoplasm in terms of absolute numbers has escalated and remains as one of the five principal causes of national mortality for the past 20 years. In 2015, cancer contributed 13.6 % of all deaths in Ministry of Health hospitals compared with 8.9% in 1996.

We know that the incidence and impact of cancer can be substantially reduced with better prevention, early detection and treatment. However for optimal cancer control and care in the country, there is a need for better integration, collaboration and coordination across government and private sectors as well as the non-governmental and professional organisations.

Generally, one third of cancers are preventable, another third can be effectively treated if given early detection and treatment, and the quality of life for the remaining third with more advanced disease can be improved with pain relief and palliative care.

The National Strategic Plan for Cancer Control Programme (NSPCCP) 2016-2020 addresses the cancer care and management from a holistic view point that spans across primary prevention, screening, early detection, diagnosis, treatment, rehabilitation, palliative care as well as traditional and complementary medicine; and research. It is a collection of inputs from various disciplines, government and non-government agencies that are involved in cancer control, with Ministry of Health as the main contributor. It spells out detailed activities that can be carried out by relevant agencies. The activities are intended to operationalise the seven strategies outlined by the WHO.

Finally, I would like to say thank you to all those involved in the development of this strategic plan that will guide all relevant stakeholders in providing services and planning activities in cancer control programme for the country.

DATUK DR.NOOR HISHAM BIN ABDULLAH
Director General of Health Malaysia

EXECUTIVE **SUMMARY**

In 2015, the Ministry of Health Malaysia gathered together prominent oncologists, clinicians, public health specialists, pathologists, radiologist, academia, scientists, researchers and policy makers to review and initiate updates for the national Cancer Control Blueprint (NCCB) 2008-2015 and proposed the National Strategic Plan for Cancer Control Programme (NSPCCP) 2016 – 2020 to replace the NCCB 2008-2015.

The aim of the NSPCCP 2016-2020 is similar with the aim for the NCCB 2008-2015 which is to reduce the negative impact of cancer by decreasing the morbidity, mortality and to improve the quality of life of cancer patients and their families.

To achieve this aim, the NSPCCP has identified nine (9) areas of focus, where their respective objectives, targets and strategic action plans are essential for instituting total cancer care in the country are outlined till 2020. The NSPCCP addressed the cancer care and management from a holistic viewpoint that spans across primary prevention, screening, early detection, diagnosis, treatment, rehabilitation, palliative care as well as traditional and complementary medicine (T&CM) and research.

The NSPCCP calls for the support and commitment from all stakeholders, strengthening of existing networks and better collaboration between the public and private sector agencies, and in particular, private cancer centres, professional bodies and NGOs to address cancer burden and management issues in the country. Continuous monitoring and evaluation of the various initiatives is very important in ensuring the successful implementation of the NSPCCP 2016-2020.

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ABBREVIATION

AAALAC	Association for Assessment and Accreditation of Laboratory Animal Care International
AAALAS	Association for Assessment and Accreditation of Laboratory Animal Science
ALK	Anaplastic Lymphoma Kinase
ANM	Agensi Nuklear Malaysia (Malaysian Nuclear Agency)
AP	Anatomical Pathology
ASC-US	Atypical Squamous Cells of Undetermined Significance
ASR	Age Standardised Rate
BCR-ABL	Breakpoint Cluster Region – Abelson Murine Leukaemia viral oncogene
BCS	Breast Conserving Surgery
BER	Beyond Economical Repair
BK	BK Virus
BKP	Bahagian Kawalan Penyakit (Disease Control Division)
BPK	Bahagian Pendidikan Kesihatan (Health Education Division)
BPL	Bahagian Pengurusan Latihan (Training Management Division)
BPM	Bahagian Pengurusan Maklumat (Information Management Division)
BPKK	Bahagian Pembangunan Kesihatan Keluarga (Family Health Development Division)
BPTK	Bahagian Perubatan Tradisional dan Komplementari (Traditional and Complimentary Medicine Division)
BPP	Bahagian Perkembangan Perubatan (Medical Development Division)
BRCA 1 / 2	Breast Cancer 1/2
BSE	Breast Self-Examination
BSKB	Bahagian Sains Kesihatan Bersekutu (Allied Health Science Division)
BSM	Bahagian Sumber Manusia (Human Resource Division)
CBE	Clinical Breast Examination
CDR	Cytotoxic Drug Reconstitution
CME	Continuous Medical Education
CML	Chronic Myeloid Leukaemia
CMV	Cytomegalovirus
COU	Clinical Oncology Units
CPG	Clinical Practice Guidelines
CRC	Clinical Research Centre
CRM	Clinical Research Malaysia
CRP	Cancer Rehabilitation Programme
CRS	Cancer Rehabilitation Services
CT	Computed Tomography
DLBCL	Diffuse Large B-cell Lymphoma
DNA	Deoxyribonucleic Acid
EBV	Epstein-Barr Virus
EGFR	Epidermal Growth Factor Receptor
EML4	Echinoderm Microtubule Associated Protein Like 4
EQA	Expand Quality Assurance

FBC	Full Blood Count
FISH	Fluorescence In Situ Hybridization
FMS	Family Medicine Specialist
HBV	Hepatitis B virus
HCP	Health Care Providers
HCV	Hepatitis C Virus
HECC	Health Education & Communication Center
HKL	Hospital Kuala Lumpur
HPJ	Hospital Putrajaya
HPP	Hospital Pulau Pinang
HPV	Human Papillomavirus
HQ	Head Quarters
HQE	Hospital Queen Elizabeth (Queen Elizabeth Hospital)
HRPZII	Hospital Raja Perempuan Zainab II
HSA	Hospital Sultanah Aminah
HSB	Hospital Sultanah Bahiyah (Sultanah Bahiyah Hospital)
HSI	Hospital Sultan Ismail
HTA	Health Technology Assessment
HTAR	Hospital Tengku Ampuan Rahimah (Tengku Ampuan Rahimah Hospital)
HTJ	Hospital Tuanku Jaafar (Tuanku Jaafar Hospital)
HUKMMC	Hospital University Kebangsaan Malaysia Medical Centre (also known as Hospital Canselor Tuanku Muhriz)
HUS	Hospital Umum Sarawak (Sarawak General Hospital)
IAEA	International Atomic Energy Agency
iFOBT	Immunochemical-based Fecal Occult Blood Test
IKN	Institut Kanser Negara (National Cancer Institute)
IMR	Institute of Medical Research
IMU	International Medical University
IMRT	Intensity-modulated Radiation Therapy
IPR	Institut Perubatan Respiratori (Institute of Respiratory Medicine)
IR	Interventional Radiologist
ISH	In Situ Hybridization
JAK2	Janus Kinase 2
JCV	John Cunningham Virusm
JKN	State Health Office (Jabatan Kesihatan Negeri)
JPA	Jabatan Perkhidmatan Awam (Public Service Commission)
KOSPEN	Komuniti Sihat, Perkasa Negara
KPI	Key Performance Indicator
KPK Khas	Mesyuarat Khas Ketua Pengarah Kesihatan Malaysia (Director General of Health Special Meeting)
K-RAS	V-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog
LBC	Liquid Based Cytology
LFT	Liver Function Test
MaHTAS	Malaysian Health Technology Assessment Section
MAKNA	National Cancer Council Malaysia (Majlis Kanser Nasional)
MALDI_TOF	Matrix Assisted Laser Desorption Ionization Time-of-Flight

MAMPU	Malaysian Administrative Modernisation and Management Planning Unit
MDT	Multidisciplinary Team
MHC	Malaysian Hospice Council
MIC	Minimum Inhibitory Concentration
MIMOS	National Research & Development Centre in Information and Communications Technology
MKAK JB	Makmal Kesihatan Awam Kebangsaan Johor Bahru (National Public Health Laboratory)
MMC	Malaysia Medical Council
MMed	Master of Medicine
MMG	Mammography
MoE	Ministry of Education
MoH	Ministry of Health
MoHE	Ministry of Higher Education
MOS	Malaysian Oncology Society
MOSTI	Ministry of Science Technology and Innovation
MOU	Memorandum of Understanding
MRCP	Member of Royal College of Physician
MRD	Minimal Residual Disease
MRI	Magnetic Resonance Imaging
MSH	Malaysian Society of Haematology
MSW	Medical Social Workers (Pegawai Pekerja Sosial Perubatan)
MWFCD	Ministry of Women Family and Community Development
MyHDW	MyHealth Data Warehouse
NCCB	National Cancer Control Blueprint
NGS	Next Gene Sequencing
NIH	National Institute of Health
NMRR	National Medical Research Registry
NMUS	National Medicine Used Survey
NOHSA	National Oral Health Survey of Adults
NPC	Nasopharyngeal Cancer
NPFDB	National Population and Family Development Board
NSPCCP	National Strategic Plan for Cancer Control Program
OBGYN	Obstetrics and Gynaecology
OCRCC	Oral Cancer Research and Collaborative Center
ORL	Otorhinolaryngology
OT	Occupational Therapist
PACS	Picture Archiving and Communication System
PCR	Polymerase Chain Reaction
PEMANDU	Performance Management and Delivery Unit
PET	Positron Emission Tomography
PIK	Pusat Informatik Kesihatan (Health Informatic Centre)
PNH	Paroxysmal Nocturnal Haematuria
PKD	District Health Office (Pejabat Kesihatan Daerah)
PRRT	Peptide Receptor Radionuclide Therapy
PSA	Prostate Specific Antigen

QALY	Quality Adjusted Life Years
RFTVR	Radiofrequency Tissue Volume Reduction
RIS	Radiology Information System
RIT	Radioimmunotherapy
RM	Malaysian Ringgit
ROS1	ROS Proto-Oncogene 1
RP	Renal Profile
RTOC	Radiotherapy & Oncology Centers
SLNB	Sentinel Lymph Node Biopsy
SME	Subject Matter Expert
SOCSO	Social Security Organization
SPECT	Single-Photon Emission Computed Tomography
TAT	Turn Around Time
TB	Tuberculosis
THIS	Total Hospital Information System
T&CM	Traditional And Complementary Medicine
UiTM	Universiti Teknologi MARA
UKM	Universiti Kebangsaan Malaysia
UMMC	University Malaya Medical Centre
USIM	Universiti Sains Islam Malaysia
WHO	World Health Organization

NATIONAL STRATEGIC PLAN FOR CANCER CONTROL PROGRAMME

NSPCCP 2016-2020

1.0 BACKGROUND

Cancer has become one of the most devastating diseases with more than 14 million new cases each year and is expected to continue rising. The expected increase is mainly due to the increase in elderly population and adoption of unhealthy lifestyles.

Cancer represents a tremendous burden on patients, families and societies. Besides the financial cost of disease, cancer has important psychosocial repercussions for patients and their families and remains, in many parts of the world, a stigmatizing disease.

Cancer is a complex group of diseases representing more than 100 distinct diseases with different causes and requiring different treatments or interventions. There is no single cause or cure for cancer and everyone is at risk.

There is hope as there are many survivors among people who are diagnosed with cancer, and much can be done to prevent, diagnose early and treat patients with cancer and to relieve suffering due to cancer. Generally, one third of cancers are preventable, another third can be effectively treated given early detection and treatment, and the quality of life for the remaining third with more advanced disease can be improved with pain relief and palliative care.

While the incidence and impact of cancer can be substantially reduced with better prevention, early detection and treatment, there is need for better integration, collaboration and coordination across government and private sectors as well as the non-governmental and professional organisations.

1.1 Cancer Situation Worldwide

The World Health Organization (WHO) in its Globocan Report 2012 estimated that the global burden of cancer was 14.1 million new cases (incidence), 8.2 million cancer deaths (mortality) and 32.6 million people living with cancer (prevalence). This report also noted that 48% (15.6 million) of the 5-year prevalent cancer cases occurred in the less developed regions.

1.2 Cancer Situation in Malaysia

Like most developed and advanced developing countries, Malaysia is approaching an epidemiologic transition, where diseases related to lifestyle particularly cardiovascular diseases and cancers have progressively become more prevalent.

Malignant neoplasm persisted as one of the five principal causes of national mortality for the past 20 years and its trend, in terms of absolute numbers, has escalated. In 2015, cancer contributed to 13.6 % of all deaths in Ministry of Health (MoH) hospitals compared with 8.9% in 1996.

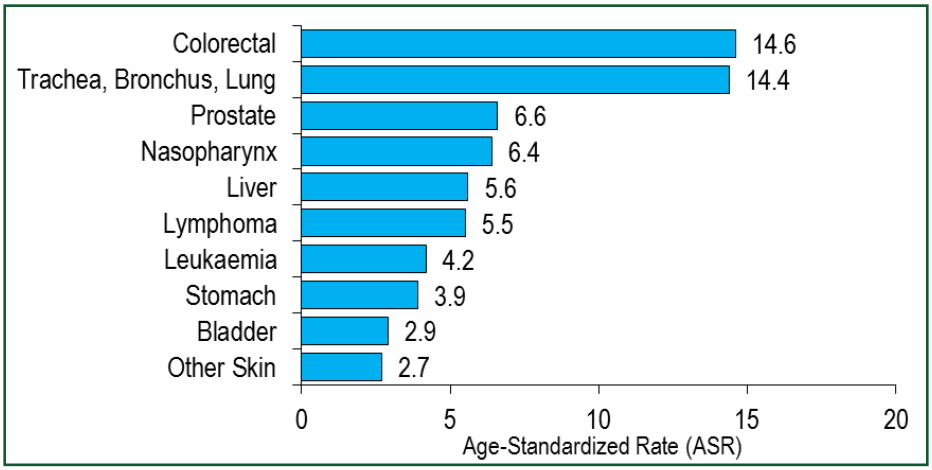
Table 1: 10 Principal Causes of Deaths in MoH Hospitals, Malaysia 2015

1.	Disease of circulatory system	22.77 %
2.	Disease of respiratory system	18.54 %
3.	Neoplasms	13.56 %
4.	Certain infectious and parasitic diseases	13.20 %
5.	External causes of morbidity and mortality	9.74 %
6.	Diseases of the Digestive System	4.82 %
7.	Diseases of genitourinary system	4.32 %
8.	Certain conditions originating in the Perinatal Period	3.16 %
9.	Endocrine, nutritional & metabolic diseases	2.08 %
10.	Disease of the nervous system	1.51 %

Reference: Health Facts 2016, MoH, Malaysia

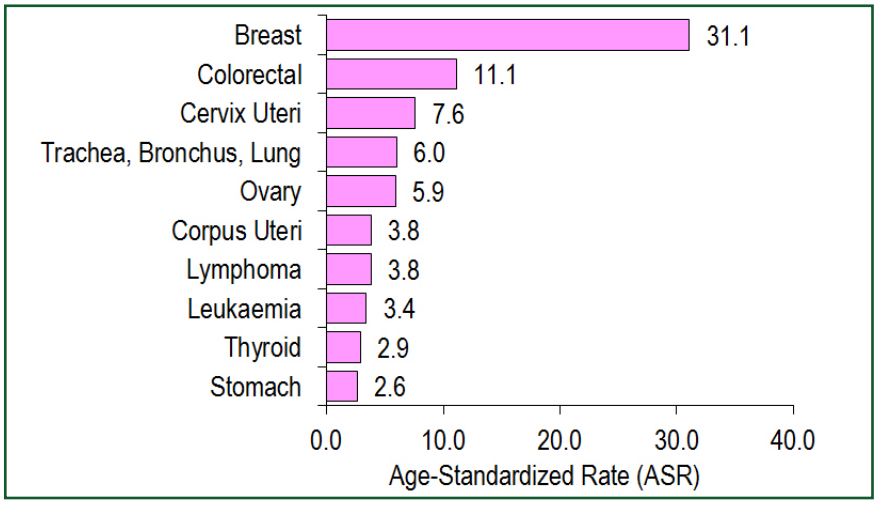
The ten most frequent cancers in Males and Females in Malaysia for the period of 2007 – 2011 are as tabulated.

Figure 1: Ten Most Frequent Cancers in Males, Malaysia 2007-2011



Source: Malaysian National Cancer Registry Report 2007 – 2011, MoH,2016

Figure 2: Ten Most Frequent Cancers in Females, Malaysia 2007-2011



Source: Malaysian National Cancer Registry Report 2007 – 2011, MoH, 2016

2. ISSUES AND CHALLENGES

The incidence of cancers in the country is expected to rise due to increasing ageing population in the country, increase in population's exposure to cancer risks with the rapid process of modernization and the growing adoption of unhealthy lifestyles.

In Malaysia, the cancer control activities for prevention, early detection and case management are still carried out quite independently by various agencies including those in the government, private sector and non-government organizations. Duplication of services provided for certain aspects of cancer control exists, whilst on the other hand, there is room for improvement for service availability in certain areas, namely prevention, treatment, rehabilitation and palliative care.

While the incidence and impact of cancer can be substantially reduced with better prevention, early detection and treatment, there is need for better integration, collaboration and coordination across government and private sectors as well as the non-governmental and professional organisations. Collaboration with these agencies should be systematically organized and these collaborative activities must pursue the government objectives and policies on cancers.

2.1 Prevention

The biggest challenge in cancer prevention is conveying the knowledge of cancer in general and the common risk factors to the public and making the knowledge gained by them being transferred into practice.

A recent study at Harvard Medical School reported that at least 50% of cancer deaths are preventable through lifestyle changes. According to WHO (Cancer Fact Sheets, Feb 2015), about 30% of cancer deaths are due to the five leading behavioural and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use, and alcohol use. Tobacco use is the most important risk factor for cancer causing over 20% of global cancer deaths and about 70% of global lung cancer deaths. Cancer causing viral infections such as Hepatitis B (HBV), Hepatitis C (HCV) and Human Papillomavirus (HPV) are responsible for up to 20% of cancer deaths in low- and middle-income countries. Infections with these agents are potentially preventable through immunisation. The other known risk factors for cancer are betel quid chewing, risky sexual behaviour and environmental factors.

Knowledge of these risk factors serves as a basis for cancer control and prevention strategy in the country. The MoH continues to be the main organisation responsible for carrying out activities for cancer prevention. Policies, programmes and activities on health education and promotion, immunisation, legislation and policies which are positive for human health requires good collaboration between relevant agencies as certain regulations and legislations are outside the purview of the MoH.

The Public Health Programme and the Oral Health Division of the MoH take the lead for most of these activities. Health education and awareness activities regarding cancer risk factors such as tobacco, food and nutrition, alcohol, betel quid and sexual habits, are being carried out through the mass media and other channels.

Legislation to regulate tobacco, food safety, drugs and chemicals have been put in place since 2004, 1985, 1984 and 1952 respectively. Besides these laws, other legal measures related to cancer control are also in the powers of other ministries like the Ministry of Human Resources, Ministry of Natural Resources and Environment, Ministry of Housing and Local Government, and Ministry of Agriculture and Agro-Based Industry.

Existing health education and awareness programmes on cancers will be continued, intensified and delivered to the public in particular to the population who are at risk of developing cancer. The modifiable risk factors for cancers are similar to other major Non-Communicable Diseases (diabetes, cardiovascular and hypertension) such as unhealthy diet, physical inactivity, high body mass index, tobacco use, and alcohol use. Other important risk factors for cancer are betel quid chewing, infections (HBV, HCV, HPV, Epstein-Barr virus (EBV) and Helicobacter pylori), biological (genetic, sexual and reproductive), occupational and environmental factors.

Plan of actions and strategies for modifiable risk factors for cancers namely smoking, alcohol, physical activity and diet is addressed in the respective strategic plans which like the NSPCCP 2016-2020, are part of the National Strategic Plan for Noncommunicable Disease 2016-2025.

2.2 Screening

Population screening as defined by WHO, is the presumptive identification of unrecognized disease or defects by means of tests, examinations or other procedures that can be applied rapidly. Screening is intended for people who do not have the symptoms of the disease, or the condition being screened and can identify a pre-disease abnormality or early disease.

The aim of screening for a disease is to reduce the burden of the disease, mortality and morbidity in the community. It is essential to recognise the limitations and benefits of screening to avoid "high technology" but poor cost-effective approaches, or to avoid methods which are not achieving the needed coverage of the targeted population. It is important to realise that screening programmes should not be introduced unless there is adequate manpower to perform the tests and enough facilities for diagnosis, treatment and follow-up of individuals with abnormal test results. However, the WHO stepwise framework indicated three steps of implementation. The first step is called the 'core step' where intervention is being implemented with the current feasibility and existing resources. Step Two or 'expanded step' is to implement an intervention that is feasible in the medium term, with a realistically projected increase in, or reallocation of resources. Step Three or 'desirable step' is to implement interventions that are beyond the reach of current resources, if and when such resources become available.

There is strong evidence to support population screening for breast, cervical and colorectal cancers. In addition to organised population screening programmes, public education campaigns, which demystify cancer and result in earlier diagnosis (down-staging), will benefit most cancer patients. Currently MoH provides screening for breast, cervical and colorectal cancer in health clinics. The current approach taken for screening is selective opportunistic and not organised as population based.

2.2.1 Breast Cancer

The MoH continues to promote Breast Self-Examination (BSE) and annual breast examination by trained health workers as part of the breast cancer awareness campaign since 1995. Although BSE is not proven to reduce breast cancer mortality, it is still being promoted to create breast health awareness thus empowering women to take responsibility for their own health.

The Third National Health & Morbidity Survey (NHMS III) in 2006 showed that the percentage of women who carried out monthly BSE was 57.6%, Clinical Breast Examination (CBE) 53.5% and underwent Mammography (MMG) 7.9%. These figures showed the coverage for breast cancer screening was not optimum and thus stronger promotion is required to make women come for breast examination and screening.

In 2012, the MoH Malaysia implemented nationwide mammogram screening for high-risk women through primary health care facilities. A structured and organised population based mammogram screening is ideal. However, it is a huge challenge and may not be practical in the near future due to limited resources.

The new development in MRI involving breast imaging may result in a stronger role as a diagnostic and screening tool. In a few established breast centres in Malaysia, breast MRI has been offered to complement mammography and ultrasound in efforts to improve accuracy, particularly in the high risk dense breast group of patients. However, the challenge in implementing this approach

is the limited number of MRI machines available in most hospitals and the limited number of trained radiologists.

2.2.2 Cervical Cancer

Pap smear screening was initiated by the MoH in 1969. The MoH and the National Population and Family Development Board of the Ministry of Women, Family and Community Development are providing services for Pap smear screening. Other providers are private clinics and hospitals, university hospitals and army hospitals. However, the programme approach remains as opportunistic screening.

In 1996, the second National Health & Morbidity Survey (NHMS II) revealed that only 26% of eligible women had ever done cervical cancer using Pap smears and in 2006 (NHMS III) it increased to 43.7%. The NHMS 2011 survey found that only 12.8% of eligible women had a Pap smear examination done in the past 12 months. The MoH's focus is to improve the coverage, efficiency and effectiveness of the National Pap Smear Screening Programme. This includes increasing public awareness of cervical cancer screening through Pap smear and improving the efficiency and effectiveness of Pap smear tests. Liquid-based cytology is one of the screening technologies which has superior advantages over conventional methods.

The coverage of population based screening especially for women over 30 years old should be increased and made accessible to every eligible woman in the country. The WHO recommended that proportion of women between the ages of 30–49 to be screened for cervical cancer at least once, or more often, and for lower or higher age groups according to national programmes or policies.

Human Papillomavirus (HPV) immunization programme has already been implemented as a modality for primary prevention. However, cervical screening program should be continued as HPV vaccination is expected to prevent only 71% of cervical cancer. The future direction is to have HPV DNA testing as primary screening or as co-testing.

To have an impact on reducing cervical cancer incidence and mortality, efforts must be focused on increasing the awareness of women about cervical cancer and preventive health-seeking behaviour. Efforts to organize effective cervical cancer prevention programme require collaboration and full commitment from the government, health authorities, clinicians, pathologists, medical personnel, media and the public. This effort must be accompanied with adequate financial resources, upgrading of infrastructure and equipment and increasing the number of trained medical personnel.

2.2.3 Colorectal Cancer

Colorectal cancer has become the second most common cancer among the Malaysian population after cancer of the breast and the most common cancer among males (MNCR Report 2007-2011). Efforts will be taken to expand colorectal cancer screening services to all health clinics and in providing sufficient colonoscopy services in hospitals.

The Guideline for Colorectal Screening was published in 2016, which serves as a guide for the development of the screening programme for colorectal cancer. We look forward also to the development of Clinical Practice Guidelines for Colorectal Cancer Management.

2.2.4 Lung Cancer

Lung cancer is overall the third commonest cancer in Malaysia and the most common cause of cancer deaths accounting for 19.8% of all medically certified cancer related mortality in this country. Cigarette smoking is a major aetiological risk factor and 92% of Malaysian male lung cancer patients have a significant smoking history. The smoking prevalence in Malaysia is exceptionally high with almost 50% of all adult males being smokers. The morbidity and therapy of smoking induced lung cancer accounts for approximately Ringgit 440 million annually and thus a major economic burden on our personal and national health care finances.

Early stage disease is amenable to curative surgery which affords the best prognosis in terms of a cure and long term disease free survival. However, in Malaysia, most cases are diagnosed too late with either locally advanced tumours or distant metastasis, precluding surgical resection. Over 75% of lung cancer cases are at Stage III or IV at diagnosis, and these patients can only be treated palliatively.

The natural history of lung cancer and its high prevalence in Malaysia mandates serious consideration for disease screening on clinical and health economic grounds. The goal of screening is to detect the disease at an early pre-clinical stage in "at risk" individuals thereby facilitating early effective intervention. Screening must be cost effective, affordable, reproducible and reliable. A high sensitivity and a high specificity are ideal.

2.2.5 Prostate Cancer

The Prostate Specific Antigen (PSA) may indicate a prostate problem, however the Health Technology Assessment (HTA) for prostate cancer screening using PSA which was conducted in 2011 suggested that screening should only be done for the high-risk group, mainly close family members.

2.2.6 Nasopharyngeal Cancer

Risk factors for nasopharyngeal cancer (NPC) include Epstein-Barr virus (EBV) infection (sero-positive) and family history of NPC. EBV serology test is a promising tool for selective screening in those with a family history of NPC. Health Technology Assessment for NPC screening which was conducted in 2011 found there was fair evidence on acceptable diagnostic accuracy for EBV serology test in a NPC screening programme. However, there was no evidence on the cost effectiveness and no evidence on the effectiveness of NPC screening in terms of reduction in mortality or increase in QALY. In view of this, the HTA did not recommend NPC screening as a public health policy.

2.3 Early Detection

Early detection as defined by WHO is the awareness of early signs and symptoms of cancer in order to facilitate diagnosis before the disease becomes advanced. This enables more effective therapy to be possible. The concept of early diagnosis is sometimes called *down-staging*.

The aim of early detection is to detect the cancer when it is localized to the organ of origin and before it invades the surrounding tissues and distant organs, or for some sites, to detect precancerous lesions. It is based on the concept that the sooner in its natural history the cancer is detected, the more effective the treatment is likely to be. Most cancers are detected late mainly because of late presentation due to lack of awareness and knowledge of public and health care providers on signs and symptoms of cancers. Preliminary data on NPC suggests that early detection may improve survival.

Patients with early signs and symptoms for cancers such as cancer of the breast, colorectum, nasopharynx and oral cavity should receive thorough and appropriate assessments. Focus on these groups will be able to improve the pick-up rate and the cost effectiveness of early detection efforts.

2.4 Diagnosis

Early detection and screening for cancer can reduce morbidity and mortality, as long as there is a good supportive environment. An accurate diagnosis is the first step in cancer management. This calls for a combination of careful clinical assessment and diagnostic investigations including endoscopy, imaging, histopathology, cytology and laboratory tests. Accessible and affordable competent diagnostic facilities should be more widely available.

2.4.1 Radiology Services :

Radiology services are provided in all MoH hospitals and most health clinics. The services range from special radiological examinations (Ultrasound, CT, MRI, Mammography, Fluoroscopy, Angiography) and general radiography in the tertiary and larger hospitals to basic radiographic examination in smaller hospitals and health clinics.

As of 2015, there are 50 hospitals (14 state, 25 major specialist,9 minor specialist and 2 special institutions) with 250 resident radiologists.

- General Radiography Services are present in all hospitals and certain major health clinics.
- Ultrasound services are present in all hospitals and many health clinics.
- CT services are present in 50 MoH hospitals with a total of 57 scanners, the latest addition being in Kemaman, Limbang, Sarikei and Labuan Hospitals. Cardiac examinations are now able to be performed in designated hospitals with cardiac services.
- MRI services are currently provided in 29 hospitals with the most recent addition to Batu Pahat Hospital. Examinations for iron overload studies in thalassaemia patients are now being carried out in major specialist and state hospitals.
- Mammography services are available in 39 hospitals i.e tertiary, state and major district specialist hospitals.
- Angiography services are provided in 6 hospitals.

- Advanced Interventional Radiology services are provided in eight hospitals: HKL, Hospital Selayang, Hospital Sg. Buloh, IKN ,Hospital Sultanah Bahiyah, Alor Setar ,Hospital Sultanah Aminah, Johor Bahru, Hospital Umum Sarawak, Kuching and Hospital Serdang by specially trained radiologists. Basic IR services are provided at all hospitals with radiologists. There are scheduled visits by IR consultants from HKL and Hospital Selayang to perform complex as well as routine procedures in the other hospitals.
- Hospital Selayang and HKL are the two centres for IR training with trainees from MoH as well as universities and international trainees in the future.
- Teleconsultation services are in place at selected hospitals. It is widely used in Sabah and Sarawak.
- Patient safety has always been an important aspect of the radiological service especially radiation safety. Continuous ongoing efforts are undertaken to update the regulations as well as new projects to enhance the safety efforts.

There are big challenges in terms of equipment, manpower (numbers and skills) as well as operational budget. With the advent of interventional radiology into the therapeutic arena, more budgetary allocation are need by the radiology departments.
Proper planning has to be done in order to optimize the available resources and overcome the constraints.
These are outlined in the section on Plan of Action – Diagnosis.

2.4.2 Pathology Services :

As of 2015, the MoH provides pathology services at 14 state hospitals, 26 major specialist hospitals, 27 minor specialist hospitals, 11 special hospitals/ institutions, 855 health laboratories and 5 public health laboratories. Histopathology services are available in 14 state hospitals and 8 major specialist hospitals while chemical pathology, haematology and microbiology services are available in all hospitals.

The scientific advances and technology development in molecular testing have transformed cancer diagnosis. The application of molecular testing in histopathology started from immunohistochemistry methods by detecting protein expression in the cancer cells. Immunohistochemistry test is readily available in all the hospitals providing the histopathology service. With advances in technology, this approach has evolved by using gene probes to detect molecular defects in the cancer cells. This can be carried out using in-situ hybridsation methods by manual or automated platforms.

Profiling of cancers at the molecular and cellular level is now possible using microarray and high-throughput genotyping platforms. In MoH hospitals, the pathology service had proposed to develop molecular pathology testing in the 10th Malaysian Plan and a few new tests have commenced in response to clinical demands. For the 11th Malaysian Plan, the pathology services have projected to expand the scope of molecular testing not only using blood but also tissue specimens and fluid. Moreover, there is also an increase in the number of tests for the diagnosis and management of a wider scope of solid cancers and leukaemias.

2.4.3 Nuclear Medicine Services :

Nuclear Medicine Service had been introduced into Malaysia since 1964,beginning at Hospital Kuala Lumpur. It was later expanded to various hospitals in Malaysia in the last 2 decades. The nuclear medicine set-up under the MoH is categorized into 2 levels:
Level 1 : Diagnostic & Outpatient Therapy Service
Level 2 : Level 1 + Inpatient Therapy Service

Depending on the availability of equipment and facility, each centre is assigned with following subset :

Subset s : with SPECT service
Subset p : with PET service
Subset sp : with both SPECT and PET services

MoH has taken a regional approach in delivery of this service. Nuclear medicine services are currently divided into 5 regions, i.e. :

<u>Peninsular Malaysia</u>

Northern region	:	Hospital Pulau Pinang (Level 2sp)
Central region	:	Hospital Kuala Lumpur (Level 2s) & National Cancer Institute (Level 2sp)
Southern region	:	Hospital Sultanah Aminah (Level 1s)

<u>East Malaysia</u>

Sarawak	:	Hospital Umum Sarawak (Level 2s)
Sabah	:	Sabah Women amd Children Hospital (Level 2s)

A nuclear medicine centre providing a regional based services should be equipped with a Level 2sp facility.

The MoH has installed the country's first PET/CT machine in 2005. In the following year, the first cyclotron was commissioned. Currently, centers in the northern and central zones are equipped with PET/CT machine and another is planned for the southern region. With fast expanding use of PET-CT in oncology, PET-CT has become an inseparable part for nuclear oncology service. Unfortunately, at present, only 2 out of the 6 nuclear medicine centres under MoH are equipped with PET-CT machines.

In order to provide a better service to the country and its people, Nuclear Medicine service under the MoH should strive forward towards the following goals in the next 5 years :

i. Replace all the old machines that are beyond economical repair.
ii. Upgrade all the centres to Level 2sp so as to cater to the need of medical services at various regions of this country.
iii. Equip all nuclear medicine centres with at least one unit of PET-CT machine.
iv. Reduce the period of machine down-time for every machine to an acceptable level (<14 working days/machine/year).
v. Optimize the capacity and usage of all nuclear medicine machines and radioisotopes.

The following are the targets set for each center in the future development of this field under MoH:

NUCLEAR MEDICINE CENTRES	GOALS AND NEW POLICIES
Northern Region :	
Hospital Pulau Pinang	• To replace the old machine with a new unit of SPECT-CT machine
Central Region :	
i) Hospital Kuala Lumpur	• To advance and upgrade the current radioisotope lab in order to fulfil *Good Radiopharmacy Practice* • To install a new PET-CT unit for the existing nuclear oncology services
ii) Institut Kanser Negara	• To introduce the use of new targeted radionuclide therapies like PRRT and RIT • To explore new radiopharmaceutical substances used in oncology for diagnosis and/or therapy
Southern Region :	
Hospital Sultanah Aminah, Johor Bahru	• To replace the old machine with a new unit of cardiac dedicated SPECT machine • To construct a new building for the Department of Nuclear Medicine and PET with Level 2sp facility at Hospital Sultan Ismail
East Malaysia, Sarawak :	
Hospital Umum Sarawak	• To upgrade the current facility for radioiodine treatment • To expand the services with installation of SPECT and PET-CT units
East Malaysia, Sabah :	
Hospital Wanita & Kanak-Kanak Sabah	• To expand the service provided by the new Nuclear Medicine Department • To install a PET-CT unit for the oncology services
East Coast, Peninsular	
• A new Nuclear Medicine Center for the east coast region of the peninsular Malaysia, probably at the state of Terengganu or Pahang	
Towards a comprehensive multidisciplinary approach in cancer management	
All new oncology centers should have at least a Level 1sp Nuclear Medicine facility	

2.5 Treatment

The strategy for treatment and management is to detect cancer as early as possible and initiate treatment in a timely fashion. Successful cancer treatment increasingly involves multidisciplinary management of the cancer patients, where all treatment modalities (e.g. surgery, anti-cancer drugs, radiotherapy, psycho-oncology) are considered, and optimal individual treatment plans are designed using evidence-based guidelines and protocols.

Surgery for different types of cancers as well as chemotherapy is presently available at all state hospitals and some of the larger district hospitals. These services are provided by surgeons in various surgical disciplines and physicians in consultation with oncologists.

In this review, there are efforts at integration between disciplines, such as in strengthening multidisciplinary management of cancer.

There are proposals for plans to upgrade and strengthen the existing government centers and to open new ones, and to consolidate efforts at training of skilled manpower. Other strategies that have been drawn up address the great need for a more equitable and accessible cancer treatment programme.

Improvement in cooperation between health care professionals in hospitals and Public Health will be further strengthened especially with the introduction and implementation of Treatment Outcome Databases and the intensification of Screening and Early Detection of cancer, so that it can emulate the networking achieved in Maternal and Child Health, Immunization and Infectious Diseases.

Interventional radiologists play an increasingly important role in cancer treatment services particularly in the area of minimally invasive and targeted treatment procedures, such as guided local ablation therapy to treat liver, lung, soft tissue, bone and breast cancer.

Pathology service also plays an important role in the monitoring and surveillance of specific cancers, and the response to cancer treatment.

Future plans include the development of proteomic testing centres to enable tailoring of treatment, prognostication as well as monitoring of residual disease. For the Haematology discipline, expansion of stem cell transplant and chimerism services are required to support the increasing workload related to diagnosis and treatment monitoring.

Microbiology tests are used to detect infections in patients getting cancer treatment so that these patients can attain maximum benefit from the treatment rendered. Hence, a comprehensive microbiology service is required to detect the potential microorganisms that may hinder the success of treatment.

There is the need to diagnose cancers early so that prompt and adequate treatment can be instituted, and a referral system from primary health clinics to various secondary and tertiary care centers need to be strengthened further. There is a need to develop a system of reply and feedback so that the treatment and follow up for patients can be seamless.

With the development of novel therapies that are guided by specific tests or genetic profiles, there must be better efficiency of reporting of results, eg pathology so that implementation of treatment is facilitated.

Budget for treatment needs to take into account the cost of tests to determine the optimum patient selection.

2.5.1 Radiotherapy and Oncology

2.5.1.1 Issues and Proposals

2.5.1.1.1 Improve access to Radiotherapy and Oncology facilities

Cancer treatment is provided by Public and Private sector mainly in the Klang Valley region, Johor Bahru, Kuching, Kota Kinabalu, Malacca and Penang. However, in the MoH, there are only 5 centres with radiotherapy facilities. Buying and outsourcing of radiotherapy services from the private centers is costly in the long run.

Existing Radiotherapy and Oncology Centers (RTOC) within MoH:

- Hospital Kuala Lumpur
- Hospital Umum Sarawak Kuching
- Hospital Sultan Ismail, Johor Bahru
- Hospital Kanak-kanak dan Wanita, Likas
- Institut Kanser Negara
- Hospital Pulau Pinang (Oncology center without radiotherapy facilities)

Currently, there is no government radiotherapy center in the Northern Region (Penang, Kedah, Perlis & North Perak) and the East Coast of Peninsular Malaysia (Kelantan, Terengganu, Pahang)

There is room for improvement in the coverage of large parts of Sarawak.

There are 3 University centres and 20 private facilities.

PLAN:

To build new RTOC at Sungai Petani by 2020.

These new centers will effectively enable access to cancer treatment for more patients in the country. Currently, the main priority is to build a centre for the northern region based on the high numbers of cancer patients reported in the northern region and the absence of a government centre in this region.

2.5.1.1.2 Upgrading of existing facilities

In the existing centers, some of the equipment related to radiotherapy delivery are past their life span and problems of frequent breakdowns (downtime) had resulted in long waiting times to start treatment and a reduced capacity to treat patients.

2.5.1.1.3 Establishment of Clinical Oncology Units (COU) at MoH tertiary hospitals

Following primary diagnosis of a cancer, all patients should preferably be referred to an Oncologist before the next treatment is decided upon. Many patients however are reluctant to travel a long distance to get oncologist's advice at any of the 6 centres mentioned above.

PLAN :
Develop new Clinical Oncology Units (COU) in Tertiary Hospitals:

The proposed COU's will be headed by a specialist who has an interest and is involved in cancer management. It shall be directly placed under the Hospital Director of the respective hospital administratively. The regional Oncologists will do visiting clinics periodically at least once a month.

Each unit shall consist of the following:

- Daycare facility/space and a ward containing at least 15 Oncology beds.
- A cytotoxic drug reconstitution (CDR) room or equivalent to ensure proper and safe chemotherapy drugs preparation and an outpatient clinic.
- Staffing (minimal requirements)
  1. A specialist – Head of the COU
  2. 3 medical officers
  3. An Oncology Pharmacist or equivalent
  4. Adequate nursing team for a ward, daycare and outpatient clinic

Training of all the above staff will be required and this should be done at an established Radiotherapy and Oncology department. The training program should adequately include all clinical aspects of cancer patient management emphasizing on common clinical encounters.

The centres as below will be developed in stages within the next 5 years.

To initiate, efforts will be made to develop 4 Clinical Oncology Units (COU) in Tertiary Hospitals :
1. Muar
2. Kuantan
3. Alor Setar
4. Sandakan/Tawau

2.5.1.1.4 Increase number of Clinical Oncologists, Physicists and Radiation Therapists

Shortages in human resource are a major issue in the field of Oncology and occur at all levels of staff. These shortages of Oncologists, Medical Physicists and Radiation Therapists contribute to the poor access of patients to cancer treatment.

Currently there are 28 graduates from the Master of Clinical Oncology programme, with another 37 who are within the training programme. These graduates have contributed immensely towards the manpower needs especially in Government departments.

In addition to the Master of Clinical Oncology which started in 2002, and has produced oncologists to address the current need of the country, efforts are being taken together between Universities, MoH staff and Professional Society to write a National Curriculum for the training of Clinical Oncologists outside the university. This will further improve the capacity of the country to train oncologists locally.

At the moment, we are still critically short of oncologists in MoH to meet the increasing needs of patients who need cancer treatment. The Government facilities, especially the MoH facilities treat all cancer patients who are referred, especially the patients who are unable to afford private care. When the National Cancer Institute started functioning, the needs of Malaysian patients who required sophisticated treatment were addressed, such that patients can now be treated within the country, and with a cost that is affordable for poor patients. The various centres, especially the Government centres continue to treat all patients with the available resources.

PLAN: 1. To network closely with universities

i. Masters in Clinical Oncology (increase allocation of intakes that is consistent with the recommended trainer to trainee ratio)
ii. Medical Physics (need to have post degree training in specialized techniques, eg IMRT, Tomotherapy)
iii. Degree courses for Radiation Therapists and upgrading of the Diploma holder.
iv. Developing a National Curriculum for Clinical Oncologists.
v. Incentives and exception for intake of Foreign Doctors to work as Clinical Specialists in Radiotherapy and Oncology.
vi. Increase allocation for advanced radiotherapy technique training overseas.
vii. Increase in number of posts needed in all oncology centres.

2.5.1.1.5 Affordable Treatment

Value - Based Medicine

Value - Based Medicine will be adopted, involving Health Technology Assessment, the adoption of a threshold, effective negotiations with pharmaceutical industry on prices, and adherence to chemotherapy guidelines which have been agreed upon and adopted by consensus.

The inclusion of cancer drugs into the National Formulary, especially the expensive drugs, will depend on effective negotiations made with industry regarding the pricing of drugs, which will be guided by the cost effectiveness threshold and estimated Incremental Cost-effectiveness Ratio (ICER) in Health Technology Assessment Report, after recommendations on the clinical benefit of using such drugs in specific conditions are made by clinicians involved in cancer treatment. Health Technology Assessment which includes economic evaluation will be strengthened further.

The Protocol for Systemic Therapy has been revised recently and further revisions will be carried out at regular intervals.

2.5.1.1.6 To improve on Radiotherapy processes in an effort to reduce waiting times through implementation of LEAN healthcare management

Some radiation processes, involving patient treatment can be redundant processes and can be eliminated. The LEAN management system can be used to look at 'wastages' from every aspect of the process itself and modify/

remove these wastages. LEAN identifies issues in the processes and helps overcome these issues but at minimal or no extra cost.

Areas where LEAN maybe implemented includes issues pertaining to waiting times of patient to gain access to treatment.

To enable LEAN to be implemented, centres have to identify issues or problems that they are facing.

2.5.2 Nuclear Medicine

Currently, other than the southern zone, inpatient radioiodine treatment for thyroid cancers was offered in all other nuclear medicine centers under MoH. Besides this, other targeted radionuclide therapies such as radioimmunotherapy (RIT) for non-Hodgkin lymphoma, radionuclide therapy for pain palliation in bone metastases and selective internal radiation therapy (SIRT) for liver cancer have been carried out by specific centers from time to time. The first peptide receptor radionuclide therapy (PRRT) for neuroendocrine tumors was introduced in 2015 at National Cancer Institute, Putrajaya. In the future, we look forward to provide ancillary support for PET/CT-guided radiotherapy planning as well.

In order to address shortages in human resource but at the same time to ensure qualified and adequately trained nuclear medicine specialists, a structured post-graduate education and training programme was started in 2008 by University of Science Malaysia. Till now, there has been 20 graduates from the Master of Medicine in Nuclear Medicine and 23 (21 from MoH) are currently in training under this programme. Separate training modules have also been drafted for those interested physicians and radiologists to take up this specialty, in addition to their basic specialty. There are currently 32 registered nuclear medicine specialists in this country, of which 13 are in government service, 11 practicing in universities and 8 in the private sector.

2.5.3 Clinical Haematology

There are currently 24 centers in Malaysia with clinical haematology services, of which 11 are in MoH hospitals, 4 in university hospitals and 9 in private setting. All the states have clinical hematology service except for Seremban and Kuala Terengganu with monthly visits.

There are 25 clinical hematologists in the MoH, 9 are practicing in university and 10 in the private. In addition, there are 15 officers in training, of whom 12 are in the MoH and 3 in the universities.

The exit examination for haematology is conducted by the Malaysian Society of Haematology (MSH) and has been accepted by the Academy of Medicine as a clinical fellowship. Majority of the subspecialty training for clinical haematology is undertaken by MoH.

For adult stem cell transplantation services, there are currently 2 centres in the MoH (Hospital Ampang and Hospital Pulau Pinang) which services 70% of the workload. The third centre in Hospital Wanita dan Kanak-kanak Sabah will service adults once the stem cell laboratory is ready.
There are 3 transplant units in the university and 3 in the private hospital which

accounts for 30% of the transplants.

For registries, we have the Chronic Myeloid Leukemia (CML) registry under the MyPAP program, a Myeloproliferative Neoplasm Registry under MSH and a Paroxysmal Nocturnal Haematuria (PNH) registry which is registering.

2.5.4 Breast and Endocrine Surgery

In Malaysia, facilities to diagnose and treat breast cancer patients are mainly available in major public hospitals. It is still very much in the realm of general surgeons. However, we now have increasing number of surgeons trained under Breast & Endocrine Surgery Subspecialty who are well - trained in breast cancer management. Currently we have dedicated Breast & Endocrine Surgeons in 8 major government hospitals:

1. Hospital Kuala Lumpur - 3 surgeons
2. Hospital Putrajaya - 6 surgeons
3. Hospital Sultan Ismail, Johor Bahru - 2 surgeons
4. Hospital Raja Perempuan Zainab II, Kota Bharu - 2 surgeons
5. Hospital Sultanah Nur Zahirah - 1 surgeon
6. Hospital Pulau Pinang - 1 surgeon
7. Hospital Queen Elizabeth - 2 surgeons
8. Hospital Raja Permaisuri Bainun, Ipoh - 2 surgeons

These hospitals usually provide 'One-Stop Centre' where patients with suspicious breast lesions will be seen at the Breast Clinic and subsequently imaging and biopsy of the lesions will be done in the same day. These centres have access to Oncology Services for patients' adjuvant treatment. There are 19 trained surgeons, while another 7 surgeons are under training. In addition to managing patients with breast cancer, the surgeons are also trained in managing cancers arising from endocrine glands such as thyroid cancers and adrenal tumours.

Two major centres from the universities, University of Malaya Medical Centre (UMMC) and Universiti Kebangsaan Malaysia Medical Centre (UKMMC) also provide dedicated breast cancer care services which help to relieve some of the burden of services in the Klang Valley. All these specialized centres also function as tertiary referral centres for other parts of the country.

Timeliness of diagnosis and accessibility of care also need to be considered. Accessibility is still a major issue especially to those living in rural areas. These patients are usually seen by medical officers or by primary care physicians at health clinics and referred to general surgeons at the nearest hospitals. Since these hospitals do not have full cancer care facilities, patients need to be referred to other hospitals for Oncology treatment thus causing delays in treatment.

2.5.4.1 Surgical Treatment of Breast Cancer :

Surgical treatment for breast cancer has undergone transformation from very radical operation i.e Radical Mastectomy by Halsted in the late 19th century to breast conserving surgery (BCS) for small tumours. This is especially so with the advent of mammogram screening allowing for patients to be diagnosed with smaller tumours.

The extent of practice of breast conserving surgery in the country is unknown.

Lack of breast surgeons and radiotherapy services may reduce the uptake of breast conserving surgery. The introduction of Sentinel Lymph Node Biopsy (SLNB) is now considered as a standard procedure. However, there are still variances in practice among centres.

In countries where patients mainly present at intermediate and advanced stages, the standard mastectomy and axillary clearance is still the main treatment used. In Malaysia, SLNB is not widely practiced because patients frequently present with large tumours. However, SLNB is available in some MoH Hospitals (HPJ; HSIJB; HPP; HRPB Ipoh, HQE and HKL); UMMC; UKMMC and few private hospitals.

The current approach is to incorporate plastic surgery component in breast surgery. Whenever cosmesis is a major concern for patients, reconstructive surgery is offered and performed by Plastic Surgeons either as combined surgery or performed at a later stage depending on the suitability of cases. Breast surgeons increasingly perform "Oncoplastic Surgical Procedures" ranging from simple implants, to tissue flaps. A higher level of satisfaction is achieved among patients without compromising the safety and oncological clearance.

2.5.4.2 Multidisciplinary Team Management :

One of the main key points in managing breast cancer patients is to have a dedicated Multidisciplinary Team (MDT) management where all the main healthcare providers are involved including the surgeon, breast radiologist, pathologist, oncologist and supporting staff. A regular MDT meeting should be part of the main activities in a specialised Breast Cancer Care Centre apart from Breast Clinics and dedicated operation theatres. Patients' management plans will be discussed as well as any related issues with regards to pathological and radiological findings.

2.5.4.3 Key Performance Indicators (KPI) :

Currently there are two indicators to measure the performance of breast cancer management.

1. Percentage of patients given appointment at Breast Clinic for a suspicious breast lump/lesion within 14 working days of referral.
   - Standard > 80%

   (Timely Access Measure: Waiting time for patient seeing specialist at Breast Clinic for suspicious breast cancer)

2. Percentage of patients going for definitive surgery for breast cancer within 4 weeks of the diagnosis.
   - Standard >75%

   (Timely Access Measure: Waiting time for definitive surgical treatment for patients with breast cancer)

2.5.4.4 Challenges and Future Plans :

To achieve a comprehensive and up-to-date Breast Cancer Management stated above, the following issues need to be addressed :

1. Training and retaining of manpower.
   Skilled manpower is the biggest asset. There is a great need to increase numbers of breast surgeons, oncologists, breast radiologists and pathologists to fill up the gaps and needs in the future. Additional expertise to be built up includes Clinical Geneticists, Genetic counselors, and Breast Care Nurses and dedicated Mammographers.

2. More training and exposure of breast surgeons with oncoplastic work in the short term locally can be achieved by having more workshops and conferences as well as training abroad as part of fellowship training in recognized centres. Training Plastic surgeons will be part of the long term plan.

3. More efforts should be given in giving better and attractive package to encourage this expertise to be in public services. Presently, there is high turnover of surgeons where after completion of training, they quit the public service after only been in service for a year or two.

4. Improvement of infrastructure and equipment, SLNB facilities, high quality pathology laboratory, digital mammography with tomosynthesis, breast MRI intervention, radiotherapy and oncology services.

5. Every effort should be made to set up a proper and regular MDT meetings. Where certain services are not available such as Oncology services, the use of tele-conferencing can be made available.

6. More centres with trained breast surgeons to be set up. Future plan:
   Kuching, Sarawak; Southern region – Seremban; East Coast – Kuantan.

7. CPG Management of Breast Cancer – the Second Edition (2010) is due for review. The request to Health Technology Assessment has been submitted.

2.5.5 Colorectal Cancer Surgery

Currently there are 11 surgeons trained in Colorectal Surgery. Colorectal surgery is also performed in hospitals by General Surgeons.

The Clinical Practice Guideline for the Management of Colorectal Cancer is in progress.

2.5.6 Psycho-oncology Service

Psychological needs of patients with cancer are an essential component of a comprehensive high quality medical care. It is concerned with complex needs surrounding the psychological, social, behavioural, and ethical aspects of cancer.

At present, psycho-oncology service is basically provided as a general 'consultation' activity based on referrals to psychiatry in most of the hospitals. The approach is mainly focusing on the treatment of major psychiatric conditions either as a reaction towards the illness or manifestation of treatment side effects. The service is limited in the form of consultation basis as other referrals despite being provided in all general hospitals.

The small number of psychiatrists with the ratio of 0.83 per 100,000 populations (2009) and with a few trained personnel in Consultation-liaison Psychiatry fellowship programme contributes to the minimal coverage of service provision in the interest of psycho-oncology, with no 'full time' mental health professional dedicated to this important area. Of necessity, most of this work is being done by general psychiatrists in hospitals.

The interest and the demand for psycho-oncology liaison work are growing, and in keeping up we need to continue upgrading the skills and knowledge via extensive clinical exposure, training and research. We need to have more concerted efforts to develop and establish practical models of care, and standardized forms. The evolving constructive network with oncology, palliative medicine, rehabilitation and complementary medicine would enhance the quality of life of cancer patients.

Psycho-oncology is considered an area under consultation-liaison subspecialty, a relatively new emerging subspecialty gaining more interest among psychiatrists in Malaysia in recent years. Consultation-liaison subspecialty focuses at the interface of psychiatry and other medical specialties including care of cancer patients. It is an important component of overall comprehensive cancer management to enhance patient and family quality of life. Therefore, there is a need to strengthen and upgrade this service, starting with a pilot project.

As in 2015, there are 3 consultation-liaison psychiatrists in the MoH. By 2020, it is projected that there will be increasing number of consultation liaison psychiatrists designated in the hospitals listed below :

1. Hospital Putrajaya -1
2. Hospital Kuala Lumpur–1
3. Hospital Pulau Pinang – 1
4. Hospital Sultan Ismail, Johor Bahru – 1 (2017)
5. Hospital Queen Elizabeth, Kota Kinabalu -1 (2018)
6. Hospital Raja Perempuan Zainab II, Kota Bharu - 1 (2019)
7. Hospital Tuanku Jaafar, Seremban - 1 (2019)
8. Hospital Raja Perempuan Bainun, Ipoh – 1 (2020)

Some degree of psycho-oncology services generally are provided by all hospitals with general psychiatrists. However, the availability of persons trained in specialized psycho-oncology interest may be more focused in the coordination of care. All the hospitals listed above are hospitals with existing oncology or palliative services. Additionally, two major centres from the universities, UMMC and HUSM also provide psycho-oncology services led by consultation liaison psychiatrists.

2.5.6.1 Psycho-oncology Management for Cancer Patients

Psychosocial wellbeing should remain a main concern across the cancer journey; from the initial screening through diagnosis and treatment, recurrence or shift to palliative care and cancer survivorship; with each professional being able to make a meaningful contribution to care within the scope of their roles and expertise.

Holistic management approach encompassing bio-psychosocial-spiritual modalities and interventions will be used in line with the recent evidence in psycho-oncology.

2.5.6.2 Multidisciplinary Team Management :

One of the main key points in psychosocial care is to have a dedicated Multidisciplinary Team (MDT) management where all the main healthcare providers are involved including the oncologist, palliative physicians, psychiatrist, psychologist, rehabilitation therapist, medical social workers, spiritual/religious personnel and paramedics. A regular MDT meeting should be part of the main activities in order to provide holistic care throughout their illness trajectory. Patients' psychosocial management plans will be discussed focusing on a patient-centered approach.

2.5.6.3 Key Performance Indicators (KPI) :

1) Percentage of patients given appointment at psycho-oncology combined clinic within 14 working days of referral. Standard > 75%.

(Timely Access Measure: Waiting time for patient seeing specialist at psycho-oncology combined clinic)

2.5.7 Gynae-Oncology

Gynaecological malignancy is the second most common female cancer after breast cancer. The incidence is expected to rise with an increasingly aging population. Cervical cancer, is not only curable if detected early, but is also largely preventable. Through regular screening tests – namely the Pap smear and the HPV DNA test, and HPV (human papillomavirus) vaccination, the outcomes for patients with cervical cancer should be better than before.

The high incidence of cervical cancer in Malaysia is largely because of a lack of awareness among women about how preventable the disease is, as well as the importance of screening in preventing the disease from developing. We need a robust programme to raise awareness among women, girls and men on the importance of screening.

The Gynaecological Oncology services in Malaysia began in the mid 1960's. After 1980's, MoH and other public universities sent dedicated specialists to an accredited center overseas for one to two years. At that time, the focus was on surgery and chemotherapy.

Since 1998, the O&G Development Committee has formalised 3 years training in this sub-speciality and candidates were sent for at least a year to an overseas center to gain experience. Till 2016, thirteen government hospitals had provided such services namely :

1) Hospital Kuala Lumpur
2) Hospital Sultanah Bahiyah, Alor Setar
3) Hospital Tuanku Fauziah, Kangar, Perlis
4) Hospital Pulau Pinang
5) Hospital Raja Perempuan Zainab II, Kota Bhru
6) Hospital Sultanah Nur Zahirah, Kuala Terengganu
7) Hospital Tengku Ampuan Afzan, Kuantan
8) Hospital Sultan Ismail, Johor Bahru
9) Hospital Ampang, Selangor
10) Hospital Serdang, Selangor

11) Hospital Selayang, Selangor
12) Hospital Umum Sarawak, Kuching
13) Hospital Likas, Kota Kinabalu

In 2017 onward, the services will be extended further to 5 other hospitals in stages, based on placement of these trainees upon completion of their training:

1) Hospital Melaka
2) Hospital Tuanku Jaafar, Seremban
3) Hospital Raja Permaisuri Bainun, Ipoh
4) Hospital Tengku Ampuan Rahimah, Klang
5) Hospital Sibu, Sarawak

It is our hope that the development of these services will be available in other major hospital with specialists. The hospitals that were identified in the pipeline are:

1) Hospital Sultanah Nora Ismail, Batu Pahat
2) Hospital Sultan Hj Ahmad Shah, Temerloh
3) Hospital Kuala Krai, Kelantan
4) Hospital Sultan Abdul Halim, Sg Petani
5) Hospital Taiping
6) Hospital Sandakan/Tawau
7) Hospital Miri/Sibu

Each centre shall have at least 2 Gynae-oncologists to cater to the increasing workload. The target is to have a total of 52 gynae-oncologists to fill the posts in the hospitals mentioned above. Till today 26 specialists had completed their fellowship training.

2.5.8 Rhinology, Head and Neck Surgery

In 2007, cancer was the third common cause of death in MoH Malaysia Hospitals after heart diseases and diseases of pulmonary circulation and septicaemia. Head neck cancers encompass lip and oral cavity, sinonasal, nasopharyngeal, oropharynx, hypopharynx, larynx and salivary gland malignancies. These cases are managed by otorhinolaryngologist trained under the Head Neck Laryngology Subspeciality and the Rhinology Sub-speciality Programme. Thyroid cancers are also being handles by Head Neck surgeons in selective cases such as those involving the airway or cases requiring neck dissections. Currently MoH has dedicated Head Neck Surgeons and Rhinologist only in these major government hospitals:

No	MoH Hospital	Number of Trained Head Neck Surgeons	Number of Trained Rhinologist
1.	Hospital Tunku Fauziah, Kangar, Perlis	1	0
2.	Hospital Sultanah Bahiyah, AlorSetar , Kedah	1	1
3.	Hospital Pulau Pinang	0	0
4.	Hospial Raja Permaisuri Bainun, Ipoh, Perak	1	3
5.	Hospital Taiping, Perak	0	0
6.	Hospital Selayang	1	0
7.	Hospital Kuala Lumpur	1	1
8.	Hospital Putrajaya	0	3
9.	Hospital Melaka	1	0
10.	Hospital Tengku Ampuan Rahimah, Klang, Selangor	0	1
11.	Hospital Sultanah Aminah ,Johor	0	1
12.	Hospital Sultanah Nur Zahirah, Kuala Terengganu, Terengganu	0	1
13.	Hospital Raja Perempuan Zainab II, Kelantan	0	1

Total number of surgeons trained in Head Neck surgeries – 6
Total number of trainees in the Head Neck Subspeciality Programme - 4

Total number of surgeons trained in Rhinology – 12
Total number of trainees in Rhinology - 7

In addition, ORL departments from 5 major university hospitals also provide dedicated Head Neck surgeons that help manage patients with head neck cancers. These include:

1. UKMMC
2. UMMC
3. USM
4. UPM
5. UIA (Kuantan)

The National Cancer Registry 2007 documented 57.6% of cancer cases were diagnosed at stage III and IV. Out of this group of patients, the lip, tongue, oral cavity and nasopharynx malignancies contributed more than 50% of cancers diagnosed at an advanced stage. Patients are usually seen by medical officers or primary care physicians at health clinics and subsequently referred to the ORL surgeons. All major MoH hospitals with ORL services have sufficient tools and imaging facilities to diagnose head neck cancers. Unfortunately awareness of the early symptoms and signs of the vast subtypes of head neck cancers should be instilled not only among the primary care givers but also the public in general. Nevertheless this has improved with programmes such as Head Neck cancer road shows organized by various ORL departments from both MoH and university hospitals. An audit done by ORL department Hospital Sultanah Bahiyah in 2003, 2008 and 2013 showed that there is significant improvement in early detection of Head and neck cancers following the 2013 Head and neck cancer awareness programs. In 2003 and 2008, 0% of stage 1 and stage 2 cases were detected while 93% and 86% respectively presented at stage 4. However, following the Kedah awareness program, 77% of cancer of the larynx itself was detected at stage 1.

At present, the most challenging aspect of managing head neck cancer patients is the timeliness and accessibility of post-operative radiotherapy treatment. About 95% of head neck cancers are squamous cell carcinomas that respond well to radiotherapy. In the Northern region of Peninsula Malaysia, ranging from Perlis, Kedah, Pulau Pinang and northern half of the state of Perak, covering a population of more than 4 million people, there is only 1 MoH oncology centre located in Pulau Pinang without a MoH Radiotherapy facility. The Radiotherapy services are outsourced from private institutions.

2.5.8.1 Key Performance Indicators (KPI)

Currently we suggest 2 indicators to measure the performance of head neck cancer management;

i. Percentage of patients given appointment at Head Neck Clinic for suspicious symptoms or signs of head neck cancer within 7 working days - Standard > 80%
ii. Percentage of patients referred to oncologist within 2 weeks after obtaining HPE after surgery – Standard > 80%

2.5.8.2 Challenges and Future Plans

To achieve a comprehensive and updated Head Neck Cancer Management stated as above, few issues need to be addressed :

1) Training and retaining of manpower - the biggest asset. Need to increase the numbers of head neck surgeons, rhinologist and especially oncologist to fill up the gaps and needs at present and in the future.
2) In order to promote interest in pursuing sub-speciality training and to retain the manpower, time-based promotion and special allowances for surgeons and other specialist with sub-speciality training should be allocated to encourage these expertise to flourish and remain in the public sector.
3) Training of supportive team (paramedics) designated in the management of head neck oncology patients. Syllabus is already available under nursing college.
4) Urgent need of more Oncological Centers throughout Malaysia. For example, Hospital Sultanah Bahiyah has sub-speciality services dealing with Head Neck cancer, Colorectal and Hepatobiliary cancer, Gynae Oncology and others. There is a dire need to have an oncology centre in Alor Setar so timely oncological treatment can be given, discussions between surgeon and oncologist can be done, and complications can be managed as a team for better patient outcome.
5) Definite need of Oncology Head Neck Surgery Clinic in each hospital providing head neck sub-speciality services to enable proper discussion and management.
6) Designated operating time for Head Neck and Rhinology sub-speciality services once a week in view cases are complicated and lengthy operating time.
7) Establishing better collaboration and team work between disciplines for example Rhinology, Neurosurgery and Ophthalmology.
8) To provide each centre with head neck sub-speciality services with equipments such as ultrasound machine, head neck operative set, laser, radiofrequency tissue volume reduction (RFTVR) machine and sialandoscopy set.
9) Established a nationwide continuous and regular awareness campaign program for early detection of head and neck cancers.

2.5.9 Nurse-Patient Navigation

Navigation of cancer patients is an important area to develop in Cancer Control Programme. Efforts are being carried out for breast cancer patients.

Planning includes :

1) Formulation of Guidelines that will cover public health, diagnosis, and treatment. Procedures or guidelines will include when and how to refer patients to relevant departments based on the patient's problems. There is a need to further discuss with respective groups whether referrals from nurses can be accepted, and how the referral system will be developed.

2) Preparation of information on cancer, chemotherapy and radiotherapy that can be used by navigators as health education to patients to help patients to understand and to be involved in decision- making.
3) Organising oncology nurses to assist patients who call up for advice.
4) Exploring the utilization of Patient Navigation for Inpatients who need help.

Nurse Navigation is relevant for Public Health, Oncology, Palliative Care and other disciplines. This will be helpful towards integration between the various sectors, especially between Public Health and Hospitals and between Diagnosis, Treatment and Rehabilitation.

Patient Navigation is a potential solution to address the concerns brought up in cancer care, such as long wait between diagnosis and starting treatment, patients being lost to treatment, or lost to follow up.

2.5.10 Role of Non-Government Organisations (NGOs)

While the role of NGOs in prevention, screening and health promotion and education has been covered earlier, the roles of NGOs in cancer treatment were explored further :

1) Training in communication with cancer patient support and navigation for patient.
2) Patient adherence to treatment.
3) Support for patients and families, eg accommodation, travel, logistics, financial assistance.
4) Provide pamphlets, literature, webinar, health education materials eg management of side effects.
5) Palliative Care.
6) Support of Value Based Medicine, such that there will be sustainability of health care system in the face of rapid escalation of cost of cancer treatment.

2.6 Rehabilitation

Rehabilitation is the process of helping a person to reach the fullest physical, psychological, social, vocational, and educational potential consistent with his or her physiologic or anatomic impairment, environmental limitations, and desires and life plans. Patients, their families, dependants, caregivers and their rehabilitation teams work together to determine realistic goals and to develop and carry out plans to obtain optimal function despite residual disability, even if the impairment is caused by a pathologic process that cannot be reversed.

Rehabilitation is a concept that should permeate the entire health-care system. It should be comprehensive and include prevention and early recognition, as well as outpatient, inpatient, and extended care programmes to restore, support or palliate. The outcomes include increased independence, a shortened length of hospital stay, the most efficient use of evolving health-care systems, and an improved quality of life. Rehabilitation should focus on cancer patients for whom rehabilitation medicine services would be appropriate in a seamless manner at any stage of the disease.

The Cancer Rehabilitation Programme (CRP) in Malaysia will be based on a holistic and comprehensive approach to medical care, using the combined expertise from multiple caregivers. The health-care team responsible to ensure the smooth running of the CRP includes the following: Oncologists, Therapy Radiographers, Rehabilitation Physicians, Surgeons, Oral Surgeons, Physicians, Psychiatrist, Physiotherapists, Occupational Therapists,

Clinical Psychologists, Neuropsychologists, Speech Pathologists and Therapists, Counsellors, Dieticians, Dental Technologists, Prosthetists, Orthotists, Vocational Rehabilitation Personnel, Cancer Rehabilitation Nurses and Medical Social Worker.

Resources to support and skilled assessment in formulating realistic rehabilitation needs should be available as part of the primary management of cancer treatment. Ideally this should be done in the least clinic visit in a multidisciplinary/interdisciplinary manner to reduce the burden of the patients and health care team.

In each tertiary centre with Oncology service, a core team comprising of primarily allied health personnel of at least a physiotherapist, occupational therapist and nurse should be available. This team must be in agreement with a leader from the team who will coordinate the case. The core team should be able to network with community health service by constantly updating the service directory which includes government and non-government organization. This specialized team has to be committed in continuous education by training the local professionals and groups with interest thus reducing the burden of service provision from the tertiary centre.

To facilitate accessibility to rehabilitation medicine services while enabling delivery as close to home of patients, the plan is to evolve basic services in all general hospitals and district hospitals, while networking with the Family Medicine services in the Health Clinics.

Care within a supportive and caring environment will need standards and credentialing, as well as audit of services to ensure that this objective is attained and maintained. The issues that need to be addressed by the service include managing pain, lymphoedema, improving bowel, bladder and sexual function, improving nutritional status, improving physical conditioning and activities of daily living, improving social/cognitive/emotional status that also addresses stress/anxiety/depression management, reducing hospitalizations, and improving vocational status.

There is need for cost effective, efficient and acceptable facilities and services for cancer rehabilitation that are comprehensive and holistic. Standards for benchmarking and clinical audit need to be in place to ensure appropriate service delivery. Cooperation, networking and smart partnership with other agencies are important and need to be further enhanced. Periodic review of cancer rehabilitation guidelines and care pathways has to be included. In addition, patient satisfaction surveys and opportunity for research should be available in an effort to improve cancer rehabilitation services with the best available evidence.

2.7 Palliative Care

Improved quality of life is of paramount importance to patients with cancer including those patients in whom cure is not a feasible goal of treatment. This can be attained through provision of palliative care, prompt assessment and treatment of pain and other problems which may be physical, psychosocial and spiritual.

The consumption of oral morphine is an important measure of palliative care provided by a country to relieve intolerable pain. However, there can be cultural, procedural and policy barriers, which lead to difficulties in access and usage of strong opioids. Palliative care in Malaysia has been slowly developing since 1991 and initially involved non-government organizations (NGO's) and volunteers such as HOSPIS Malaysia and the Penang branch of the National Cancer Society of Malaysia. Palliative care was offered in some hospitals (e.g.

Sarawak General Hospital) prior to the establishment of Palliative Care Units. In 1995 the first dedicated palliative care unit was established in Queen Elizabeth Hospital, Kota Kinabalu, Sabah. Subsequently the Ministry issued a directive that by the year 2000, all MoH Hospitals should develop palliative care units or palliative care teams. Since then further developments have been achieved including the establishment of the field of palliative medicine as a medical subspecialty making in roads in the MoH, MoHE and Private sectors. New NGO community services are also increasing in numbers. Also, there has been an increasing awareness for the need of paediatric palliative care services.

Common challenges of palliative care in the country include :

a) Lack of dedicated and trained healthcare personnel in palliative care to provide services in hospital, primary care and community settings in order to deliver cohesive and coordinated multi-disciplinary care.
b) Limited educational and training resources in the country at present.
c) Lack of awareness of the need and role of palliative care for the nation amongst healthcare providers, policy makers and general public.
d) Lack of community palliative care services in the public health sector with an over reliance on limited NGO services for continued care of patients after discharge from hospital. Many areas in the country have no community palliative care support available.
e) Limited access to palliative care drugs such as opioid analgesics particularly in areas outside regional healthcare facilities.
f) Limited social services and supportive network for cancer patients.
g) Insufficient research data on palliative care needs and the need for benchmarking standards of care.

2.8 Traditional and Complementary Medicine

Malaysia has a competitive advantage in promoting traditional and complementary medicine because of the confluence of Malay, Chinese, Indian and many other systems of traditional practices and knowledge, which is a great part of Malaysia's uniqueness. Furthermore, Malaysia's rain forest is rich in flora and fauna with a great potential to make advancement in developing a lucrative herbal industry and also to support long term research in the field of natural product biotechnology and phyto medicine development.

Within the context of cancer control and management, T&CM is facing challenges from many aspects as below:

1) Practice
   - Diversity of T&CM practices in term of history, philosophy and degree of development make it extremely difficult to position T&CM's role in cancer treatment and become a challenge to identify suitable modalities for cancer management;
   - Asymmetrical of knowledge between T&CM practitioner and other healthcare providers as well as the public created the main barrier for accepting T&CM;
   - Lack of integration within cancer management team; i.e. mutual referral/ understanding between T&CM practitioner and western medicine practitioners;

2) Research
   - In order to gain confidence from the public and western trained practitioners, research on the safety and effectiveness of Traditional and Complementary (T&CM) become mandatory. However, evidence-based medicine may not be objectively possible in certain T&CM especially that based on traditional system knowledge,

and for such circumstances, research in T&CM will pose a challenge.

- There is emerging extensive research shows there might be some benefits of T&CM in areas of palliative care, rehabilitative, and preventive medicine of cancer management leading to the possibility of revision on T&CM's scope for cancer management. Further evaluation and compilation of existing T&CM evidence in cancer management is in urgent need.
- Disparity in the quality of T&CM research and lack of funding.

3) Health human resource
   - Lack of basic cancer knowledge among public as well as lack of consensus between T&CM practitioners and other healthcare providers in cancer management who serve as primary health care worker may delay the early detection of cancer.
   - Other challenges include qualification, registration status of T&CM practitioner (with oncology expertise) are always the issue of concern.

4) Access
   - Lack of access among cancer patients to qualified and credited T&CM practitioners with expertise in cancer management.

5) Product
   - There is always concern about drug interactions (between T&CM product and pharmaceutical product).

3 ACHIEVEMENTS OF PREVIOUS STRATEGIC PLAN (NCCB 2008-2015)

Human Papillomavirus Immunisation Programme has been introduced in 2010 as a national programme targeted to adolescents aged 13 years for prevention of cervical cancer. In 2014, the national coverage for the third dose of the HPV immunisation programme was 84.4%. The catch-up programme has also been initiated under the Ministry of Women, Family and Community Development in 2012 targeted for 18 years old female adolescents.

Beginning in 2012, the mammogram screening for high-risk women was conducted as a structured programme. Women who have factors that increase their risk of suffering from breast cancer are identified. These risk factors are based on the Clinical Practice Guideline, Management of Breast Cancer (2nd Edition). The Health clinic serves as the entry point for high risk women before being referred for a mammogram examination at government hospitals (34 hospitals with facilities for mammogram) or Mammogram Subsidy Programme. The National Population and Family Development Board (NPFDB) or private hospital or non-governmental organisations are options for the client. In 2015, number of high risk women registered (new cases) was 24,199 and 20,457(84.5%) were referred for mammogram screening. Of the women who were referred for mammogram screening, 20, 345 (99.4%) of them had undergone MMG and 94(0.46%) of the women were confirmed to have cancer.

Colorectal cancer comprises about 13.2% of all cancers in Malaysia (NCR 2007-2011).The colorectal cancer screening was initiated as a pilot project in six states namely Terengganu, Pahang, Negeri Sembilan, Pulau Pinang, Perak and Federal Territory of Kuala Lumpur and Putrajaya from March 2012 to March 2013. Following the encouraging findings in this pilot project, the screening was implemented throughout the country (selected health clinics) in 2014. The screening for colorectal cancer is carried out using immunological faecal occult blood test (iFOBT) followed by colonoscopy. The objectives are to detect pre-lesions and colorectal malignancy at the earliest stage possible among asymptomatic population aged 50 – 70 years. In 2014, 11,230 clients were screened where 7.1% were positive for iFOBT and referred for colonoscopy. Of those who were referred, 64.5% underwent colonoscopy. Of these,

4.4% were detected to have colonic polyp and 4.4% diagnosed for colorectal cancer. In 2015 a total of 16,743 were screened, 9.0% cases were positive for iFOBT and referred. However, only 50.3% underwent colonoscopy. Of these, 4.1% were diagnosed for cancer and 5.0% noted to have colonic polyp. The cancer detection rate among the individuals screened in 2014 and 2015 were 0.18% and 0.16% respectively, which were comparable with the results of screening programme in Japan in 2006 which was 0.15%.

Liquid Based Cytology has been initiated for cervical cancer screening in 2014 in several states namely Kelantan, Johor, Negeri Sembilan and Selangor.

Among the notable achievements in the area of treatment is the setting up and operationalisation of the National Cancer Institute (Institut Kanser Negara) and upgrading of the regional service in Sabah with the setting up of Hospital Wanita dan Kanak-kanak Likas. Equipment has been upgraded in Hospital Kuala Lumpur, Hospital Umum Sarawak and Hospital Sultan Ismail. Haematology and bone marrow transplant services have also been strengthened. As to the Human resource development for treatment, the Master of Clinical Oncology has produced more graduates and the Post Basic Oncology Nursing Course has been upgraded to advanced diploma programme which is a one year programme.

For Palliative Care, achievements from the previous 2008-2015 plan were :

a) In 2007-2008 a local 3-year fellowship training programme was developed and commenced in the MoH which started with 2 candidates. Up to 2015, a total of 5 specialists have completed the training and another 3 are approaching completion of training. Specialists from medical schools have also utilized the same training structure for similar purposes and thus in major teaching hospitals (UMMC, HUKM, UiTM and USIM) have a total of 7 palliative medicine specialists. Apart from this, there have also been 3 specialists who have returned from overseas to serve in Malaysia. With that, the number of palliative care specialists in the country at the end of 2015 totalled 17.
b) As of 2015, there are 6 government hospitals (including both MoH and teaching hospitals) and 1 private medical centre with specialized palliative care units.
c) In 2010, the evidence based CPG on management of cancer pain was completed and implemented throughout the nation with on-going training workshops in cancer pain management have been conducted in every state.
d) Undergraduate teaching in palliative care is developing in several medical schools at present with the first established palliative care department in UMMC with 4 lecturers including the first associate professor in palliative medicine.
e) The Advanced Diploma in Palliative Care programme for nurses and allied health professionals has commenced since 2014 with the second batch of students in progress.
f) Collaboration with NGOs has been increased with better integration with the MoH and teaching institutes. Collaborations have been in the areas of clinical services, education, public awareness and advocacy.
g) Paediatric palliative care has also developed with 1 specialist now in training and the establishment of a formal fellowship training programme.
h) Performance indicators for specialized palliative care services in MoH have been introduced since 2015.

In the NCCB 2008-2015, T&CM established the objectives of improving the quality of life of cancer patient and allowing the patient to cope better with the cancer treatment by minimizing the side effects of cancer treatment as well as relieving pain and suffering. To support these main objectives, T&CM services in the area of herbal therapy as an adjunct treatment for cancer patient, acupuncture and Malay Traditional Massage for chronic pain were progressively introduced into the T&CM units from 2008 to 2015. In terms of physical structure, there were four T&CM units established by the end of 2015,ie, in Hospital Likas, Hospital Putrajaya, Hospital Kepala Batas, Hospital Sultan Ismail and National Cancer Institute. In 2013, Policy on T&CM in Primary Health care was launched successfully. Acupuncture and traditional Malay postnatal service were established in Masai Community clinic Johor. The objectives established in the previous blue print were realistic and achievable. The achievement in the past eight years had paved the way for us to expand the scope of T&CM in the National Strategic Plan for Cancer Control Programme 2016-2020 to the area of early detection, prevention and public education. The existing herbal therapy and acupuncture services will be further upgraded and the relevant guidelines will be revised.

T&CM is actively involved in scientific research. The effectiveness of acupuncture as a complementary treatment among opioid dependence patients who are on methadone maintenance therapy will be commenced in 2016. It is a cross discipline project and involving multiple agency and departments such as T&CM division, Hospital Kuala Lumpur Psychiatric and mental health department) and CRC.

MoH plans to start implementing T&CM Act 2016 (775) by 2016.

4 POLICY STATEMENT, VISION AND MISSION

4.1 Policy Statement

Prevention, control and management of cancers will be made accessible and affordable to the population through collaboration with various stakeholders and integrated into the social, economic and environmental system to establish a robust platform for effective control of the disease.

4.2 The Vision

By the year 2020, there will be integration of all agencies involved in Cancer Control Programme, so that there will be optimal results from all the stakeholders involved in the Cancer Control Programme.

The negative impact of cancer will be reduced, by decreasing disease morbidity and mortality, and by improving the quality of life of cancer patients and their families.

4.3 The Mission

Through awareness and empowerment, all Malaysians will have an understanding of cancer and how it may be prevented, recognise the early signs and symptoms, and be aware of the treatment, rehabilitation and possible outcomes.

All cancer patients are cared for within a supportive and caring environment in a holistic approach, which is cost effective and efficient.

5. OBJECTIVE

The overall objective of Malaysia NSPCCP (National Strategic Plan for Cancer Control Program) is to reduce the negative impact of cancer by decreasing the disease morbidity, mortality and to improve quality of life of cancer patients and their families.

6. STRATEGY

The strategies outline in this NSPCCP 2016 – 2020 is in line with the seven strategic action areas addressed by National Strategic Plan for Non-Communicable Disease (NSPNCD) 2010-2014. These strategies are:

Key Strategy 1: Prevention and promotion
Key Strategy 2: Clinical management
Key Strategy 3: Increasing patient compliance
Key Strategy 4: Action with NGO's, professional bodies and other stakeholders
Key Strategy 5: Monitoring, surveillance, research and development
Key Strategy 6: Capacity building
Key Strategy 7: Policy and regulatory intervention

7. PRIORITIES

a) Enhance coordination and implementation of the National Cancer Control Programme through establishment of Steering Committee for National Cancer Control Programme (SCNCCP).
b) Increase efforts in prevention and screening.
c) Strengthen access to service and care.
d) Value based medicine.
e) Enhance the coordination and implementation of National Cancer Control Programme through establishment of a National Cancer Control Committee with directors from all relevant divisions as committee members, chaired by DG, represented at NCD Committee and Disease Control Division as secretariat.
f) Improved cancer surveillance through strengthening of a comprehensive cancer data and information systems (NCR & PRIS).

*The implementation of priorities and plan of actions are subject to available resources during targeted timeframe. Repriorition and updates will be done if deemed necessary.

8. PLAN OF ACTION

The action plan in this NSPCCP 2016 - 2020 includes prevention, screening, early detection, diagnosis, treatment, rehabilitation, palliative care, traditional and complimentary medicine, and research and development. The plan of action and objectives of each component are as follow.

8.1 Key Strategy 1 : PREVENTION AND PROMOTION

Objectives

Objective 1 : To increase awareness and knowledge of general public on common cancers in Malaysia and their risk factors

Objective 2 : To strengthen the intervention of specific cancer risk factors

Plan of Action Matrix : As described in Appendix 1.

8.2 Key Strategy 2 : CLINICAL MANAGEMENT

8.2.1 SCREENING

Objective :

Objective : To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Plan of Action Matrix : As described in Appendix 2.

8.2.2 EARLY DETECTION

Objective :

Objective : To detect potentially malignant / cancerous lesions in symptomatic and high risk individuals for the selected cancers i.e. breast cancer, cervical cancer, oral cancer, colorectal cancer and nasopharyngeal cancer.

Plan of Action Matrix : As described in Appendix 3.

8.2.3 DIAGNOSIS

Objectives :

Objective 1 : To improve the accuracy, efficiency, accessibility and timeliness of cancer diagnosis.

Objective 2 : To streamline cancer diagnosis using state-of the-art technologies to better characterize, grade, stage, prognosticate and predict response to treatment leading to best possible effective personalized treatment and outcome.

Objective 3 : To provide comprehensive diagnostic services to support cancer patients in all aspects of care including recurrence, complications and secondary effects of cancer and its treatment.

Objective 4 : To increase the detection rate of cervical cancer at an earlier stage of the disease.

Plan of Action Matrix: As described in Appendix 4

8.2.4 TREATMENT

a) Radiotherapy and Oncology

Objective

Objective : To enhance delivery of cancer therapy services which are timely, equitable and accessible for cancer patients throughout the country.

Plan of Action Matrix : As described in Appendix 5(a).

b) Nuclear Medicine

Objective

Objective : To expand the type and widen the range of SPECT and PET radiopharmaceuticals used in nuclear medicine for this country

Plan of Action Matrix : As described in Appendix 5(b).

c) Clinical Haematology

Objective

Objective : To strengthen haematology services

Plan of Action Matrix : As described in Appendix 5(c).

d) Colorectal

Objective

Objective : To increase the number of centres providing colorectal sub-speciality services

Plan of Action Matrix : As described in Appendix 5(d).

e) Breast and Endocrine

Objective

Objective : To increase the number of centres providing breast endocrine sub-speciality services

Plan of Action Matrix : As described in Appendix 5(e).

f) Paediatric Oncology

Objective

Objective : To strengthen Paediatric Oncology Services

Plan of Action Matrix : As described in Appendix 5(f).

g) Psycho-oncology Services

Objective

Objective : To provide psycho-oncology services in all cancer centres

Plan of Action Matrix : As described in Appendix 5 (g).

h) Gynaecological Oncology

Objective

Objective : To strengthen Gynae-oncology services

Plan of Action Matrix : As described in Appendix 5 (h).

i) Otorhinolaryngology : Head and Neck Cancers

Objective

Objective : To strengthen Otorhinolaryngology services

Plan of Action Matrix : As described in Appendix 5 (i).

j) Gastro-Enterology

Objective

Objective : To strengthen Gastro-Enterology services

Plan of Action Matrix : As described in Appendix 5 (j).

8.2.5 REHABILITATION

Objectives :

Objective 1 : To provide Cancer Rehabilitation Services (CRS) to all patients who would need and benefit from rehabilitation medicine services so as to improve their quality of life.

Objective 2 : To establish effective social and public policies that will advance Cancer Rehabilitation Program (CRP)

Plan of Matrix : As described in Appendix 6.

8.2.6 PALLIATIVE CARE

Objectives :

Objective 1 : To relieve pain and suffering in cancer patients of all ages.

Objective 2 : To provide a support system for patients and families of life-threatening cancers from diagnosis to issues of grief and bereavement, addressing physical, psychosocial and spiritual needs.

Objective 3 : To increase standards of existing and future palliative care services

Objective 4 : Develop collaborative research initiatives with service providers

Plan of Matrix : As described in Appendix 7.

8.2.7 TRADITIONAL AND COMPLEMENTARY MEDICINE

Objectives :

Objective 1 : To allow cancer patients to cope better with cancer treatment

Objective 2 : To integrate T&CM practitioner in early detection and prevention of cancer

Objective 3 : To enhance public health education on T&CM role and knowledge in cancer management

Plan of Action Matrix: As described in Appendix 8.

8.3 Key Strategy 3 : INCREASING PATIENT COMPLIANCE

8.3.1 Patient Navigation

Objective

Objective 1 : To ensure patient compliance on cancer management and care

Plan of Action Matrix: As described in Appendix 9.

8.4 Key Strategy 4 : ACTION WITH NGO'S, PROFESSIONAL BODIES AND OTHER STAKEHOLDERS

Involvement with other stakeholders at every level is very important to ensure a comprehensive and holistic approach in cancer control programme. Collaboration with relevant agencies, NGO's, professional bodies and other stakeholders is addressed in the strategic plan.

8.5 Key Strategy 5 : MONITORING, SURVEILLANCE, RESEARCH AND DEVELOPMENT

Monitoring the variation in the impact of cancer epidemiology and other cancer related information is essential. Cancer data and information systems are important for planning, implementing, and evaluating programs, policies and cancer research.

Research based on data collected needs to be a continuous process in order to provide information on cancer risks factors for common cancers amongst the Malaysian population. Appropriate resources including IT personnel, infrastructure and funding need to be available for cancer data systems.

8.5.1 Monitoring and Surveillance

Objective

Objective 1 : To strengthen cancer surveillance through a comprehensive cancer data and information systems - The National Cancer Registry (NCR), Patient Registry Information System (PRIS) and Laboratory Information System (LIS)

Plan of Action Matrix : As described in Appendix 10.

8.5.2 Research and Development

a) Research and Development - Institute for Medical Research

Objective

Objective 1 : To streamline and strengthen cancer research at the Institute for Medical Research in order develop long term research programs based on national need, strengths and resources

Plan of Action Matrix : As described in Appendix 11 (a).

8.6 Key Strategy 6 : CAPACITY BUILDING

Continuous improvement of skills, knowledge and attitude of all health care personnel, both in primary care and hospital setting is needed to address challenges in the various aspect of cancer control. It is mentioned in detail in the respective plan of action described in Appendices.

8.7 Key Strategy 7 : REGULATORY INTERVENTION

Legislation to regulate tobacco, food safety, drugs and chemicals have been put in place since 2004, 1985, 1984 and 1952 respectively. Besides these laws, other legal measures related to cancer control are also in the powers of other ministries like the Ministry of Human Resources, Ministry of Natural Resources and Environment, Ministry of Urban Wellbeing, Housing and Local Government and Ministry of Agriculture and Agro-Based Industry.

T&CM Act 2016 (775) came into operation on 1 August 2016. One of the main aims is to make it mandatory to register various T&CM practitioners under the respective recognized practice areas. The registration will commence after the formation of the T&CM Council which will then make decisions on the registration process and other related issues such as disciplinary proceedings. The enforcement of T&CM Act signifies an important milestone in enhancing the professionalism of T&CM practices as well as in the transition from self-regulation to statutory regulation.

9. COMMITTEES

9.1 Steering Committee for National Cancer Control Programme (SCNCCP)

The establishment of a Steering Committee for National Cancer Control Committee is required to enhance the coordination and implementation of the National Cancer Control Programme.

- Chairperson : Director General of Health
- Committee members :
  - Three Deputy Director General of Health (Medical, Public Health and Research & Technical Support)
  - Director of Disease Control Division
  - Director Family Health Development Division
  - Director Medical Development Division
  - Director of Health Education Division
  - Other relevant Divisional Directors (by invitation)
  - Relevant Heads of Services
  - Representatives from relevant professional bodies (by invitation)
  - Representatives from relevant NGOs (by invitation)

- Representatives from other Ministries / government bodies
- Secretariat

- Terms of Reference (TOR) :

  - To discuss progress on the implementation of the NSPCCP 2016-2020, to propose new policies or amendment of existing policies/resources etc.
  - To meet at least once per year
  - To guide, decide and monitor on policy and implementation

9.2 Technical Working Committee for Cancer Control Programme

The committee members are the officers of each discipline / services / programmes involved in the National Cancer Control Programme and representatives from MoE, relevant NGO's and professional bodies (by invitation).

- Chairperson: Director of Disease Control Division
- Committee members :

  - Relevant Heads of Services (Pathology, Radiology, Radiotherapy & Oncology, Surgery, Gastroenterology, Paediatric Oncology, Obstetrics & Gynaecology, Haematology, Palliative Care, Rehabilitation)
  - Technical officer from Family Health Development Division, Disease Control Division, Medical Development Division, Health Education Division, Traditional and Complementary Medicine Division, Oral Health Development Division, Pharmaceutical Services Division.
  - Representatives from relevant professional bodies (by invitation)
  - Representatives from relevant NGOs (by invitation)
  - Secretariat

- Terms of Reference (TOR) :

  - To meet at least twice per year
  - To discuss on technical issues related to the implementation of National Cancer Control Programme

9.3 Interagency Steering Committee for NCD

(Cabinet Committee on Creating a Health Promoting Environment chaired by Deputy Prime Minister)

Cancer is part of non-communicable diseases that share common risk factors. Relevant cancer related issues are also discussed at this committee meeting.

10. CONCLUSION

One important progress will be the re-initiation of interagency meeting to facilitate planning and monitoring of the Cancer Control Programme. Thus, agencies like the universities, Health Promotion Board and the NGOs can be more effectively coordinated and united in efforts to improve the Cancer Control in Malaysia.

The strategy for this revision is to consolidate the progress achieved thus far, and to embark on activities that are affordable, especially on improving public awareness, screening coverage, palliative care, developing psycho-oncology, value based medicine and patient navigation.

11. REFERENCES

1. Cancer Control: Knowledge into Action. WHO Guide for Effective Programmes. Geneva: World Health Organization; 2006.

2. Colorectal Cancer Screening using Colonoscopy and Economic Evaluation Health Technology Assessment session (MAHTAS), Ministry of Health Malaysia, 2016.

3. Devi BC, Tang TS, Corbex M. Reducing by half the percentage of late-stage presentation for breast and cervix cancer over 4 years: A pilot study of clinical downstaging in Sarawak, Malaysia. Ann Oncol. 2007 Jul;18(7):1172-6. Epub 2007 Apr 13.

4. Evolution of Traditional & Complementary Medicine in the Malaysia Public Healthcare System. Traditional and Complementary Medicine Division, Ministry of Health Malaysia, 2013.

5. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray, F. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

6. Malaysian National Cancer Registry Report 2007-2011, Ministry of Health Malaysia, 2016.

7. Muzaffar Desmond Tate, et.al. History of Medicine in Malaysia-The Foundation Years. Acedemy of Medicine of Malaysia, 2005.

8. Nasopharygeal Carcinoma Screening. 2011. MaHTAS, Ministry of Health Malaysia.

9. National Cancer Control Blueprint 2008-2015, Ministry of Health Malaysia (unpublished).

10. National Health & Morbidity Survey 2015, Traditional & Complementary Medicine Volume IV, Institute of Public Health, Ministry of Health Malaysia, 2015.

11. National Plan of Action for Nutrition of Malaysia III, 2016-2025. Ministry of Health Malaysia.

12. National Policy of Traditional and Complementary Medicine. Traditional and Complementary Medicine Division, Ministry of Health Malaysia. Second edition 2007.

13. National Strategic Plan on Non-Communicable Disease (NSP-NCD) 2016-2025, Ministry of Health Malaysia.

14. Pelan Strategik Kebangsaan Bagi Kawalan Tembakau, 2015–2020, Unit Kawalan Tembakau dan Urusetia FCTC, Bahagian Kawalan Penyakit, Kementerian Kesihatan Malaysia.

15. Pelan Tindakan Kebangsaan: Pencegahan dan Pengurangan Kemudaratan Alkohol 2013-2020 (PeTA 2013-2020), Bahagian Kawalan Penyakit, Kementerian Kesihatan Malaysia.

16. Prostate Cancer Screening. 2011. MaHTAS, Ministry of Health Malaysia.

17. Saito H, Colorectal Cancer Screening Using Immunochemical Faecal Occult Blood Testing In Japan, J Med Screen. 2006;13 Suppl 1:S6-7.

18. Song M, Giovannucci E. Preventable Incidence and Mortality of Carcinoma Associated with Lifestyle Factors Among White Adults in the United States. JAMA Oncology. Published online May 19 2016.

19. Traditional and Complementary Medicine Act 2016 (775).

20. World Health Organization (WHO). WHO Traditional Strategy Medicine, 2014 – 2023. China: WHO; 2013.

Key Strategy 1 : PREVENTION AND PROMOTION

Objective 1 :
To increase awareness and knowledge of general public on common cancers in Malaysia and their risk factors

Target :
Based on NHMS III findings, public knowledge on health information was 46.9%. In view of no data on public knowledge for cancer, the NHMS III findings are used as proxy. In order to achieve optimum impact of knowledge in reducing the risk factor for cancers, it is targeted that 75% of general public has knowledge on the risk factors of common cancers by 2020.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Increase awareness on modifiable risk factors with emphasis on the similarity of risks for other major NCD cancer at nation wide	• Health promotion activities/seminar • Organise World Cancer Day (4th February) yearly	2016-2020	Number of activities organised Number of activities organise in conjunction with world cancer day	MoH (HECC, NCD, Nutrition Division, JKN, PKD), MoHE, National Population and Family Development Board, NGOs Universities, Academy of Medicine, Clinical Research Malaysia (CRM), Corporate sector, International agencies / institutions.
2.	Strengthen collaboration/ networking with related agencies at all level with registration and mapping of activities	• Create a list of relevant NGO's and their activities • Involvement in activities on cancer prevention and risk factors	2016-2020	Directory of NGO's and their activities printed and distributed Number of involvement on cancer prevention and awareness	MoH MoH, MoE, MoHE, National Population and Family Development Board, NGOs Universities, Ministry of Women, Family and Community Development, Academy of Medicine, Clinical Research Malaysia (CRM), Corporate sector, International agencies / institutions

Objective 1 :
To increase awareness and knowledge of general public on common cancers in Malaysia and their risk factors

Target :
Based on NHMS III findings, public knowledge on health information was 46.9%. In view of no data on public knowledge for cancer, the NHMS III findings are used as proxy. In order to achieve optimum impact of knowledge in reducing the risk factor for cancers, it is targeted that 75% of general public has knowledge on the risk factors of common cancers by 2020.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	Increase awareness on selected cancers (Breast, Colorectal, Lungs, Cervix, Nasopharynx, Prostate, liver and oral) and their risk factors, sign and symptoms, importance of screening, diagnosis, treatment, re-habilitation and T&CM, e.g. Pap Smear, breast awareness, mammogram, mouth self-examination, importance of family history, and breast cancer awareness program and ensuring accessibility to information on promotive and preventive activities	• Media campaign for cancer prevention at national level	2016-2020	At least one cancer related campaign implemented a year - 4 types of media (social - fb, twitter, YouTube, electronic - television, radios, printed- newspaper, magazine)	HECC, Ministry Of Health Health Promotion Board, HECC, Ministry of Health, Ministry of Education, Ministry of Communication an Multimedia, Ministry of Women, Family and Community, Media Prima, NGOs, Industries and other relevant agencies. MoH, MoE, NGO MoH, NGO
		• Enhancing existing and coordinated health promotion messages (produce educational material-poster, pamphlet, booklet, flyers etc). This include the role of T&CM in getting accurate information on T&CM practice and products • Expand awareness on screening through social media and outreach programmes	2016-2020	Type of health education materials produced (poster, pamphlet, video, booklet, flip chart, exhibition material, teaching aids) Number of educational material produced : - Poster : 10,000 - Pamphlet : 50,000 - Videos : 5 common cancers - Flip chart : 5 common cancers (5,000) - Exhibition material : 5 common cancers (1,000 each cancer) Number of social media that promote cancer prevention (facebook, Youtube, twitter, naksihat, portal myHealth, Infosihat)	

Objective 1 :
To increase awareness and knowledge of general public on common cancers in Malaysia and their risk factors

Target :
Based on NHMS III findings, public knowledge on health information was 46.9%. In view of no data on public knowledge for cancer, the NHMS III findings are used as proxy. In order to achieve optimum impact of knowledge in reducing the risk factor for cancers, it is targeted that 75% of general public has knowledge on the risk factors of common cancers by 2020.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		• Create supportive environment at hospital and clinic level • Organise activities that related to cancer prevention	2016-2020	Total of hospital / clinic (KK/ KD / KP / K1M) have cancer informations corner Number of health camp organised/ KOSPEN participated related to cancer awareness and prevention program	
4.	Continuing to educate community through current and appropriate evidence based medicine (eg. alternative treatment and non-evidence based screening tool)	Consolidate current existing health education materials and programs - Update information on cancer in Infosihat website & My-Health portal	2016-2020	Number of new / updated cancer education material included in MyHealth portal &Infosihat website	HECC, Nutrition, NCD, Oral Health, Radiation Unit, T&CM MoH
5.	Strengthen health education on cancer-importance of screening, early detection and treatment, alternative medicine, T&CM, palliative and rehabilitation e.g. Pap Smear, breast awareness, mammogram, mouth self-examination, importance of family history, and breast cancer awareness program	Organize cancer prevention program e.g health campaign, carnival, talks, focus group discussion, counselling, outreach programme	2016-2020	Number of cancer prevention program organized Number of participants involved in cancer prevention program	MoH, Ministry of Youth and Sport, Ministry of Communication & Multimedia, MoE, National Population and Family Development Board, KOSPEN, MAKNA
6.	Ensuring accessibility to information on navigation to services, screening, diagnosis, treatment and rehabilitation including T&CM practice and practitioners	Develop information on services in the Myhealth Portal and Infosihat	2016-2020	Information on cancer services to be included in existing Myhealth portal and Infosihat	NGO (MAKNA, NCSM), HECC MoH, private hospitals

Objective 2 :
To strengthen the intervention of specific cancer risk factors

Target : a) To sustain the implementation of the National HPV immunization programme and improve coverage >90% (84.07% in 2015)
b) To sustain the implementation of the National Hepatitis B immunization programme and maintain 95% coverage by year 2020 (99.2% in 2015)
c) To develop effective cessation initiatives for betel quid chewing behaviour

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To sustain the implementation of the National HPV immunisation programme	Monitoring of the National HPV immunization programme	2016-2020	Complete recommended doses>90%	MoH
2.	To sustain the implementation of the National Hepatitis B immunisation programme	Monitoring of the National Hepatitis B immunization programme	2016-2020	Complete 3 doses in >95%	MoH
3.	To initiate / support development of effective cessation of betel quid chewing behaviour	Strengthen multi-sectoral initiatives in oral cancer management / research on betel quid chewing risk habits	2016-2020	Initiated with OCRCC / Universities by 2017	Oral Health Division, MoH, Oral Cancer Research and Collaborative Center (OCRCC), Universities

Key Strategy 2 : CLINICAL MANAGEMENT

a) Screening

Objective :

Objective :

To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Target :

a. To increase the detection rate of stage 1 and 2 breast cancer from 57% (NCR 2007 - 2011, 56.9%) to 60% by 2020
b. To increase the detection rate of stage 1 and 2 cervical cancer from 60% (NCR 2007 - 2011, 59.7%) to 65 % by 2020
c. To increase the detection rate of stage 1 and 2 colorectal cancer from 35.0% (NCR 2007 - 2011: Male 34.1%, Female 34.8%) to 40% by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To ensure appropriate and effective cancer screening initiatives	To review/develop and disseminate cancer screening guideline (Health Care Provider)	2016-2020	Cancer Screening guideline for breast, cervix and colorectal reviewed HPV DNA as primary screening and Onco E6 (and equivalent) as a predictive test Development of other relevant screening guidelines (e.g lung, prostate, colorectal, NPC for high risk)	MoH (BKP, BPKK, BPM), NGO, MoE
2.	To increase screening coverage on targeted population	• To educate public the importance of cancer screening - Develop activities (seminar, training, forum) with pre and post evaluation test - Outreach program to include awareness and screening for breast, cervix and colorectal.	2016-2020	At least 2 programmes / district / year At least once / year	MoE, MoH (JKN, PKD), NGO MoE, MoH with NGO collaboration

Objective :

Objective :

To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Target :

a. To increase the detection rate of stage 1 and 2 breast cancer from 57% (NCR 2007 - 2011, 56.9%) to 60% by 2020
b. To increase the detection rate of stage 1 and 2 cervical cancer from 60% (NCR 2007 - 2011, 59.7%) to 65 % by 2020
c. To increase the detection rate of stage 1 and 2 colorectal cancer from 35.0% (NCR 2007 - 2011: Male 34.1%, Female 34.8%) to 40% by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
2.	To increase screening coverage on targeted population	• To enhance monitoring mechanism on screening - Explore possibility of developing a cancer screening monitoring system with sub-module for breast, cervical and colorectal and initiation of system if approved by top management	2016-2020	Discussions / meetings conducted (working paper presented at various level committees if proposal to develop system approved)	MoH (BKP, BPKK, BPM), NGO, MoE
3.	To strengthen existing screening program and increase accessibility on screening services	• To change age target group for cervical cancer screening from '25 – 65 years' to '30 – 65 years'	2016	Proposal presented in various committee for approval -JK Exco dan Dasar (JKA) through presentation of NSPCCP 2016 – 2020 -KPK Khas	MoH (BKP, BPKK)
		• To convert conventional pap smear to liquid based cytology in phases	2016-2020	Conventional pap smear fully converted to liquid based in 2020	MoH (Public Health Dept., Med. Dev. Div.)

Objective :

Objective :

To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Target :

a. To increase the detection rate of stage 1 and 2 breast cancer from 57% (NCR 2007 - 2011, 56.9%) to 60% by 2020
b. To increase the detection rate of stage 1 and 2 cervical cancer from 60% (NCR 2007 - 2011, 59.7%) to 65 % by 2020
c. To increase the detection rate of stage 1 and 2 colorectal cancer from 35.0% (NCR 2007 - 2011: Male 34.1%, Female 34.8%) to 40% by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		• To make cancer screening compulsory in health screening for civil servant (age of 40 years and above- iFOBT, CBE, mammogram, cervical smear according to target age group, gender and criteria)	2016-2020	Proposal presented in various committee for approval -JK Exco dan Dasar (JKA) through presentation of NSPCCP 2016 – 2020 -KPK Khas Meeting between BKP, BPKK & JPA for implementation	MoH (BKP, BPKK) & JPA
		• To promote CBE for all women attending health facilities (according to age group)	2016-2020	Development of promotional materials	MoH (BKP, BPKK, BPP, BPK)
		• Expansion of colorectal cancer screening services to all health clinics with 100% referral of cases with positive iFOBT for colonoscopy	2016-2020	Central purchasing for iFOBT 100% referral of cases with positive iFOBT for colonoscopy	MoH (BKP) MoH (BPP)
		• Providing sufficient colonoscopy services in hospitals	2017-2020	Submission of Dasar Baru / One Off for colonoscopy	MoH (BPP)

Objective :

To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Target :

a) To increase the detection rate of stage 1 and 2 breast cancer from 57% (NCR 2007 - 2011, 56.9%) to 60% by 2020
b) To increase the detection rate of stage 1 and 2 cervical cancer from 60% (NCR 2007 - 2011, 59.7%) to 65 % by 2020
c) To increase the detection rate of stage 1 and 2 colorectal cancer from 35.0% (NCR 2007 - 2011: Male 34.1%, Female 34.8%) to 40% by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		• Develop screening algorithm for high risk group (family history of colorectal cancer, inflammatory bowel disease and colonic polyp)		Algorithm to be developed and distributed (Fact sheet)	MoH (BPKK, BKP, BPP)
		• Develop CPG for Colorectal Cancer Management	2016-2020	CPG Developed	MoH (MaHTAS)
		• To ensure quality of endoscope performed - to include removal of polyps if detected	2016-2020	Training of colonoscopist (2 person/year) Audit quality of colonoscopy	College of Surgeon / Gastroenterologist College of Surgeon / Gastroenterologist
		• To increase resource for cervical cancer screening management (cytoscreeners, liquid-based cytology, colposcopy, histopathology service)	2016-2020	" Dasar Baru / One Off " for liquid-based cytology, colposcopy, histopathology service	MoH (BPKK & BPP)
		• Referral for Image guided biopsy and hook wire guided biopsy	2016-2020	Registration of centres with guided biopsy Number of training conducted	

Objective :

To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Target :

a) To increase the detection rate of stage 1 and 2 breast cancer from 57% (NCR 2007 - 2011, 56.9%) to 60% by 2020
b) To increase the detection rate of stage 1 and 2 cervical cancer from 60% (NCR 2007 - 2011, 59.7%) to 65 % by 2020
c) To increase the detection rate of stage 1 and 2 colorectal cancer from 35.0% (NCR 2007 - 2011: Male 34.1%, Female 34.8%) to 40% by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		• To ensure quality of screening tools: Auditing of mammogram centers	2016-2020	Percentage of mammogram centres audited. Suggestion: > 70% of accredited / gazetted mammogram centres to meet the standard set by College of Radiology	College of Radiology
		• To explore the possibility of insurance coverage for cancer screening (mammogram, colonoscopy, colposcopy, genetic testing, HPV DNA testing, pap smear, etc)	2016-2020	Meeting with Life Insurance Association Malaysia (LIAM) and other insurance agencies Policy proposal pending decision and agreement by insurance companies	MoH, Private Hospitals, Bank Negara Malaysia,

Objective :

To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Target :

a) To increase the detection rate of stage 1 and 2 breast cancer from 57% (NCR 2007 - 2011, 56.9%) to 60% by 2020
b) To increase the detection rate of stage 1 and 2 cervical cancer from 60% (NCR 2007 - 2011, 59.7%) to 65 % by 2020
c) To increase the detection rate of stage 1 and 2 colorectal cancer from 35.0% (NCR 2007 - 2011: Male 34.1%, Female 34.8%) to 40% by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
4.	Screening for high risk group (Prostate, colorectal & NPC)	• Development of screening policies for prostate, nasopharynx and colorectal cancer for high group populations	2017 - 2020	Proposal presented in various committee for approval - JK Exco dan Dasar (JKA) through presentation of NSPCCP 2016 – 2020 - KPK Khas	
		• Development of screening guidelines/ algorithm	2017 - 2020	Guidelines / algorithm developed	MoH, MoE, NGO, Private
5.	Establishment of screening centre(s)	• To explore the possibility of establishing cancer screening centre(s) for breast, cervix, colorectum at identified setting and location	2017 - 2020	Discussions / meetings conducted (working paper presented at various level committees if proposal is approved)	MoH (BKP, BPKK, BPP, BPK), MoE
6.	Research				
	a. Exploring new modalities on cancer screening available	Conduct research / HTA on feasibility of using other available cancer screening modalities:	2016 – 2020		
		- Cervical cancer screening - Urine for HPV DNA testing (HTA)	2016	HTA conducted	MoH (MaHTAS)

Objective :

To detect potentially malignant / cancerous lesions in asymptomatic population at risk for the selected cancers i.e. breast cancer, cervical cancer, colorectal cancer

Target :

a) To increase the detection rate of stage 1 and 2 breast cancer from 57% (NCR 2007 - 2011, 56.9%) to 60% by 2020
b) To increase the detection rate of stage 1 and 2 cervical cancer from 60% (NCR 2007 - 2011, 59.7%) to 65 % by 2020
c) To increase the detection rate of stage 1 and 2 colorectal cancer from 35.0% (NCR 2007 - 2011: Male 34.1%, Female 34.8%) to 40% by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		- Lung Cancer Screening - Undertake the low dose CT scan research for detection of early lung cancer	2016 – 2018	Research conducted and ongoing	14 MoH Hospitals
		- Colorectal Cancer - Flexible sigmoidoscopy (HTA)	2017 – 2018	HTA conducted	MoH (MaHTAS)
		- Prostate cancer screening using multiparametric MRI and PSA	2017 -2020	Research conducted and report produced	IKN, College of Radiology, MoH
		- NPC screening using EBV Serology and EBV DNA	2017 -2020	Research conducted and report produced	IMR
	b. Strengthening research on cancer screening	• Develop breast cancer risk prediction model initiatives for Malaysia (HTA)	2016-2020	HTA report on Malaysian breast cancer risk prediction model	MoH (BPK), MoE, NGO
		• To continue breast cancer risk prediction model initiatives for Malaysia conduct by MoH (BPK)	2016 -2020	Breast cancer risk prediction model initiated	MoH (BPK)
		• Conduct pilot	2016 -2020	Project and budget Proposal (2018) Project rolled out (2019) Analysis and recommendation (2019)	MoH (IMR, BKP, BPKK)

Key Strategy 2: CLINICAL MANAGEMENT

b) Early Detection

Objective 1 :
To detect potentially malignant / cancerous lesions in symptomatic individuals for the selected cancers i.e. breast cancer, cervical cancer, oral cancer, colorectal cancer and nasopharyngeal cancer

Target :
Down-staging of selected cancer at diagnosis (Colorectal, NPC and Oral)
NPC (NCR 2007 - 2011 : Male : 63%, Female : 60%) to 60% (overall)by 2020
Colorectal (NCR 2007 - 2011: Male 65.9 %, Female 65.2%) to 60% (overall) by 2020 and
Oral Cancer 53% (NCR 2011) to 45% by 2020.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To increase awareness on early warning signs and symptoms in the population and among health care providers	• Training for health care providers (HCP – Private and government) - Inter/intra sectoral collaboration	2016	Develop training module for common cancers – risk factors, sign and symptom and management pathway for lung, breast, cervix, colorectal and NPC Percentage of practitioner trained - 50% in 5 years	MoH, MoE, Professional Bodies, NGO
2.	To increase accessibility to early detection and referral to secondary care	• To develop referral pathway and management for common cancers – lung, colorectal and NPC	2016 - 2020	Training module for patients navigation developed and training conducted	MoH, MoE, private hospitals, NGOs
		• To provide NGOs community based navigation and supportive care	2016 - 2020	Referral pathway developed	MoH (BKP, BPKK)

Objective 1 :
To detect potentially malignant / cancerous lesions in symptomatic individuals for the selected cancers i.e. breast cancer, cervical cancer, oral cancer, colorectal cancer and nasopharyngeal cancer

Target :
Down-staging of selected cancer at diagnosis (Colorectal, NPC and Oral)
NPC (NCR 2007 - 2011 : Male : 63%, Female : 60%) to 60% (overall)by 2020
Colorectal (NCR 2007 - 2011: Male 65.9 %, Female 65.2%) to 60% (overall) by 2020 and
Oral Cancer 53% (NCR 2011) to 45% by 2020.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	To strengthen existing early detection program for oral cancer	• Refer to Guidelines on Prevention and Early Detection of Oral Potentially Malignant Diseases and Oral Cancer (2015) - To distribute guideline/ fact sheet/ quick reference of warning signs and symptoms of oral potentially malignant diseases and oral cancer for health care providers (HCP) - To strengthen referral mechanisms for further management	2016-2020	Distribution of guideline/ fact sheet/ quick reference of warning signs and symptoms of oral potentially malignant diseases and oral cancer to HCP	MoH, University hospitals, private sector (general dental practioners), Oral Health Division, Ministry of Defense, NGO, Professional Bodies, MaHTAS

Key Strategy 2 : CLINICAL MANAGEMENT

c) Diagnosis

Objective 1 :
To improve the accuracy, efficiency, accessibility and timeliness of cancer diagnosis

Target :

a. To provide comprehensive pathology services for cancer diagnosis, and to be delivered in a timely manner by appropriately qualified and trained medical professionals

b. To progressively equip all diagnostic facilities with information systems (LIS) to ensure efficient and lossless transfer of information. This will be done in phases initially with state hospitals and subsequently link to all relevant medical facilities by 2025

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Install/ Upgrade RIS in all radiology departments in the state and specialist hospitals.	Presently all THIS hospitals are installed with RIS. Three hospitals (HRPB Ipoh, HTJ Seremban and HRPZ2 Kota Baru) have started using RIS module of SPP which is part of HIS@MoH. The SPP-RIS shall be extended to the rest of the MoH hospitals.	2016-2020	At least 5 hospitals per year to be installed with RIS.	MoH (Telehealth and Medical Development Division)
2.	Install PACS in all radiology departments in the state and specialist hospitals. This will enable teleradiology to be implemented between all facilities.	Presently all THIS hospitals are installed with PACS. HRPZ2 will be installed with the first PACS to be interfaced with SPP. Subsequently this will be extended to all hospitals that have been provided with SPP-RIS.	2016-2020	At least 2 hospitals per year to be installed with PACS.	MoH (Telehealth and Medical Development Division)

Objective 1 :
To improve the accuracy, efficiency, accessibility and timeliness of cancer diagnosis

Target :

a. To provide comprehensive pathology services for cancer diagnosis, and to be delivered in a timely manner by appropriately qualified and trained medical professionals

b. To progressively equip all diagnostic facilities with information systems (LIS) to ensure efficient and lossless transfer of information. This will be done in phases initially with state hospitals and subsequently link to all relevant medical facilities by 2025

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	Equip all health facilities with radiological modalities according to the designated category.	Replace all BER equipment. Install new equipment according to the norms set out in KKM Equipment Blueprint.	2016	1. All minor specialist hospitals to be provided with CT scan. 2. All major specialist hospitals to be provided with MRI. 3. All regional hospitals and 2 additional state hospitals to be provided with Angiography machines.	MoH (Medical Development Division, Planning Division, Engineering Service Division)
4.	Ongoing training in radiology subspecialties ie interventional radiology, musculoskeletal, breast imaging, neuroradiology, head and neck radiology, uroradiology, cardiac radiology, thoracic radiology and paediatric radiology.	To encourage all radiologists to train in subspecialty or special interest areas.	2016	1. At least 6 radiologists to be accepted into subspecialty training program every year. 2. At least 2 radiologists to be accepted into Interventional Radiology subspecialty training.	MoH (Profession Development Division, Training Management Division), JPA
5.	Training and upgrading skills of radiographers and nurses.	Advanced diploma courses have been introduced for Allied Health Personnel i.e Breast Imaging and Cardiovascular Imaging for radiographers and peri-operative / radiological nursing for staff nurses. Advanced Diploma in CT will begin soon.	2016	Advanced Diploma in MRI to start by 2020.	MoH (Training Management Division), JPA

Objective 2 :
To streamline cancer diagnosis using state-of-the-art technologies to better characterize, grade, stage, prognosticate and predict response to treatment leading to best possible effective personalised treatment and outcome

Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Upgrade the scope and efficiency of existing laboratory diagnostic services in all national, regional and state hospitals to provide total support for cancer patients in the disciplines				
	<u>Anatomical pathology</u>				
	- To upgrade ISH testing and continuity of service for Ca Breast and Ca Lung (HKL,H. RPB Ipoh and HUS Kuching)	• To upgrade automated platform of ISH testing from batch testing equipment to random access equipment fpr HKL, H. RPB Ipoh and HUS Kuching	2016-2017	• By 2017,all 3 AP centres will be upgraded for ISH testing	MoHE (HUKMMC & UMMC)
	- To establish ISH testing service for Ca Breast and Ca Lung (HRPZII Kota Bharu and HSA JB)	• To renovate testing sites, procure equipment and training of manpower	2017-2018	• By 2018,another 2 testing sites will be established for ISH testing	
	- To establish molecular cancer diagnostics and therapeutics using PCR methodologies for Colorectal cancer and Lung Ca, and FISH for Lymphoma, Childhood solid tumours (HKL and IKN)	• To renovate testing sites, procure equipment and training of manpower • To procure equipment and reagents	2017-2020	• By 2016 one testing site in HKL will be renovated and establish for PCR and FISH • By 2020, a new testing site will be established in IKN	

Objective 2 :
To streamline cancer diagnosis using state-of-the-art technologies to better characterize, grade, stage, prognosticate and predict response to treatment leading to best possible effective personalised treatment and outcome

Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	- To establish molecular cancer diagnostics and therapeutics using PCR methodologies for Lung Ca, and FISH for Lymphoma and Lung Cancer (IMR)	• Collaboration HKL with IMR for detection of mutation for Lung Ca(e.g. EGFR, K-RAS, EML4, ROS1 and ALK mutation)	2016-2017	• By 2017, the service will be establish in HKL and the present testing site in IMR will be transferred to HKL for both PCR and FISH	
		• Collaboration HKL with IMR for detection of mutation [t(2;8), t(8;22) and t(8;14) for Lymphoma (Burkitt Lymphoma, DLBCL)	2016-2017	• By 2020, IMR will continue to explore new molecular test and research in cancer testing	
	<u>Haematology</u> To provide comprehensive molecular genetic/ cytogenetic service including genetic profiling for both adult and childhood leukaemia for 4 centres (HKL, IMR, H. Pulau Pinang, HSAJB) by 2018 and flow cytometry for leukaemia profiling at 7 centres (HQE Kota Kinabalu, HRPB Ipoh, HSA Johor Bharu, H. Pulau Pinang, HKL, H. Melaka and HSZII KB) - To upgrade cytogenetic- To upgrade cytogenetic and molecular genetic service using FISH, RT-PCR, Next Gene Sequencing (NGS) and other state-of-the art methodologies for diagnostic, prognostic and therapeutic purpose at IMR				

Objective 2 :
To streamline cancer diagnosis using state-of-the-art technologies to better characterize, grade, stage, prognosticate and predict response to treatment leading to best possible effective personalised treatment and outcome

Target :
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No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	• To expand service				
		• To start new services e.g. FISH for acute Lymphoblastic Leukaemia, Chronic Lymphocytic, Leukaemia, Plasma Cell Myeloma and Lymphoma (Bone marrow aspirate/ tissues)	2018	• FISH analysis should be able to be performed on Acute Lymphoblastic Leukaemia, Chronic Lymphocytic Leukaemia, Plasma Cell Myeloma by 2018	
		• To start new service for detection of 7 TKD mutation in CML i.e Molecular BCR-ABL t(9;22) Kinase Domain Mutation Analysis	2017	• Mutation analysis is performed on CML cases by 2017> 80% of indicated CML cases	
		• To start new service for detection of mutation gene in Acute Myeloid Leukaemia using Next Gene Sequencing	2020		
		• To purchase FISH automation system, Quantitative real time-PCR, DNA sequencer and other equipments to cater for the new service			

Objective 2 :
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Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	- To upgrade molecular genetic testing using PCR, RT-PCR and other state-of-the-art methodologies for diagnostic, prognostic and therapeutic purpose at HKL	• To renovate testing sites, • To procure equipment and reagents			
	-To upgrade equipment	• To start new services e.g. BCR-ABL quantification for Chronic Myeloid Leukaemia and Acute Leukaemia,JAK2 mutation	2016-2017	• By 2016 HKL is able to perform BCR-ABL quantification for paediatric CML cases at paediatric institute, HKL. By 2017, HKL is able to perform BCR-ABL quantification of paediatric CML from cases from Northern Region by 2017	
	• To expand service and increase workload - To establish 2 new cytogenetic and molecular cytogenetic (ISH) centers for diagnostic, prognostic and therapeutic purpose at H. Pulau Pinang and HQE, Kota Kinabalu	• To renovate testing site	2017 (H. Pulau Pinang)	• By 2020 all testing site (H. Pulau Pinang and HQE, Kota Kinabalu) should be renovated.	
		• To procure equipment including FISH automation system and reagents to cater for the new service	2020 (HQE, Kota Kinabalu)	• By 2020 all required equipment should be procured	

Objective 2 :
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Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
				• By 2017, H. Pulau Pinang should be able to perform the test for patients from Northern Region (Penang,Kedah and Perlis). By 2020, HQE, Kota Kinabalu is able to perform the test	
	- To establish 3 new molecular genetic testing centers using PCR and other state-o-the-art methodologies for diagnostic, prognostic and therapeutic purposes at HSA, JB, HPP and HQE, Kota Kinabalu	• To renovate testing site	2017 (HQE, Sabah)	• By 2019, all testing sites (H. Pulau Pinang, HQE, Kota Kinabalu and HSA, JB) should be renovated	
		• To procure equipment (PCR, Quantitative real time PCR and other equipments) and reagents to cater for the new service	2018 (H. Pulau Pinang)	• By 2019 all required equipment should be procured	
			2019 (HSA,JB)	• By 2019 all testing sites (H.Pulau Pinang, HQE, Kota Kinabalu and HSA, JB) should be able to perform molecular test on acute leukaemia cases	

Objective 2 :
To streamline cancer diagnosis using state-of-the-art technologies to better characterize, grade, stage, prognosticate and predict response to treatment leading to best possible effective personalised treatment and outcome

Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	- To upgrade flow cytometry service for leukaemia profiling from 4-colours to 6-colours flow cytometry in 5 centres (HQE Kota Kinabalu, HRPB Ipoh , HSA JB, HPP and to strengthen current monitoring of leukaemia treatment by measuring minimal residual disease using 6 colours flowcytometry at all centres providing the service • To upgrade equipment • To back up first equipment • To expand services and increase workload	• Purchase / upgrade flow cytometry analyzers (6-colours or more) at some centers in order to maintain continuity of the services	2016-2020	• By 2017 all centres (HQE, Kota Kinabalu, HRPB Ipoh, HSA JB, H. Pulau Pinang and HKL) should use 6- colours flow cytometry for diagnosis of leukaemia	

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Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	- To establish 2 new flowcytometry centers for leukaemia profiling and MRD monitoring using 6 coloursflowcytometry (HRPZII, KB and H. Melaka)	• To expand the service for Lymphoma immunophenotyphing	2016-2017 (other hospital)	• Workload and budget trend	
		• To upgrade MRD monitoring by using 6 colours flow cytometry at HKL	2016-2017 (HKL)	• By 2015,HKL should be able to perform MRD monitoring using 6-colours	
		• To start MRD monitoring by using 6 colours flow cytometry at all hospitals (H. Pulau Pinang,HRPB Ipoh,HQE Kota Kinabalu,HSA JB)	2016-2018 (other hospitals)	• By 2018, other 4 hospitals should be able to perform MRD monitoring using 6-colours-flowcytometry	
		• To renovate testing sites	2015 (HRPZII)	• By 2017 both testing sites (HRPZII,KB and H Melaka) should be renovated	
		• To procure equipment and reagents to cater for the new service	2016-2017 (H. Melaka)	• By 2017 all equipment and reagents to start the service are procured two testing sites renovated	

Objective 2 :
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Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	- To upgrade 2 existing stem cell transplant centers in HKL and H Likas, Sabah • To upgrade equipment • To expand services and to increase workload	• To start leukaemia profiling at HRPZII, KB and H. Melaka by using 6-colours flow cytometry • To start MRD monitoring by using 6 colours at HRPZII KB and H Melaka	2015 (HRPZ II, KB) 2016-2017 (H. Melaka)	• By 2015 HRPZII,KB should be able to perform leukaemia profiling by 6- colours flow cytometry.By 2017,H. Melaka should be able to perform leukaemia profiling by 6-colours flow cytometry • By 2018, both hospitals (HRPZII, KB and H. Melaka) should be able to perform MRD monitoring by 6- colours flow cytometry.	

Objective 2 :
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No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	<u>Chemical Pathology</u> - Expand the range of tumour markers for testing in regional centres (HKL, HSA JB, Hosp. Pulau Ping, HRPZ II Kota Bharu, HUS Kuching and HQE Sabah)	• To upgrade equipment to ensure continuity of the service		• By 2020, equipment at both center are upgraded as required (to support expansion of services and increment of workload)	
	- Establish toxicology for chemotherapy and cancer related therapy example antifungal Variconazole in regional centers (IKN, HKL, Hospital Ampang, HSA JB, Hosp. Pulau Pinang, HRPZ II Kota Bharu, HUS Kuching and HQE, Kota Kinabalu Sabah)	• To offer newly introduced tumour markers internationally recognised and accepted for ten cancers for cancer monitoring.	2016-2020	• Achieve 50% of the tumour markers achieved.	
		• To upgrade and back up first equipment		• 100% of equipment shall be placed and added	
		• To renovate all testing sites.	2016-2018	• Renovation of testing sites shall be completed in 2018.	
		• To procure equipment and reagents for new testing sites		• 100% of equipment and reagent shall be procured	

Objective 2 :
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Target :
To continually upgrade diagnostic facilities in existence and those newly established with state-of art technology and in line with evidence-based practice

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.4	**Genetic**	• To establish generic screening for cancers example BRCA 1 / 2 mutation for breast, colorectum and Lung cancers (HKL, IMR)	2017	• Number of tests established	
Training					
2.	Train professional, scientific and technical staff to support upgraded and newly established pathology services in all hospitals that support cancer service	• Pathologist: Cancer related long course - Anatomical Pathology - Haematology - Chemical Pathology - Medical Microbiology	2020	• By 2020, at least 10 pathologists from different disciplines will be trained in cancer related pathology course	KPT (PPUKM & PPUM) Queen's University, Belfast, UK National University Singapore (NUS)
3.	Quality				
	Expand Quality Assurance Programme and accreditation in all the testing laboratories	• To subscribe in EQA programme whenever possible	2018	• By 2018, all AP centres will participate in relevant EQA Programmes to maintain completency and proficiency	

Objective 3 :
To provide comprehensive diagnostic services to support cancer patients all aspects of care including recurrence, complications and secondary effects of cancer and its treatment.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Strengthen current bacteriology diagnosis including TB using state-of-the-art methodology	• To procure new analyser for bacterial Identification (MALDI_TOF) for IKN, HKL, Hospital Pulau Pinang HRPZ, HUS, Hospital Sultan Ismail, HSNZ and Hospital Ampang to improve the TAT.	2016-2018	• At least 50% of the centres have TAT within one hour for bacterial identification.	
		• To start molecular diagnosis for Mycobacterium tuberculosis using PCR (GeneXpert) both adult and childhood leukaemias at HKL, Hospital Queen Elizabeth, HRPZ HSNZ and Hospital Umum Sarawak.	2016-2018	• Five new centers established for Tuberculosis diagnosis in immunocompromised patient.	
2.	Establish fungal molecular and serology testing	• To start fungal molecular service for fungal identification in HKL, Hosp QE, HUS, HPP and HSNZ for invasive fungal infection.	2016-2018	• At least 50% of the centres have established fungal molecular service.	
		• To start fungal serology testing such as Galactomannan and Candida and Histoplasma antigen in HKL, HUS, HQE, HSI, HPP and HSNZ.	2016-2018	• At least 50% of centres have established fungal serology testing.	
		• Strengthen antifungal susceptibility by using MIC testing for Candida and MOLD in HKL, HPP, HUS and QE Hospital.		• At least 50% of centres have established antifungal susceptibility testing.	

Objective 3 :
To provide comprehensive diagnostic services to support cancer patients all aspects of care including recurrence, complications and secondary effects of cancer and its treatment.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	Established viral molecular and serology testing	• To start molecular service using PCR for detection of CMV, EBV. JC, BK and Adenovirus in HPP, QE Hospital, HUS, HSAJB for immunocompromised patient	2016-2018	• 50% of the centres have established molecular service for detection of at least 3 viruses.	
		• To provide Qualitative and Quantitative molecular testing for Hepatitis B and C in HKL, HUS, HPP, HQE, HSNZ, HSAJB and HRPZ	2016-2018	• 50% of the centres have established Qualitative and Quantitative molecular testing for Hepatitis B and C	
4.	Establish a new Stem Cell Transplant Laboratory at HPP	• To renovate the laboratory in order to start the service	2016	• By 2016, the laboratory is renovated	
		• To procure equipment to ensure continuity of the service	2016	• By 2016, the equipments and reagents are procures to start the service	
5.	Upgrade 2 existing chimerism service at IMR and HKL	• To upgrade equipment to ensure continuity of service	2015-2020	• By 2020, equipment at both center are upgraded as required(to support expansion of service and increment of workload)	
		• To renovate testing sites	2015-2020	• By 2020, the sites should be renovated if needed	
6.	Establish 2 new centers for chimerism services in H Pulau Pinang and HQE, Sabah	• To renovate testing sites	2018	• By 2018, both testing sites should be renovated	
		• To procure equipment and reagents	2018-2020	• By 2020, equipment and reagents for chimerism services should be procured	

Objective 3 :
To provide comprehensive diagnostic services to support cancer patients all aspects of care including recurrence, complications and secondary effects of cancer and its treatment.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
7.	Establish proteomics testing for oncology in Hospital Ampang	• To renovate testing sites and to procure equipment and reagents	By 2020	• Renovation of testing sites shall be completed by 2020 • 100% of equipment and reagent shall be procured by 2020	
8.	Conduct research using various methods and techniques to improve and facilitate cancer diagnosis and management	• To conduct research on cancer patients who are on 10 commonly prescribed herbal preparation as supplement post chemotherapy and its effect on blood test interference. The tests may include either of the following: RP, LFT, FBC, Glucose, specific tumor markers, Full Blood Picture, Coagulation Test, Thyroid Function Test, Cortisol and Fasting Serum Lipid. The research will be conducted in IKN and 3 hospitals (Hospital Kepala Batas, HSI and Hospital Putrajaya). Focusing on 3 types of herbal preparation yearly and 4 types of herbal in 2020.	2016 (IKN) 2017-2018 (Hospital Kepala Batas, HSI, Hospital Putrajaya)	At least one research will be conducted per centre.	

Objective 4 :
To increase the detection rate of cervical cancer at an earlier stage of the disease.

Target :

a. To continually upgrade screening facilities in existence and those newly established with state-of-art technology and in line with evidence-based practice.
b. To provide comprehensive cytology service for cervical cancer screening, and to be delivered in a timely manner by appropriately qualified and trained medical personnel.
c. To provide efficient and self-sufficient cytology service for cervical cancer screening.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Strengthen/replace conventional cytology with Liquid Based Cytology (LBC) in 15 hospitals				
	• To strengthen LBC in existing centres	• To expand coverage: - HTJ Seremban to cover entire Negeri Sembilan - HRPZII Kota Bharu to cover entire Kelantan - HSA JB to cover entire Johor - Hospital Serdang, Hospital Selayang and HTAR, Klang to cover entire Selangor - HKL to cover entire Wilayah Persekutuan	2016-2018	• 80% of District Health Office (PKD) Pap Smear sent to MoH Hospitals by 2018	MoH
	• To replace conventional cytology with LBC in centres in stages	• To establish LBC service in states; Melaka, Kedah (HSB Alor Setar to cater for Sg. Petani & Kangar), Pulau Pinang (to cater for Seberang Perai), Perak, Terengganu, Pahang, Sabah and Sarawak	2016-2020	• 20% per year of the pap smear workload will be processed by LBC method in the states of Melaka, Kedah, Pulau Pinang, Perak, Terengganu, Pahang, Sabah and Sarawak	MoH

Objective 4 :
To increase the detection rate of cervical cancer at an earlier stage of the disease

Target :

a. To continually upgrade screening facilities in existence and those newly established with state-of-art technology and in line with evidence-based practice.
b. To provide comprehensive cytology service for cervical cancer screening, and to be delivered in a timely manner by appropriately qualified and trained medical personnel.
c. To provide efficient and self-sufficient cytology service for cervical cancer screening.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
2.	Establish computer-assisted primary screening	• To place one computer assisted primary screening machine each in HSA JB/MKAK JB, HRPZII, HQE and Hospital Serdang	2016-2020	• By 2019, all 4 centres will be equipped with computer assisted primary screening analyser.	MoH
3.	Establish HPV DNA testing to triage Atypical Squamous Cells of Undetermined Significance (ASC-US) for women aged 35 years or older	• To establish HPV DNA testing in two centers: HRPZII (cover Peninsular Malaysia) and HQE (cover Sabah and Sarawak)	2016-2018	• By 2018, two centres will establish HPV DNA testing	
4.	Train professional, scientific and technical staff to support cytology service for cervical cancer screening	• Pathologist : one candidate per year • Scientific Officer : In-house/local training and workshops : one candidate per year • Cytotechnologist : Advanced Diploma Cytology: twenty candidates every other year	2016-2020	• Five cytopathologists to be trained by 2020 • Ten (10) Scientific Officers to be trained per year • Twenty (20) Cytotechnologists to be trained every other year	

Objective 4 :
To increase the detection rate of cervical cancer at an earlier stage of the disease.

Target :

a. To continually upgrade screening facilities in existence and those newly established with state-of-art technology and in line with evidence-based practice.
b. To provide comprehensive cytology service for cervical cancer screening, and to be delivered in a timely manner by appropriately qualified and trained medical personnel.
c. To provide efficient and self-sufficient cytology service for cervical cancer screening.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
5.	Strengthen specialized human resource - Number of Cytopathologist: at least one per center - Number of Cytology Scientific Officer: at least one per center - Number of Cytotechnologist: at least fifteen (15) per center	• To create additional posts : - Cytopathologist : to increase number to 10 from the current number of 3 - Cytology Scientific Officer: to increase number to 20 from current number of 12 Cytotechnologist: to increase number to 225 from current number of 157	2020	• By 2020, all centres will be staffed by at least one Cytology trained Anatomic Pathologist • By 2020, all screening centres shall have at least 2 cytology-trained Scientific officers. • By 2020, all screening centres shall have at least 15 cytotechnologists	MoH
6.	Replace /upgrade existing equipment - To replace /upgrade cytology microscope	• To replace /upgrade microscope to the latest cytological screening specification for all cytopathologist and cytoscreeners in each centre	2017-2020	• 80% of all microscopes in each centre shall be replaced /upgraded according to specification by 2020	MoH

Objective 4 :
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Target :

a. To continually upgrade screening facilities in existence and those newly established with state-of-art technology and in line with evidence-based practice.
b. To provide comprehensive cytology service for cervical cancer screening, and to be delivered in a timely manner by appropriately qualified and trained medical personnel.
c. To provide efficient and self-sufficient cytology service for cervical cancer screening.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	To upgrade manual process to automated process - Slide labeller	• To upgrade process using automated process - Slide labeller: one slide labeller for each centre - Automated cover slipper: one cover slipper for each centre - Automated stainer: to back up first equipment		• 100% of all equipment in each centre shall be upgraded using automated process by 2020	MoH
7.	Expand Quality Assurance Programme and accreditation in all the testing laboratories for cytology testing	• To subscribe in EQA programme whenever possible • To accredit Anatomic Pathology Centre as cytological testing	2016-2020	• 100% of all centres shall subscribe to EQAP • 80% of all centres shall be accredited for cytological testing.	MoH
8.	Outsourcing of Pap Smear service as a temporary measure to overcome long turn-around time and shortage of manpower	To allocate sufficient budget for outsourcing	2016-2020	• 90% of outsource centres provide Turn-Around Time (TAT) of Pap smear ≤ 14 days.	MoH

Key Strategy 2 : CLINICAL MANAGEMENT

d) Treatment

Radiotherapy and Oncology

Objective 1 :
To enhance delivery of cancer therapy services which are timely, equitable and accessible for cancer patients throughout the country.

Target 1:
Each patient to consult an Oncologist at least once prior to cancer treatment.

Target 2:
Double the number of Clinical Oncologists in Ministry of Health Hospitals by 2019.

Target 3:
Successful implementation of Value Based Medicine with effective price negotiations based Health Technology Assessment recommendations that are derived from Threshold and the use of protocol guidelines.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Increase number of cancer treatment facilities	Needs to be upgraded in the NCCP document	2020	New centre functioning in 2020	MoH (BPP, Planning & Development Division, BPL, BSKB
2.	Upgrading of existing facilities		2017-2020	Upgraded facilities	BPP
3.	Establishment of Clinical Oncology Units (COU) at KKM tertiary hospitals	Develop 4 Clinical Oncology Units (COU) in Tertiary Hospitals 1. Muar 2. Kuantan 3. Alor Setar 4. Sandakan/Tawau	2016-2020	Establishment of Clinical Oncology Units in the identified hospitals, especially in Terengganu, Sabah and Sarawak	MoH (BPP, hospital directors, State Health Directors)
4.	Increase number of Human Resources (Clinical Oncologist& Medical Oncologist, Pharmacist, Physicists and Radiation Therapists, Nurses and other Allied Health) within MoH	Clinical Oncologists & Medical Oncologist 1. Masters in Clinical Oncology (increase allocation of intakes) 2. Developing a National Curriculum for Clinical Oncologists	2016 Write up started in 2015	Increase from 4 per intake to 10 per intake National Curriculum established 2017	- MoH (BPL and Planning & Development Division) - Universities - MoH (BPL and Planning & Development Division) - Universities

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		3. Developing a local Medical Oncology Training Programme as a subspecialty of Internal Medicine	2017-2018	Curriculum of training program outlined and application for program approval	- MoH (BPL and Planning & Delopment Division) - Universities
		4. Allocation of special training budget for advanced radiotherapy technique / application (for all categories of health professionals)	2016-2020	Sufficient budget per centre for a team comprising doctor and paramedic	- MoH & JPA
		5. Creation of more post for clinical oncologist At least #JUSA A:One post each state that have Oncology centre #JUSA B:One post #JUSA C:Two post #UD54:Three post in each centre	2016-2020	Post created and filled	
		<u>Pharmacists</u>			
		1. Master / PhD program conducted by local or overseas university. (Increase intake)	2016-2020	2 pharmacists trained	Academia (local and international)
		2. Credentialing for clinical oncology pharmacist	2017	All oncology pharmacists to be credentialed in all regional centres	Pharmaceutical Services Division

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		3. In-house Training conducted by senior pharmacists. A structure program to strengthen the knowledge and experience of oncology pharmacist	2016	To be implemented in all centres	Pharmaceutical Services Division
		<u>Physicists</u>			
		1. Develop training programme specifically for Radiotheraphy	2018-2020	Curriculum of Training Programme and application for Programme approval	MoH (Head of Services for Physics, BPL)
		2. In-house training programme, including log book	2016	Approval of training programme	MoH (Head of Services for Physics)
		3. Increase intake and scholarship for Master / PhD program conducted locally or overseas	2016		MoH (BPL), UKM and JPA
		4. Create promotion to higher posts for Physicist with Master / PhD	2017-2020		MoH (BPL, BSM), JPA

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		5. To retain those trained in radiotherapy to be kept in that field upon promotion by increasing number of promotional posts in radiotherapy	2017	Posts approved by JPA	MoH (BPL, BSM, Head of Services for Physics), JPA
		Radiation Therapists			
		1. Advanced diploma program for Radiation Therapists	2016-2020	Curriculum of training program outlined and application for program approval	MoH (BPL)
		2. Degree Program in Radiotheraphy and Oncology - Provide opportunity for diploma holder to upgrade to degree level	2018-2020	Curriculum of training program outlined and application for program approval	
		3. Masters in Radiation Therapy	2019-2020	Three Radiation Therapists trained	
		Allied Health			
		1. Training of core team members for cancer rehab; PT / OT / Nursing	2018-2020	All tertiary Oncology centre to have cancer rehab team by 2018	MoH (Oncology / Rehab Physician / PT / OT / Nursing / MSW / Speech therapist / Counsellor)
		2. Create new post for at least basic core team members: PT / OT/ Nursing		All tertiary Oncology centre to be able to provide training for Cancer rehab core team members	

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
5.	Establish Value Based Medicine as a strategy to maintain sustainability of treatment	1. Optimization of Chemotherapy Protocol Guidelines	Initiated in 2014	Circulate in 2016	
		Protocol of management of important cancers *Colorectal cancer *Nasopharyngeal cancer	Initiated in 2015	Finalised protocols by 2017	MoH (BPP)
		2. Implementation of HTA assessment, Threshold on prices in accordance to our Chemotherapy protocol guidelines *For implementation of 2 above, Health Technology Assessment Division has to be strengthened to enable capacity to carry out functions similar to NICE and counterpart in Thailand. There has to be plans by Ministry of Health to strengthen capacity	2016	HTA for high cost oncology drugs that are requested to be included in the Formulary Threshold to be declared 2016	*MoH (Pharmaceutical Services Division, HTA), Ministry of Finance, NGO, JPA, other Third Party payors
		3. Establish companion diagnostic tests for targeted therapies to improve management	2017-2020	Number of companion diagnostic tests	IKN, HKL, IMR
6.	Reduce waiting time for Radiotherapy treatment	LEAN healthcare management - Each centre have to identify the issues or problem they are facing and implementation is absolutely at their own will	2016	Processes to initiate LEAN healthcare management started in all centres in 2016	Heads of Department and Hospital Directors which have Radiotherapy and Oncology

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
7.	Development of Oncology Clinical Research	1. Research development should be considered as a key performance index for all the regional oncology centres in Malaysia	2016	Establish research committee in each oncology center.	MoH (NIH agencies, CRC), Academia, Pharmaceutical Industries and NGOs
		2. Collaboration is imperative between all key stakeholders including public and private oncology centres, pharmaceutical industry, academia as well as agencies in particularly from National Institute of Health	2017	(3 meeting / year)	
		3. Centralized oncology cooperative group in particularly among public institutions	2020	Oncology trials (industry sponsored or investigator initiated trial) started in each centre. Oncology cooperative group formed	
8.	Chemotherapy Service	1. Clinical Oncology Unit (COU) Chemotherapy budget (4 units)	2016- 2020	Sufficient budget for drug and non-disposable (per centre per year) Four Clinical Oncology Units initiated by 2020	MoH
		2. Additional Oncology Budget (additional budget based on the cancer incidence and new indication)	2016-2020	Appropriate budget allocated annually	

Nuclear Medicine

Objective :
To expand the type and widen the range of SPECT, PET and therapeutic radiopharmaceuticals used in nuclear medicine for this country.

Target 4:
All Nuclear Medicine Centre with Level 2sp facility.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To expand the type and widen the range of SPECT, PET and therapeutic radiopharmaceuticals used in nuclear medicine for this country	a) Thyroid Cancer: I-124 dosimetry for optimization therapy b) Non-Hodgkin Lymphoma: I-131 Rituximab (Therapy) c) Liver cancer / metastases: Y-90 microsphere d) Neuroendocrine tumour: Ga-68 sst ligands (diagnosis & staging) Lu-177 sst ligands (therapy) Y-90 sst ligands (theraphy) Y-90 sst ligands (therapy) e) Prostate Cancer: Ga-68 PSMA (diagnosis &staging) Lu-177 PSMA (therapy)	2016-2020	All Nuclear Medicine Centres with Level 2sp facility	MoH, ANM, IAEA

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
2.	Human resource development	a) Optimizing networking and linkage with other institutions within and outside Malaysia, to support cancer research.	2016-2020	All Nuclear Medicine Centres	MoH (CRC, Head of Nuclear Medicine Service), WARMTH, Society of Nuclear Medicine from various countries for region, IAEA.
		b) Establishment and creation of new posts.	2016-2020	Increasing the number of new posts at various nuclear medicine centers. Fellowship training programs with other overseas centers / universities	Malaysian SNMMI & Head of Nuclear Medicine Service, MoH
		c) Formalized establish training program in Nuclear Oncology with oversees cancer centers	2016-2020		

Appendix 5 (c)

Clinical Haematology

Objective :
Strengthening haematology services.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Strengthen Sabah (HQE), Ampang and Penang centres for stem cell laboratory		2016-2020	All Nuclear Medicine Centres with Level 2sp facility	MoH (State Health Departments)
2.	Develop stem cell laboratory in HSA.				MoH (State Health Departments)
3.	Additional Budget for hematology medicine	Year 2016, MyPAP-34 mil, cancer treatments -18mil Year 2017,My-PAP-38mil, cancer treatments-25 mil Year 2018,MyPAP-43 mil, cancer treat-ments-30mil Year 2019-2020, as in 2018 budget	2016-2020		MoH

Colorectal

Objective :
To increase the number of centres providing colorectal subspeciality services.

Target 5:
All Surgical Departments to have Colorectal Services.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To increase number of centres providing colorectal sub-specialty services	Establishing a colorectal unit in each state Government Hospital Upgrade the surgical oncology equipments and facilities including operating time and post-operative care. Adequate funding for consumables and other surgical related therapy. Strengthen the patient referral system from the primary, secondary or tertiary care centres or vice versa Encourage collaboration with related NGOs and advocacy groups in relation to cancer management Increase surgical time so that cancer surgery waiting time is maintained between 2-4 weeks	2016-2020 (Estimated 14 units) 2016-2020	Number of Surgical Departments with Breast Endocrine sub-specialty services Formal Referral Policies	

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		Optimizing networking and linkages within MoH Hospitals and NIH research institutes to support cancer research. Human capital development through establishment of new posts and targeted training programmes Formalized training with overseas cancer centres needs to be encouraged.		Suggest the number of new posts to be created in the various hospitals Strengthening of training programmes or the formalization of a National Curriculum for Colorectal cancer	
2.	Increase the number of post	At least - JUSA A:One post each state - JUSA B:One post per unit - JUSA C: Two post per unit - UD54:Three post in each center	2016-2020		MoH, JPA

Breast & Endocrine

Objective :
To increase the number of centres providing breast endocrine subspeciality services.

Target 6:
All Surgical Departments to have Breast Endocrine services.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To increase the number of centres providing breast endocrine sub-specialty services	- Establishing a breast and endocrine unit in each state Government Hospital	2016-2020	Number of Surgical Departments with Breast Endocrine sub-specialty services	MoH
		- Upgrade the surgical equipments and facilities including operating time and post-operative care.	2016-2020		MoH (Head of Surgery Services)
		- Adequate funding for consumables and other surgical related therapy			MoH (BPP)
		- Strengthen the patient referral system from the primary, secondary or tertiary care centres or vice versa		Formal Referral Policies	MoH
		- Encourage collaboration with related NGOs and advocacy groups in relation to cancer management timely confirmation of diagnosis of breast cancer (biopsy result within two weeks)		KPI for Breast Cancer Surgery (new KPI)	Head of Pathology Services
		- Increase surgical time so that cancer surgery waiting time is maintained between 1-2 weeks		KPI for Breast Cancer Surgery (existing indicator)	Head of Anaesthesia Services

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		- Optimizing networking and linkages within MoH Hospitals and NIH research institutes to support cancer research			MoH (CRC)
		- Human capital development through establishment of new posts and targeted training programmes		Suggest the number of new posts to be created in the various hospitals	Head of Surgery Services
		- Formalized training with overseas cancer centres needs to be encouraged		Strengthening of training programmes Sending trainees to university settings as part of training programme	Head of Surgery Services

Appendix 5 (f)

Paediatric Oncology

Objective :
Strengthening Paediatric Oncology Services.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To strengthen Paediatric Oncology Services	Estimation of Budget for paediatric oncology medicine	2016-2020	Services upgraded using allocated budget	MoH

Psycho-oncology Services

Objective :
To provide psycho-oncology services in all cancer centres.

Target 7:
a. All cancer patients receiving inpatient care will be screened with Distress Thermometer.
b. All patients with positive scores will be referred to Psycho-oncology Team.
c. 75% of referrals at psycho-oncology clinic within 14 working days (by 2020).

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To establish centers providing Psycho-oncology subspecialty services	Establishing a Psycho-oncology Services in phases: 1.Institut Kanser Negara 2.Hospital Kuala Lumpur 3.Hospital Pulau Pinang 4.Hospital Sultan Ismail 5.Hospital Queen Elizabeth	 2016 2017 2018 2019 2020	A dedicated team lead by a psychiatrist subspecialized in Consultation Liaison Psychiatry	MoH (Head of Psychiatry Services)
2.	To provide subspecialty Psycho-oncology services at the identified centres	To establish a model of care outlining a systematic approach in psychosocial management of cancer patient: 1.To provide a suitable brief assessment tool for screening for psychosocial distress 2.To create well-coordinated referral system for cancer patients 3.To establish regular combines clinics at Oncology Clinics 4.To be part of the multidisciplinary team addressing psychosocial issues	2016-2020	1. All cancer patients receiving inpatient care will be screened with Distress Thermometer. All patients with positive scores will be referred to Psychooncology Team 2.(KPI) 75% of referrals at psyhoonology clinic within 14 working days	Oncology Clinic Oncology Unit Palliative Unit Other Clinical Units Medical Social Worker Unit Rehabilitation Unit Religious Bodies Counseling Unit

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	To develop training modules on psychosocial aspects of cancer with topics and target audience in line with the model of care	To set up a working group for training module	2016		MoH (BPP)
4.	To train health care professionals based on their responsibility in providing psychosocial support to patients throughout the cancer journey	For all: - Communication skills - Recognize psychological needs For medical: - Use of Screening tools - Psychological intervention For psychiatry: - Diagnosis of psychopathology - Use of psychotropics - Specific sychological interventions		Annual training per centre / national level	The identified institutions
5.	To provide psycho-education programmes for cancer patients / families / carers	1. To prepare psycho-education materials to aid in understanding psychosocial responses to cancer and identify when further help is needed 2. To facilitate self –help programme and patient support activities	2016		NGOs MoH (BPK)
6.	To train and support mental health professionals from general hospitals involved in Psycho-oncology consultation	1. To incorporate psycho-oncology syllabus in postgraduate training 2. To coach the general psychiatrist on specific issues in psycho-oncology	2016		

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
7.	To provide recommendation for psycho-oncology service delivery that applicable to other hospitals with no liaison psychiatric services	To establish regional psycho-oncology network from the main identified centers			

Appendix 5 (h)

Gyneacological Oncology

Objective :
To strengthen Gynae-oncology services.

Target 8:
a) Number of O&G Departments with Gynaecological Oncology sub-specialty services.
b) Each centre shall have at least 2 Gynae-oncologists to cater to the increasing workload.
c) The target is to have a total of 52 gynae-oncologists.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Increase the number of centres providing Gynaecological Oncology sub-specialty services	- Establishing a Gynaecological Oncology unit in major Government Hospital	2016-2020	Number of O&G Departments with Gynaecological Oncology sub-specialty services	MoH
		- Upgrade the surgical equipments and facilities including operating time and post-operative care	2016-2020		MoH
		- Adequate funding for consumables and other surgical related therapy			Head of O&G Services
		- Strengthen the patient referral system from the primary, secondary or tertiary care centres or vice versa		Formal Referral Policies	MoH (BPP)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		- Encourage collaboration with related NGOs and advocacy groups in relation to cancer management			
		- Increase surgical time		Cancer surgery waiting time is maintained between 2-4 weeks	Head of Anaesthesia Services
		- Optimizing networking and linkages within MoH Hospitals and NIH research institutes to support cancer research			
		- Human capital development through establishment of new posts and targeted training programmes		Number of new posts created in the various hospitals	MoH (BSM, BPP)
		- Formalized training with overseas cancer centres needs to be encouraged		Strengthening of training programmes	Head of O&G Services
				Sending trainees to university settings as part of training programme	Head of O&G Services

Appendix 5 (i)

Otorhinolaryngology: Head and Neck Cancers

Objective :
To strengthen Otorhinolaryngology services.

Target 9:
Major state hospitals with ORL sub-specialty.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Increase the number of centres, manpower and resources providing treatment of head and neck cancer	-Establishing Head and neck surgery and Rhinology services in major state Government Hospital	2016-2020	Number of major state hospital ORL sub-specialty services	MoH
		-Upgrade the surgical equipment and facilities including operating time and post-operative care.	2016-2020		MoH (Head of ORL Services)
		-Adequate funding for equipment, consumables and other surgical relates therapy			MoH (BPP)
		-Strengthen the patient referral system from the primary, secondary or tertiary care centres or vice versa		Formal Referral Policies	
		-Encourage collaboration with related NGOs and advocacy groups in relation to cancer management. timely confirmation of diagnosis of head and neck cancers (biopsy result within two weeks)		KPI for head and neck cancer surgery (new KPI)	Head of Pathology Services
		-Increase surgical time so that cancer surgery waiting time is maintained between 2-4 weeks		KPI for head and neck cancer surgery (existing indicator)	Head of Anaesthesia Service

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		- Optimizing networking and linkages within MoH Hospitals and NIH research institutes to support cancer research			MoH (CRC)
		- Human capital development through establishment of new posts and targeted training programmes	2016-MoH 2020-JPA	Creation of more post for head & neck surgeon + rhinologist At least: Jusa A:1 post each state for those with head &neck surgeon: -Jusa B:1 post in each centre -Jusa C:2 post in each centre -UD54: 3 post in each centre	MoH (Head of ORL Services)
		- Formalized training with overseas cancer centres needs to be encouraged	2016-2020	Strengthening of training programmes	MoH (Head of ORL Services)
			2016-2020	Sending trainees to university settings as part of training programme	
		- Provision of dedicated operating time for head and neck cancers once a week			
		- Training of supportive team (paramedics) under the advance post basic nursing training programme designated in the management of head neck oncology patients			College of Nursing

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
2.	Early Head and Neck cancer detection awareness campaign	Established a nationwide continuous and regular awareness campaign program for early detection of head and neck cancers. For example self-neck examination for detection of neck nodes Campaigns dedicated to both the public and health care workers	2016-2020		

Appendix 5 (j)

Gastro-Enterology

Objective :
To strengthen Gastro-Enterology services.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To improve cancer treatment	Formation of MDT in the management of cancer / oncology	2016-2020	Formation of MDT team in at least 1 team for every region: north, south, central, east coast, Sabah and Sarawak. The team preferably consists of gastroenterology, physician (preferably palliative), surgeons (GI), oncology, pathologist (preferably GI pathologist), radiologist (preferably interventional)	MoH, universities and private sector

Key Strategy 2: CLINICAL MANAGEMENT

e) Rehabilitation

Objectives :
1. To provide Cancer Rehabilitation Services (CRS) to all patients who would need and benefit from rehabilitation medicine services so as to improve their quality of life.

2. To establish effective social and public policies that will advance Cancer Rehabilitation Program (CRP).

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To provide Cancer Rehabilitation Services (CRS) to all patients who would need and benefit from rehabilitation medicine services so as to improve their quality of life	• Develop 'Cancer Rehab' team in tertiary centers with Oncology service • Collaboration between University and MoH hospitals to ensure accessibility to CRS	2016 - 2018	• Cancer rehab team in IKN by 2016	- MoH (Oncology / Rehab Physician / PT / OT / Nursing / MSW / Speech therapist / Counsellor/ T&CM), - Universities (UM / USM / UKM)
2.	Improve and strengthen cancer rehabilitation services by upgrading the facilities and equipment.	Review and rebuild in: • Putrajaya (IKN) • Sabah (Likas Hospital) • Sarawak (HUS) • Northern Zone (HPP) • Southern Zone (HSI) Training of core team • Include cancer rehabilitation topic in post basic nurse training module	2018-2020	• All tertiary Oncology centers to provide cancer rehab service by 2020 • Set up cancer rehabilitation team in Eastern region (Kuantan) by 2020	MoH (Oncology / Rehab / T&CM)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	Develop Cancer Rehab service in the community to improve clients quality of life as well as providing support groups	• Identify and approach PKD with high load of cancer survivors • Incentives for PKD to start community cancer rehab program • Establish effective planning and communication with support group in the community in regards of aftercare service • Smart –partnership program to get involvement of NGO in rehabilitation activities eg: qi-gong, acupuncture	2016-2018	• Community Cancer Rehab in each region (north, south, east)	- MoH (PKD / Rehab / FMS / T&CM) - NGOs
4.	Increase human resource in line with newly set up cancer centers	• Training of core team members for cancer rehab; PT / OT / Nursing • Create new post for at least basic core team members: PT/OT/Nursing	2018-2020	• All tertiary Oncology center to have cancer rehab team by 2018 • All tertiary Oncology center to be able to proving training of Cancer rehab core team members	MoH (Oncology / Rehab Physician / PT / OT / Nursing / MSW / Speech therapist / Counsellor)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
5.	Improve the referral services through a system of networking and establish a national guideline for Cancer Rehabilitation Services	•Exposure of healthcare workers to Cancer Rehab (inpatient and community service) • Develop a workflow for efficient referral	By 2018	• Patient flow chart for referral according to Standard for Oncology Rehabilitation	-MoH (FMS/PKD/ Oncology/ Rehab/ Public Health) -NGOs
6.	Set up Standard National Quality Assurance Program in all established cancer rehabilitation service centers.	• Patient satisfaction questionnaires • QoL outcome measure • Audit	By 2020	Malaysian Standard Oncology Rehabilitation	MoH (Rehab/ Oncology)
7.	Opportunity for research in Cancer Rehabilitation	• Studies conducted periodically	2019-2020	• A section of 'Rehabilitation Oncology' in Medical Journal Malaysia	MoH (Rehab/CRC), MMA

Key Strategy 2 : CLINICAL MANAGEMENT

f) Palliative Care

Objective 1 :
To relieve pain and suffering of cancer patients.

Target :
50% of patients with moderate to severe cancer pain receive opioid analgesia.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Identify gaps in opioid accessibility – KKM, private sector, NGO	• Survey of opioid accessibility in the various settings including : • MoH – major, minor specialist centre - Non-specialist hospitals - Health Clinics - University hospitals • NGOs – all hospice services • Private sector - Private hospitals - All private cancer facilities - GP clinics (sample)	2 Years	• Publication of research paper reporting access to opioid analgesia in Malaysia. • Number of pharmaceutical establishments dispensing strong opioids per 1 million inhabitants.	- MoH (Pharmaceutical Services Division, Palliative Care Services) - UMMC, HUKM - Malaysian Hospice Council (MHC) - Hospis Malaysia - MASP - Assoc. Of Private Hospitals Malaysia(APHM) Federation of Private Medical Practitioners Association Malaysia (FPMPAM) - MMA
2.	Audit of usage of opioids in moderate to severe cancer pain.	• Design and conduct epidemiological study on prevalence of cancer pain - multicentre study to look at prevalence in all cancer patients and severity. (stage, pain score, use of opioids)	1 year	• Publication of research paper on the prevalence of cancer pain and usage of opioids • Other indicators: - Strong opioid consumption (excluding methadone) per cancer death	MoH (Cancer centres, Palliative Care Centre, CRC) UMMC / HUKM

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	Analyse the national opioid usage from the NMUS data annually and extrapolating from cancer registry data.	• Analyse the latest National Medicine Used Survey (NMUS) data and cancer registry data along with cancer pain prevalence study conducted to determine probable opioid usage in Malaysia for cancer pain.	Annual data analysis	• 50% of patients requiring strong opioids for cancer pain receive it. • Strong opioid consumption (excluding methadone) per capita	MoH (Pharmaceutical Services Division, Pain / Palliative Care, CRC)
4.	Engage NGO and health education to promote awareness in cancer pain.	• Develop health education materials for public awareness on cancer pain. • Schedule publicity exercises in local newspapers, tabloids, health literature on cancer pain. • Distribute education materials to target audience through MoH, MoHE, private healthcare services.	On-going over 5 years	• 100% of cancer treatment centres in MoH have education materials. • 100% of teaching hospitals have materials. • 70% of private cancer treatment facilities have materials.	MoH (BPK), Pain and Palliative Care Services at MoH / MoHE, Cancer related NGO, MOS (Malaysian Oncology Society)
5.	Continue Cancer Pain CPG training regularly.	• Revise and update CPG • Conduct CPG training workshops in all MoH hospitals routinely • Systematically go through every MoH hospital to ensure coverage.	On-going over 5 years	• At least 1 CPG training workshop to be conducted in every state every 2 years.	MoH (Palliative Care Services, Oncology Services, Pain Medicine Services, MaHTAS)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
6.	Conduct CME to generalists in pain and palliative care approach	• Work through MHC & MMA to conduct training workshops for GPs, private practitioners • Produce educational materials – reprint handbook of palliative medicine	On-going over 5 years	At least 1 CME in every state annually.	- MHC - MoH / MoHE Palliative Care Services - MMA
7.	Include palliative care curriculum as part of cancer training programme	• Initiate discussions with UM on curriculum development and incorporation of minor module in palliative care.	1 year	To have initiated discussions and minuted at least 1 meeting regarding this proposal.	MoHE

Objective 2 :
To provide a support system for patients and families of life-threatening cancers from diagnosis to issues of grief and bereavement.

Target :
a. Develop the MoH dormiciliary palliative care programme with operating procedure, policy and training standards whilst integrating with NGO community palliative care services.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Engage the family health division to plan operating procedure and implementation.	• Meeting to discuss implementation of palliative care domiciliary programme. • Develop framework for the implementation of programme. • Develop care delivery system to be effective and efficient integrating with existing healthcare services.	On-going over 5 years	• Minuted meetings with family health division • Development of implementation framework and care delivery system	MoH (BPKK, BPP, Palliative Care Services), Community Palliative Care NGOs MoH (Development Division, BPKK, Palliative Care Services) Community Palliative Care NGOs

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
2.	Develop training module for prospective domiciliary care staff	• Identify training needs and negotiate with family health division on the training needs to establish a training module.	1-2 years	• Develop structured training programme with clear objectives and goals.	
3.	Collaborate with local NGO to assist with training and coordinate services to prevent duplication of services.	• Identify NGOs to assist with training of staff based on capabilities and capacity of NGO. • Link NGO to MoH services involved in developing domiciliary care services. • Develop MoU between NGO and MoH to collaborate in training	1-2 years	• Establish MoU with NGO to collaborate	
4.	Identify clinics to start pilot service and build research mechanisms to evaluate progress	• Engage clinics nearby the NGO service to establish pilot programme. • Develop KPIs for assessing progress and success of pilot programme • Present pilot project findings to MoH and later to roll out programme throughout country	2 years	• Numbers of patients served • Characteristics of patients served and problems. • Duration of follow up • Patient and family satisfaction survey • Feedback from the staff involved	
5.	Identify and train mentors / preceptors to debrief / support	• Engage palliative care physicians / specialists palliative care nurses to coordinate training programme and monitor progress	1 year and on-going	• Successful establishment of pilot project	

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
6.	Provide career development pathways for sustainability and progress within the field of domiciliary palliative care.	• Trained nurses to be deployed to centres to continue work in the field of community palliative care and be given opportunities for specialised training in advanced diploma programme.	5 years	• Numbers of nurses trained in community palliative care in MoH	

b. Increase number of trained Palliative Medicine specialist from 8 (in 2015) to 30 by 2020

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Identify specialists to be trained –at least 2 per year.	• Promote palliative care at educational district / state training programs and CPG dissemination • Engage medical officers undertaking MMed/MRCP programs in adopting the palliative training • Make available funding and posts for training identified individuals	On-going over 5 years	• Expansion of trainee enrolment to at least 2 a year • Dissemination of upcoming educational activities related to palliative care • Regular post creation to accommodate trainees	MoH Palliative Care Specialists /units MoHE (UMMC / UKM / UiTM / USIM) PA
2.	Collaborate with local NGOs and other stakeholders to establish comprehensive service network.	• Establish linkages between palliative care providers and local NGO organizations • Jointly develop processes/ procedures to facilitate joint care	2 years	• Formal meetings conducted with NGO leads • Commencement of pilot projects to test initiatives	MoE MHC

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	Encourage Malaysian doctors specialised in palliative medicine abroad to return to serve in Malaysia.	• Improve visibility of palliative care in Malaysia - publications - involvement in conferences - web presence by providers / NGOs • Providing options for out of programme training in Malaysia - engagement with training program directors	5 years	• Number of returning Malaysian Palliative Medicine Physicians	Talent Corp, MMC, MoH (BSM)
4.	Conduct CME to doctors in order to promote awareness in the field of palliative medicine and encourage sub-specialist training.	• Conduct roadshows to improve awareness of the field • Department / Hospital CME session on palliative care on an annual basis where specialists are based	Ongoing 5 years	• Number of roadshows conducted	Palliative Care Services MoH Palliative Care Services MoHE Malaysian Hospice Council Hospis Malaysia
5.	Enhance existing fellowship training programme.	• Revise the existing programme to improve both professional and personal growth of each trainee. • Develop a more standardised curriculum to ensure learning outcomes and competencies. • Develop an essential reading list of literature for both physical and non-physical management skills (including literature on philosophy and experiences in death and dying). • Develop exit examination to ensure the standards of each trainee upon completion of training programme.	2 years	• Formalisation of fellowship training programme in the form of FCP (palliative medicine) by College of Physicians, Academy of Medicine Malaysia	Palliative Care Services MoH Palliative Care Services MoHE Malaysian Hospice Council Hospis Malaysia

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
6.	Promote the need for paediatric palliative care amongst paediatric oncologists and general paediatricians to strengthen the paediatric palliative care fellowship programme.	• Conduct CME sessions for paediatric units on the importance of paediatric palliative care. • Collaborate with NGOs and teaching institutions to promote the need for paediatric palliative care. • Ensure training positions for paediatricians interested in training as paediatric palliative medicine specialists. • Develop adedicated paediatric palliative care service in major paediatric institutions (Institute Paediatrics, HKL).	On-going 5 years	• Number of trained paediatric palliative care specialists. • Number of paediatric units with paediatric palliative care services.	MoH (BPP, Paediatric Institute, HKL) Hospis Malaysia Malaysian Hospice Council MoHE (UMMC, HUKM, HUSM) Other paediatric NGOs and child care foundations.

c. Develop specialised palliative care services in 4 other major hospitals while enhancing existing services

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Identify hospitals to develop specialised units based on needs and resources available.	• Conduct a needs analysis based on services provided and population covered in specific hospitals. Priority to hospitals with oncology and major subspecialties managing complex conditions (southern, east coast, east Malaysia). • Identify suitable resources particularly specialists keen on training. • Initiate discussions with local hospital administration and state health department.	As and when specialist identified and 2 years before completing training	• Identification of 4 new sites to develop	MoH (Head of Palliative Care Services) Local hospital administration State health department

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
2.	Prepare "*Dasar Baru*" and work with hospital administrators to develop the service officially and submit to medical development division.	• Look at site and identify location for unit and whether renovation or construction required. • Estimate human resource needs. • Estimate costs of equipment medical/non-medical. • Estimate cost of essential drugs.	As and when hospital identified	• Development of *"Dasar Baru"*	MoH (Head of Palliative Care Services, BPP)
3.	Identify specialists to train and agreeable to work in the planned specialized unit.	• Promote palliative medicine amongst young physicians, MRCP, MMED candidates. • Conduct roadshow particularly in priority areas identified.	On-going over 5 years	• Number of new specialists trainees	MoH (Palliative Care Services) Palliative Medicine UMMC/UKM College of Physicians Malaysian Hospice Council Hospis Malaysia
4.	Train specialist nurses and paramedical staff in palliative care.	• Identify nurses and paramedical staff from priority hospitals to train in palliative care. • Recommend nurses / OT / PT to take up advanced diploma in palliative care.	On-going over 5 years	• Number of nurses and paramedical staff with advance diploma in palliative care	MoH (BPL, Nursing Division, OT / Physio Services) Local hospital administration State Health Department
5.	Collaborate with local NGOs and other stakeholders to establish comprehensive service network.	• Establish linkages between palliative care providers and local NGO organizations. • Jointly develop processes / procedures to facilitate joint care.	Within 6 months of establishing new Palliative Care Service	• Formal meetings conducted with NGO leads • Commencement of pilot projects to test initiatives	MoH / MoE Palliative Care Services MHC and member organizations

Objective 3 :
To increase standards of existing and future palliative care services.

Target :
a. Create core standards of care for palliative care service.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Review existing literature on standards and experience from other countries to determine those which are applicable to local setting.	• Formation of a quality group dedicated to identifying standards and selecting measures applicable to the local setting. • Review of literature on quality markers, patient related outcomes.	1 year	• Named members of quality group • Report on quality measures used internationally and selection of potential local measures	MoH MoE NGOs / MHC
2.	Refine national KPI for Palliative Care Services in MoH and promote this amongst other providers.	• Formal review of KPI measures of palliative care services by MoH specialists. • Engagement by other providers as collaborator in KPI setting. • Dissemination recommendations and standards of practice to other providers.	2 years	• 3 yearly review of KPIs - with finalization of key measures to be utilized • Dissemination of KPI measures	MoH Palliative Care Specialists Other providers in MoE, NGOs and private facilities
3.	Develop minimum standards to define palliative care service provision.	• Selection of baseline core clinically relevant palliative care measures (in conjunction with engagement below).	3 years	• Report on minimum standards for palliative care provision	MoH MoE NGOs Private facilities

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
4.	Engage major palliative care service providers to buy in to standards of care and patient related outcomes.	• Agreement of stakeholders on number and types of measures to be assessed (with minimum standards above)	5 years	• Establishment of definitive standard measures	Quality group All palliative care providers
5.	Implement scheduled audits amongst service providers (MoH, NGO, Private).	• Setting of audit standards for palliative care service provision and KPI targets • Formation of a group to assess audit / KPI performance • Feedback mechanisms and changes to be implemented before re-auditing performance	5 years	• Audit / standards • Audit / KPI group formation • Named representatives for audit process /cycle from providers • Documentation / demonstration of audit cycle	Quality group

b. Sustain and enhance the educational programmes in palliative care at the undergraduate and postgraduate levels

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Incorporation of a palliative care component in all undergraduate medical and nursing programmes conducted in Malaysia.	Ministry of Health and Ministry of Education to determine a minimum standard of palliative care exposure / training in medical and nursing undergraduate training by subject experts.	5 years	• Formal requirement as part of undergraduate training • Reporting of topics, teachers and hours of taught palliative care exposure by each institution • Core basic palliative care topics to be taught at undergraduate level	MoH MoE NGOs / MHC
2.	Review the Advanced Diploma curriculum and implementations after feedback from candidates.	• Annual review of results and feedback from tutors and learners. • Implement changes as part of a regular cycle of improvement.	1 year and ongoing	• Log/description of curriculum changes in response to feedback • Ongoing evidence of receipt and response to feedback	MoH Palliative Care Specialists Other providers in MoE, NGOs and private facilities

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
3.	Engage administration to allow & ensure appropriate deployment after Advanced Diploma training.	• Recruitment of staff from palliative care units (actual and potential) for future service in those areas • Utilisation staff expertise in specific field of training	1 year	• Annual record of staff output from the Advanced Diploma programme and main area of work post completion after 6 months	MoH MoE NGOs Private facilities
4.	Expand teaching faculty for the Advanced Diploma as expertise increases.	Active recruitment of tutors for programme including top performers by programme leads / coordinators.	3 years	• Number on teaching faculty	Quality group All palliative care providers
5.	Recruitment and awareness amongst potential candidate for the Advanced Diploma in Palliative Care.	• Publicity outreaching of the Advanced Diploma programme within MoH (by BPL based on existing websites / information streams) • Reaching out via Nursing, AHP and social work management in national hospitals	1 year	Minimum target of 15 per year	Quality group

Objective 4 :
To develop collaborative research initiatives with service providers

Target :

a. Create and promote a minimum database for use across all sectors to enable information sharing and research to enhance care.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Engage providers to suggest needs for information and research	• Identification of a key worker to co-ordinate initiative • Engagement with providers to form core database parameters	2 years	• Named coordinator • Minimum database parameters identified	MoH MoE NGOs / MHC
2.	Develop coordinating team to collect / process data	• Development of a database information storage system • Dissemination of database usage to national providers	3 years	• Team formation • Establishment of a national system of data collection	MoH Palliative Care Specialists Other providers in MoE, NGOs and private facilities
3.	Coordinator to produce regular reports	• Reporting and benchmarking of services	5 years	• Regularly published annual reports on palliative care service utilisation	Other providers in MoE, NGOs and private facilities
4.	Engage providers to suggest needs for information and research	• Identification of a key worker to co-ordinate initiative • Engagement with providers to form core database parameters	2 years	• Named coordinator • Minimum database parameters identified	Quality group All palliative care providers
5.	Develop coordinating team to collect/process data	• Development of a database information storage system • Dissemination of database usage to national providers	3 years	• Team formation • Establishment of a national system of data collection	Quality group

b. Identify fundamental areas of priority for collaborative research to inform future service development and delivery.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Review of all palliative care literature in Malaysia	• Identification of an individual / party to conduct review • Formal literature review of Malaysian palliative care services • Create palliative care e-library and to ensure palliative care literature included in KKM virtual library.	1 year	• Formal report of palliative care related literature • Accessibility of palliative care journals.	MoH MoE NGOs
2.	Establish research forum/ group amongst palliative care providers	• Creation of a group to enable open discussion for sharing of ideas and encouraging discourse to advance the research agenda of palliative care in Malaysia • Recruitment of interested parties among research oriented stakeholders • Development of key research priority areas for national attention	1 year	• Formation of a research group for palliative care among providers and academic institutions • Record of minutes from meetings • Formalisation of 3 key research areas for national focus	MoH MoE NGOs
3.	Engage CRC to advise and support research initiatives	• Engagement with CRC for assistance in developing, refining and conducting research priority areas	2 years	• Records of meeting • Registration of NMRR projects - within 3 months	CRC MoH MoE NGOs

Key Strategy 2 : CLINICAL MANAGEMENT

g) Traditional and Complementary Medicine

Objective 1 :
To allow cancer patients to cope better with cancer treatment and cancer.

Target :
To help in reducing the side effect, pain management and improving the quality of life of cancer patient.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To build human capacity according to existing best practice in T&CM oncology.	• To formulate training scheme and career pathway for T&CM practitioners and medical officers which include: - Continuous professional development - HLP for area of sub-specialty - TCM (clinical oncology) - Herbal pharmaceuticals	2016-2020	• Training plan and proposal of career pathway submitted	MoH (BPTK, Pharmaceutical Services Division) JPA.
		• To create government service scheme for T&CM practitioners and medical officers with T&CM expert qualification leading to the establishment of SME-subject matter expert scheme. This scheme involves clinical attachment (Gazettement) for new MO with T&CM qualification before promoted to SME, placement of SME at regional T&CM unit with herbal medicine service.	2016-2020	• Proposed service scheme for T&CM practitioner formulated and submitted for approval.	MoH (BPTK, Pharmaceutical Services Division, BSKB)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		• Transfer of Technology by foreign experts through MOU : - Herbal expert – 1	2015-2016	• Number of expert invited (1)	
		• Credentialing and privileging of T&CM unit personnel namely - Herbal practitioners -Acupuncture practitioners - Pharmacist - Supportive staff	2016-2020	• Credentialing and privileging system formulated.	
2.	To enhance the professionalism of T&CM practitioner and thus contribute to the safety and quality of cancer management.	• To implement T&CM Act 2016 (775)	2016-2020	T&CM Act enforced	MoH (BPTK, T&CM Council)
3.	To enhance the quantity and quality of research in T&CM by broadening and improving the research areas.	• To initiate research on T&CM treatment in cancer patient (e.g. retrospective study on safety of the herbs)	2015-2020	• Number of presented/ published research (1)	MoH (T&CM Unit , IKN)
		• To evaluate the interference of herbs toward laboratory value in cancer patients	2016-2018	• Top ten most commonly prescribed herbs in cancer patient • Research paper published	MoH (Pathology, IKN, T&CM Unit)
		• To conduct a study on effectiveness of acupuncture as a complementary treatment among opioid dependence patient who are on methadone maintenance therapy • To conduct a study on effectiveness of acupuncture as a complementary treatment for smoking cessation	2017-2018	• Research paper published	MoH (Hospital Kuala Lumpur Psychiatric and Mental Health Department, CRC, BPTK)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
4.	To establish T&CM facilities and services for cancer patients in centers in line with oncology service.	• Establish T&CM services at the centers that provide chemotherapy for Clinical Oncology	2016 -2020	• Number of center established. (Based on demand and case by case basis)	
		• To upgrade the herbal dispensing system in the T&CM unit in: - National Cancer Institute, Putrajaya - HSI, JB - Hospital Kepala Batas, Penang - Hospital Likas, Sabah	2015-2017	• Number upgraded. (4)	
		• Revise standards and guidelines of T&CM service for cancer patients - Herbal therapy as an adjunct treatment of cancer patients	2016-2020	• Number of guideline and standard revised (1) (estimated budget RM10,000)	
		• To introduce Acupuncture Therapy cater to relief and manage post chemotherapy symptoms/ side effect, such as pain, nausea, vomiting and post chemotherapy fatigue	2016-2020	• Preparation of practice guideline completed till the stage of information gathering.	

Objective 2 :
To integrate T&CM practitioner in early detection and prevention of cancer.

Target :
To train T&CM practitioner and related medical staff for early detection and prevention of cancer.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Increase the knowledge level of basic cancer management especially on the early detection of cancer, their risk factors, importance of screening, treatment and rehabilitation. and ensuring accessibility to information on promotion and preventive activities and services	• To establish a program that helps T&CM practitioners to acquired basic knowledge of cancer especially on the early detection of cancer, their risk factors, importance of screening, treatment and rehabilitation.	2016-2018	• Program established (estimated budget RM10,000)	MoH (BPK, BPTK, IKN, T&CM Unit)
		• To conduct training program for T&CM practitioners in Government hospitals as well as NGO & professional bodies	2019-2020	• Training conducted (3 batches of T&CM practitioners and related medical staff in T&CM unit and 3 batches of T&CM practitioners associated with Professional Body) • Program participated.(3)	MoH (IKN, T&CM Unit) NGO
		• To empower T&CM practitioners to participate and involve in Cancer awareness program organized by either private or public agencies.	2019-2020		MoH/HECC/Health Promotion Board/ NGO

Objective 3 :
To enhance public health education on T&CM role and knowledge in cancer management.

Target :
To collaborate with government agencies and NGO for public education and health promotion in T&CM area.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	To increase the awareness and knowledge level of the public and all health service providers regarding the T&CM's role and knowledge in cancer management.	• To empower T&CM unit and NGO to participate in the formulating and implementation of cancer awareness program organized by the public and private agencies	2016 -2020	• Number of program participate	MoH (IKN, T&CM Unit) NGO
		• To empower T&CM unit and NGO to conduct public education activities regarding the role of T&CM and its knowledge in cancer management at community level, hospital level and the mass media	2016-2020	• Number of program conducted. (5)	MoH (IKN, T&CM Unit) NGO

Appendix 9

Key Strategy 3 : INCREASING PATIENT COMPLIENCE

Patient Navigation

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	**Outreach and screening**				
	To establish patient navigation services in the community and health clinics and upstream services	• Navigation for breast cancer - Development of guideline	2017	Guideline developed	MoH, MoE, NGO's, KPWKM (MWFCD)
		- To train health care providers (medical officers and paramedics) and related NGO's in phases	2017	Number of personnels / NGO's trained	
		- Implementation of services in phases	2017	Services implemented in phases	

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		• Navigation for cervical cancer - Development of guideline - To train health care providers (medical officers and paramedics) and related NGO's in phases - Implementation of services in phases	2018 2018 2018		MoH, MoE, NGO's, KPWKM (MWFCD)
		• Navigation for colorectal cancer - Development of guideline - To train health care providers (medical officers and paramedics) and related NGO's in phases - Implementation of services in phases	2017 2018 2018		MoH, MoE, NGO's, KPWKM (MWFCD)
2.	**Symptomatic Patient**				
	To establish patient navigation services for patient with symptoms (general and specific) in the community and health clinics and upstream services	• Navigation for patient with symptoms - Development of guideline - To train health care providers (medical officers and paramedics) and related NGO's in phases - Implementation of services in phases	2017 – 2020	Guideline developed Number of personnels / NGO's trained Services implemented in phases	MoH, MoE, NGO's, KPWKM (MWFCD)
3.	**Treatment** Target : a) Establish a nurse/patient navigation Service in IKN by 2016 b) To establish a model of care outlining a systematic approach in navigation of cancer patient: 2016 -2020 c) Fifty percent of cancer patients receiving inpatient care will be referred to navigation team by 2020				

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	1, To establish nurse/ patient navigation services	• Establishing a nurse/patient navigation services in IKN	2016	• A dedicated team lead by a oncology nurses, oncologist. psychologist, health education officer,dietition, medical social worker	MDD, Nursing Division, Hospital Director, respective HoD
		• To establish a model of care outlining a systematic approach in navigation of cancer patient: - To create well-coordinated referral system for cancer patients - To establish nurse led navigation clinics at Oncology Clinics - To be part of the multidisciplinary team addressing patient's issues and need - To establish a hotline counter	2016-2020	• 50% cancer patients receiving inpatient care will be referral to nagivation team • Referral policy	Oncology Clinic Oncology Unit Palliative Unit Other Clinical Units Medical Social Worker Unit Rehabilitation Unit Religious Bodies Counseling Unit

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	2. To train health care profession als based on their responsibility in providing care to patients throughout the cancer journey	• Cancer health disparities,case management,breast and colorectal cancer education, interpersonal communication, community resources, motivational interviewing,end of life care,Recognize psychological needs,counselling • Formalized training with overseas cancer centres needs to be encouraged	2016-2020	• Annual training per centre/ national level • Sending nurse navigators for oversea cancer center for attachment	The identified institutions BPL, Hospital Directors, HOD
	3. To provide navigation programmes for cancer patients/families/carers	• To prepare educational materials to aid in understanding disease, management and coping mechanism to cancer and identify when further help is needed • To facilitate self help programme and patient support activities	2016		NGOs,Health Education Division, Religious Bodies, Psychologist
	4. To provide recommendation for navigation service delivery that applicable to other hospitals with no liaison psychiatric services.	• To establish regional navigation network from the main identified centers.			

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
4.	**Palliative care** Develop the MoH Domiciliary palliative care programme with operating procedure, policy and training standards whilst integrating with NGO community palliative Care services.				
	To strengthened domiciliary care services pertaining to cancer patient	• Develop framework for the implementation of programme. • Develop care delivery system to be effective and efficient integrating with existing healthcare services. • Training domiciliary care staff (Team) • Collaborate with local NGO to assist with training and coordinate services	2016 – 2020	Implementation framework and care delivery system developed Structured training module developed and training carried out with collaboration with NGO	MoH (Family Health Dev. Division, Medical Dev. Divisiion, Palliative Medical Services), Community Palliative Care NGOs

Appendix 10

Key Strategy 5: MONITORING, SURVEILLANCE, RESEARCH AND DEVELOPMENT

a) Monitoring and surveillance

Objective 2 :
To strengthen cancer surveillance through a comprehensive cancer data and information systems – The National Cancer Registry (NCR), Patient Registry Information System (PRIS) and Laboratory Information System (LIS)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Establishment of Cancer Screening Registry	• Exploring possibility of establishing Cancer Screening Registry with submodule for breast, cervical and colorectal through discussion with relevant stakeholders and initiation of system if approved by top management	2016 -2020	Discussions / meetings conducted	MoH (BKP, BPKK, BPM), NGO, MOE
2.	Establish/ Upgrade Laboratory Information System (LIS) in all diagnostic laboratories in the state and specialist hospitals	• To upgrade all LIS available in the state and specialist hospitals in preparation for efficient interfacing between hospitals. The LIS should encompass all disciplines in pathology. The upgrading should involve both functionality and hardware	2016-2020	• Every year at least 10 state and specialist hospitals will have upgrade versions/new installation of LIS • By 2020,all state and specialist hospitals will be equipped with LIS	PEMANDU, MAMPU, MOSTI / MIMOS
3.	Comprehensive cancer data and information systems	• Improve cancer surveillance through strengthening of the National Cancer Registry (NCR) under IKN through supports from LIS and implementation of the Patient Registry Information System (PRIS)	2016-2020	• Comprehensive and quality reports produced by the registry	MoH (IKN. BPP, BKP, PIK)

Appendix 11 (a)

Key Strategy 5 : MONITORING, SURVEILLANCE, RESEARCH AND DEVELOPMENT

(a) Research and Development

i. Institute for Medical Research

Objective 2 :
To streamline and strengthen cancer research at the Institute for Medical Research in order develop long term research programs based on national need, strengths and resources.

Target :

By 2020, the IMR will have long term research programs on nasopharyngeal carcinoma and leukemia.

Development of an enabling environment which fosters innnovative high impact research on cancers at the IMR based on international best practices.

Research core facilities (biospecimen bank, molecular/genomics/bioinformatics, cell, pathology, animal labs for in vivo drug testing) would be fully developed to support the cancer research programs.

To carry out strategic collaborations with other organizations to complement internal research programs.

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
1.	Develop long term research programs on nasopharyngeal carcinoma at the IMR			Discussions / meetings conducted	
	a. NPC Lab-to-community program	• Lab-to-community : - NPC Biomarkers : Feasibility and pilot studies of the use of EBV serology and EBV DNA / other markers for NPC screening in high risk groups.	2016-2020	• Completion of feasibility studies • Proposed screening protocols • Initiation of pilot study (if found feasible)	MoH (IMR, Sarawak State Health Dept., HUS, Serian District Hospital, Serian District Health Office, CRC) UM Others
		- NPC Prevention, NPC Biology : Identification of cancer risk/ susceptibility and understanding of pathogenesis for development of novel approaches to prevention	2016-2025	Proposed strategies to develop novel approaches to prevention	MoH (IMR, Sarawak State Health Dept., HUS, Serian District Hospital, Serian District Health Office) IMU UM Others

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	b. NPC Lab-to-clinic program	• Lab-to-clinic - NPC Developmental Therapeutics: Repurposing of FDA approved drugs. - Developmental therapeutics and Biomarkers: Identification of new targets for therapy, development of new therapies and companion diagnostics; strategic partnership for the development of affordable effective therapeutic agents for major cancers	2016-2020 2016-2025	• Candidate drugs with evidence to justify clinical trials • Identified targets, candidate drugs, companion diagnostics assays. • Establishment of a drug discovery and chemical biology centre at the IMR to address national health priorities including cancers. • Evaluation of companion diagnostics to optimize matching of cancer patients to treatment	MoH (IMR, CRC) IMU SMDC, UCSF MoH (IMR, CRC, IKN, other MoH Health Facilities) IMU SMDC, UCSF Drug companies Other hospitals
2.	Develop Leukemia program at the IMR	• Development of precision medicine for leukemia	2016-2025	• Companion diagnostics assays for leukemia	MoH (IMR)
3.	Develop the Bio-bank to support research programs at the IMR	• Review of SOPs • Implementation of processes • Establishment of bio-bank mirror site and satellite collection sites at major hospitals (inclusive of minor renovations and purchase of equipment) • Development of network for collection of specimens and data • QC and audit system	2016-2020	• Fully functional bio-bank	MoH (IMR, MoH Health Facilities, CRC, Clinical Research Malaysia (CRM)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
4.	Strengthening animal research capabilities for *in vivo* drug testing	• Hiring and training of permanent officer • Development of SOPs and implementation of in vivo drug testing pipeline • AAALAS training and certification of personnel • AAALAC accreditation of facility	2016-2020	• Fully functional facility for laboratory small animal research • Candidate drugs tested • Candidate drugs tested which proceeded into clinical trials • Candidate genes/ drug targets/ prognostic markers evaluated	MoH (IMR)
5.	Strengthening of genomics and bioinformatics	• Hiring of bio-informatician • Training of staff in genomics and bioinformatics • Strengthening of downstream studies	2016-2020	• Fully functional genomics and bioinformatics facility • Candidate genes identified and validated • Diagnostic assays developed based on findings	MoH (IMR)
6.	Strengthening of *in vitro* drug discovery pipeline	• Hiring of staff • Screening of compound libraries • Validation of hits	2016-2020	• Established drug discovery pipelines • Candidate drugs identified which proceeded to in vivo validation studies	MoH (IMR)
7.	Develop strategic collaborations with other groups to strengthen research to address issues related to cancer in the country	• Collaborative arrangements/ agreements • Implementation of collaborative work	2016-2020	• Successful collaborations which resulted in useful output/ outcomes	MoH (IMR) Other organisations

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
8.	Strategic planning of research programs and Scientific Advisory Board Reviews	• Sessions for in-depth strategic planning of research programs • Scientific advisory board reviews (2016/2017: strategic plan review; 2018: midterm review; 2020 full review and planning for next 5 year cycle) • Revise current mechanisms to ensure implementation of best practices of research management in line with the IMR Transformation Program • Ensure that scientific reviews (prospective/ retrospective) are carried out by independent experts in the field (need to be identified) • Establish mechanism for long term research programs designed to maximize impact on cancer, with focus on quality and impact rather than mere number of projects • Strategic planning of the use of resources to maximize impact	2016-2020	• Strategic plan • Appointment of International Scientific Advisory Board • Scientific advisory board reviews conducted • Scientific advisory board recommendations which have been successfully implemented	MoH (IMR)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
9.	Strengthening the information and communication technology (ICT) facilities to enhance cancer research	• Upgraded ICT to curate and analyse "big data" emerging from laboratory studies as well as encourage and facilitate collaborative projects between local and international research teams. • Adequate technical ICT support • Tap on Malaysian Health Data Warehouse (MyHDW) to retrieve clinical data to support research through the Bio-specimen bank.	2016-2020	• Collaborative projects between local/international research teams facilitated by ICT • Impact of research projects supported by ICT to retrieve clinical data from MyHDW via bio-specimen bank	MoH (IMR) MyHDW
10.	Strengthening cancer research by recruiting and keeping talent as well as combining effort from the public sector as well as research universities	• The possibility of setting up a National Cancer Research Consortium to increase research cooperation and collaboration between research institutes and universities from the public and private sector as well as to enhance international networks and partnerships and the NIH (Malaysia) should be considered. (this will become the link between the research communitry and the Steering Committee for the National Cancer Control Program)	2016-2020		MoH (IMR, IKN) local universities etc

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
		• Possibility of setting up laboratories at the IMR serving as the National Laboratories for the consortium should be explored. • Create a mechanism to hire / offer internationally competitive post-doctoral training fellowships, fellowships for Masters and PhD as well as long term training in cancer which allows recent PhD graduates from local and foreign universities to work at the NIH Malaysia in the area of cancer and for IMR staff to be trained abroad (short and long term) • Explore the possibility of setting aside a National Cancer Research Grant to supplement current research funding including a Cancer Research Challenge Fund which encourages donation for cancer research and training (including attendance at international cancer conferences)		• Mechanism to hire post-doctoral fellow being set up • Numbers of post-doctoral, master and PhD fellowships given to facilitate cancer research	

Appendix 11 (b)

Key Strategy 5 : MONITORING, SURVEILLANCE, RESEARCH AND DEVELOPMENT

ii. Other Research Activities

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	Prevention				
1.	To assess awareness and knowledge of general public on common cancers in Malaysia and their risk factors	• KAP study on cancer prevention (and screening) among public	2020	• Study conducted and report produced	MoH MoE
	Screening				
1.	Exploring new cost effective modalities for cancer screening	• Conduct research / HTA on feasibility of using other available cancer screening modalities:	2016 – 2020		MoH, MoE, Professional Bodies
		- Cervical cancer screening - Urine for HPV DNA testing (HTA)	2016	• HTA conducted	MoH (MaHTAS)
		- Lung Cancer Screening - Undertake the low dose CT scan research for detection of early lung cancer	2016 – 2017	• Research conducted and report produced	College of Radiology, IPR
		- Colorectal Cancer - Flexible sigmoidoscopy (HTA)	2017 – 2018	• HTA conducted	MoH (MaHTAS)
		- CT Colonoscopy		• HTA/Pilot Study- report produced	College of Radiology, HTA unit, Surgery
		- Prostate cancer screening using MRI and PSA	2017 – 2020	• Research conducted and report produced	IMR, College of Radiology, IKN, MoH
		- NPC screening using EBV Serology and EBV DNA	2017 – 2020	• Research conducted and report produced	

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
2.	Feasibility on self-sampling on HPV DNA testing as a primary for cervical cancer	• Conduct feasibility study based on urban and rural area	2017 -2018	• Research conducted and report produced	MoH (IMR, IKU, BKP, BPKK, BPP)
3.	Strengthening research on cancer screening	• Develop breast cancer risk prediction model initiatives for Malaysia (HTA) • To continue breast cancer risk prediction model initiatives for Malaysia conduct by MoH (BPK)	2016-2020	• HTA report on Malaysian breast cancer risk prediction model • Breast cancer risk prediction model initiated	MoH (BPK), MoE, NGO MoH (BPK)
	Clinical research on Oncology				
1.	Engaging multinational pharmaceutical and medical devices companies to bring their clinical trials related to the field of oncology to Malaysia	• Conduct feasibility studies • Increase number of oncologist in the country to be principal investigator • Conduct ISR	On going	• Number of ISR in oncology	MoH (CRC) and Clinical Research Malaysia (CRM)

No	Strategy	Activities	Implementation period	Indicator	Collaboration / Coordinating Agencies
	Palliative Care				
	Identify gaps in opioid accessibility – KKM, private sector, NGO	• Survey of opioid accessibility in the various settings including : • MoH – major, minor specialist centre - Non-specialist hospitals - Health Clinics - University hospitals • NGOs – all hospice services • Private sector - Private hospitals - All private cancer facilities GP clinics (sample)	On going	• Number of ISR in oncology	MoH (CRC) and Clinical Research Malaysia (CRM)
	T & CM				
	To enhance the quantity and quality of research in T&CM oncology by broadening and improving the research areas.	• To initiate research on T&CM treatment in cancer patient.(e.g. retrospective study on safety of the herbs) • To evaluate the interference of herbs toward laboratory value in cancer patients	2015-2020	• Number of presented/ published research (1) • Top ten most commonly prescribed herbs in cancer patient evaluated	MoH (T&CM Unit, IKN) MoH (Pathology,I-KN,T&CM unit)