National Strategic Plan for Cancer Control Programme

2021-2025

MINISTRY OF HEALTH MALAYSIA

Published by
Non-Communicable Disease Section (NCD)
Disease Control Division
Ministry of Health Malaysia
Level 2, Block E3, Complex E
Federal Government Administration Centre
62590 WP Putrajaya
MALAYSIA

Year of publication: 2021

Suggested citation
Ministry of Health Malaysia (2021). National Strategic Plan for Cancer Control Programme 2021-2025.

This document is available at the MOH Website:
http://www.moh.gov.my

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ACKNOWLEDGEMENT

The Non-Communicable Disease Section, Disease Control Division, Ministry of Health Malaysia would like to express its gratitude to all individuals and organisations who have directly or indirectly contributed to the development of the National Strategic Plan for Cancer Control Programme 2021-2025.

Special thanks especially to the following:

1. Tan Sri Dato' Seri Dr Noor Hisham Abdullah
   Director General of Health Malaysia
2. Datuk Dr Chong Chee Kheong
   Deputy Director General of Health (Public Health)
3. Dato' Dr Norhizan bin Ismail
   Deputy Director General of Health (Medical)
4. Datuk Dr Hishamshah bin Mohd Ibrahim
   Deputy Director General of Health
   (Research and Technical Support)
5. Datuk Dr Norhayati binti Rusli
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7. Dr Ahmad Razid bin Salleh
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8. Suraiya binti Syed Mohamed
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9. Dr Goh Cheng Soon
   Director, Traditional and Complementary Medicine Division
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    Principal Director, Oral Health Programme
11. Dr Mohd Anis bin Haron@Harun
    Director, National Cancer Institute
12. Directors of relevant research institutes
    National Institute of Health, Ministry of Health

FOREWORD

Cancer is one of the most important non-communicable diseases (NCDs) worldwide, and the incidence is expected to continue rising. The expected increase in incidence is mainly due to the rapidly ageing population and unhealthy lifestyles.

The World Health Organization (WHO) in its Globocan report 2018, estimated that the global burden of cancer was 18.1 million new cases, 9.5 million cancer deaths and 43.8 million people living with cancer. It is estimated that 30 to 50% of cancers can be prevented through healthy lifestyles, eradication of risk factors such as tobacco use and vaccination. Whilst systematic screening and access to treatment can lead to effective treatment of a significant proportion of cancers in high-income countries, late presentation and limited access to treatment lead to the high percentage (around 70%) of deaths due to cancer in low- and middle-income countries.

In Malaysia, malignant neoplasm persists as one of the five principal causes of national mortality for the past two decades. In 2018, cancer contributed to 11.82% of all deaths in Ministry of Health (MOH) hospitals compared with 9.34% in 2003. The number of cancer cases reported within the 5-year period of 2007-2011 and 2012-2016 had increased by 11% for all types of cancer. Cancer of breast, colorectal, lung, lymphoma, nasopharynx, leukaemia, prostate, liver, cervix uteri and ovary were the ten most common cancers reported for the year 2012-2016.

Similar to the previous National Strategic Plan for Cancer Control Programme (NSPCCP) 2016-2020, the NSPCCP 2021-2025 also addressed cancer prevention and control 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. This new cancer strategic plan includes monitoring and surveillance of cancer, and human capacity building as new focus areas. The NSPCCP 2021-2025 identifies ten specific objectives, which are aligned with the ten focus areas of concern; whereby their respective strategised action plans and targets are essential for instituting a comprehensive cancer prevention and control program in the country until 2025. The ability to implement the outlined strategised action plans is important to enabling Malaysia to effectively manage the increasing cancer burden in the country.

Last but not least, I would like to express my gratitude to all editors and contributors from the MOH and all other key stakeholders who were involved in the development of this new strategic plan. The concerted effort from all stakeholders and commitment from everyone is very important in ensuring the successful implementation of the NSPCCP 2021-2025.

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TAN SRI DATO' SERI DR NOOR HISHAM BIN ABDULLAH
Director General of Health Malaysia

EXECUTIVE SUMMARY

At the end of 2019, the Cancer Unit under the Non-Communicable Disease Section, Disease Control Division at the Ministry of Health Malaysia (MOH) initiated the discussions on the development of the next reiteration of the National Strategic Plan for the Cancer Control Programme (NSPCCP) for the year 2021-2025. This is to replace the NSPCCP 2016-2020. A series of discussions and meetings involving the relevant public health specialists, clinicians from relevant disciplines, researchers and health education officers from the MOH was conducted, followed by consultations and meetings with academicians, universities, private healthcare providers, NGOs and pharmaceutical companies. The meetings addressed related issues, concerns, strategies and priorities for the cancer control for the country.

The overall objectives of the NSPCCP 2021-2025 are aligned with the objectives of the National Cancer Control Blueprint (NCCB) 2008-2015, which is to reduce the negative impact of cancer by decreasing the disease morbidity, mortality and to improving the quality of life of cancer patients and their families. The NSPCCP 2021-2025 identifies ten specific objectives which are in line with the ten focus areas of concern; whereby their respective targets and strategised action plans are essential for instituting a comprehensive cancer prevention and control program for the country until 2025. Implementation of the outlined strategised action plans is important to enabling Malaysia to achieve the overall targets of the NSPCCP i.e., down-staging cancer at diagnosis, improving survival rates for certain cancers and reducing the premature mortality due to cancer.

Similar with the previous NSPCCP, the NSPCCP 2021-2025 also addresses cancer prevention and control 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. This strategic plan also included monitoring & surveillance of cancer and human capacity building as new focus areas.

MOH calls for support and commitment from all relevant stakeholders in government, non-government organisations, professional bodies, private cancer centres and facilities, and pharmaceutical companies to strengthen the existing network and collaboration, together play our respective important roles in addressing the cancer burden in the country. Concerted efforts from all, plus continuous monitoring and evaluation of the various initiatives, are very important in ensuring the successful implementation of the NSPCCP 2021-2025.

NATIONAL STRATEGIC PLAN FOR CANCER CONTROL PROGRAMME (NSPCCP) 2021–2025

1 INTRODUCTION

Cancer is one of the most important non-communicable diseases (NCDs) globally, and the incidence is expected to continue to increase. The expected increase in incidence is mainly due to rapidly ageing populations and behavioural risk factors.

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

It is estimated that one-third of the global burden of cancers are preventable through vaccination and eradication of modifiable risk factors such as tobacco use. Whilst systematic screening and access to treatment can lead to effective treatment of a significant proportion of cancers in high-income countries, late presentation and limited access to treatment means that 70% of the deaths due to cancer occur in low- and middle-income countries (LMIC).

1.1 Cancer Situation Worldwide

The World Health Organization (WHO) in its Globocan Report 2020 estimated that the global burden of cancer was 19.3 million new cases (incidence), 9.9 million cancer deaths (mortality) and 50 million people living with cancer within five years of diagnosis (prevalence) (1).

1.2 Cancer Situation in Malaysia

Malaysia, like most developed and advanced developing countries, is also 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 increased. In 2019, cancer contributed to 12.18% of all deaths in the Ministry of Health (MOH) hospitals compared with 9.54% in 2004. The percentage of deaths in MOH hospitals attributable to cancer over 20 years are displayed in **Table *1***.

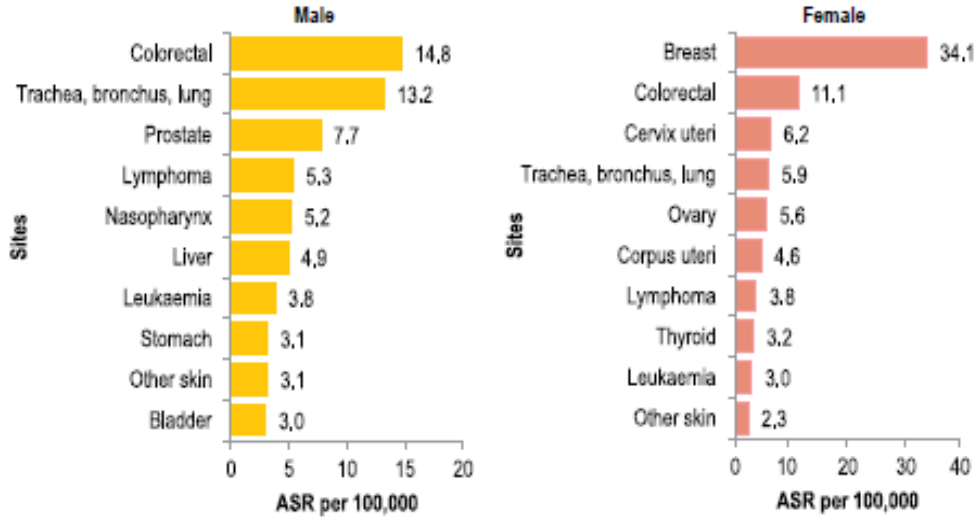
The number of cancer cases reported within the 5-year period of 2007-2011 and 2012-2016 had increased by 11% for all cancer sites (2). Meanwhile, the age-standardised incidence rate (ASR)[1] had increased by 2.3 per 100,000 population in females and slightly reduced by 0.8 per 100,000 population in males. Cancer of breast, colorectal, lung, lymphoma, nasopharynx, leukaemia, prostate, liver, cervix uteri and ovary were the ten most common cancers reported for the year 2012-2016. The ASR of the ten most common cancer by sex is further illustrated in **Figure 1** below.

Table 1: Top 5 Principal Causes of Deaths in MOH Hospitals, Malaysia

	2004	2009	2014	2019
1st	Septicaemia (15.10%)	Heart Disease & Diseases of Pulmonary Circulation (16.09%)	Diseases of Circulatory system (23.34%)	Diseases of Circulatory system (22.27%)
2nd	Heart Disease & Diseases of Pulmonary Circulation (14.52%)	Septicaemia (13.82%)	Diseases of Respiratory System (18.19%)	Diseases of Respiratory System (21.17%)
3rd	**Cancer (9.54%)**	**Cancer (10.85%)**	Certain infectious & Parasitic Diseases (14.35%)	Certain infectious & Parasitic Diseases (12.47%)
4th	Cerebro-vascular disease (8.40%)	Pneumonia (10.38%)	**Cancer (13.02%)**	**Cancer (12.18%)**
5th	Accidents (6.07%)	Cerebro-vascular disease (8.43%)	External causes of morbidity and mortality (9.30%)	Diseases of the genitourinary system (5.93%)

Source: Health Facts, Ministry of Health (3)

1 ASR is a measure of risk of developing cancer at any given age



Source: Malaysia National Cancer Registry (MNCR) 2012-2016 (2)

Figure 1: Age-standardised incidence rate for ten most common cancers in Malaysia, by sex, 2012-2016

'Stage' is a measure of cancer growth and spread, with later stages having poorer outcomes. Stage at diagnosis is probably the most important determinant of survival. According to the Malaysian Study on Cancer Survival (MySCan), the relative survival[2] was highest at stage I compared to stage IV (**Table 2**) (4).

Table 2: Relative survival by stage at diagnosis and cancer types, period of diagnosis 2007-2011 and followed up to 2016, Malaysia

Cancer type	1-year relative survival rate (%)		5-year relative survival rate (%)	
	Stage I	Stage IV	Stage I	Stage IV
Breast	97.8	66.8	87.5	23.3
Colorectal	87.8	55.1	75.8	17.3
Cervix Uteri	94.3	53.0	75.3	23.0
Lung	63.3	29.6	37.1	6.3
Nasopharynx	94.0	66.2	63.7	26.9

2 Relative survival refers to the probability of being alive for a given amount of time after diagnosis compared with all mortality in the general population

Improving staging at diagnosis can be achieved by earlier detection of cancer. Certain types of cancer such as breast, colorectal and cervical are possible to be detected early through screening and early diagnosis. However, the Malaysia National Cancer Registry (MNCR) 2012-2016 revealed that the stage at diagnosis for these cancers were mostly at stage III and IV. **Figure 2**, **Figure 3** and **Figure 4** showed the percentage of staging for female breast, colorectal and cervical cancer at time of diagnosis, as reported for the year 2012-2016 (2).

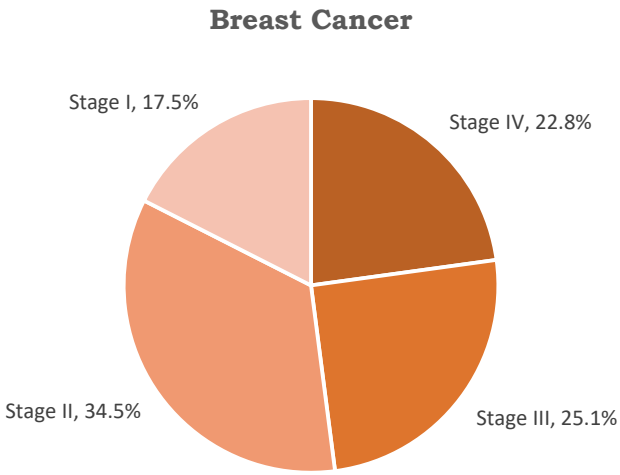


Figure 2*:* Percentage for stage at diagnosis for female Breast Cancer, Malaysia, 2012-2016

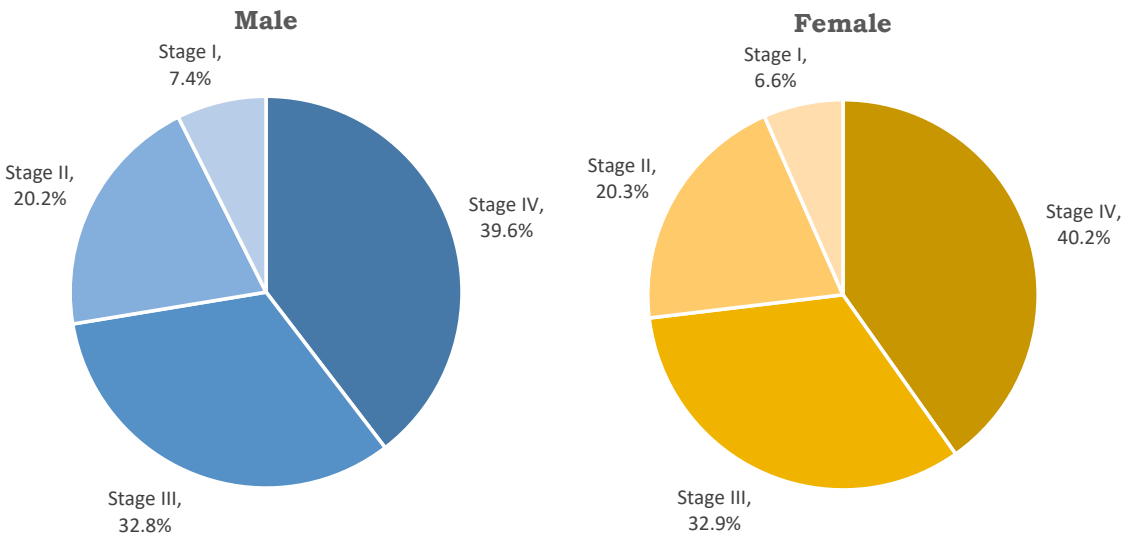


Figure 3: Percentage for stage at diagnosis for Colorectal Cancer, by sex, Malaysia, 2012-2016

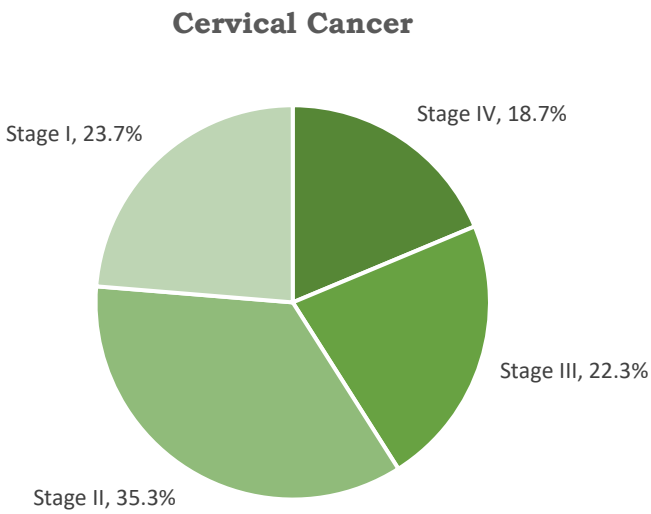


Figure 4: Percentage for stage at diagnosis for Cervical Cancer, Malaysia, 2012-2016

Cancer survivors faced financial and emotional burden that affect their quality-of-life following diagnosis and treatment of cancer. A study on economic impact of cancer on patients and their families in Southeast Asia was conducted by the ACTION study in 2015 concluded that over 75% of new cancer patients in Southeast Asia experience financial catastrophe or die within one year (5) we instigated a study of new cancer patients in the Association of Southeast Asian Nations (ASEAN. Financial catastrophe here is defined as incurring out-of-pocket medical costs exceeding 30 percent of annual household income. Out-of-pocket medical costs are medical care that is not covered by health insurance.

For Malaysia alone, about 45% of Malaysian cancer survivors spend over a third of their household income for cancer care within the first year of diagnosis (5)we instigated a study of new cancer patients in the Association of Southeast Asian Nations (ASEAN. These financial problems may extend to many more years after diagnosis due to ongoing cancer treatment and care for late effects of treatment. Being diagnosed with cancer also affect an individual's ability to work and contribute to productivity loss in economy. Under the high cost scenario, cancer accounts for 14.1% of productivity loss[3] (6).

3 Productivity loss comprise losses due to absenteeism, presenteeism and death.

Apart from productivity losses due to cancer, there is also a health burden incurred by individuals as a result of loss of healthy life years. The burden of disease, measured in Disability-Adjusted Life Years (DALYs), combines the potential Years of Life Lost (YLL) due to cancer deaths and the Years Lost due to Disability (YLD). In 2017, neoplasm accounted for 717,318 DALYs in the Malaysian population (54.3% males and 45.7% females). The DALY burden of cancer primarily occur in the 50 to 69 age group (47.9%), and the largest burden of diseases losses were from trachea, bronchus and lung cancer (15%) (6).

2 ACHIEVEMENT OF PREVIOUS STRATEGIC PLAN (NSPCCP 2016-2020)

The first national strategic plan for cancer control for Malaysia, the National Cancer Control Blueprint (NCCB) 2008-2015, was published in 2008. The overall aim of the NCCB 2008-2015 was to reduce the negative impact of cancer and to improve quality of life of people living with cancer. Under the NCCB, the main achievements include the introduction of the Human Papillomavirus (HPV) vaccination as a National Immunisation Program; initiation of the colorectal cancer screening program using immunological faecal occult blood test (iFOBT); development of a structured mammogram screening program for high-risk women; initiation of liquid based cytology (LBC) for cervical cancer screening; and upgrading and development of various treatment centres and infrastructures, including establishment of the National Cancer Institute (IKN) in Putrajaya.

The second strategic plan, the National Strategic Plan for Cancer Control Programme (NSPCCP) 2016-2020, was published in 2017. The aim of the NSPCCP 2016-2020 is similar with the NCCB 2008-2015, and it addressed the cancer care and management from a holistic viewpoint that spans across primary prevention, screening, early detection, diagnosis, treatment, rehabilitation, palliative care, traditional and complementary medicine, as well as research. The achievements following implementation of the NSPCCP 2016-2020 are elaborated below.

Primary Care : As a continuity of the HPV vaccination program's success for the prevention of cervical cancer, in 2019 the MOH was able to start initiate cervical cancer screening using self-sampling for HPV testing, which is more sensitive than the conventional Pap smear. The target age group is between 30 to 65 years. Implementation was planned for four phases and will be continued during the NSPCCP 2021-2025 period. With this stepwise approach, MOH aims to achieve 40% coverage of the target group by year 2025.

For detecting cancerous lesion in asymptomatic population, the radiology services proposed to undertake lung cancer screening using low-dose CT (LDCT) (for time period 2016-2018). A health technology assessment was conducted by the MOH

Health Technology Assessment (HTA) Unit in 2017. The HTA reported that, in view of LCDT having high sensitivity but low specificity when used for lung cancer screening among the high-risk group, it was recommended that it may be used for lung cancer screening among this high-risk group in a research environment or for research purposes. A lung cancer screening study using LDCT that targeted 14 MOH hospitals was initiated by the Respiratory Medicine Services of the MOH and the Clinical Research Centre (CRC), in collaboration with Johnson & Johnson Medical Malaysia. The study was finally advised to discontinue due to poor response from the public and target population, as well as budget constraints for the campaign and promotional activities. The Radiology Department in IKN however decided to continue the Lung Cancer Screening using LDCT as part of the department routine services.

Secondary Care : For the period of 2016-2020, the Pathology Services had expanded the scope of molecular testing to tissue specimens.

For treatment, a budget of RM500 million for the development of the Northern Oncology Centre was announced by the Prime Minister in 2018. The first Clinical Oncology Unit (COU) was also established in Hospital Pakar Sultanah Fatimah, Muar in 2017. Several new services were initiated, including the Stereotactic Body Radiotherapy (SBRT) in IKN and Stereotactic Radiotherapy and Radiosurgery in Hospital Sultan Ismail (HSI) Johor Bahru, Hospital Umum Sarawak (HUS) and Hospital Wanita dan Kanak-Kanak Sabah (HWKKS). Gefitinib and Afatinib (both tyrosine kinase inhibitors) were listed in the National Formulary as first line treatments in epidermal growth factor receptor (EGFR) mutated metastatic non-small cell lung carcinoma, after successfully negotiated to cost-effective pricing using value-based medicine.

For the year 2016 to 2020, the Radiology Services had successfully installed two hospitals with the Radiology Information System (RIS), from the initial target of five hospitals per year. The two hospitals were Hospital Raja Perempuan Zainab II Kota Bharu (HRPZ II) and Hospital Tuanku Jaafar Seremban (HTJS). For the picture archiving and communication system (PACS) installation, only one hospital i.e. HRPZ II was installed with PACS. The initial target was two hospitals per year. For replacing beyond economic repair (BER) equipment and installing new equipment based on the norms set out in the MOH Equipment Blueprint, only seven minor specialist hospital were provided with computerised tomography (CT) scans, out of the original target of all minor specialist hospitals (28 in total). As for providing Magnetic Resonance Imaging (MRI) services to all major specialist hospitals, there are now 12 major specialist hospitals out of 28 major specialist hospitals providing MRI services. For angiography machines, there were only four units available in regional hospitals out of the target of six hospitals.

The Clinical Haematology Services was able to achieve most of the targets for the year 2016-2020. Among the milestones achieved were:

- In 2016, a stem cells laboratory was successfully set up and currently operational in Hospital Queen Elizabeth (HQE), Sabah. As such, the Haematology Unit in HQE is able to provide complete autologous stem cells transplant services since 2016, which include stem cells collection and infusion for patients undergoing autologous stem cells transplant.
- The Malaysia Patient Assistance Program (MYPAP) has been sustainable due to adequate additional budget to support the activities. Owing to the successful MYPAP program, patients with Chronic Myeloid Leukemia (CML) are able to get access to Tyrosine Kinase Inhibitor (TKI) therapy, which can usually control the disease well and allow patients to live normally.

The Breast & Endocrine Surgery sub-specialty centres were established in Hospital Selayang (January 2016) and HUS (July 2018). Both these centres started with two Breast & Endocrine surgeons. Hospital Selayang was the first Breast & Endocrine Surgery sub-specialty centre for Selangor. Previously, most patients were referred to Hospital Kuala Lumpur (HKL) and Hospital Putrajaya (HPJ). There are now three Breast & Endocrine Surgery sub-specialty centres in the Central Region. The Breast & Endocrine Surgery Subspecialty Centre at HUS was very much anticipated as it would be able to be the centre of excellence for Breast Cancer treatment for Sarawak. The existing Oncology Services in HUS would be able to support and complement the treatment for breast cancer patients. This was also the second centre set up in East Malaysia. The other centre is at Hospital Queen Elizabeth II (HQE II), Kota Kinabalu. Therefore, MOH now has ten Breast & Endocrine Surgery Sub-specialty Centres (HKL, HPJ, Hospital Selayang, Hospital Pulau Pinang (HPP), Hospital Raja Permaisuri Bainun (HRPB) Ipoh, HSI, HRPZ II, Hospital Sultanah Nur Zahirah (HSNZ), HQE II and HUS.

The Sentinel Lymph Node Biopsy services were established in nine Breast & Endocrine sub-specialty centres under MOH (i.e HKL, HPJ, Hospital Selayang, HPP, HRPB Ipoh, HSI, HRPZ II, HQE II and HUS). Similar services are also available in University Malaya Medical Centre (UMMC) and Hospital Canselor Tuanku Muhriz UKM (HCTM-UKM).

The Traditional and Complementary Medicine (T&CM) services has set the objectives of improving the quality of life of cancer patients and allowing the patients to cope better with the cancer treatment by minimising the side effects of treatment, as well as relieving pain and suffering. To support these main objectives, the T&CM services in the area of herbal therapy as an adjunct treatment for cancer patient and acupuncture for chronic pain was introduced in the T&CM out-patient units of IKN, Hospital Kepala Batas, HSI Johor and HWKKS. The existing herbal therapy and acupuncture services were further upgraded, relevant guidelines revised, and

facilities upgraded. Acupuncture services to cater to relieve and manage post-chemotherapy symptoms and side effects such as pain, nausea, vomiting and post-chemotherapy fatigue were introduced to help patients cope better with cancer treatment. The effort of the T&CM services involvement in early detection, prevention and public education has been an on-going activity.

Clinical Guidelines : The Clinical Practice Guideline (CPG) for Management of Nasopharyngeal Carcinoma and CPG for Colorectal Cancer were published in 2016 and 2017 respectively. The CPG for Management of Breast Cancer (3rd edition) was completed in 2019 and published in 2020.

Research : The MOH Biobank was formalised in 2019 and is centralised at the Institute for Medical Research (IMR), National Institutes of Health (NIH), Setia Alam, Selangor. The MOH Biobank is in the midst of rolling out prospective biospecimen collection to support cancer research for the country. In collaboration with the MOH Pathology and Surgical Services, satellite collection sites at major hospitals will be set up during the NSPCCP 2021-2025 time period. However, currently there is a lack of manpower to manage the day-to-day operations and strategic planning for the MOH Biobank.

During this 5-year period, the Clinical Research Malaysia successfully coordinated 95 oncology related industry-sponsored research (ISR).

In the area of research for T&CM services, the effectiveness of acupuncture as a complementary treatment among opioid dependence patients was successfully conducted involving patients from HKL, Jinjang Health Clinic and Batu 9 Cheras Health Clinic. However, unfortunately the finding was inconclusive due to insufficient sample size.

Human Capacity Building and Development : A 100% achievement was obtained in producing radiologists with sub-specialty training. These include sub-specialties in Interventional Radiology (IR), Musculoskeletal, Breast, Thoracic and Paediatric Radiology. The targets for this activity were to train at least six radiologists every year in the sub-specialty training programs and to train two radiologists in the IR sub-specialty training. Similar achievement (100%) was obtained in training and upgrading the skills of radiographers and nurses. Advanced diploma courses have been established including breast imaging, cardiovascular imaging for radiographers, Advanced Diploma in CT and Perioperative Nursing for Radiology. An Advanced Diploma in MRI will be introduced this year (2020), and the curriculum is currently being developed.

There was an expansion of 13 training centres for the Gynaecological Oncology sub-speciality training, in collaboration with Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM) and Universiti Sains Malaysia (USM), and currently

there are 23 certified gynaecological oncologists providing services all over the country. Oncoplastic training has been incorporated in the sub-specialty training, resulting in more trained Breast & Endocrine Surgeons able to perform the procedures. Currently, these services are available in seven centres (HKL, HPJ, Hospital Selayang, HPP, HSI, HSNZ, HRPZ II). As for the number of trained surgeons, three Breast & Endocrine Surgeons have recently completed their sub-specialty training, with eight other trainees still undergoing training. Due to limited places abroad as well as the COVID-19 pandemic, several trainees were sent to do their training in HCTM-UKM and UMMC. Unfortunately, during this period, seven fully trained Breast & Endocrine Surgeons have resigned or retired. This net loss affected greatly in terms of overall manpower development and service coverage for MOH.

T&CM : For T&CM, one foreign expert from Shanghai, China was deputed to facilitate the T&CM service in HWKKS. Additionally, two MOH medical officers (MOs) with post-graduate training in T&CM herbal oncology were posted to IKN and HWKKS. Phase one of the T&CM Act [Act 775] was implemented with the formation of the T&CM Council. The registration of T&CM practitioners will commence soon.

3 SWOT ANALYSIS

A SWOT analysis consisting of strengths, weaknesses, opportunities and threats in cancer continuum of care was done based on the achievements and challenges faced during the NSPCCP 2016-2020. This analysis was done in order to establish a more comprehensive and improved strategic plan for cancer control in Malaysia. The table

Strengths	Weakness
1. Existing good healthcare system in the country. 2. Extensive primary care services and health clinics under MOH. 3. Universal coverage for public healthcare facilities. 4. Existing MOH policies for screening services for specific cancers. 5. Availability of comprehensive cancer treatment in public and private facilities.	1. Organisational silos between the Government, private facilities and NGOs. 2. Healthcare workers under MOH are multitasking. 3. High turnover of healthcare workers. 4. Uneven distribution of oncologists across Malaysia. 5. Public cancer centres are still not enough to cover the entire nation – none in East Coast (except USM). 6. There is still a need to buy services from private healthcare providers. 7. NGOs mainly operate in urban centres. 8. Health insurance companies mainly do not include cancer screening coverage in their policies. 9. Issues on timeliness and completeness of data submission to cancer registry and reporting.

Opportunities	Threats
1. Existence of supporting NGOs to complement Government's outreach activities in bridging the gaps. 2. Social media to serve as platform to distribute health education materials / health campaigns. 3. Extensive network of private general practitioners throughout the country can facilitate specific cancer screening (colorectal, breast and cervical) and early detection. 4. MOH has used pool procurement for other drugs that can be extended for cancer treatment.	1. Majority of cancers detected are at late stages. 2. Financial catastrophe faced by 45% of patients. 3. High treatment costs (borne by MOH). 4. Limit or ceiling in insurance coverage for treatment. 5. Service inequity for secondary and tertiary care such as in rural areas, Sabah and Sarawak (for confirmatory diagnosis and treatment). 6. Uneven numbers of oncologist in the public sector compared to the private sector. 7. Patients lost from follow-up (i.e. due to preference for unproven therapies). 8. Unproven therapies being promoted in the media. 9. Unproven screening modalities being promoted by distributors and being used by private healthcare facilities.

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 Vision

A nation working together in reducing cancer burden, with optimum involvement from relevant stakeholders, to improve positive outcomes of cancer by decreasing disease morbidity, mortality and improving the quality of life of cancer patients and their families.

4.3 Mission

Through awareness and empowerment, all Malaysians will have an understanding of cancer, its prevention, screening and early diagnosis, treatment, rehabilitation, survivorship 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 the Malaysian National Strategic Plan for Cancer Control Program (NSPCCP) 2021-2025 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 SPECIFIC OBJECTIVES

(1) To increase health-seeking behaviour through awareness and knowledge on common cancers and to strengthen the intervention of specific cancer risk factors;

(2) To strengthen early detection of cancer;

(3) To improve the accuracy, efficiency, accessibility and timeliness of cancer diagnosis;

(4) To enhance delivery of cancer therapy services which are timely, equitable and accessible for cancer patients throughout the country;

(5) To improve wellbeing and health of cancer survivors during and after diagnosis and treatment by optimising quality of life;

(6) To develop and deliver effective palliative care to all cancer patients in an equitable and patient-centred manner;

(7) To address cancer research needs in line with overall cancer control;

(8) To allow cancer patients to cope better with side effects of cancer treatment through traditional and complementary medicine;

(9) To improve cancer surveillance and monitoring through strengthening of comprehensive cancer data and information systems; and

(10) To build workforce capacity and strengthen human capital development.

7 OVERALL TARGETS

(1) To downstage breast, colorectal and cervical cancer at the time of diagnosis by 25% by the year 2030 (Baseline MNCR 2012-2016);

(2) To improve 5-year relative survival rate for colorectal, breast and cervical cancer by 2030 [The overall cancer survival for period of diagnosis 2007-2011 are 56.8%, 66.8% and 70.6% for colorectal, breast and cervical cancer respectively]; and

(3) To reduce the risk of premature mortality rate caused by cancer by one third by 2030 i.e from 5.7% in 2019 to 3.8% in 2030 [Sustainable Development Goals 2030, indicator 3.4.1: Reduction for mortality rate by a third attributed to cardiovascular disease, diabetes, cancer and chronic lung disease by 2030 (7)].

8 FOCUS AREAS OF THE STRATEGIC PLAN

(1) Prevention and Health Promotion
(2) Screening and Early Diagnosis
(3) Diagnosis
(4) Treatment
(5) Survivorship (including rehabilitation and vocational rehabilitation)
(6) Palliative Care (Refer to separate document[4])
(7) Traditional and Complementary Medicine
(8) Research and Development
(9) Monitoring and Surveillance
(10) Human Capacity Building and Development

9 PRIORITIES

(1) Intensify prevention and promotional activities as well as health-seeking behaviours through multiple media platforms;

(2) Increase colorectal screening coverage, early diagnosis and services;

(3) Strengthening patient navigation and cancer treatment services including establishment of the Northern Cancer Centre;

(4) To improve cancer data submissions, analysis and reporting through the existing information systems and registry (National Cancer Registry).

4 http://www.moh.gov.my/moh/resources/Polisi/BUKU_NATIONAL_PALLIATIVE_CARE_POLICY_AND_STRATEGY _PLAN_2019-2030.pdf

10 PLAN OF ACTION

The Plan of Action and Objectives of each component are described below.

10.1 Prevention and Health Promotion

10.1.1 Background

The biggest challenge in cancer prevention is changing the perception and behaviour among general public on transferring knowledge of risk factors and correct health seeking behaviour into practice.

According to the WHO, 30 to 50% of cancers can be prevented by avoiding risk factors and implementing existing evidence-based prevention strategies. 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 and is responsible for approximately 22% of cancer deaths.

Currently there is limited national information available on the level of public knowledge on cancer risk factors, its preventability and on the sign and symptoms. A study in 2014 served as baseline where general knowledge on cancer risk factors was 62% and general knowledge on sign and symptoms was 52% (8).

There is no information on the public's acceptance and behaviours towards cancer screening and proven or unproven therapies.

A concerted effort must be taken between all stakeholders involved in cancer prevention and care.

10.1.2 Plan of Action Matrix

Please refer to **Appendix 1**.

10.2 Screening and Early Diagnosis

10.2.1 Background

Screening aims to identify individuals with abnormalities suggestive of a specific cancer or pre-cancer, who are asymptomatic, and refer them promptly for diagnosis and treatment. Screening is far more complex public health intervention compared to early diagnosis. It is important to realise that screening programs should not be introduced unless:

- the burden of the desired type of cancer to be screened is highly significant;
- availability of accepted screening test/method;
- adequate resources to perform the tests; and
- sufficient services and facilities for diagnosis, treatment and follow-up of individuals with abnormal test results.

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 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.

Examples of screening methods are, iFOBT for colorectal cancer, PAP smear cytology and HPV test for cervical cancer, and mammography screening for breast cancer.

Currently in Malaysia, there are four screening programs available. The four programs are screening for breast, colorectal, cervical and oral cancer. The current policies for these screenings are as below:

1. Breast cancer: The screening for breast cancer in Malaysia comprises of Clinical Breast Examination (CBE) and Mammogram. The current policy states that:

   (a) For CBE: Woman aged 20 years and above must undergo breast examination by trained HCPs every three years for age between 20 to 39 years, and annually for age 40 and above.

   (b) For mammogram: Woman aged 40 years and above with risk factors, are recommended to undergo mammogram every year. For women aged 50 to 74 years, mammography may be performed every two years.

2. Colorectal cancer: Asymptomatic individuals aged 50 to 75 years should undergo screening using iFOBT to detect blood in stool, followed by colonoscopy if iFOBT is positive. The current screening interval is every two years. Asymptomatic individuals who are at higher risk for this cancer should get medical advice for assessment and screening.

3. Cervical cancer: All sexually active women aged 30 to 65 years using HPV via vaginal sample (either self-sampling or by a healthcare professional). The screening interval is every five years for those who are tested HPV negative.

4. Oral cancer: The screening policy for oral cancer involves oral examination for individuals aged 18 years and above known to have high-risk habits or living in a community which is more prone to take up that habit. The high-risk communities identified includes Indian community in rubber and palm oil estates in Peninsular Malaysia, and other Bumiputera in Sabah and Sarawak. In addition to that, opportunistic screening is also conducted for walk in patients to the dental clinic and communities or outreach programs.

Lung cancer is the third most common cancer in Malaysia (2). However, there is no national lung cancer screening program established yet. As mentioned earlier, the HTA on LDCT for lung cancer screening conducted by the MOH in 2017 concluded that LDCT had high sensitivity but low specificity when it is used for lung cancer screening among the high-risk group and recommended that it may be used for lung cancer screening among this group in research environment or for research purposes. Lung cancer screening using LDCT scan among high-risk group is available at certain private hospitals.

Nasopharyngeal cancer (NPC) is fifth most common cancer in Malaysia and its risk factors include Epstein-Barr virus (EBV) infection and family history of NPC (2). Hence, EBV serology test is a promising tool for selective screening in those with a family history of NPC. An HTA conducted in 2011 reported that there was fair evidence on acceptable diagnostic accuracy for EBV serology test in an NPC screening program. 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.

Prostate cancer is seventh most common cancer in Malaysia (2). The prostate-specific antigen (PSA) test may indicate a prostate problem, however the HTA on prostate cancer screening conducted by MOH in 2011 suggested that screening for prostate cancer with PSA should only be done for the high-risk group, mainly close family members. In view of prostate cancer is an indolent cancer, the age for the close family member to be screened should be taken into consideration.

Early diagnosis is identifying cancer among those presented with the signs and symptoms of cancer. When cancer is identified early, cancer is more likely to respond to effective treatment and can result in a greater probability of surviving, less morbidity, and less expensive treatment. Significant improvements can be made in the lives of cancer patients by detecting cancer early and avoiding delays in care.

Early diagnosis consists of three steps that must be integrated and provided in a timely manner:

- awareness and accessing care
- clinical evaluation, diagnosis and staging
- access to treatment.

Early diagnosis is relevant in all settings and in the majority of cancers. In the absence of early diagnosis, patients are diagnosed at late stages when curative treatment may no longer be an option.

10.2.2 Plan of Action Matrix

Please refer to **Appendix 2**.

10.3 Diagnosis

10.3.1 Background

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.

Pathology services for cancer diagnosis and monitoring are mostly carried out in the state and major specialist hospitals. Anatomical Pathology services are available in the 14 state hospitals and 8 major specialist hospitals, while chemical pathology, haematology and microbiology services are available in all specialist hospitals. Genetic service currently is centralised in Tunku Azizah Women and Children Hospital in Kuala Lumpur.

Scientific advances and technology development in molecular testing have revolutionised cancer diagnosis and treatment. Molecular diagnostic tests detect specific biologic molecules or biomarkers in a patient's tissue and fluid samples.

The test can be used to assess a person's risk of developing cancer, screening for cancer in a person that may be asymptomatic, provide accurate cancer diagnosis for informed decision management, and monitoring how a patient is responding to treatment. In the recent decade, molecular diagnostics have been referred to as companion diagnostics tests to determine whether a specific cancer therapy would likely be effective treatment for a specific cancer patient based on characteristics of or changes in the biomarker. Although the application of molecular testing is widely applied worldwide, its implementation in Malaysia is still at a preliminary stage and not yet comprehensive due to the high cost and low prioritisation compared to other more urgent test demands.

The pathology service had proposed to develop the molecular pathology testing from as early as the 10th Malaysia Plan (2011-2015), whereby several new tests were developed in response to clinical demands. For the 11th Malaysia Plan (2016-2020), the Pathology services has expanded the scope of molecular testing to tissue specimens. It is hoped that for the 12th Malaysia Plan (2021-2025), we could expand the service and include proteomics testing in addition to the genomics tests that will continuously progress. We also hope to establish a comprehensive digital pathology system to enhance the cancer diagnostics service better, especially in aspects of training and consultancy to enable quality diagnostic service particularly diagnostic accuracy and timeliness. Lastly, we hope to achieve laboratory accreditation for all these laboratories to ensure reliability of the service provision.

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 2020, there are 54 public hospitals with 386 resident radiologists providing services as below:

- General Radiography services are present in all hospitals and certain major health clinics.
- Ultrasound services are present in all specialist hospitals and several non-specialist hospitals.
- CT services are present in 54 MOH hospitals with a total of 68 scanners.
- MRI services are currently provided in 31 hospitals.
- Mammography services are available in 50 hospitals i.e. tertiary, state and major specialist hospitals.

- Angiography services are provided in eight hospitals. Interventional Onco-Radiology services are provided in eight hospitals: HKL, Hospital Selayang, Hospital Sungai Buloh, IKN, Hospital Sultanah Bahiyah Alor Setar (HSBAS), Hospital Sultanah Aminah (HSA) Johor Bahru, HUS and HPP by specially trained radiologists. Basic IR services are provided at all hospitals with radiologists. There are scheduled visits by IR consultants to perform complex procedures in the other hospitals as part of IR networking.

All centres with angiography services are function as the IR training centres for specialty and sub-specialty trainees from MOH, universities and international trainees. The challenges faced include increasing demand and emergence of new technologies in cancer treatment delivery by IR due to lack of trained IR and budgetary constraint. Patient safety has always been an utmost 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. Radiology services are in the process of improving overall quality performance and obtaining certification from IAEA-QUAADRIL (International Atomic Energy Agency – Quality Assurance Audit for Diagnostic Radiology Improvement and Learning) Program in 2021.

Proper planning has to be done in order to optimise the available resources and overcome the constraints. There are major challenges in terms of procuring and equipment replacement, manpower (numbers and skills) as well as operational budget. With the advent of IR into the therapeutic arena, more budgetary allocation is needed by the radiology departments.

Nuclear Medicine Services was introduced into Malaysia since 1964 at HKL. It was later expanded to various hospitals in Malaysia in the last two decades. The nuclear medicine set up under the MOH are categorised into two 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 subsets:

- Subset s: with Single Photon Emission Computed Tomography (SPECT) service
- Subset p: with Positron Emission Tomography (PET) service
- Subset sp: with both SPECT & PET services

The MOH has taken a regional approach in delivery of this service. Nuclear medicine services are currently divided into five regions i.e.:

Peninsular Malaysia	
Northern region:	HPP (Level 2sp)
Central region:	HKL (Level 2s) &
	IKN (Level 2sp)
Southern region:	HSA (Level 1s)
East Malaysia	HUS (Level 2s)
Sarawak:	HWKKS (Level 2s)
Sabah:	

It has been decided that a nuclear medicine centre providing a regional based service should be equipped with a Level 2sp facility.

The MOH had installed the country's first PET/CT back in 2005. In the following year, the first cyclotron was commissioned. Currently, only the centres at the Northern and Central Zones are equipped with PET/CT machines. Another has been planned for the Southern Region since 2006. With the fast-expanding use of PET-CT in oncology, PET-CT has become an inseparable part for nuclear oncology service. Unfortunately, at present, only two out of the six nuclear medicine centres under MOH are equipped with PET-CT machines.

Currently, other than the Southern Zone, in-patient radioiodine treatment for thyroid cancers is offered in all other nuclear medicine centres under MOH. In addition, 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 centres from time to time. The first peptide receptor radionuclide therapy (PRRT) for neuroendocrine tumors was introduced in mid-2015, whereas prostatic-specific membrane antigen directed radioligand therapy (-RLT) was conducted in 2020 at IKN Putrajaya. In the future, we hope to provide ancillary support for PET/CT-guided radiotherapy planning as well.

A structured post-graduate education and training program was started in year 2008 by USM and, until present, there has been 38 graduates from the Masters of Medicine in Nuclear Medicine. Separate training modules have been developed for interested physicians or radiologists to take up this specialty, in addition to their basic parental specialty.

10.3.2 Plan of Action Matrix

i. Pathology (**Appendix 3a**)
ii. Radiology (**Appendix 3b**)
iii. Nuclear Medicine (Diagnosis) (**Appendix 3c**)

10.4 Treatment

10.4.1 Background

Cancer is the third leading cause of death in this country, contributing to 11.82% of all deaths in MOH hospitals in 2018 compared to 9.34% in 2003. The incidence of cancer is expected to rise with the increasing lifespan of the general population as well as rising unhealthy lifestyle practices. Cancer treatment is provided by both public and private hospitals and mainly concentrated over west coast of Peninsular Malaysia. The following are the public oncology centres around Malaysia which offer both systemic as well as radiotherapy treatment:

1) Hospital Kuala Lumpur
2) Institut Kanser Negara
3) Hospital Pulau Pinang
4) Hospital Sultan Ismail
5) Hospital Umum Sarawak
6) Hospital Wanita & Kanak-Kanak Sabah
7) University Malaya Medical Centre
8) Hospital Canselor Tuanku Muhriz UKM
9) Hospital Universiti Sains Malaysia, Kubang Kerian

Cancer treatment involves multi-disciplinary and multi-modality approach which includes surgery, radiotherapy, systemic chemotherapy, targeted therapy, immunotherapy and hormonal therapy. Over the past 15 years, many advancements have been made in the field of oncology in terms of improved diagnostic tools, better imaging modalities, state-of-the-art molecular and genetic testing, as well as enhanced therapeutic options. However, with the advent of precision medicine, the cost of cancer care especially targeted treatment is exorbitant. This would increase the strain on national healthcare budget. Thus, MOH introduced Value Based Medicine, an initiative aimed to measure the value of the new therapies from different aspects such as utility, emotional, spiritual and monetary significance. A sound healthcare economic evaluation conducted from various stakeholders' perspective is required before approving a therapy to be implemented in MOH hospitals.

With only six MOH oncology centres which are dealing with the majority of Malaysians with cancers, limitations in facilities, human resource and funding are currently huge challenges. Thus, strategies need to be put in place to reduce long waiting time for curative radiation treatment, better access to formulary drugs, decentralise the current oncology centres as well as improve access to oncologist's consultation.

Oncology surgery services under the MOH is presently available at all state hospitals and several of the larger district hospitals. These services are provided by surgeons in various surgical disciplines. For colorectal surgery, there are currently 64 surgeons trained and registered with the National Specialist Registry (NSR), however, only 15 surgeons are working at the MOH hospitals. For breast & endocrine surgery, currently there are 10 sub-specialty centres at the MOH hospital, and out of the 56 surgeons registered under the NSR, only 22 are working at these centres.

Psycho-oncology services look at the psychological aspects of the treatment and management of patients with cancer. It combines the element of psychology, social, behavioural and ethical aspects of cancer. The availability of advanced cancer treatment with early detection of cancer have led to more adults and children earning the title of cancer survivors. However, regardless of the prognosis, psychological distress particularly anxiety and depression were reported in at least one third of cancer survivors in a middle-income country (9). At present, psycho-oncology service is basically provided as a general 'consultation' activity based on referrals to psychiatry in most of the hospitals. Some degree of psycho-oncology services generally is provided by all hospitals with general psychiatrists. 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.

Haematology services was first established in 1986 under the auspices of the late Dr Visalachy Purushothaman at HKL. In 1999, the first successful bone marrow transplant in an adult with chronic myeloid leukaemia was performed through the establishment of a stem cell transplant service in HKL.

In 2002, with the support of the former Deputy Director General of Health (2000-2004), Dato' Dr Ahmad Tajuddin Jaafar, a Department of Haematology was established that comprised of both clinical and specialised laboratory services. In 2006, the whole Department of Haematology moved to Ampang Hospital, which was designated as the national referral centre for haematology. Over the years, the haematology service has expanded to 13 haematology centres in 11 states. There are four centres with transplant services. Currently, there are 35 clinical haematologists in MOH hospitals.

The objective of the clinical haematology service is to provide excellent patient-centred care for patients with all types of blood disorders such as leukaemia, lymphoma and multiple myeloma and non-malignant haematology conditions like thalassaemia and haemophilia. We also aim to provide prompt and accurate diagnosis of diseases at presentation by sophisticated laboratory investigations to risk-stratify patients at diagnosis and guide individualised treatment, to prevent over-treatment and to provide monitoring for early detection of treatment failure.

Paediatric Oncology: Childhood cancer make up 3% of all cancers diagnosed in Malaysia and remain a leading cause of death. In the children below 15 years old, the main cancers were leukaemia (40%) and tumours of the central nervous system (CNS) (15.2%) followed by lymphoma (10.6%).

Paediatric Cancer treatment is provided by public, universities and private sector in Malaysia. The seven regional centres within MOH providing paediatric haemato-oncology services include:

1) Hospital Tunku Azizah Kuala Lumpur
2) HPP
3) HRPB, Ipoh
4) HSI, Johor Bharu
5) HSNZ, Kuala Terengganu
6) HUS, Kuching
7) HWKKS

The universities include UMMC and HCTM-UKM in the Klang Valley and Hospital Universiti Sains Malaysia (HUSM) in Kubang Kerian, Kelantan. Private hospitals are mainly in the Klang Valley and one hospital in Kuching.

Early detection and an accurate diagnosis are the first step towards good cancer management. A supportive environment is required; detection and staging require good and timely imaging and biopsies must be done as soon as possible. Paediatric tumours require good histopathology and cytogenetics therefore accessible and affordable competent diagnostic facilities should be readily available to all centres in Malaysia. This will ensure proper stratification of treatment and good outcome. Treatment must be initiated as soon as possible. Successful cancer treatment involves multidisciplinary involvement with each component given in a timely manner.

Transfusion Medicine Service (TMS) : Blood and blood components are a vital part of patient treatment and management especially for patients with underlying oncological pathologies. Overall, patients with oncological and haematological malignancies may use up around 34% of the RBC supply at any one time (10) few data concerning the urgency of transfusion are available to inform planning. This study sought to determine the proportion of red blood cells (RBCs. Anaemia may occur in 90% of patients during chemotherapy and cancer treatments often cause the loss, destruction, and decreased production of RBCs — all of which lead to anaemia (11)we investigated the incidence and severity of chemotherapy-induced anemia caused by the most common chemotherapy regimens, including the new generation of chemotherapeutic agents, used in the treatment of the major nonmyeloid malignancies in adults. Five hundred fifty-two patients with histologically proven carcinoma originating from breast (n = 165. In addition, cancer patients with anaemia show a decrease in quality of life, increased cancer-induced fatigue and indicators of poor clinical outcome. This signifies that blood product supply is very crucial to support the management of these cancer patients. The fundamental pillar in ensuring adequate, safe and timely supply of blood, blood products and services for patient needs is by maintaining the sustainability of blood donation activities through effective blood donation awareness programs.

The TMS in Ministry of Health is responsible for ensuring the accessibility and availability of safe and quality blood products, its appropriate use and other related services in the country. Service delivery is undertaken through the network of 1 standalone blood centre (Pusat Darah Negara, PDN), 14 State Hospital Blood Banks and 119 other hospital blood banks. PDN is the national reference centre for TMS for the country and is responsible for the development of policies, standards and strategic plan; coordinates and monitors all blood transfusion activities carried out in government hospitals; provision of technical support and consultation in all areas of blood banking. The scope of activities in the MOH facilities may include the following:

- Clinical transfusion services including pre-transfusion compatibility testing, appropriate use of blood; Patient Blood Management (PBM) and hospital blood supply management in 134 MOH hospitals
- Blood donor management and blood collection in 115 MOH facilities
- Blood component preparation- preparation of platelets, fresh frozen plasma, cryoprecipitate for clinical use in 22 MOH facilities
- Screening of donated blood for transfusion transmissible infections (TTI) through serology testing and nucleic acid testing, (NAT) as well as ABO & Rh Grouping in 13 MOH facilities

Each of the activities must occur in the framework of quality management system to ensure the safety and quality of the products and safety of blood donors through implementation of Good Manufacturing Practices, GMP and related laboratory accreditation such as MS ISO 15189. As blood and blood products are precious national resources, the Transfusion Medicine Service in MOH should work together and share the available blood and blood products throughout the country as and when required thus ensuring the accessibility to the blood and blood products at all time.

There have been several major progresses made in the TMS till date, namely nationwide increase in blood collection based on 100% voluntary non-remunerated blood donation prior to Covid19 pandemic with concurrent increase in the provision of labile blood components as well as ongoing supply of plasma derived medicinal products. Clinical use of blood has also improved with the expansion on basic immunohaematology services nationwide and implementation of Patient Blood Management. Furthermore, TMS was strengthened through training and placement of Transfusion Medicine Specialists in PDN, state hospitals and several major specialist hospitals together with the procurement of equipment, transport and renovation of infrastructure in several MOH facilities.

Recently, TMS has also successfully completed the development and deployment of the cloud-based Blood Bank Information system (BBISv2) for use in PDN and 21 selected Hospitals which will be expanded to other blood banks in future. Nationwide expansion of NAT testing to cover the whole country started in 2019 and is estimated to increase coverage from 60% to 100% donation by 2021. This includes the establishment of 3 of Nucleic Acid Testing (NAT) screening centres in Kedah, Sabah and Sarawak. Consistent and ongoing training for all categories of personnel involved in the transfusion process and research activities are further supported.

PDN continue to provide transplant related services that include Cord Blood Banking (from cord blood collection, processing and storage) as a source of haematopoietic stem cells, Histocompatibility and Immunogenetics Laboratory and National Stem Cell Coordinating Centre for the coordination of donors and patients for haematopoietic stem cell transplant especially for haemato-oncology patients. The expansion of transplant immunology services to support solid organ transplant and haematopoietic stem cell transplant (HLA typing with High Resolution, HLA Antibody testing and HLA Cross-matching) started in 2020 and is planned to be extended nationwide.

TMS is committed to the provision of holistic patient-centred care for all patients requiring transfusion while maintaining quality of care for blood donors. As part of the national strategic plan for TMS, several regional blood centres (Pusat Darah Wilayah, PDW) are being planned apart from PDN, namely PDW Utara, PDW Sabah, PDW Tengah, PDW Selatan, PDW Sarawak and PDW Pantai Timur. In RMK 10, two new regional blood centres were approved and PDW Sabah will be built in Kota Kinabalu, Sabah and PDW Utara in Sg Petani, Kedah. This will enable the expansion of services and expertise in Transfusion Medicine Service especially in the field of platelet immunology testing; specialised blood products supply such as rare phenotype blood and platelet cross match for platelet refractoriness cases throughout the country. It is therefore critical for Transfusion Medicine Services nationwide to move in tandem with the NSP CCC to ensure access and availability to safe, quality and adequate blood supply nationwide including for cancer patients. Furthermore, the TMS will work toward ensuring various specific requirements for cancer patients such as irradiated cellular blood products for haemato-oncology patients, apheresis platelets and the provision of filtered red blood cells can be met together with expansion of transplant immunology services.

10.4.2 Plan of Action Matrix

i. Radiotherapy & Oncology (**Appendix 4a**)
ii. Haematology (**Appendix 4b**)
iii. Nuclear Medicine (Treatment) (**Appendix 4c**)
iv. Paediatric Oncology (**Appendix 4d**)
v. Gynaecology Oncology (**Appendix 4e**)
vi. Colorectal (**Appendix 4f**)
vii. Breast & Endocrine (**Appendix 4g**)
viii. Transfusion Medicine Service (**Appendix 4h**)

10.5 Survivorship

10.5.1 Background

Cancer survivorship begins at the time of diagnosis until the end of life. It refers to the process of living with, through and beyond cancer. Internationally, survivorship care has been developing rapidly in recent years as there are more patients surviving cancer. However, they may have sequelae of cancer or cancer treatment which may hamper them physically, cognitively, psychologically

and emotionally. These problems may limit one's ability to do daily activities, participating in their usual activities or return to work/school. Timely rehabilitation can help in maintaining or restoring those function depending on patients' physiologic or anatomic impairment, environmental limitations, desires and life plans.

Medical Rehabilitation: Cancer Rehabilitation Program is the first of such program dedicated to cancer survivor in MOH. It is a reconditioning program which aims to prevent or lessened the effect of cancer or its treatment through education series, exercise program, nutritional program and strategies to restore or maintain physical function. Generally, this program is delivered in the outpatient setting and introduced to patients as early as possible by the treating team. Further rehabilitation strategies such as return to work program are applied according to patients' needs. Program development and pilot project is currently ongoing in Hospital Sultan Ismail Johor Bahru. Those with severe disability such as neurological impairment due to brain or spinal cord involvement, amputation or joint replacement should be referred to a Rehabilitation Physician.

Medical Rehabilitation services are available in all MOH hospitals, delivered through different levels of care. In most facilities, care is delivered by allied health professionals (i.e. Physiotherapist and Occupational Therapists). Medical Rehabilitation Specialist care is available in almost all state hospitals and several major district hospitals. This creates an opportunity to develop and run this program especially in hospitals with Rehabilitation Physicians and Oncologists.

The common challenges faced in delivering rehabilitation service includes:

1) Limited number of human resources particularly for allied health professionals i.e., physiotherapist and occupational therapist, rehabilitation nurse, counsellors and dietitian.
2) Limited space to run the program as most physiotherapy and occupational therapy area are not at the same location, small gymnasium or therapy areas.
3) Limited budget for equipment purchasing/replacement and training.

Nevertheless, this program is feasible (within facility capability) and may be expanded to a survivorship program as it matures. Future plans should include development of the National Consensus and service standards.

Vocational Rehabilitation is a series of services to facilitate the entrance into or return to work of individuals with disabilities. It provides vocational and rehabilitative services to individuals to help them secure, regain or retain employment. Based on the MNCR report 2012-2016, the incidence of all cancers in males and females increased after the age of 30 years old, which is an age where career plays an important role in one's life (2). Employment is also reported to be one of the unmet needs in Asian patients living with cancer in a middle-income setting (12). This shows that employment is associated with higher quality of life.

However, a meta-analysis and meta-regression of 36 studies assessing the association of cancer survivors and unemployment has reported that cancer survivors are 1.37 times more likely to be unemployed than healthy control participants. The report also stated that job discrimination, difficulty combining treatment with full time work, and physical or mental limitation may be the major causes of unemployment (13). Therefore, a strategic plan for vocational

rehabilitation in cancer patients during survivorship is essential and collaboration with various related agencies is also crucial in executing this plan.

Vocational rehabilitation services are not readily available within government facilities in Malaysia. Most of the vocational rehabilitation are implemented by professional bodies and non-governmental organisations (NGOs). The Cancerfly Networks is one NGO that aims to provide employment and advertising opportunities to cancer survivors and to their next of kin. They organise a series of events that encourage cancer survivor's participation and provide a platform of job opportunities for cancer survivors. They often collaborate with other agencies such as the MOH, Ministry of Human Resource, other NGOs and professional bodies. They have launched a Cancerfly employment portal and Canbazaar HKL in 2017 and co-organised the first job fair for cancer survivors called 'CanMERDEKA Career Carnival' on 17 October 2019 in collaboration with the Faculty of Medical and Health Sciences Universiti Putra Malaysia (UPM), Cancer Resource and Education Centre UPM and JobsMalaysia.

10.5.2 Plan of Action Matrix

Please refer to **Appendix 5**.

10.6 Palliative Care

10.6.1 Background

Palliative care is an approach that improves the quality of life of patients and their families facing the problems associated with life threatening illness through the prevention and relief of suffering. It is a field that has been developing in Malaysia since the early 1990s and continues to grow. Specialised services have been developed in several state and major specialist hospitals, and NGO hospices are also available in almost all states across the nation.

In October 2019, a National Palliative Care Policy and Strategic Plan 2019-2030 was published. It provides a framework for the development of a nationwide palliative care program that is more out-reaching and equitable for the entire population. The vision is to provide a minimum standard of palliative care for all who need it wherever they may be in the country.

10.6.2 Plan of action matrix

Please refer to the National Palliative Care Policy and Strategic Plan 2019-2030, accessible via the following webpage:
http://www.moh.gov.my/moh/resources/Polisi/BUKU_NATIONAL_PALLIATIVE_CARE_POLICY_AND_STRATEGY _PLAN_2019-2030.pdf

10.7 Traditional and Complementary Medicine

10.7.1 Background

In the MOH, the role of T&CM services for cancer is mainly to improve the quality of life of the patients, allowing them to cope better with treatment by reducing the side effects, as well as relieving pain and suffering. A nationwide survey conducted in 2004 found that 69.6% of the population had used T&CM in their lifetime while 55.6% had used T&CM in the last 12 months prior to the survey. The results of the National Health and Morbidity Survey (NHMS) 2015 also showed that 29.5% of survey participants had used T&CM with consultation.

At present, T&CM in Malaysia exhibits four unique features. Firstly, it is highly diversified in terms of heritage, history, language, philosophy, ethnic origin, geographical distribution and stages of development of each practice. Secondly, T&CM is strongly linked to the culture and heritage of each ethnic group in Malaysia. Thirdly, the provision of T&CM services in Malaysia is dominated by the private sector (mainly sole proprietors) with limited involvement of the public sector. Fourthly, Malaysia's rain forest is rich in flora and fauna. This rich natural and cultural resources possess 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. All these features are exerting strong influences on the healthcare system in Malaysia.

The diversity of T&CM practice areas recognised in Malaysia poses a challenge to the legislative efforts, and thus, the T&CM Acts 2016 has to be implemented using a phased approach. In addition, the concept of "appropriateness" when developing legislation and suitable healthcare models for T&CM should be emphasised. A "one size fits all" concept is definitely not suitable for T&CM in Malaysia as it is not possible to have a single management approach that would apply uniformly across each practice area.

10.7.2 Plan of Action Matrix

Please refer to **Appendix 6**.

10.8 Research and Development

10.8.1 Background

Cancer is the second most common cause of death in Malaysia after cardiovascular diseases. Most cases still present at late stages, resulting in poor survival. The direct and indirect costs of cancer is high and is rising further. There is a need to increase impact on cancer control and care with limited resources (value-based medicine). Research in Malaysia is mainly carried out by government research institutes, public and private universities, as well as NGOs.

The 5-year goals of the NSPCCP in Research are:

1. To better manage cancer through breakthroughs in cancer screening, diagnosis and treatment.
2. To consolidate research groups across the country to address national cancer research needs.
3. To improve cancer patient management via improvements in process triangulation and modelling.
4. To translate research findings into implementable policies.
5. To better facilitate entry of cancer patients into clinical trials for improved survivability.
6. To improve private-public partnership in cancer research.

Strategies:

1. Develop research in priority areas (see below).
2. Align individual research to the national needs.
3. Consolidate research and develop long term research programs to ensure continuity to address complex research questions.
4. Establish scientific advisory boards which carry out periodic reviews and advisory sessions at national, institutional and program levels.
5. Improve support for researchers:
   (a) To facilitate sharing of facilities and laboratories at national level.
   (b) To facilitate local and international collaborative research and promote partnerships between public and private sectors.
   (c) To build up the capability of researchers to reach excellence at international level.
6. Encourage novel and impactful research which ultimately benefit health and improve healthcare of cancer patients.
7. Strengthen human resource capacity and expertise:
   (a) Facilitate recruitment and retention of experienced researchers to develop critical mass of the expertise.
   (b) Develop staff-exchange program.
   (c) Improve opportunity for training of researchers.
   (d) Establish post-doctoral fellowships.
   (e) Increase number of laboratory support staff.

Research priority areas [the sequence does not indicate level of importance]:

1. Screening and early detection of major cancers:
   (a) Evaluation and improvement of existing cancer screening programs, cancer prevention and promotional program.
   (b) Development and evaluation of biomarkers and other modalities for screening and early detection of cancers.

2. To study the cancer risk factors in order to develop new ways to prevent, detect and treat cancer
   (a) Identification of cancer burden attributable to modifiable risk factors.
   (b) Studies on environmental and dietary factors in cancer development.
   (c) Identification and development of biomarkers for cancer prevention.
   (d) Studies on awareness, knowledge, attitude and practice of general public on cancer risk factors to identify strategies for behavioural intervention.

3. Diagnostics:
   (a) Develop new biomarker-based diagnostic, predictive and prognostic tools.
   (b) Enhance accessibility, efficiency and timeliness of diagnostic services (pathology and diagnostic imaging).

4. Treatment of major cancers:
   (a) Research to provide evidence for the implementation of value-based medicine (especially for precision medicine & immunotherapy) for cancer patients.
   (b) Improve accessibility to new drugs by conducting clinical trials for cancer treatments.
   (c) Treatment de-escalation and drug repurposing.
   (d) Research to provide evidence for the implementation of supportive treatments for cancer patients.
   (e) Improve the rate of treatment completion.

5. Research on rehabilitation and palliative care:
   (a) Delivery and performance of rehabilitation and palliative care services.
   (b) Accessibility to facilities and provision of pain management.

6. Psycho-socio-economic impact and improvement in cancers
   (a) Financial impact of cancer control in the country and nation.
   (b) Cancer survivors and caretakers:
      i. Quality of life
      ii. Psychological consequences
      iii. Self-help and peer support groups
      iv. Follow-up and after care
      v. Impact on social life
      vi. Functioning

7. Cancer health literacy of general population, patients and healthcare practitioners:
   (a) Cancer health literacy and its relation to cancer prevention, early detection, diagnosis, treatment and palliative care
   (b) Studies on cancer patients and its associated factors with non-compliant, default or refusal of cancer treatment
   (c) Studies to address causes of late presentation of cancers (population behavioural issues & health system issues).

10.8.2 Plan of Action Matrix

Please refer to **Appendix 7**.

10.9 Monitoring and Surveillance

10.9.1 Background

Accurate and comprehensive data coverage are essential for planning and evaluating cancer control policies, planning public health program and improving patient care. In 2019, online notification of cancer cases via the Malaysian Health Data Warehouse (MyHDW) has commenced through Patient Registry Information System (PRIS). Still in the early phase, training for data submission, monitoring of data quality and system improvements are the focus by the Malaysian National Cancer Registry (MNCR). Appropriate infrastructure and trained personnel need to be available in the MNCR and all facilities to support the system. The second five-year report "MNCR 2012-2016" was published in 2019. The report also included the comparison with the first MNCR report with information on the trend and the burden of cancer in Malaysia for the period of ten years (2007-2016).

10.9.2 Plan of Action Matrix

Please refer to **Appendix 8**.

10.10 Human Capacity Building and Development

10.10.1 Background

The number of cancer cases in Malaysia continues to increase. In 2007 to 2011, a total of 103,507 cancer cases were reported to MNCR, and the number had increased to 115,238 cases in 2012 to 2016. In view that more people are affected by cancer, there is also a rapid growth in demand of cancer healthcare services. In order to ensure high-quality cancer care services, it is essential to have a skilled and sustainable workforce in the field. There is also the need to overcome the shortages in some areas of essential workforce.

10.10.2 Plan of Action Matrix

Please refer to **Appendix 9**.

11 PATIENT NAVIGATION

Patient navigation is a community-based healthcare delivery support system advocating timely diagnosis and treatment of cancer patients across the healthcare continuum by eliminating barriers to care. The Patient Navigation Program (PNP) was first initiated in 1990 at Harlem Hospital Centre, New York by Dr Harold P. Freeman following a report issued by the American Cancer Society on 'Report to the Nation: Cancer in the Poor'. The program focused on saving lives from cancer by eliminating barriers to timely care between the point of a suspicious finding and the resolution of finding by further diagnosis and treatment (14).

Based on the MNCR 2012-2016 report, 64% of all cancer cases were detected at Stages III and IV at time of diagnosis. Late-stage diagnosis affects treatment outcomes and reduce the chance of survival. There were many factors contributing to the majority diagnosed at late-stage. According to a meta-synthesis study in 2015 on 'Exploring barriers to health seeking behaviour among Malaysian Breast cancer patients' (15) the common barriers identified consist of:

1. **Lack of knowledge** in symptoms appraisal as a factor in delayed presentation: Non-recognition of cancer symptoms and seriousness of symptoms; Unawareness of being at risk effecting immediate treatment.
2. **Psychological burden** as factor of delay treatment: Denial and psychological stress leading to delay in treatment-seeking.
3. **Socio-cultural** effects on health decision: Cultural beliefs towards traditional care and friends and family member's advice hindering immediate access to medical diagnosis and care.
4. **Health system issues**: Delays in referral and appointments to diagnostic facilities indirectly affect early diagnosis and treatment outcome; lack of communication between healthcare provider and patient may result in misunderstanding that reduces patient's trust and compliance to care.

In order to overcome these barriers to care, a patient navigation program is a potential community-based solution to improve survivorship of cancer. The scope of patient navigation covers across the entire healthcare continuum, including prevention, detection, diagnosis, treatment and survivorship to the end of life.

In Malaysia, PNP was initiated in 2014 spearheaded by the Cancer Research Malaysia (CRM) in collaboration with the MOH, aiming to manage breast cancer patients especially those from the B40 community. The pilot program involving the Hospital Tengku Ampuan Rahimah Klang (HTAR) and CRM aimed to overcome barriers faced by patients in the continuum of care by allocating a meeting room, known as the Pink Ribbon Centre (PRC) as the location for the hospital-based navigation.

In 2015, the program in this centre alone has successfully navigated 669 breast cancer patients and recorded a total of 7,585 registered visits to the PRC. In 2019, through collaborative efforts, the PNP has expanded to other centres i.e., HQE II, HTJS and HUS.

Following the success of the PNP in breast cancer patients, further implementation of the PNP in other cancer of national interest will be carried out. As the philosophy of patient navigation encourages a system of healthcare delivery by supporting timely movement of individual patient through healthcare system, barriers to timely care across healthcare continuum are expected to be further eliminated.

12 ACTION WITH OTHER NON-GOVERNMENT STAKEHOLDERS

Like most other countries, Malaysia has a dual-tiered healthcare system; one is by government-run public services and another by the private sector. The private sector comprises of private clinics and hospitals, private companies (laboratories, ambulance services and pharmaceuticals), several NGOs and other privately-owned health-related services. With regards to cancer care, the private sectors play a significant role particularly in providing healthcare services through private clinics and private hospitals, providing pharmaceutical assistance, organising cancer awareness campaigns, providing supportive services as well as welfare support for cancer patients.

Hence, to ensure a comprehensive and holistic approach in cancer control program, involvement with other stakeholders at every level is important. Further collaboration with relevant agencies, NGOs, professional bodies and other stakeholders is addressed accordingly in this strategic plan.

The involvement and collaboration of other stakeholders; particularly NGOs, private healthcare sector and Academia (Universities) in this strategic plan is summarised according to focus areas below:

Focus Area 1:	Prevention and Health Promotion	-	NGOs, private healthcare sectors
Focus Area 2:	Screening and Early Diagnosis	-	NGOs, private healthcare sector, Universities
Focus Area 3:	Diagnosis	-	Private healthcare sectors, Universities
Focus Area 4:	Treatment	-	NGOs, Universities
Focus Area 5:	Survivorship	-	NGOs
Focus Area 7:	Traditional and Complementary Medicine	-	NGOs, private healthcare sectors
Focus Area 8:	Research and Development	-	Universities, NGOs, private healthcare sectors
Focus Area 9:	Monitoring and Surveillance	-	Private health sectors, Universities

13 CONCLUSION

The NSPCCP 2021-2025 provides the framework for all relevant stakeholders in cancer prevention and control in Malaysia to work together in reducing the negative impact of cancer by decreasing the disease morbidity, mortality and to improve the quality of life of cancer patients and their families.

Similar with the previous NSPCCP 2016-2020, this new strategic plan also addresses cancer prevention and control from a holistic viewpoint that cuts across the continuum, spans from prevention and health promotion, screening and early diagnosis, diagnosis, treatment, survivorship, palliative care as well as T&CM and research. Ten specific objectives which are in line with the ten focus areas of concern are identified; where their respective targets and strategised action plans are essential for instituting a comprehensive cancer prevention and control program for the country until 2025. Accurate and timely cancer information will not be obtained without systematic and timely data collection and reporting. Likewise, access to cancer care will not be improved without improving the required human capacity. This NSPCCP sees these two important aspects as new focus areas that must be addressed.

The ability to implement the outlined strategised action plans is important to enable Malaysia to achieve the overall targets set in this strategic plan. Sufficient resources together with continuous support and commitment from all relevant stakeholders in government, NGOs, professional bodies, private cancer centres and facilities as well as pharmaceutical companies is required to reduce the cancer burden in the country.

REFERENCES

1. Sung H., Ferlay J., Siegel R.L., Laversanne M., Soerjomataram I., Jemal A. et al (2021). Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin,71(3) :209–49.
2. Ab Manan A., Basri H., Kaur N., Abd Rahman S.Z., Amir P.N., Ali N. et al (2019). Malaysia National Cancer Registry Report (MNCR) 2012-2016.
3. Health Facts 2020 (Reference Data for year 2019). 2020;20(October):1–19.
4. National Cancer Institute. Malaysian study on cancer survival (MySCan). Vol. 4, National Cancer Institute, Ministry of Health Malaysia. 2018. 1–72 p.
5. Kimman M., Jan S., Yip C.H., Thabrany H., Peters S.A., Bhoo-Pathy N. et al (2015). Catastrophic health expenditure and 12-month mortality associated with cancer in Southeast Asia: Results from a longitudinal study in eight countries. BMC Med,13(1).
6. The Impact of Noncommunicable Disease and Their Risk Factors on Malaysia's Gross Domestic Product. Putrajaya, Malaysia: Ministry of Health Malaysia.
7. United Nations Sustainable Development Goals. Goal 3: Good Health and Well-being. Retrieved from: https://www.un.org/sustainabledevelopment/health/
8. Schliemann D., Ismail R., Donnelly M., Cardwell C.R., Su T.T. (2020). Cancer symptom and risk factor awareness in Malaysia: Findings from a nationwide cross-sectional study. BMC Public Health, 20(1):1–10.
9. Subramaniam S., Kong Y.C., Chinna K., Kimman M., Ho Y.Z., Saat N., Malik R.A., Taib N.A., Abdullah M.M., Lim G.C., Ibrahim Tamin N.S, Woo Y.L., Chang K.M., Goh P.P., Yip C.H. & Bhoo-Pathy N. (2018). Health-related quality of life and psychological distress among cancer survivors in a middle-income country. Psychooncology, 27(9): 2172–9.
10. Shortt J., Polizotto M.N., Waters N., Borosak M., Moran M., Comande M., Devine A., Jolley D.J. & Wood E.M. (2009). Assessment of the urgency and deferability of transfusion to inform emergency blood planning and triage: the Bloodhound prospective audit of red blood cell use. Transfusion,49(11): 2296–303.
11. Tas F., Eralp Y., Basaran M., Sakar B., Alici S., Argon A. et al (2002). Anemia in oncology practice: Relation to diseases and their therapies. Am J Clin Oncol Cancer Clin Trials, 25(4): 371–9.
12. Bhoo-Pathy N., Kong Y.C., Bustaman R.S., Matin Mellor A., Zaharah H., Taib N.A. et al (2019). Needs of cancer patients in an Asian Setting. Ann of Oncol, 30(9): ix140-ix150.
13. G.E.M. de Boer A., Taskila T., Ojajarvi A. et al (2009). Cancer Survivors and Unemployment: A Meta-analysis and Meta-regression. Am Med Assoc. ,301(7): 753–62.
14. Freeman H.P., Rodriguez R.L. (2011). History and principles of patient navigation. Cancer,117(SUPPL. 15): 3537–40.

15. Yu F.Q., Murugiah M.K., Khan A.H., Mehmood T. (2015). Meta-synthesis exploring barriers to health seeking behaviour among Malaysian breast cancer patients. Asian Pacific J Cancer Prev, 16(1):145–52.

16. Ministry of Health Malaysia (2017). Clinical Practice Guidelines Management of Colorectal Carcinoma. Putrajaya, Malaysia: Malaysian Health Technology Assessment Section.

17. Ministry of Health Malaysia (2016). National Plan of Action for Nutrition in Malaysia III. Putrajaya, Malaysia: National Coordinating Committee on Food and Nutrition.

APPENDICES

Appendix 1	Prevention and Health Promotion
Appendix 2	Screening and Early Diagnosis
Appendix 3a	Pathology
Appendix 3b	Radiology
Appendix 3c	Nuclear Medicine (Diagnosis)
Appendix 4a	Radiotherapy and Oncology
Appendix 4b	Clinical Haematology
Appendix 4c	Nuclear Medicine (Treatment)
Appendix 4d	Paediatric Oncology
Appendix 4e	Gynaecology Oncology
Appendix 4f	Colorectal
Appendix 4g	Breast & Endocrine
Appendix 4h	Transfusion Medicine Service
Appendix 5	Survivorship
Appendix 6	Traditional and Complementary Medicine
Appendix 7	Research and Development
Appendix 8	Monitoring and Surveillance
Appendix 9	Human Capacity Building and Development

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
1	**To increase health-seeking behaviour through awareness and knowledge of general public and healthcare providers (HCPs) on common cancers**	1.1 Develop a Strategic Communication Plan – to address stigma against cancer	Plan developed	2022	MOH (to coordinate)
		1.2 Development of a dedicated landing page of Malaysian Cancer Awareness in MyHealth Portal. Portal will consist of: a) Resources for public and caregivers, common signs and symptoms of common cancer and risk factor. b) E-learning for HCPs c) E-learning for NGO (knowledge for advocacy)	Landing page developed	2022	MOH (BKP, BPK, IKN)
		1.3 Increase promotional activities for the general public (prevention/ modifiable risk factors, signs and symptoms of common cancers, importance of screening, unproven therapies) via conventional media (TV channels - RTM, TV3, Astro, Radio). Proposed themes: • Cervical Cancer Awareness Month – January • World Cancer Day – February • Colorectal Cancer Awareness – March	During each awareness months, at least: • 2 infographics (Malay & English) • 1 slot at TV • 2 slots at radio • 1 factsheet	8 topics per year	MOH (BPK, BKP, BPKK, OHP, IKN), NGO, Academy of Family Physicians of Malaysia

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		• NPC Awareness Month – April • Prostate Cancer Awareness Month – September • Breast Cancer Awareness Month – October • Lung Cancer Awareness Month – November • Mouth Cancer Awareness Week – November	·		
		1.4 Increase promotional activities via new media for general public (prevention/modifiable risk factors, signs and symptoms of common cancers, importance of screening, unproven therapies): • Portal MOH/BPK/IKN/ MySejahtera • Social Media (Facebook, Instagram, Telegram, Twitter)	Number of reach and views Number of promotion activities on social media Baseline for MOH social media 2019 (Twitter, Facebook, Instagram)[5]: Total number of cancer-related posts: 18 Total number of reach/views: 28,143	Increase 5% of views/year Increase number of posts on social media by 25%/year	MOH (BPK, BKP, IKN), NGOs, Private sectors

5 Source: Information from Portal MYHEALTHKKM

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.5 Development of promotional materials for dissemination through media / outreach program: • Infographics • Videos • Printed materials	Number of publication on infographics/videos/ printed materials	Infographics: 24/6 months Videos: 5/year Printed materials: 3 topics/year	MOH (BPK, BKP, IKN), NGOs, Private sectors
		1.6 Cancer Outreach programs by PKD	Number of programs conducted per year conducted by PKD at district level	One (1) activity / district / year	MOH (JKN, PKD)
		1.7 Cancer Outreach programs with NGOs	Number of programs per year organised by MOH at HQ level	At least two (2) programs per year	MOH (NCD), NGOs
		1.8 Cancer Outreach programs with KOSPEN / COMBI. Cancer topics: Risk factors, importance of cancer screening and patient navigation included in every outreach program at community-level organised by HQ, State, District	Number of KOSPEN / COMBI localities conducting cancer outreach program per year	At least one (1) activity/locality/ year	MOH (BKP, JKN/PKD and KOSPEN, COMBI)

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.9 Training of HCPs (public and private) using e-learning modules. The same modules can be used by the Academy of Family Physician to train the GPs	Number of HCPs in private and government health centre completed e-learning module	At least 500 new HCPs (public and private) completed e-learning module per year	MOH (BKP, JKN, PKD), Professional Bodies, NGOs
		1.10 Training of NGOs using e-learning module. The modules can also be used by other agencies	Number of NGOs trained	Two (2) NGOs/ state/ year	MOH (BPK, BKP)
		1.11 Specific promotion activities for colorectal cancer. Priority to promote to high-risk population[6] *Further detail for strategised actions on colorectal cancer can be referred at the National Strategic Plan for Colorectal Cancer 2021-2025	At least one (1) program per year conducted by JKN at State level	One (1) activity/ state/ year	MOH (BPK, JKN)
		1.12 To create awareness on performing Breast Self-Examination (BSE) among Malaysian women and to encourage Malaysian women to come forward for CBE via social media platform (Facebook, Twitter and Instagram)	Frequency of posting	Twice a month (early and end of the month)	MOH (BPKK)

6 Clinical Practice Guidelines: Management of Colorectal Carcinoma, Ministry of Health Malaysia (2017) (16)

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.13 To encourage Malaysian woman to come forward for Pap Smear examination or HPV testing via social media platform (Facebook, Twitter and Instagram)	Frequency of posting	4 times per year	MOH (BPKK)
		1.14 To promote Breast Care and Cervical Cancer Awareness during waiting time in clinics	Frequency of breast cancer and cervical cancer awareness shows or talks given by HCPs	Once a month	MOH (BPKK, JKN, PKD)
		1.15 To strengthen women's health literacy through provision of animated materials and infographics on breast and cervical cancers	Frequency of community surveys conducted via social media.	2 times a year	MOH (BPKK, JKN)
		1.16 To strengthen the skill among new HCPs in conducting CBE by introducing Mentor Mentee Program	Percentage of new HCPs involved in Mentor-Mentee Program	Yearly performance 90%	MOH (BPKK)
		1.17 Collaborate with intra-/inter-agencies on Oral Cancer Awareness activities Baseline data 2019: Number of activities conducted: 11,576 activities (source: PKP201C, Oral Health Program, 2019)	Number of oral cancer awareness activities conducted through collaboration	10% increase yearly	MOH (OHP), OCRCC, NGOs (MDA, MPDPA)

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.18 Oral Cancer Training for HCPs Baseline data 2019: 18,049 personnel involved in Oral Cancer Training and 25 trainers (source: Appendix 7 Latihan Berkaitan Program Kanser Mulut, Program Kesihatan Pergigian, 2019)	Number HCP involved in Oral Cancer training	5% increase yearly	MOH (OHP, JKN/PKD), OCRCC, NGOs (MDA, MPDPA, MMA)
2	**To strengthen the intervention of specific cancer risk factors**	2.1 To strengthen the implementation of Tobacco Control Programme to reduce the national smoking prevalence. Substantial articles of World Health Organization Framework Convention on Tobacco Control (WHO FCTC) to be strengthened:			MOH (BKP),mQuit partners, WHO FCTC Steering Committee and 10 related Ministries
		• Article 6: Price and tax measures to reduce the demand for tobacco	Increase tax imposed from retail price (most popular brand)	Tax imposed increased from current 45% to 70%	
		• Article 8: Protection from exposure to tobacco smoke	Increase number in public places gazetted as no smoking area / places (current 23 area/ places gazetted)	All public places gazetted as no smoking area/place	

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		• Article 11: Packaging and labelling of tobacco products	Implementation of pictorial health warning (PHW) on all tobacco products	PHW implemented on all tobacco products packaging and plain packaging implemented	
		• Article 12: Education, communication, training and public awareness AND Article 14: Demand reduction measures concerning tobacco dependence and cessation	Prevalence of smoker in Malaysia (21.3% in NHMS 2019)	Prevalence of smoker reduced to <5% in 2045 (tobacco endgame)	
		• Article 16: Sales to and by minors	Improve regulation on sales by minor (< 18 years old currently still allowed)	Sales by minor not allowed	
		2.2 To reduce obesity prevalence in Malaysia by strengthening obesity intervention implementation	*To refer NPANM III[7] (Enabling Strategy 4: Preventing and Controlling Obesity and Other Diet-Related NCDs)	*To refer NPANM III (Enabling Strategy 4: Preventing and Controlling Obesity and Other Diet-Related NCDs)	MOH (Nutrition Division), Professional bodies, NGOs
		2.3 To promote and support healthier food choices particularly high consumption of fruit and vegetables, and low fibre diet by continue healthy eating intervention	*To refer NPANM III (Enabling Strategy 2: Promoting Healthy Eating and Active Living)	*To refer NPANM III (Enabling Strategy 2: Promoting Healthy Eating and Active Living)	MOH (Nutrition Division), MOE, Professional bodies, NGOs

7 National Plan of Action for Nutrition of Malaysia III, 2016-2025 (17)

FOCUS AREA 1: **Prevention and Health Promotion**					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		2.4 To continue implementation of healthy lifestyle initiatives to increase active living among adult.	Index score for physical activity behaviour among adult (Malaysia Healthy Lifestyle Index)	Increment of index score for physical activity behaviour among adult	MOH (BPK)
		2.5 To sustain the implementation and monitoring the National HPV immunisation program	Percentage of 13 years old girls being vaccinated and completed 2nd dose vaccination	Yearly performance >80% from target population	MOH (BPKK)
		2.6 To sustain the implementation and monitoring of the National Hepatitis B immunisation program	Completed 3rd dose Hep B Vaccination	Yearly performance >95%	MOH (BKP, BPKK)

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
1.	**To increase and strengthen early detection of cancer (screening and early diagnosis)**	**A. Colorectal Cancer: Increase accessibility and capacity of colorectal cancer screening services**			
		1.1 To equip all cluster hospitals and/or hospital with visiting specialists with colonoscopy services	Availability of colonoscopy services in all cluster hospitals and/or with visiting specialists	By 2025 all cluster hospitals are equipped with colonoscopy set and hospital with visiting specialist/district hospitals to at least have the service using portable colonoscopy: By 2022 (First phase): 9 portable colonoscopies for Kedah, Pahang, Johor, Kelantan, Terengganu, Sarawak (2), Negeri Sembilan and Selangor	MOH (BPP)

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.2 To increase screening coverage	Percentage of screening coverage	Coverage increased from 10.8% (NHMS 2019) to 30% at NHMS 2023	MOH (BKP), Private sectors, SOCSO, NGO
		a) To encourage GPs to participate in colorectal cancer screening and early detection, with support of the Academy of Family Physicians of Malaysia (AFPM)	To initiate discussion with AFPM in 2021 and AFPM supports the initiative	By 2021, AFPM started to participate in colorectal cancer screening	MOH (BKP) AFPM
		b) To expand iFOBT screening at KOSPEN and screen the eligible volunteers	Implementation of iFOBT screening for the KOSPEN volunteers	By 2025, 80% of all eligible KOSPEN volunteers screened using iFOBT	MOH (BKP), JKN, PKD
		c) To explore the possibilities of adding iFOBT screening under SOSCO's Health Screening Program	Discussion with SOSCO's officials in 2022	iFOBT screening services included in SOCSO's Health Screening Program/ activity by 2025	MOH (BKP), SOCSO
		d) iFOBT screening included in PeKa B40	iFOBT screening in PeKa B40 Health Screening Scheme	iFOBT screening services included in PeKa B40 Health Screening Scheme by 2025	MOH (BKP), Protect Health

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.3 To strengthen navigation, referral pathway and supportive care for colorectal cancer	Development of navigation and referral pathway	Navigation and referral pathway developed / incorporated under Guideline for Screening & Early Detection and being used as reference	MOH (BKP, JKN, PKD), NGOs
		1.4 To promote and encourage screening for asymptomatic first-degree relatives of Colorectal Cancer using current modalities	Screening for asymptomatic first-degree relatives included in the Colorectal Cancer Screening and Early Diagnosis Programme	By 2021, screening for first degree relatives of colorectal cancer is being promoted and practised	MOH (BKP/BPP/ BPKK / JKN)
		B. Breast Cancer			
		1.1To enhance knowledge on latest information, management and treatment of breast cancer as well as to improve the quality of clinical breast examination by continuous training of primary HCPs through various platform (CME, CNE, webinar etc.)	Percentage of HCPs trained	At least 80% of primary HCPs trained every year	MOH (BPKK, BPP, JKN, PKD), Universities, NGOs, Professional bodies.

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.2 To reinforce navigation and effective referral pathway in breast cancer prevention and early diagnosis	Refinement of Patient Navigation Guideline in Brest Cancer	To be ready by 2021	MOH (BPKK, JKN, PKD)
		1.3 Early referral to Surgeons from other healthcare facilities for all suspected breast cancer cases (clinical/radiological symptoms) and facilitating the process of getting early appointment	Percentage of patients at high risk of having Breast Cancer and/or having suspicious symptoms of malignancy / lump / lesion should be given an early appointment within ≤ 14 working days	≥80% (3 monthly) (NB: Old KPI – dropped in 2020)	MOH (BPKK Family Medicine Specialists, Liaison Officer/ dedicated MO, JKN)
		1.4 To increase CBE coverage and early detection	Percentage of women aged 20 to 65 years examined per year by each nurse and doctor	30% population coverage	MOH (BPKK, JKN, PKD)
		1.5 To foster smart partnership with other agencies and NGOs in improving access for women screened at primary care facilities to undergo mammography examination	Percentage reduction in the average waiting time for mammography appointment	25% reduction from the average waiting time (e.g., average waiting time: 8 months, the target is 6 months	MOH (BPKK, JKN), Hospitals

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		C. Cervical cancer			
		1.1 Implementation of more effective cervical cancer screening program through self-sampling HPV testing as primary screening test among women age 30-65 years	Number of states implementing HPV testing	Phase 1: 2019 started in 3 states (Kuala Lumpur & Putrajaya, Kedah and Kelantan) Phase 2: 2020 add another 4 states (Negeri Sembilan, Selangor, Penang and Sarawak) Phase 3: 2021 add another 3 states (Kuala Terengganu, Johor, Melaka) Phase 4: 2022 add another 4 states (Perak, Pahang, Perlis and Sabah) Nationwide by 2024/2025	MOH (BPKK)
		1.2 To increase effective screening coverage on the targeted population and improve early detection	Percentage of women aged 30-65 years screened for cervical cancer	40% by 2025	MOH (BPKK, JKN, PKD), NGOs

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		1.3 To foster smart partnership with other agencies and NGOs in enhancing cervical cancer screening coverage among women aged 30-65 years	Percentage of women aged 30-65 years screened for cervical cancer	40% by 2025	MOH (BPKK), NGOs
		1.4 To ensure a prompt intervention after positive diagnosis of HPV infection	Percentage of confirmed cases seen by gynaecologist in 2 weeks (after getting result)	Waiting time <2 weeks	MOH (BPKK, BPP)
		1.5 To improve the quality of cervical cancer screening continuous training of primary HCPs through various platform (CME, CNE, webinar etc)	Percentage of HCPs trained	At least 80% of primary HCPs trained every year	MOH (BPKK, JKN, PKD)
		1.6 Use of Liquid Base Cytology (LBC) for all pap smear	Percentage of LBC pap smear used in clinics and hospitals. This is for screening and follow-up of cervical and endometrial cancer patients	Target 80% from target population by 2022/2023	MOH (BPKK)

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		D. Oral cancer *Oral Cancer Screening Program, refer to Guidelines on Primary Prevention and Early Detection of Oral Potentially Malignant Disorders and Oral Cancers (2018)			
		1.1 Increase coverage of opportunistic screening for oral cancer	Percentage of opportunistic oral cancer screening for walk-in patients	10% increase every year for opportunistic screening Baseline data 2019: Total 112,748 patients (age 18 year and above)	MOH (OHP), NGO, MPDPA
		1.2 Improve coverage of high-risk community screening for Oral Cancer	Number of people in high-risk community (>18 years old) screened for Oral Cancer	10% increased every year Baseline data 2018: 2,972 patients	MOH (OHP), NGO, MPDPA
		1.3 Increase early detection of Oral Cancer cases	Percentage of Oral Cancer cases detected at Stage 1	30% of oral cancer detected at Stage 1. Baseline data 2019: 15.6% (MNCR 2012-2016)	MOH (OHP), NGO, MPDPA

FOCUS AREA 2: Screening and Early Diagnosis					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / collaborating Agencies**
		E. Monitor Cancer Screening			
		Monitor screening activities through an online system	An online cancer screening database is developed and operational	By 2025, an online cancer screening database is developed and can be used (an online screening data base with sub-modules for colorectal, breast, cervical (pap smear and HPV DNA) and oral cancers under the e-CDC platform where all information on screening until diagnosis are registered)	MOH (BKP, BPM)

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
1.	**To 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 of:**	**A. Anatomical Pathology**			
		1.1 To establish IHC, ISH, PCR and sequencing-based molecular tests at identified centres on solid tumours.	a. To enhance molecular-based IHC in centres with subspecialty services (HKL, HSBAS, HTAA) for colorectal cancer and brain tumours	By 2025, all centres with subspecialty services will be able to provide molecular-based IHC	MOH
			b. To expand ISH-testing at identified centres for solid tumours at identified centres (HKL, HRPB Ipoh and HQE Sabah).	To expand ISH-testing for lymphoma, soft tissue tumours and paediatric malignancies in HKL by 2025 To procure FISH testing equipment, reagents and consumables for lympho-proliferative malignancies in HQE Sabah and HRPB Ipoh by 2025	MOH
			c. To establish PCR and sequencing diagnostics in HKL focusing primarily on solid tumours	To establish PCR and sequencing diagnostics in HKL by 2022 for colorectal carcinoma and other cancers by 2025	MOH

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
			d. To expand molecular service to HUS focusing on lung cancer	Renovation of testing site in HUS Sarawak by 2022 To procure PCR-based equipment, reagents and consumables for molecular service in HUS Sarawak by 2023 To provide the molecular service focusing on lung cancer in HUS Sarawak by 2025	MOH
		1.2 To strengthen molecular testing on liquid biopsy samples for cancers	To strengthen PCR and high-through put sequencing diagnostics focusing on liquid biopsy for disease monitoring	To establish testing on liquid biopsy for screening, treatment monitoring, recurrence and metastasis in cancers by 2025	MOH

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		B. Chemical Pathology			
		1.3 Expand the range of new tumour markers for testing in IKN. (List of tumour markers: calcitonin, chromogranin A, HE4, HER2-neu, PIVKA2, CYFRA 21-1 and PROGRP)	a. To offer newly introduced tumour markers internationally recognised and accepted for cancer monitoring	Achieve all of the tumour markers by 2025	MOH
			b. To upgrade and back up first equipment	100% of equipment shall be placed and added	
		1.4 Establish proteomics testing for oncology in IKN	To renovate testing site and to procure equipment and reagents	Renovation of testing site shall be completed in IKN by 2025 100% of equipment and reagent shall be procured by 2025	MOH

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		C. Haematology			
		1.5 To start and expand molecular services	a. To expand molecular detection of common translocations in leukaemia at Hospital Tunku Azizah and to take over service from IMR as referral centre	By 2023, Hospital Tunku Azizah will be able to take over up to 50% of the service from IMR To upgrade equipment and procure reagents, consumables and EQA by 2023	MOH
			b. To start molecular detection of common translocations in leukaemia at HQE, Sabah	By 2022, HQE will be able to start the service To procure equipment, regents, consumables and EQA by 2022	MOH
			c. To start new service (AML Mutation Study) at Hospital Tunku Azizah and to take over from IMR as referral centre	By 2023, Hospital Tunku Azizah will take over the service from IMR as referral centre To procure reagents, consumables and EQA by 2023	MOH

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
			d. To expand Major BCR-ABL1 quantification service for monitoring of CML cases using existing platform at identified locations	By 2021, will start the service at: 1. HQE, Sabah 2. Hospital Melaka 3. HTAA Kuantan To procure reagents, consumables and EQA by 2021	MOH
			e. To change chimerism assay method at HTA from STR to Real Time Quantitative PCR	By 2022, HTA will be able to change chimerism assay method from STR to Real Time Quantitative PCR To optimise the method and to procure reagents, consumables and EQA by 2022	MOH
		1.6 To strengthen the bone marrow cytogenetic service.	a. To start bone marrow cytogenetic service at HUS	By 2023, HUS will establish the cytogenetic service To procure equipment, reagents, consumables and EQA by 2023	MOH

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
			b. To expand cytogenetic service at HPP	By 2021, HPP will expand the service other than FISH for BCR-ABL1 for Northern Region To procure reagents, consumables and EQA by 2021	MOH
		1.7 To strengthen flowcytometry service	a. To expand the MRD monitoring at Hospital Tunku Azizah for adult Acute Lymphoblastic Leukaemia cases	By 2021, Hospital Tunku Azizah will be able to expand the MRD monitoring for adult Acute Lymphoblastic Leukaemia cases To procure reagents, consumables and EQA by 2021	MOH

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
			b. To start MRD monitoring for adult and paediatric Acute Lymphoblastic Leukaemia cases using local standardised protocol (Modified Euroflow protocol) 8 colours flowcytometry at two centres	Will start the service by 2021 at: 1.HSA Johor Bahru 2.HPP To procure reagents, consumables and EQA by 2021	MOH
			c. To start diagnostic service for leukaemia/ lymphoma and MRD monitoring service using 8 colours flowcytometry at HUS Sarawak	By 2021, HUS will be able to start the service To procure reagents, consumables and EQA by 2021	MOH
		1.8 To strengthen the Stem Cell Laboratory service	To upgrade Stem Cell Laboratory and to include clean room facility for cellular therapy as part of upgrading of IPHKL project RMK-12	By 2022, HTA will be able to upgrade Stem Cell Laboratory and to include clean room facility for cellular therapy as part of upgrading of IPHKL project RMK-12	MOH

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
2.	**To provide comprehensive pathology services for cancer diagnosis and to be delivered in a timely manner by appropriately qualified and trained medical professionals**	**A. Digital Pathology**			
		2.1 To establish a digital pathology system involving MOH hospitals	a. To set up a pilot project in HKL and HUS	By 2023 the completion of the pilot project with improvement for expansion	MOH
			b. KIV to expand the service to other regional centres after exploring the uses	By 2025, at least two regional centres have established the service (Sabah and East Coast)	MOH
		B. Accreditation			
		2.2 Accreditation of molecular ISH test at identified Anatomic Pathology centre	a. To achieve accreditation in centre providing the ISH service	To upgrade and achieve accreditation in the testing centre (HKL) by 2025.	MOH, Accreditation Body (DSM)
			b. For HKL to become the EQA provider for ISH (DDISH for breast cancer)	For HKL to become the EQA provider for ISH by 2025	MOH, Universities, Private sectors
		2.3 Accreditation of Molecular test at all centres providing the test	To achieve accreditation at Hospital Tunku Azizah and HQE	To achieve accreditation by 2023	MOH, Accreditation Body (DSM)

FOCUS AREA 3: Diagnosis (Pathology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		2.4 Accreditation of Cytogenetic test at identified centres.	To achieve accreditation at HUS	To achieve accreditation by 2025	MOH, Accreditation Body (DSM)
		2.5 Accreditation of Flowcytometry Service at all centres providing the test.	To achieve accreditation at all centres providing flowcytometry service	To achieve accreditation by 2022	MOH, Accreditation Body (DSM)
		C. Human Resource & Training			
		Refer to **Appendix 9** (Focus Area 10: Human capacity building and development)			

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
1	**To reduce waiting time for staging and image guided procedures**	1.1 Staging to be carried out within 2 weeks of confirmed diagnosis by HPE.	Percentage of cases with staging done within 2 weeks of confirmed diagnosis by HPE	90% by 2025	MOH
		1.2 Urgent image guided procedure performs for clinical / radiological diagnosis 'consistent with/ suspicious for/ probable' (≥75% level of certainty) of cancer to be done within 1 week.	Percentage of urgent image guided procedures perform within 1 week for cases with clinical/radiological diagnosis of cancer	80% by 2025	MOH
2	**To upgrade and replace aging radiology equipment**	2.1 To replace Mammography machine more than 10 years old with Digital Breast Tomosynthesis.	Number of Mammography machine replace yearly	At least 6 Mammography machines yearly (In centres assigned by year as below): **2021** Hospital Ampang, Hospital Melaka, Hospital Seberang Jaya, HRPB, HPP, HSA	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
				2022 HTAA, HTJS, HSBAS, Hospital Selayang, HSNZ, HIS **2023** HUS, HRPZ II, Hospital Miri, Sungai Buloh, Sultan Abdul Halim, Taiping **2024** HQE, HWKKS, Sibu, Bintulu, Teluk Intan, Pakar Sultanah Fatimah, Muar, Pakar Sultanah Nora Ismail **2025** Serdang, Langkawi, HOSHAS, Kemaman, Kajang, Seri Manjung, Tuanku Ampuan Najihah	
		2.2 To replace CT scan machine more than 10 years old.	Number of CT Scan machines replace yearly	At least 6 CT Scan machines yearly (in centres assigned by year as below): **2021** HKL, HUS, HTJS, HRPB, HTAR	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
				2022 Sungai Buloh, HQE, HRPZ II, Segamat, Serdang, Pusat Jantung HUS **2023** Pakar Sultanah Fatimah, Muar, Sultan Abdul Halim, HKL, IKN, Sibu, Kulim **2024** Ampang, Bintulu, HTAA, Labuan, Enche' Besar Hajjah Khalsom, Kluang, Taiping **2025** Miri, HWKKS, Lahad Datu, Sarikei, Limbang, Kajang, Shah Alam	
		2.3 To replace conventional fluoroscopy machine with multipurpose C-arms.	Number of Fluoroscopy machines replace yearly	At least 5 Fluoroscopy machines yearly (In centres assigned by year as below): **2021** Sultan Ismail, Selayang, Melaka, Miri, HRPB, Seberang Jaya	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
				2022 Sungai Buloh, Ampang, Bintulu, Serdang, HTAR, HQE, HUS **2023** HPP, Sultan Abdul Halim, HSBAS, HTAA, HAS, HTJS **2024** HRPZ II, HOSHAS, Seri Manjung, Sultanah Fatimah, Tuanku Fauziah **2025** Sarikei, HKL, HWKKS, Enche' Besar Hajjah Khalsom, Taiping	
		2.4 To replace General Radiography machine	Number of General Radiography machine replace yearly	25 General Radiography machines yearly. **2021** **Direct Digital Radiography (DDR)** Selayang, HSBAS, HRPB, HTAR, Sungai Buloh, HSNZ, Teluk Intan, HTJS, HOSHAS, HKL, Sibu, Sultan Abdul Halim, HSI, HTAA, HAS, Serdang	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
				Analogue Dalat, Besut, Kota Belud, Jasin, Pekan, Sungai Bakap, Jerantut, Gerik, Kota Tinggi, Kudat, Kunak, HTAA **2022** **Direct Digital Radiography (DDR)** HQE, Ampang, Melaka, Banting, HUS, HKL, HSBAS, Miri, Kajang, HPP, Selayang, HPJ, Sungai Buloh, HTJS, Melaka, HSI, HOSHAS **Analogue** Beluran, Lahad Datu, Bahagia Ulu Kinta, Sultanah Hajjah Kalsom, Cameron Highland, Ranau, Raub, Lawas, Labuan **2023** **Direct Digital Radiography (DDR)** Bukit Mertajam, Tuanku Ampuan Najihah, HUS, Pusat Jantung Sarawak,	

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
				HSA, HPP, Seberang Jaya, HRPB, Taiping, HWKKS **Analogue** Temenggung Seri Maharaja Tun Ibrahim, Mukah, HQE, Tanah Merah, Bau, Sarikei, Tanjong Karang, Inst. Perubatan Respiratori, Tumpat, Gua Musang, Jeli, Kuala Lipis, Parit Buntar, Port Dickson **2024** **Direct Digital Radiography (DDR)** Bintulu, HSNZ, Serdang, Kulim, Segamat, Sultanah Nora Ismail, HRPZ II, Kemaman, HQE II, HQE, Sultan Abdul Halim **Analogue** Lundu, Daro, Slim River, Pontian, Mersing, Sik, Kuala Kangsar, Tapah, Kampar, Tengku Anis, Pasir Puteh, Tuaran, Yan	

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
				2025 **Direct Digital Radiography (DDR)** Selayang, Sungai Buloh, HSBAS, Serdang, Ampang, HTAR, HSI, Sultan Abdul Halim, HOSHAS, HUS, Sultanah Fatimah **Analogue** Parit Buntar, Baling, Kuala Nerang, Pasir Mas, Machang, Jengka, Muadzam Shah, Betong, Sungai Siput, Rompin, Batu Gajah, Jelebu, Kuala Krai, Jitra	
		2.5 To upgrade and replace MRI machine.	Number of MRI machines replace yearly	At least 2 MRI machines yearly. **2021** - HTAR, Pusat Jantung Sarawak, Sibu **2022** – HQE II, Sultanah Fatimah, Muar **2023** - Miri, HWKKS **2024** - Selayang, IKN **2025** - Taiping, HKL, Sultanah Nora Ismail	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
		2.6 To replace Angiography machine.	Replacement of angiography machine in major centre	**2021** - HKL (Hybrid), HSBAS (Bi-Plane) **2022** - HUS (Bi-Plane) **2025** - HKL (Bi-Plane)	MOH
		2.7 To replace Ultrasound machine.	Number of Ultrasound machine replace yearly	30 Mid-High Range Ultrasound machines yearly	MOH
3	**To expand diagnostic and therapeutic radiology services.**	3.1 Mammography machine.	Mammography Machine to minor specialist Hospital and Level 1 Health Clinic.	Mammography machine is available in each centre by year indicated: **2022** - Labuan **2023** - Kuala Lipis **2024** - Keningau **2025** - Klinik Kesihatan Kuala Lumpur	MOH
		3.2 CT scans.	a. Number of CT Scan machines install in minor specialist hospital	At least 2 CT Scan machines to be install in minor specialist hospitals: **2021** - Bukit Mertajam, Slim River **2022** - Sri Aman, Gua Musang	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
				2023 - Beaufort, Kota Marudu **2024** - Banting, Besut **2025** - Port Dickson, Inst. Perubatan Respiratori	
			b. To install second CT Scan in hospital in state and major hospital with high workload. (Peninsular Malaysia: 15,000 cases per year; Sabah and Sarawak: 12,000 per year)	At least 2 CT Scan machines yearly: **2021** - HSI, HRPB **2022** - HSBAS, HUS **2023** - Pulau Pinang, Melaka **2024** - HTJS, HTAR **2025** - Seberang Jaya, HQE, Sibu	MOH
		3.2 Multipurpose C-arm.	Number of Multipurpose C-Arm install to minor specialist hospitals	Two (2) units of Multipurpose C-Arm to minor specialist hospitals: **2023** - Hospital Labuan **2025** - Hospital Langkawi	MOH
		3.3 Biplane Angiography machine.	Unit of Bi-plane Angiography in regional Hospital	1 unit of Bi-plane Angiography for regional hospital: **2021** - HQE	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
		3.4 Ablation therapy machine (RFA/Cryoablation/ microwave)	Unit of Ablation therapy machine for each cancer centre	1 unit for each cancer centre: **2021** - HUS **2022** - HPP **2023** - HSI **2024** - HWKKS **2025** - HSBAS, HRPZ II	MOH
		3.5 Mobile Ultrasound	Unit of mobile Ultrasound in all angiography facilities	1 units mobile Ultrasound in all angiography facilities: HSBAS, HPP, HKL, Selayang, Sungai Buloh, IKN, HSA, HUS	MOH
		3.6 Establish public private partnership (PPP).	Outsourcing service for planning CT Scan/ MRI if waiting time exceed 2 weeks.	100%	MOH
		3.7 Install RIS-PACS for all centre with oncology services	Number of centres with RIS-PACS installed	4 regional Oncology Centre. **2021** - HKL **2022** - HUS **2023** - HPP **2024** – HWKKS	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
		3.8 Consumables for interventional oncology for following service: • TACE • RFA • Cryoablation • Microwave • SIRT	Number of cases yearly for each interventional oncology services	• 950 cases /year • 600 cases/year • 160 cases/year • 400 cases/year • 150 cases/year (6 centres)	MOH
4	**To improve radiology reporting standard, training and research.**	4.1 To produce Oncology-Radiology Reporting proforma.	Producing the Oncology-Radiology Reporting proforma	Oncology-Radiology Reporting proforma is produced by 2025	MOH
		4.2 To update Oncology-Radiology report using standard structured reporting template.	To establish standard structured reporting template for following imaging/ procedures: i) CT colonography ii) Lung nodule iii) Prostate imaging	Oncology Radiology report that is based on standard structured reporting template is establish by year 2025	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
		4.3 To update cancer staging reporting	i) To incorporate American Joint Committee on Cancer (AJCC) Staging System in routine reporting of cancer cases (TNM staging) ii) To incorporate latest criteria for surveillance of cancer. (e.g.: RECIST/ mRECIST/ PERCIST/ CHOI relevant cases)	Cancer staging reporting based on AJCC Staging System and latest criteria for cancer surveillance is incorporated by 2025	MOH
		4.4 'Advance competency program/training' (sabbatical or equivalent leave given to Senior Consultants in area of subspecialty working in MOH)	Number of Senior Consultants undergoing 'Advance competency program/training'	2 senior consultants in 5 years	MOH

FOCUS AREA 3: Diagnosis (Radiology)					
No.	**Specific Objective**	**Strategic Action**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
		4.5 To support research participation and new practices.	Scientific paper presentation/ publication local and international. Peer reviewed/High index journal.		MOH
		4.6 Lung cancer screening - LDCT screening in high-risk group.	To incorporate LDCT in Lung cancer screening for high-risk group	LDCT for early Lung cancer detection is incorporated as part of the Radiology Service.	MOH
		4.7 Colorectal cancer detection using CT Colonography.	To equip Automated CO2 insufflation system with a software for CT-colonography at state Hospitals.	Automated CO2 insufflation system with a software for CT-colonography is available at state Hospitals.	MOH
		4.8 Multiparametric MRI for Prostate cancer imaging.	Availability of multiparametric MRI for Prostate cancer imaging	Selected MRI facility may offer the service	MOH
5	**To strengthen our human capital development**	Refer to **Appendix 9** (Focus Area 10: Human capacity building and development)			

FOCUS AREA 3: Diagnosis (Nuclear Medicine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating agencies**
1	**To ensure all the regions in Malaysia have nuclear medicine centres that are capable to provide the essential supportive oncology services**	1.1 To establish at least two new regional nuclear medicine centres to provide the latest diagnostic and therapeutic outpatient and inpatient radionuclide services for oncology.	Establishment of centres at: 1. HSI, Johor – southern region (approved under RMK-10) 2. As part of Northern Cancer Centre, Sungai Petani, Kedah (approved) 3. Kuala Terengganu or Kuantan – east coast region	By 2025 at least two Level 2sp nuclear medicine centres, one for southern region and the other for east coast region are set up.	MOH
		1.2 To replace all the old SPECT machines with new SPECT-CT units.	To ensure all operating SPECT-CT & SPECT machines are within the operational lifespan of <10 years.	All existing regional nuclear medicine centres should have at least 1 SPECT-CT machines (<10 years).	MOH
		1.3 To ensure all the existing nuclear medicine centres could provide the essential oncological PET-CT services.	The nuclear medicine centres at the Sabah, Sarawak and Northern Cancer Centre shall be equipped with PET-CT.	All existing regional nuclear medicine centres should have at least 1 PET-CT machine.	MOH

FOCUS AREA 3: Diagnosis (Nuclear Medicine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating agencies**
		1.4 To establish a cyclotron and related hotlab facility for East Malaysia, in Sabah or Sarawak.	A self-sufficient supply of PET radiotracers for East Malaysia.	Allowed all the PET-CT operation in East Malaysia to have sufficient radiotracer to perform >2,000 patients/year for each PET-CT unit installed in Sarawak & Sabah.	MOH, IAEA

FOCUS AREA 4: Treatment (Radiotherapy & Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating agencies**
1	**To improve access to oncology services in MOH**	1.1 Increase number of cancer treatment facilities within MOH	a. Establishing Northern Oncology Centre equipped with radiotherapy, chemotherapy and basic nuclear medicine services.	Northern Oncology Centre operating in 2025	MOH (BPP, Planning & Development Division, BPL, BSKB), MOF, SPA, JKR
			b. Establishing Sarawak Cancer Centre	Sarawak Cancer Centre expected to be operating by 2025.	
			c. Establishing East Coast Oncology Centre at Kuantan/ Kuala Terengganu	East Coast Oncology Centre expected to be operating by 2030.	
		1.2 To establish Clinical Oncology Units (COU) at MOH hospitals	Developing Clinical Oncology Units (COU) in Periphery Hospitals: 1. Hospital Selayang 2. Hospital Batu Pahat 3. Hospital Tawau	COU to be set up in Hospital Selayang and Batu Pahat by 2021 and Hospital Tawau by 2025	MOH (BPP, hospital directors, State Health Directors)

FOCUS AREA 4: Treatment (Radiotherapy & Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating agencies**
2	**To provide radiotherapy services in timely manner**	2.1 Upgrade of Radiotherapy facilities within MOH.	**HKL** • To replace CT simulator (2002) To replace Linear Accelerators (2002 and 2009) • To increase treatment planning system **IKN** • To add 5th Linear Accelerator • To add treatment planning system • HSI Johor • To replace Brachytherapy System • To replace Linear Accelerator (2005) **HSI Johor** • To replace Brachytherapy System • To replace Linear Accelerator (2005)	CT simulator to be replaced by 2022 Linear accelerators replaced by 2021-2022 New Linear accelerator installed by 2021. New brachytherapy system to be replaced by 2021 Linear accelerator replaced by 2022	MOH (BPP)

FOCUS AREA 4: Treatment (Radiotherapy & Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating agencies**
			HUS • To add CT simulator • To replace CT simulator (2008) • To replace LINACs (2008 and 2009) **HWKKS** • To add CT simulator • To replace LINAC (1997) at HQE2	New CT simulator to be installed by 2022 CT simulator to be replaced by 2023 Old Linear Accelerator to be replaced in 2021 and new one to be installed in 2023 New CT simulator to be installed by 2021 Linear accelerator replaced by 2023	
		2.2 To outsource radiotherapy services to private oncology centres.	To outsource radiotherapy services to private oncology centre for patients in Perak.	Patients from Perak get radiotherapy treatment at private centre by 2023	
3	**To strengthen manpower and improve career development within MOH**	Refer to **Appendix 9** (Focus Area 10: Human capacity building and development)			

FOCUS AREA 4: Treatment (Radiotherapy & Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating agencies**
4	**To establish Value Based Medicine as a strategy to maintain sustainability of treatment**	To request for HTA for new targeted therapies that are being requested to be included in MOH Formulary		Effective price negotiation-based HTA recommendations that are derived from threshold and the use of protocol guidelines	MOH (Pharmaceutical Services Division, HTA), MOF, NGOs, JPA, Other third-party payors
5	**To improve access to targeted therapies**	5.1 To request additional Oncology Budget (additional budget for targeted therapies for medication in Blue book based on the cancer incidence).	Patients to get targeted therapies in timely manner		MOH (Pharmaceutical Services Division), Pharmaceutical Industries, Ministry of Finance
		5.2 To improve access to new targeted therapies via Early Access Program/ Patient Assisted Program by submitting for DG of Health approval			Oncology centres, MOH (Pharmaceutical Services Division)

FOCUS AREA 4: Treatment (Radiotherapy & Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating agencies**
		5.3 To start systemic chemotherapy as early as possible from the time of decision made.	Percentage of patients started on chemotherapy within two weeks from the date of decision	≥90%	All Oncology centres
6	**To improve personalised care of cancer patients**	6.1.To form multidisciplinary teams in all oncology centres and state hospitals	To increase number of oncologists in each oncology centre	All oncology centres (six centres) to have MDT teams/meetings for common cancer sites by 2025.	MOH
		6.2 To tailor the systemic therapy based on biomolecular profile of the cancer	To work together with molecular pathologists to establish the service	All oncology centres with molecular pathology laboratory will decide the treatment of cancer patients according to molecular profiling by 2025.	MOH

FOCUS AREA 4: Treatment (Haematology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating Agencies**
1	**To strengthen haematology services**	1.1 To strengthen haematology services in HKL, HTJS, HSNZ and Hospital Taiping. *Two (2) haematologists have been posted to Seremban and HKL, while 1 haematologist each in Terengganu and Taiping in 2016-2020	a. By 2025 these hospitals will have dedicated Haematology ward and day-care	To have dedicated ward and day-care in HKL, HTJ, HSNZ and Hospital Taiping.	MOH (State Health Departments)
			b. To be able to provide established first line cancer treatment in patients with haem malignancies	>80%	
		1.2 To develop cytotoxic drug reconstitution unit in HTAR.	Establishment of designated CDR Unit in HTAR in 2021-2025	To have designated CDR unit in HTAR	MOH (State Health Dept, Pharmacy Dept)
		1.3 Strengthen stem cell transplant service in HA, HQE and HPP. *The stem cell complex in Penang which includes the	By 2024, stem cell complex completed in Penang.	To have a well-established stem cell transplant centre in HA, HPP and HQE with a separate transplant budget	MOH (State Health Departments)

FOCUS AREA 4: Treatment (Haematology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating Agencies**
		stem cell lab and 6 transplant rooms has completed tender evaluation phase in Aug 2019 but need to resubmit	By 2025 the stem cell transplant in HA, HPP and HQE are fully operational and well equipped.	To have a fully operational stem cell complex in HPP	
		1.4 Develop stem cell transplant service in HAS Johor Bahru * Two (2) transplant rooms completed in Sept 2016 funded by study fund and Yayasan Kanser Laksamana Johor	By 2025, another two (2) additional transplant rooms for allogeneic stem cells transplant	Establishment of two (2) more transplant rooms with HEPA flow Need a separate stem cell transplant budget	MOH (State Health Departments)
		1.5 Strengthen molecular and cytogenetics services in HA and HPP *HA has purchased 1 PCR unit in 2016-2020	By 2025, both cytogenetics and molecular services are fully established in HA and HPP and can provide essential and important tests	HA and HPP have well established cytogenetics and molecular services	MOH

FOCUS AREA 4: Treatment (Haematology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating Agencies**
		1.6 Strengthen treatment services by budget increment for haematology drugs.	Budget for Malaysian Patient-assisted Program for CML (MyPAP) program and Monoclonal antibodies and targeted therapies increased in 2021-2025	i. Budget for MyPAP program for treatment of chronic myeloid leukaemia increased 20% every two years ii. Additional budget of RM30 mil. with increment by 10% every year for purchase of Monoclonal antibodies (e.g. rituximab, brentuximab, daratumumab, blinatumumab) and novel therapies (e.g. bortezomib, ruxolitinib, ibrutinib, lenalidomide, pomalidomide)	MOH
		1.7 Laboratory monitoring for STOP TKI program	By 2021 Molecular Laboratory is able to fully support the STOP TKI program which requires frequent molecular monitoring	At least 10% of patients who achieve deep molecular response and fulfil criteria can stop TKI	MOH

FOCUS AREA 4: Treatment (Haematology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating Agencies**
		1.8 Minimal residual disease (MRD) monitoring by molecular- important to monitor disease response to treatment in leukemia	By 2025 MRD monitoring service is fully established	MRD monitoring service is available and provided for leukemia cases	MOH
		1.9 Diagnostics – molecular markers for targeted therapy. New tests for molecular diagnosis. Additional budget for HA	By 2025 the service to do molecular markers for targeted therapy is fully established	Molecular markers tests for targeted therapy is available and provided for indicated cases	MOH
		1.10 Develop CAR-T therapy - innovative therapy with high response and CR rate. CAR-T laboratory will be set up in local GMP certified lab.	By 2025, CAR-T therapy service is fully established in KKM. Hematologist will carry out T-cell apheresis and administration of CART cell therapy	CAR-T therapy is available in local setting and can be provided for indicated cases like refractory leukemia, lymphoma and multiple myeloma	MOH (NIH)

FOCUS AREA 4: Treatment (Haematology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ collaborating Agencies**
2	**To strengthen human capital development in Haematology services**	Refer to **Appendix 9** (Focus Area 10: Human capacity building and development)			

FOCUS AREA 4: Treatment (Nuclear Medicine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
1	**To expand the types and widen the range of theragnostic nuclear medicine in cancer management**	1.1 Thyroid CA: I-124 dosimetry for optimisation therapy.	All existing Level 2sp nuclear medicine centres should provide this service	A total of at least 300 cases are performed each year	MOH, IAEA
		1.2 Colorectal liver metastases / hepatocellular CA: SIRT.	All existing Level 2sp nuclear medicine centres should provide this service	A total of at least 150 cases are performed each year	MOH, IAEA
		1.3 Neuroendocrine tumour theranostic: Ga-68 SST ligands (diagnosis & staging), Lu-177 SST ligands (therapy).	All existing Level 2sp nuclear medicine centres should provide this service	A total of at least 150 cases are performed each year	MOH, IAEA
		1.4 Prostate CA theranostic: Ga-68 PSMA (diagnosis & staging), Lu-177 PSMA (therapy).	All existing Level 2sp nuclear medicine centres should provide this service	A total of at least 150 cases are performed each year	MOH, IAEA

FOCUS AREA 4: Treatment (Paediatric Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
1	**Strengthen Paediatric Oncology Services**	1.1 Creation of a separate subcode for paediatric haematology oncology (separate from paediatrics subcode) to increase the budget for medications and consumables.	Increase of budget allocation	Proposal submitted for approval	MOH (BPP), MOF
		1.2 Improve access to new medications or patient-assisted medications programs.	Availability of drugs	New drugs will be available to patients by 2025	MOH (Pharmacy, Cawangan Perkembangan Perubatan)
		1.3 Standardised evidence-based protocol for the treatment of childhood cancer among all MOH centres in Malaysia that will be revised regularly.	Availability of protocol that can be utilised in all centres	Protocols to be utilised in all centres by 2025	Paediatric Oncologists in MOH

FOCUS AREA 4: Treatment (Paediatric Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
		1.4 Drugs used in standardised protocols must be made available in the national formulary.	Availability of drugs to be utilised in all centres	Drugs used in standardised protocols are available in all centres by 2025	MOH (Pharmacy Division) JKTU Onkologi
		1.5 PET scan and MIBG.	Availability of services beyond Klang Valley: east coast & southern region	PET scan & MIBG services available beyond Klang Valley by 2025	Nuclear medicine
		1.6 Improve pathology services and improve access to special stains and molecular services: • MRD detection for acute leukemias • Availability of flowcytometry in HUS • BCR -ABL quantification • Availability of molecular tests to paediatrics -n-myc, WT1 & special stains for brain tumours and Ewings	Availability of tests	Tests available by 2025	Pathology Services

FOCUS AREA 4: Treatment (Paediatric Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
2	**Upgrading of existing facilities**	2.1 Proper negative pressure isolation rooms for infective patients.	Upgrading negative pressure isolation room	Negative pressure isolation room upgraded by 2025	MOH (Hospital director, HOD) MOF
		2.2 Proper positive pressure rooms for autologous transplants and severely immunocompromised patients.	Upgrading positive pressure isolation room	Positive pressure isolation room upgraded by 2025	
		2.3 HEPA filtration of all paediatric haemato-oncology units.	Number of HEPA filtration negative/ positive pressure isolation rooms in all paediatric haemato-oncology unit	At least 4-6 HEPA filtered negative/ positive pressure isolation rooms in each centre	
		2.4 Increasing number of beds in Hospital Tunku Azizah, Hospital Permaisuri Bainun Ipoh and HSI to 20 beds	Hospital Tunku Azizah: Refurbishment of current IPHKL to fulfil bed requirement Increased beds in other centres	• Hospital Tunku Azizah to 48 beds, • Hospital Permaisuri Bainun Ipoh to 20 beds • HSI to 20 beds	

FOCUS AREA 4: Treatment (Paediatric Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
3	**Establishment of Clinical Oncology Units (COU) at MOH tertiary hospitals**	Develop 4 Clinical Oncology Units (COU) in Tertiary Hospitals 1. Alor Setar 2. Kuantan 3. Miri 4. Sandakan/Tawau	Establishment of COU in respective hospitals together with travelling budget to manage diseases of mild - moderate complexity.	COU in respective hospitals are established by 2025	MOH (BPP, Hospital Directors, HOD Paeds)
4	**Establishment of new service**	Specialised Late Effects clinic in the existing oncology clinic	At the moment, there is no designated clinic for cancer survivors. Most will attend general oncology clinic with patients on active treatment. All hospitals with paediatric oncology services should have a dedicated Long-Term Survivors Clinic.	Long Term Survivors Clinic in hospitals with Paediatric Oncology Services established by 2025	MOH (Hospital Directors/ HOD Paeds)
5	**Human resources**	Refer to **Appendix 9** (Focus Area 10: Human capacity building and development)			

FOCUS AREA 4: Treatment (Paediatric Oncology)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating / collaborating Agencies**
6	**Research**	6.1 To study late effects in previously treated paediatrics oncology patients.	Refer to **Appendix 7** (Focus Area 8: Research, on sub-topic F: No.2)		
		6.2 Collaboration between MOH and academia to conduct research in paediatric oncology.	Number of publications	2 per year	Paed oncology fraternity, MOH, Universities

FOCUS AREA 4: Treatment (Gynaecology Oncology)					
No	**Specific Objective**	**Strategic Action**	**Performance Indicator**	**Target**	**Coordinating/ Collaborating agencies**
1	**To strengthen Gynae-oncology services**	1.1 Human capital development and training.	Refer to **Appendix 9** (Focus Area 10: Human capacity building and development)		
		1.2 Upgrade the surgical equipment and facilities including operating time and post-operative care.	Number of Gynae-Onco cases operated in each centre	Number of operated cases increase about 1.5 to 2.0 folds within 5 years	MOH (Head of O&G Services)
		1.3 Adequate funding for consumables and other surgical related therapy.	Number of Gynae-Onco equipment in each centre	Number of instruments: 14 Laparoscopic systems 16 colposcopes 20 hysterectomy instrument sets 20 units of Yellowfin/ stirrup 10 units of retractors	
		1.4 Strengthen the patient referral system from the primary, secondary or tertiary care centres and vice versa.	Establishing Referral Policies	Referral Policies established	MOH (BPP)

FOCUS AREA 4: Treatment (Gynaecology Oncology)					
No	**Specific Objective**	**Strategic Action**	**Performance Indicator**	**Target**	**Coordinating/ Collaborating agencies**
		1.5 Increase operating time (OT) through implementation of decentralisation and cluster hospital. (Surgical OT time is main problem in many hospital)	1) Reduction of Gynaecological cancer surgery waiting time. 2) Increase number of cases operated.	Cancer surgery waiting time is maintained between 2 to 4 weeks	Head of Anaesthetic Services
2	**Update knowledge and enhance surgical skill on Gynae-oncology management**	2.1 To collaborate with society to organise more workshops, conferences and CME program.	Number of workshop and conferences (Colposcopy Workshop, National Gynae Onco Conference, Tricks and Tip in O&G Surgery, Gynae Onco 4U)	5 Colposcopic workshops, 1 GO conference, 2 surgical workshop and 2 GO Consensus Meeting	MOH MGCS, OGSM, Universities
		2.2 To produce more Clinical Practise Guidelines and Consensus Statement/ Guidelines.	Number of Gynae Onco CPG and Consensus Guideline	• Update Cervical Cancer CPG 2016 • Update Guidebook Cervical Cancer Prevention Program • Guideline for Primary HPV Testing in Cervical Cancer Screening • GO Consensus meeting twice a year	MOH, GO subcommittee, JKPPOG, Society

FOCUS AREA 4: Treatment (Gynaecology Oncology)					
No	**Specific Objective**	**Strategic Action**	**Performance Indicator**	**Target**	**Coordinating/ Collaborating agencies**
		2.3 To incorporate intermediate and advance laparoscopic surgery in gynaecological oncology subspeciality training. (Need to add laparoscopic attachment/rotation during sub-speciality training) as this is also align with Pain free hospitals protocols.	Increasing number of early endometrial and ovarian cancer surgery being performed laparoscopically.	To ensure all centres are well equipped with laparoscopic systems and laparoscopic surgical instrument	MOH, Gynae Endoscopy Society Malaysia (GESM), JKKPPOG
3	**Research**	3.1 Collaboration between MOH and Academic Institution to conduct more research in Gynae Cancer.	Number of research papers published	As a start 2 to 3 papers in a year.	MOH, Universities
		3.2 All Gynae Cancer Unit should have at least one Research Assistant to help conducting research.	Number of Research Assistant in Gynae Cancer Unit	At least 1 per Gynae Cancer Unit	

APPENDIX 4e

FOCUS AREA 4: Treatment (Gynaecology Oncology)					
No	**Specific Objective**	**Strategic Action**	**Performance Indicator**	**Target**	**Coordinating/ Collaborating agencies**
4	**One Stop Cancer Centre (OSCC)**	To complete existing facility i.e. IKN with adequate Surgical Expertise (Colorectal surgeon/ Upper GI surgeon, ENT, Urologist) which can expand the services under one stop centre. As already availability of nuclear medicine, medical oncologist and radiation oncologist services is a plus point to be tapped at this centre.	a. Increase in number adjuvant treatment given to patients b. Shorter waiting time for adjuvant & neo-adjuvant treatment c. Increase in research performed d. Increase in number of trainees across all specialities	Within 2 to 3 years	MOH (BPP), Head of Surgical Services.

FOCUS AREA 5: Treatment (Colorectal)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
1	**Increase capacity and quality in colorectal sub-speciality services within MOH facilities**	1.1 Increase the number of centres providing colorectal sub-speciality services.	All Major Specialist Hospitals has a Colorectal Surgeon in residence.	30 Colorectal Surgeons by 2025 2 per training centre [2x5=10] 1 per Major Hospital.	MOH
		1.2 Providing adequate infrastructure and equipment to support the service.	All Major Hospitals with Specialists equipped with Colonoscopy.	1 Colonoscopy per 350 procedures Portable Scope for Hospitals without resident Specialist To train staff To provide infrastructure	MOH
		1.3 Increase human resource by ensuring uptake of two Scholarships per year to pursue training is approved.	Percentage of patients with waiting time of ≤4 weeks for colorectal cancer surgery is increased	>80%	MOH
		1.4 Planning in terms of state-based centres with Colorectal services to ensure performance quality.	Rate of unclear surgical margins in colorectal surgery	<5 %	MOH
		1.5 Enhance centres with minimally invasive surgeries.	Number of Major Hospitals with Colorectal Surgeons providing minimally invasive surgery	90% by 2025	MOH

APPENDIX 4g

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
1	**Early Diagnosis and Early treatment**	1.1 To have dedicated Breast Clinic in all centres with Breast Surgeons/ General Surgeons with special interest in Breast Cancer. Preferably to have "One Stop Breast Centre" in highly populated area to reduce multiple clinic appointments as well as to reduce waiting time.	Establishment of dedicated Breast Clinic in Major Specialist Hospital including: • Breast Care Nurse Team • Portable Ultrasound Machine – Bedside tool as diagnostic aid "One Stop Breast Centre" should include the services of mammogram/ breast ultrasound; fine needle aspiration/breast biopsies/ image-guided biopsies on the same day of visit.	To have at least one clinic session per week at each Major Specialist Hospital	MOH (BPP), Head of: - General Surgical Services - Breast & Endocrine Surgery Services - Anaesthesiology Services - Head of Nuclear Medicine Services, HODs of Surgery; Radiology; Pathology, Hospital Director, Nursing Director/ Coordinator

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.2 Definitive diagnosis of Breast Cancer should be made early. This includes the "Triple Assessment" approach. Breast Imaging performed in timely manner. Biopsy of the suspicious lesions (including image-guided biopsy) is performed urgently after breast imaging. * Any delay in diagnosis will result in increasing number of cases presented at more advanced stage of breast cancer.	Percentage of breast imaging performed within one week of consultations Percentage of turnaround result of Biopsy specimen within one week	≥80% of cases ≥80% of cases	Head of services for: - General Surgical Services - Breast & Endocrine Surgery Services - Anaesthesiology Services - Head of Nuclear Medicine Services, HODs of Surgery; Radiology; Pathology, Hospital Director
		1.3 Definitive surgical treatment to be done in timely manner as to avoid worsening of disease and increased morbidity & mortality due to delay in treatment	Percentage of breast cancer patients going for definitive surgery within (≤) 4 weeks of the diagnosis.	≥75% of cases (3 monthly) (NB: Old KPI. Dropped in 2020)	Head of services for: - General Surgical Services - Breast & Endocrine Surgery Services

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
			To have enough manpower to achieve this target: • Breast Surgeons • General Surgeons • General Surgeons with special interest in Breast Cancer • Anaesthesiologists To have enough "operating theatre" time to accommodate cases for operations		- Anaesthesiology Services - Head of Nuclear Medicine Services. HODs of Surgery; Radiology; Pathology. Hospital Director.
		1.4 MDT – Multi-disciplinary team Management must be advocated wherever possible in managing breast cancer patients as this will ensure a holistic approach and comprehensive treatment given.	MDT should be formed in centres where Oncology services are available.	MDT meeting to be held at minimum at monthly basis. Networking should be considered if it is not available.	HODs of: - Dept of Surgery - Dept of Radiotherapy & Oncology - Dept of Pathology - Dept of Radiology, - Hospital Director.

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
2	**Adjuvant treatment of Breast Cancer – accessibility and timely treatment**	All patients that require adjuvant treatment namely Chemotherapy, Radiotherapy and/or Targeted therapy should be able to access to these treatments in a timely manner	Percentage of new cases that were given appointment for first consultation within (≤) 2 weeks at Radiotherapy and Oncology Clinic Percentage of patients who were started on chemotherapy within (≤) 2 weeks from the date of decision	Oncology Services to be available in Major Specialist Hospitals Where the services are not available, networking should be in place	Head of Radiotherapy & Oncology Services
3	**Oncoplastic Breast Surgery Services**	3.1 Breast conserving surgery using oncoplastic techniques can be performed in complex breast cancer cases that are not suitable for simple wide local excision. * Since there are increasing number of trained oncoplastic breast surgeons, oncoplastic surgery can be performed with acceptable cosmetic and oncological outcomes.	Percentage of breast conserving surgery versus mastectomy in patients with breast cancer (Oncoplastic surgery should be performed in Major Specialist Hospitals with oncoplastic breast surgeons)	≥20% (3 monthly)	HKL HPJ H. Selayang HPP HRPZ II HSNZ HIS Johor HQE II

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		3.2 Breast reconstruction should be offered to women who are going for mastectomy or had mastectomy surgery. Breast reconstruction surgery should be performed in Major Specialist Hospitals with oncoplastic breast surgeons.	Percentage of breast reconstruction (either autologous, implant or combination of both) in patients with breast cancer	≥ 5% (3 monthly)	HKL HPJ H. Selayang HPP HRPZ II HSNZ HIS Johor HQE II
4	**CPG should be revised on regular basis**	4.1 The 3rd edition of CPG on breast cancer is going to be launched in 2020. Dedicated team members selected to look into CPG for interval updates/ revision	Usage of CPG in managing breast cancer patients by relevant parties	The CPG should be revised every 5 years	MOH (HTA), Head of Services for: - Breast & Endocrine Surgery - Radiotherapy & Oncology - Radiology - Pathology, University Counterparts, NGOs & Breast cancer Advocacy Groups.

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		4.2 CPG for breast cancer in pregnancy.	Development team consisting of breast surgeon, radiologist, pathologist, oncologist, obstetrician, neonatologist & anaesthesiologists should be formed to address this issue since there is no local CPG on breast cancer in pregnancy	Development team is established	MOH
		4.3 Molecular Profiling in Breast Cancer patients.	Analysis of feasibility and cost effectiveness of molecular profiling strategy	To request for HTA to perform mini-HTA/Technical Brief	MOH (HTA)
5	**Breast & Endocrine Subspecialty Services**	5.1 Breast & Endocrine Surgery Centres at all regions. Current Centres (Number of BNE Surgeons in parenthesis): Central – HKL (3), HPJ (3), Hospital Selayang (1) North – HPP (3), HRPB (1) South – HSI (2)	Number of new centres set up	Setting up new centres: Suggested centres to be opened: Central (HTAR, HTJS), Malacca, North (Hospital Sultan Abdul Halim), East Coast: (HTAA)	MOH (BPP), Head of Services for: - General Surgery - Breast & Endocrine Surgery - Radiotherapy & Oncology

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		East Coast – HRPZ II (3), HSNZ (2) Sabah – HQE II (1) Sarawak – HUS (2) BNE Surgeons: 22 BNE Trainees: 10 (+ 1 new intake)		Sarawak (Hospital Sibu, Hospital Miri)	- Radiology - Pathology, Hospital Directors, HOD of Surgical Department of respective Hospitals.
		5.2 Subspecialty Collaboration Services.	At each Breast & Endocrine Surgical Centre, other specialty that should be available include the Breast Radiologist; Breast & Endocrine Pathologist and Medical Endocrinologist (to accommodate Endocrine Services)	This is to ensure that the services are handled and run by trained team/personnel for optimum service delivery	MOH (BPP), Head of Services for: - Breast & Endocrine Surgery - Radiotherapy & Oncology - Radiology - Pathology - Endocrinology.

FOCUS AREA 4: Treatment (Breast & Endocrine)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		5.3 Sub-specialty Training: To increase number of intake of trainees for subspecialty program. Current Training Centres: HKL, HPJ, Hospital Selayang, HIS, HPP, HSNZ, HRPZ II, HQE II	To produce enough numbers of Breast & Endocrine Surgeons for each existing subspecialty centres AND the newly set-up centres	At minimum, 20 trainees need to be trained in next 5 years i.e. 4 trainees/ year (*Current practice: 1-2 trainees intake per year)	MOH (BPP, BPL), JPA, Head of Services for: - General Surgery - Breast & Endocrine Surgery.

FOCUS AREA 4: Treatment (Transfusion Medicine Service)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
1	**To ensure access to adequate, safe and timely supply of blood and blood products**	Enhance the information, communication, education programme on voluntary blood donation for public including in schools Improve access and convenience for public to donate blood Increase donor base through retention of regular blood donors	a. Strengthen social marketing activities on blood donation	Provision of adequate budget together with an increase in the number of Medical Officers and Health Education Officers in TMS	MOH/ other ministries like KPM, KKMM, Army, Police, PBT Social Influencer Media Private Sector NGO Professional Associations
			b. Increase number of fixed donation sites in strategic location and procurement of 25 mobile blood donation bus nationwide	Increase blood collection to 2.5-3% / 1000 population by 2025 (35,0000-50,000/year)	
			c. Establish 'Regular Blood Donor Loyalty' programme that include annual celebration of World Blood Donor Day and other community-based activities	Increase collection of blood from 60% to 70% regular blood donors by 2025	

FOCUS AREA 4: Treatment (Transfusion Medicine Service)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
2	**To enhance the provision of specific blood products for cancer patient management.**	2.1 Provision of irradiated blood for all blood and blood products to inactivate lymphocytes to prevent transfusion associated graft-versus-host disease	Availability of blood irradiators in all regional centres including: • PDW Utara • PDW Sabah • PDW Selatan • PDW Sarawak • PDW Pantai Timur	5 blood irradiator to be procured by 2025	MOH
		2.2 Provision of pre-storage filtered blood for all red cell concentrate (RCC) to reduce the risk for transfusion reaction such as febrile non-haemolytic transfusion reaction and other complications	Procurement of pre-storage filtration sets to ensure residual leucocytes content less than 1 x 106 per unit	Additional 35% of all red cells to be filtered annually to cater the transfusion requirement for cancer patients	
		2.3 Provision of platelet apheresis products for patient requiring platelet support to reduce donor exposure and for patient with platelet refractoriness.	Procurement of platelet apheresis collection bags.	Increase 50% of the platelet apheresis collection to cater for haemato-oncology and paediatric cancer patients	

FOCUS AREA 4: Treatment (Transfusion Medicine Service)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		2.4 Facilitate the work up for patients with complex requirement such as platelet antibody testing, platelet crossmatching, red cell genotyping, HLA typing and complex antibody identification	To expand the Immunohaematology and H & I services in all regional centre including: • PDW Utara • PDW Sabah • PDW Selatan • PDW Sarawak • PDW Pantai Timur	Availability of GMP lab in PDN for cellular therapy Availability of equipment, reagents, consumables & EQA for PDW on Immunohaematology and H & I laboratories by 2025	
3	**To enhance workforce capacity and strengthen human capital development**	Train TM specialists, scientific officers , Medical Laboratory Technologists and technical staff to strengthen specialised human resource by having qualified and highly skilled Transfusion Medicine Specialist (TMS), scientific Officers, Medical Laboratory Technologists (MLT), Nurses and Public Relation Officers (PRO) provide comprehensive transfusion service which involve donor management, product management as well as patient management.	3 candidates per year for Subspecialty Transfusion Medicine programme with HLP.	15 specialists with subspecialty training by 2025 in the area of PBM and IH, Blood Donor Management, Quality Management, Regulation and Haemovigilance, Component, Inventory and Fractionation Management, Regenerative Medicine, and Transplant Immunology	MOH, Universities, Private Sector

FOCUS AREA 4: Treatment (Transfusion Medicine Service)					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
			10 candidates per year for Transfusion Medicine Master in Medicine programme with HLP.	At least 30 new TM Specialist to be gazetted by 2025	
			Scientific Officer: to be train as Subject Matter Expert (SME) Transfusion Microbiology/ Immunohaematology/ Quality Management/ H & I	5 Scientific Officers to be trained by 2025	
			MLT to be train in advance diploma in blood transfusion including Immunohaematology	50 MLTs to be trained by 2025	
			Nurses to be trained in advance diploma in Transfusion Medicine programme	New advance diploma in Transfusion Medicine develop to train 10 nurses annually by 2025	
			MO, HEO, PRO to be train in-house/local training and workshops (local training/short course) in social marketing, use of social media and donor retention	100 MO, HEO and PRO in TMS to be trained in social marketing, use of social media and donor retention by 2025	

FOCUS AREA 5: Survivorship					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
A.	**Medical Rehabilitation**				
1	**To provide Cancer Rehabilitation Services (CRS) to patients who would need and benefit from rehabilitation medicine services so as to improve their quality of life**	1.1 To develop a reconditioning Program-based rehabilitation service for those who needs rehab post cancer treatment based on Dietz classification and ECOG level.	a. Percentage of hospitals with Rehabilitation Specialist adopting the program	Reconditioning Program-based Rehabilitation are in place in 50% of MOH hospitals with Specialist Rehab Care	MOH
			b. Percentage of Patients completing the program		
		1.2 Cancer Survivorship training Program.	A section on cancer rehabilitation in the Cancer Survivorship Guide by 2025	Development of Rehabilitation Component within the protocol	MOH, Universities (UM)
2	**Establish a national consensus for Cancer Rehabilitation Services**	2.1 To develop workflow for cancer rehabilitation program and encourage practice sharing amongst practitioners.	Number of training session for cancer rehabilitation.	To reach consensus among all rehabilitation physicians and allied health on specific programs for cancer patients	MOH (BSKB)
		2.2 To develop Dietetic Support Centre (DSC) in tertiary Oncology centres	a. Number of DSC	All tertiary Oncology centres have DSC	MOH, NCI, NCSM, MAKNA

FOCUS AREA 5: Survivorship					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
			b. Number of cancer patients and survivors who get dietetic support through the centre.	10% of oncology admission receive DSC services	
B.	**Vocational Rehabilitation**				
1	**To provide a pathway for vocational rehabilitation, aimed to empower financial independence and improve the quality of life of cancer patients as part of tertiary prevention of cancer.**	1.1 To foster engagement with Government / Private job portals, as well as employers, to educate them on the need to provide employment opportunities to cancer survivors	Number of cancer patients being referred to employers for return to work.	To bridge the employability gap among cancer patients	MOH (PKD), Agencies under KSM (i.e.JobsMalaysia, Socso, NIOSH).
		1.2 To provide briefing to employers on the 5-year survival rate, to ensure greater understanding on cancer survivorship. For example, explaining to employers on how thyroid cancer has better survival as compared to liver cancer, based on the available data	Number of cancer patients who have successfully obtained an employment.		

FOCUS AREA 7: Traditional and Complementary Medicine					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
1	**To integrate T&CM practitioners into early detection and prevention of cancer**	Organise workshops to update the knowledge of T&CM practitioners about the management of cancer in MOH healthcare facilities (e.g. early detection of cancer, risk factors, screening, treatment and rehabilitation).	Number of workshops conducted (with pre- and post-workshop survey indicating increased in knowledge)	At least two (2) workshops/year The knowledge of T&CM practitioner towards the early detection and prevention of cancer is enhanced	IKN (T&CM Unit)
2	**To allow cancer patients to cope better with cancer and cancer treatment by building human capacity to enhance best practice and providing evidence-based adjunct treatment for cancer patients**	2.1 To enhance best practice by providing training opportunities for medical doctors and pharmacist working in T&CM-related areas in MOH.	Number of personnel who have received T&CM related training	At least ten (10) personnel/ year	T&CM Division
		2.2 To enhance the professionalism of T&CM practitioners by implementing Phase 2 of T&CM Act 2016 (Act 775) whereby the T&CM practitioners shall be registered with the T&CM Council.	Implementation of Phase 2 of the T&CM Act 2016	Phase 2 of T&CM Act 2016 implemented fully	T&CM Division
		2.3 Research – Refer to **Appendix 7** (Focus Area 8: Research)			

FOCUS AREA 7: Traditional and Complementary Medicine					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
3	**To increase the awareness and knowledge of the public and all HCPs regarding the roles of T&CM in cancer management**	3.1 To participate in cancer awareness programs organised by public and private agencies as panels or speakers.	Number of programs participated	Participated in 2 programs per year	IKN (T&CM Unit),
		3.2 To organise public education activities regarding the role of T&CM in cancer management (e.g. community level, hospital level and the mass media).	Number of programs conducted	5 programs over 5 years	NGO

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
A. Research on Strengthening					
1	**Develop the MOH Biobank to support cancer research programs in Malaysia**	1.1 Obtain necessary documentation, infrastructure, manpower and documentation for functional operation of MOH Biobank	a. Initiation of prospective collection project focusing on cancers of national interest (approved by MOH Biobank Scientific Committee).	Pilot program for prospective collection by end of 2021	MOH (NIH - IMR), Pathology Services
			b. Publications/ presentations/ patents/ policies etc. arising from research done utilising resources from the biobank.		
		1.2 Develop and establish a network of satellite collection sites at major hospitals for collection of specimens and data.	Establishment of biobanking network between government hospitals and MOH biobank for collection of specimens and data	Established biobanking network between government hospitals and MOH Biobank for collection of specimens and data by end of 2025	
2	**Research Capacity Building**	Refer to **Appendix 9** (Focus Area 10: Human capacity building and development)			

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
3	**To strengthen facilities for the development of cancer models for preclinical drug testing**	Maintain and properly run the in vivo core facility in IMR for the development of cancer models and preclinical cancer drug testing	a. Veterinarians and experienced researchers in small animal research are employed to run the facility.	At least 1 veterinarian is employed to run the facility properly	MOH (NIH - IMR)
			b. Cancer patient-derived xenografts (PDXs) are established and characterised for cancers of national interest.	At least 5 cancer PDXs are established and characterised	
4	**Develop oncology clinical research**	4.1 To consider Research development as a key performance index for all the regional oncology centres in Malaysia.	Number of hospital and oncology centres with research committee and actively running research projects	Establish a research committee in each oncology centre	MOH (NIH - ICR), Universities, Medical-related industries, NGOs
		4.2 Collaborate between all key stakeholders including public and private oncology centres, pharmaceutical industry, academia as well as agencies in particularly from NIH.	a. Number of oncology meetings/ year	3 meetings/ year	
			b. Number of oncology collaborative research projects/ year	At least 2 on-going research projects/ oncology centre	

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
5	**To improve accessibility to new drugs by conducting clinical trials for cancer treatments**	1.1. Promote participation in clinical trials among patients and HCPs.	Number of promotional activities done in MOH hospitals	At least 1 promotional activity per year to be conducted in each MOH oncology centre	MOH (NIH - ICR), hospitals, Medical-related industries
		1.2. Improve the supportive infrastructure for clinical trials.	Number of oncology trials (ISR/ IIT) conducted across MOH Hospital	At least 30% increment in the number of oncology trials from the past years	
		1.3. Succession planning, training of oncologist/ trialist.	Number of oncology industry-sponsored research and in- house trainings conducted across MOH hospitals.	At least 80% of oncologists' involvement in research	
		1.4. Training/ building in-house monitor to encourage/ prepare for in-house training.	Establishment of in-house research training team in each MOH oncology centre.	In-house research training team established in each MOH oncology centre	
		1.5. Upgrade infrastructure and devices to support clinical trials in MOH oncology centres.	Establishment of clinical trial ward in MOH oncology centres.	At least 1 of the MOH oncology centres being equipped with a clinical trial ward.	

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
6	**To strengthen and improve scientific rigour of research and align research to national needs**	6.1. Convene task force to bring together research groups from MOH, MOHE, Non-governmental organisations, industry.	Establishment of task force	Task force is formed by 2022	MOH (NIH - JPP-NIH), Universities, Medical-related industries, NGOs
		6.2. To establish national scientific advisory boards.	Establishment of a national scientific advisory board	National scientific advisory board established	
		6.3. Carry out periodic reviews and advisory sessions at national, institutional and program levels to develop strategic plans for cancers of national interest.	a. Scientific advisory board review sessions		
			b. Strategic plans for research on cancers of national interest		
B. Research on Prevention and Health Promotion					
1	**To assess cancer literacy and uptake of cancer prevention strategies**	1.1 Assessment on cancer health literacy of the general public and its relation to cancer prevention, screening, diagnosis and treatment.	Estimation of cancer health literacy among the general public.	Proposal of strategies to improve cancer prevention and health promotion, based on the result findings	MOH (NIH - IHBR, IKU), Universities, NGOs

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.2 Assessment of awareness and practice of cancer screening among the general public.	Estimation of cancer awareness among the general public.	Proposal of strategies to improve cancer prevention and health promotion, based on the result findings	MOH (NIH - IHBR, IKU), Universities, NGOs
		1.3 Exploration of best modality/ channel in educating the general public about cancer, according to specific population.	Identification of effective platform in disseminate medical information	Proposal of the best platform to disseminate cancer health information, according to the target audience	
		1.4 Conduct survey on public awareness on cancer risk factors. (baseline 2014: 62%)	Publication of the study findings	Survey conducted by 2025	MOH (NIH - IHBR) Universities
		1.5 Conduct survey on general public knowledge on signs and symptoms of cancer. (baseline 2014: 52%)	Publication of the study findings	Survey conducted by 2025	MOH (NIH - IHBR) Universities

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
2	**To study the aetiopathogenesis of cancers of national interest to assist in prevention**	2.1 Study the role of environmental, dietary, pathogens, and host factors in carcinogenesis.	Publications of novel discoveries.	Novel discoveries on the mechanism of carcinogenesis and new ways to modulate the process	MOH (NIH - IMR), Hospitals, NGOs, Universities
		2.2 Map molecular pathways involved in carcinogenesis.			
C. Research on Screening and Early Diagnosis					
1	**To explore the underlying phenomenon of delayed diagnosis and treatment amongst cancer patients in Malaysia**	1.1 Experience exploration for patients undergoing diagnosis and treatment.	Completion of research projects and publications/ presentations/ policies arising from completed research	Baseline result on the timeliness and timeliness assessment from symptom presentation, diagnosis to treatment initiation	MOH (NIH - IHSR) Universities
		1.2 Understanding ideas and perception of the patients upon diagnosis of cancer and prior to starting treatment.		Acceptance of diagnosis and treatment by cancer patients	
		1.3 Explore existing facilitators and barriers to initiate and maintain cancer treatment.		Barriers and facilitators during cancer diagnosis and treatment identified	

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.4 Any studies on cancer patients seeking alternative therapy and understanding therapy choice preferences.	Completion of research projects and publications/ presentations/ policies arising from completed research	Survey conducted by 2023	MOH (NIH-IHBR), Universities
2	**To improve the detection of cancer amenable to screening procedures**	2.1 Assessment of general public's knowledge, attitude and practice towards cancer screening	Completion of research projects and publications/ presentations/ policies arising from completed research.	Proposal of strategies to improve the cancer screening program is published/presented leading to improvements in cancer screening programs and timely referral for intervention	MOH (NIH – IHBR), Universities, NGOs
		2.2 Assessment of inequity and inequalities in cancer screening.			MOH (NIH – IHSR), Universities, NGOs
		2.3 Exploration of healthcare system and HCPs challenges in implementing cancer screening program.	Identification of barriers and facilitators for cancer screening program.		
3	**To develop accurate (high sensitivity & specificity) molecular screening tests for cancers of national interest**	Development of novel screening assays for identification of high-risk biomarkers in pre-cancer/ early-stage cancer patient.	Completion of research projects and publications/ presentations/ policies arising from completed research.	Molecular screening tests of high clinical accuracy is developed by 2025	MOH (NIH -IMR), Universities, NGOs

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
4	**To evaluate molecular screening tests for cancers of national interest in clinical/ community trial setting (prospective pilot studies)**	To evaluate the positive predictive value, negative predictive value, cost-effectiveness and feasibility of novel screening assays in clinical/ community setting.	Completion of research projects and publications/ presentations/ policies arising from completed research.	• Verify clinical utility of screening tests • Generate evidence for policymakers to improve strategies for cancer screening/ early diagnosis	MOH (NIH - ICR), Universities, NGOs
D. Research on Diagnostics					
1	**To identify predictive and prognostic biomarkers for companion diagnostics**	To identify and validate potential biomarkers for patient risk stratification and treatment planning as well for detection of recurrence and/ or distant metastasis for cancers of national interest.	Completion of research projects and publications/ presentations/ policies arising from completed research.	Identification and validation of predictive and prognostic biomarkers for companion diagnostics	MOH (NIH-IMR/ICR), Universities, NGOs

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
2	**Clinical validation of biomarkers for companion diagnostics and/ or prognosis to improve patient management**	2.1 Clinical studies to evaluate the clinical utility of novel biomarkers for companion diagnostics and/or prognosis to improve patient management	a. Completion of clinical studies b. Clinically validated novel biomarkers	• Verification of clinical utility of biomarkers for companion diagnostics and/or prognosis to improve patient management • Protocol for use of biomarkers for clinical care • Evidence for policymakers to improve strategies for cancer treatment and/ or management	MOH (NIH - ICR), Universities, NGOs, industries
		2.2 Clinical studies to integrate novel and known biomarkers into clinical care.			
E. Research on Treatment					
1	**To develop research activities which help to improve cancer equity in quality cancer treatment**	1.1 Assessment of inequity and inequality of cancer treatment.	Identification of cancer patients receive care equally.	• Report on equity and equality cancer care for cancer patients in Malaysia • Proposal of strategies to improve equity cancer care	MOH (NIH - IHSR), Universities, NGOs
		1.2 Mapping the available resources and demand of cancer treatment.	Identification social determinants affecting cancer care.		

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.3 Exploration of the needs, barriers, challenges, and factors associated with the accessibility of cancer treatment.	Identification of barriers in accessing cancer care.	• Report on equity and equality cancer care for cancer patients in Malaysia • Proposal of strategies to improve equity cancer care	MOH (NIH - IHSR), Universities, NGOs
2	**Develop research activities which help to shorten the timeline of cancer treatment**	2.1 Investigating the timeline taken for the process of inter-departmental/inter-hospital referral.	Time from the detection of cancer up till cancer treatment being delivered.	Proposal of strategies to improve the cancer treatment timeline	MOH (NIH - IHM), Universities, NGOs
		2.2 Exploration of the frequency and timeline taken for cancer treatment (e.g. biopsy, surgery, chemotherapy, radiotherapy, etc.).			
		2.3 Developing intervention to reduce timeline of referral and cancer treatment timeline.			MOH (NIH - IHM), Universities, NGOs

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		2.4 Exploration the prevalence and factors associated with patients who non-compliant with/ missed/ defaulted cancer treatment.	Number of patients who defaulted cancer treatment and their reasons.	Proposal of strategies to improve the cancer treatment timeline	MOH (NIH - IHSR), Universities, NGOs
		2.5 Development of shared decision-making tool in the process of deciding the option for cancer treatment.	Number of patients who were discussed by oncologists/surgeons on treatment options.		
3	**To assess the quality of current cancer treatment**	3.1 Evaluation of the treatment process pathway for different cancer in the oncology centre.	Number of patients who received treatment in time (e.g. radiotherapy treatment commencement date) and the ratio of cancer patients to treating Oncologists	Timely cancer treatment delivery - No delay in cancer treatment - Evading cancer progression while waiting for treatment	MOH (NIH - IHSR) Hospitals, Universities, NGOs, and other research groups
		3.2 Assessment of the variation in cancer treatment and its performance across different settings.			

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		3.3 Review of oncology drugs listed in Malaysia's drug formulary and identification of discrepancies between Malaysia and internationally recommended cancer treatment.	Usage of cancer treatment drugs which are not in the Malaysian's drug formulary	Better access and usage of recommended drugs for cancer treatment	MOH (NIH - IHSR) Hospitals, Universities, NGOs, and other research groups
		3.4 Conduct HTA on the latest cancer treatment options/ cancer drugs.	HTA conducted		MOH (HTA)
		3.5 An economic evaluation of specific cancer treatments/ drugs.	Cost-effectiveness and repurposing of cancer drugs	Value-based medicine practice	MOH (HTA)

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
4	**To develop new cancer therapies and repurpose existing drugs**	4.1 Establishment of model systems for therapeutic studies.	a. Establishment of new targets and therapies for cancers of national interest.	Candidate drugs/ herbal/ biologics/ immunotherapy with evidence to justify clinical trials	MOH (NIH - IMR), Universities, private companies, Cancer Research Malaysia
		4.2 Identify new therapeutic targets and develop new therapeutic agents for cancers of national interest.	b. Establishment of novel cell-based therapies for haematological malignancies.		
		4.3 Form strategic partnerships for the development of affordable effective therapeutic agents for major cancers.	c. Patents/ publications/ presentations from research done.		
5	**Study of newly developed/ repurposed therapeutic agents in human (investigator-initiated clinical trials)**	Carry out clinical trials to assess efficacy of newly developed therapeutic agents.	a. Completion of Phase I/ II studies.	Successful completion of Phase I/II clinical trials of newly developed/ repurposed therapeutic agents	MOH (NIH - ICR), Universities, NGOs
			b. Publications/ presentations/ policies arising from research done.		

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
6	**To determine the outcome of cancer treatment in Malaysia**	To trace patients who had defaulted treatment and study the effects of treatment default on survival	Long term outcome "real life" data of cancer treatment in Malaysia.	Information on long term survival of cancer patients	MOH (NIH - IKU)
F. Research on Rehabilitation and Survivorship					
1	**To strengthen research activities in improving survivorship**	1.1 Identification of cancer survivors' needs.	Patient experience of cancer care	Proposal of rehabilitation services to be implemented based on the needs of cancer survivors	MOH (NIH - IHSR), Universities, NGOs
		1.2 Mapping of the available resources and the burden.	Accessibility of rehabilitation services		
		1.3 Evaluation of the existing cancer rehabilitation services.			
		1.4 Exploration of the challenges and view of HCPs in cancer rehabilitation services.	Identify challenges and view of HCPs in cancer rehabilitation services	Proposal of strategies in improving/ implementing rehabilitation services for cancer survivors	

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.5 Conduct review/ HTA on different models in delivering cancer supportive care services at the community level.	Review/HTA conducted	Proposal of strategies in improving/ implementing rehabilitation services for cancer survivors	MOH (NIH - IHSR), Universities, NGOs
		1.6 To identify barriers and facilitators at primary level, secondary level, patient level and HCP level to implement/ improve rehabilitation services	Identification of barriers and facilitators to implement/ improve rehabilitation services		
2	**To study late effects in previously treated paediatrics oncology patients**	Explore the late effects in patients who were treated for cancer in childhood.	Identification of late effects of treated paediatric oncology patients.	Report on information on late effects of treated paediatrics oncology patients	MOH (NIH - ICR), Hospitals, Universities
G. Research on Palliative Care					
1	**To assess the needs and conduct studies to strengthen the quality and delivery in palliative care services**	1.1 Assessment of cancer patients', caregivers', and HCPs' needs in palliative care services.	Estimation of population require palliative care services.	Proposal of strategies to improve the delivery of palliative care services	MOH (NIH - IHSR), Universities, and NGOs

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.2 Exploration of the knowledge, attitude and practices of general public and HCPs towards palliative care services.	Estimation of population require palliative care services.	Proposal of strategies to improve the delivery of palliative care services	MOH (NIH - IHSR), Universities, and NGOs
		1.3 Mapping the available resources with the palliative care services provided by MOH.	Mapping of mismatch between the demand and supply of palliative care services.		
		1.4 Conduct review/ HTA on different models in delivering palliative care services at the community level.			
		1.5 Estimation of human resources required to deliver palliative care services at hospital and community level.			

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
2	**To assess and improve accessibility of pain management for cancer patients**	2.1 Estimation of the prevalence of pain and other health related suffering among cancer patients.	Understand the epidemiology of pain control status in cancer patients and its delivery system.	Proposal of strategies to improve pain management for cancer patients	MOH (NIH - ICR), Universities, NGOs
		2.2 Exploration of cancer patients' understanding towards analgesia (opioid).			
		2.3 Estimation of probable analgesia (opioid) usage in Malaysia for cancer pain.			
		2.4 Developing interventions/ systems to streamline the process of prescription and dispensation of analgesia for cancer patients.	Identification of barriers and facilitators in delivering pain management for cancer patients.		
		2.5 Exploration on the challenges faced in the accessibility of analgesia among cancer patients.			

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
H. Research on Traditional and Complementary Medicine					
1	**To allow cancer patients to cope better with cancer and cancer treatment by building human capacity to enhance best practice and providing evidence- based adjunct treatment for cancer patients**	1.1 To conduct a retrospective study on the safety of the herbs used in herbal therapy as an adjunct treatment for cancer patients. 1.2 To conduct a study on the effect of herbal therapy on the quality of life of cancer patient and practitioners in Malaysia.	Number of research paper presented/ published.	Presented or published at least 1 research paper each year	IKN (T&CM Unit)
I. Research on Cancer Impact on Economy					
1	**To evaluate the economic impact of cancer from the perspective of society**	1.1 Measure the degree of disease burden/ collect and analyse the information available for disease burden	Degree of disease burden of cancers, e.g. Disability-adjusted life years (DALYs), Quality-adjusted life years (QALYs).	Clearer insight of the disease burden (productivity loss) caused by cancers	MOH (NIH - IKU), Universities

FOCUS AREA 8: Research and Development					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.2 Estimate the value of productivity loss as a result of cancer mortality and morbidity, e.g. absence from work, premature mortality	Loss of productivity cost per cancer death/ case.	Clearer insight of the disease burden (productivity loss) caused by cancers	MOH (BKP)
		1.3 Assessment of financial toxicity among cancer patients undergo cancer treatment.	Estimation of catastrophic health expenditure of cancer patients.	Proposal of strategies to improve equity cancer care	MOH (BKP), Universities
2	**To evaluate cancer care expenditure in healthcare system**	Collect and analyse data on cost per cancer patient management (from screening/ diagnosis to rehabilitation/ palliative care): - cancer specific - stage specific	Estimation of cancer management cost from the HCPs' perspective.	Fully understand the cost of each cancer management to support the practice of value-based medicine (at least for the most common cancers in Malaysia)	MOH (BKP), Universities

FOCUS AREA 9: Monitoring and Surveillance					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
1	**Strengthening of comprehensive and good data quality compilation and information systems (MNCR & PRIS)**	1.1 MNCR and State Health Departments - Training on notification of cancer and ICD-O coding via Patient Registry Information System (PRIS-M2b)	a. Number of facilities to notify via Patient Registry Information System (PRIS) b. Number of facilities with ICD-O trained officer	All government and private hospitals notify all newly diagnosed cancer cases via PRIS by 2025	MOH (BKP, PIK, BPP, OHP), MHTC, MAOMS, MOS
		1.2 MNCR with support from MHTC, and MOS- to improve the notification submission rate among specialists and MOs in private health facilities			
		1.3 Audit visits to facilities including private sectors.	Number of facilities evaluated per year	High accuracy of data submitted	MOH (BKP, PIK, BPP), MHTC, MOS
		1.4 MyHDW: PIK to strengthen all LIS available in the state and specialist hospitals to support MNCR in cancer surveillance	Number of state and specialist hospitals with LIS interfaced with PRIS.	PRIS and LIS has interface in all state and specialist hospitals by 2025	MOH (PIK), Pathologists

FOCUS AREA 9: Monitoring and Surveillance					
No	**Specific Objective**	**Strategic Actions**	**Performance Indicators**	**Target**	**Coordinating/ Collaborating Agencies**
		1.5 To improve data submission of specific cancer registries under PRIS	Cancer data entered into PRIS	By 2023, all data on new cases for specific cancer registries under PRIS are submitted	MOH (PIK)
2	**Comprehensive cancer data analytics and timely cancer surveillance reports**	2.1 Establishing a networking between MNCR, other sub-module cancer registries and Universities	a. Comparable and comprehensive data coverage	3-years / 5-years data reported by the subsequent 2 years	MOH (BKP, Sub-module cancer registries), Universities
			b. Support of evidence-based cancer clinical management and cancer prevention decision makings		
		2.2 Short term training in cancer data epidemiology analysis and quality management	High quality of data		MOH (BKP), IARC
		2.3 Recruitment of research officers trained for checking accuracy of data, active search of unnotified cases in facilities and key in data into the system	2 research officers / PSH		MOH (BSM, BKP, IKN)

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
1	**To build workforce capacity and strengthen human capital development**	**A. Pathology**			
		1.1 To strengthen human resource by creating additional posts for Cytology Scientific Officers	To create more posts for Cytology Scientific Officer: 10 more posts for centres without Cytology Scientific Officers	By 2025, all centres shall have at least one cytology-trained Scientific officer	MOH
		1.2 To strengthen human resource for haemato-oncology molecular services by creating additional posts	a. To create more posts: 2 U29 Medical Laboratory Assistant (MLT), 1 U32 MLT and 1 C41 Scientific Officer (S0) to expand the molecular service at Hospital Tunku Azizah	By 2023, Hospital Tunku Azizah will have additional 2 U29 MLT, 1 U32 MLT and 1 C41 Scientific Officer trained in Molecular Pathology	MOH
			b. To create more posts: 1 U29 MLT and 1 C41 Scientific Officer post to start the molecular service at HQE	By 2022, HQE will have 1 U29 MLT and 1 C41 Scientific Officer trained in Molecular Pathology	MOH
		1.3 To strengthen the human resource for bone marrow cytogenetic service by creating additional posts	To create more posts: 3 U29 MLT and 1 C41 SO to start the cytogenetic service at HUS	By 2023, HUS will have 3 U29 MLT and 1 C41 SO trained in cytogenetic service	MOH

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		1.4 To strengthen the human resource for flowcytometry service by creating additional posts	a. To create more posts: 3 U29 MLT and 1 C41 Scientific Officer to expand the cytogenetic service at HUS	By 2021, HUS will have 3 trained MLT and 1 trained Scientific Officer	MOH
			b. To create more posts: 1 MLT and 1 Scientific Officer post at both centres to run the flowcytometry service at HSA Johor Bahru and HPP	By 2021, HSI Johor Bahru and HPP will have additional 1 MLT and 1 Scientific Officer	MOH
			c. To create more posts: 1 U29 MLT and 1 C41 Scientific Officers to run the service at Hospital Tunku Azizah.	By 2021, Hospital Tunku Azizah will have additional 1 MLT and 1 Scientific Officers	MOH
		1.5 Strengthen specialised human resource by having qualified and highly skilled Pathologists, Scientific Officers and Medical Laboratory Technologist trained in Molecular Pathology	a. Pathologist: one candidate under Subspecialty program with Hadiah Latihan Persekutuan (HLP) for Molecular Pathology	One (1) Pathologist to be trained abroad by 2025	MOH, Universities, Private Sector

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
			b. Scientific Officer: to train one candidate per year for Subject Matter Expert (SME) trained in Molecular Pathology in solid tumours and Bioinformatics as Subject Matter Expert (SME)	Five (5) Scientific Officers to be trained by 2025	MOH, Universities, Private Sector
			c. Scientific Officer and Medical Laboratory Technologist: In-house/ local training and workshops: one candidate per year	Five (5) officers to be trained by 2025	MOH, Universities, Private Sector
		1.6 Train professional, scientific and technical staff to strengthen specialised human resource by having qualified and highly skilled Pathologists, scientific Officers and Medical Laboratory Technologist provide comprehensive cytology service as first line diagnostic test for cancer	a. Pathologist: one candidate per year under Subspecialty program with HLP	Five (5) cyto-pathologists to be trained abroad by 2025	MOH, Universities, Private Sector

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
			b. Pathologist: one pathologist to be trained locally and sit for the Fellowship of International Academy of Cytology (FIAC) examination	Five (5) cyto-pathologists to be trained locally by 2025	MOH, Universities, Private Sector
			c. Cytology Scientific Officer: to train for Subject Matter Expert (SME) in Cytology: Advance in Cytology (CTIAC)	Six (6) Scientific Officers to be trained by 2025	MOH, Universities, Private Sector
			d. Cytology Scientific Officer: to train for Subject Matter Expert (SME) in Cytology: Molecular Cytopathology (long course): at least one candidate per year.	Three (3) Scientific Officers to be trained by 2025	MOH, Universities, Private Sector
			e. Scientific Officer: In-house/local training and workshops (local training/ short course) in cytology.	Five (5) Scientific Officers to be trained by 2025	MOH, Universities, Private Sector

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
			f. Cytotechnologist: Revision of the current Advanced Diploma in Cytology and to incorporate Molecular technology module into the program.	Completion of the revised module by 2023.	MOH
				Fifteen (15) Cytotechnologists to be trained by 2025	MOH
		1.7 Train professional, scientific and technical staff to provide comprehensive molecular service by skilled and competent staff	Training for Pathologists, Scientific Officers and MLT to expand the molecular service at Hospital Tunku Azizah and to start the service at and HQE	Pathologists, Scientific Officers and MLTs are to be trained by 2023 at Hospital Tunku Azizah	MOH, MOHE
				Pathologists, Scientific Officers and MLT are to be trained by 2022 at HQE	MOH, MOHE
		1.8 Train professional, scientific and technical staff to provide comprehensive cytogenetic service by skilled and competent staff.	Training of Pathologists, Scientific Officers and MLT to start cytogenetic service at HUS and expand the service at HPP.	Pathologists, Scientific Officers and MLT are to be trained by 2023 at HUS	MOH, MOHE
				Pathologists, Scientific Officers and MLT are to be trained by 2021 at HPP	MOH, MOHE

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		1.9 Train professional, scientific and technical staff to provide comprehensive flowcytometry service by skilled and competent staff.	a. Training for Pathologists, Scientific Officers and MLT in order to start flowcytometry service at HUS.	Pathologists, Scientific Officers and MLT are to be trained by 2021	MOH
			b. Training of Pathologists, Scientific Officers and MLT in order to expand the MRD service at Hospital Tunku Azizah and to start MRD service at HSA Johor Bahru and HPP.	Pathologists, Scientific Officers and MLT are to be trained by 2021	MOH
		1.10 Train professional, scientific and technical staff to provide comprehensive stem cell laboratory service.	Training of Pathologists, Scientific Officers and MLT once new method has been established.	Training of Pathologists, Scientific Officers and MLT once new method has been established by 2021	MOH, MOHE
		B. Radiology			
		1.11 To further expand Radiology sub-specialty training into: • Interventional Onco-Radiology • Onco-Radiology	Number of sub-specialist trained in interventional Onco-radiology / Onco-radiology.	5 sub-specialists trained in interventional Onco-radiology / Onco-radiology within 5 years	MOH

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		1.12 To strengthen the Radiology sub-specialty: • Interventional Radiology • Body-Thoracic Radiology • Body-Onco Radiology • Body-Urogynae Radiology • Neuro-Head and Neck Radiology • Neuro-Neuroradiology • Breast Radiology • Musculoskeletal Radiology • Paediatric Radiology	Number of trainees yearly.	4 Interventional Radiologist Trainee yearly 2 Radiologists for each sub-specialty training apart from IR yearly	MOH
		1.13 Increase production of radiologist by Masters/ parallel pathway program.	Number of radiologists	300 new radiologists over the next 5 years.	MOH

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		1.14 Radiographers to go for short courses/ intensive training/ advance diploma programs locally or abroad to be modality expert • CT • MRI • Mammography • Angiography (To be integrated the training program with existing advance diploma in cardiovascular imaging)	Number/percentage of Radiographers to go for short courses/intensive training/advance diploma programs.	10 radiographers yearly for CT and MRI 20% of radiographer should obtain Advance Diploma certification training in breast imaging/ CT/ Cardiovascular and future program	MOH
		1.15 Radiology Nurse Training.	Number of nurses who undergo Radiology Nurse Training.	20 nurses to undergo Advance Diploma Perioperative Nursing (Radiology) over the next 5 years.	MOH
		1.16 Pegawai Sains (Fizik).	Number of Pegawai Sains (Fizik) obtaining Post Graduate Qualification.	All Pegawai Sains (Fizik) should obtain a Post Graduate Qualification after 5 years in service.	MOH

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		C. Clinical Haematology			
		1.17 Training for nurses.	2021-2025 Post-basic training centres for nurses are set up in Penang, Johor Bahru, Sabah and Sarawak. In 2025 KKM is able to train 50 post-basic nurses in hemato-oncology yearly.	To increase number of training centres – Penang, Johor Bahru, Sabah, Sarawak (Post-basic training for nurses are mainly in the Klang valley) To produce 50 post-basic nurses in hemato-oncology every year	MOH
		1.18 Training for laboratory technician and scientists	By 2025 each haematology laboratory will have adequate technicians and scientists.	To have adequate laboratory technicians and scientists for the increasing workload	MOH
		1.19 Training for Haematologists. *Total no. of haematologists in MOH in 2019 is 35.	By 2025, about 35 to 45 new haematologists will be trained and completed training.	To increase the number of doctors trained in haematology (both laboratory and clinical) such that by 2025 there will be 70 to 80 haematologists To encourage parallel pathway e.g. RCPath and RCPA	MOH

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		D. Radiotherapy & Oncology			
		1.20 Clinical Oncologists.	To maintain at least 10 candidates per intake in Masters in Clinical Oncology.	Aim to have 50 Oncologists by 2025	MOH (BPL and Planning & Development Division), Universities
		1.21 Physicists. Strengthening Medical Physicist through education and Structured Training Program specialising in Radiotherapy	a. To increase higher rank posts for Physicists with Masters/PhD.	PhD: 1 physicist/year	MOH (BPL, BSM), JPA
			b. To retain those trained in radiotherapy to be kept in that field upon promotion by increasing number of promotional posts in radiotherapy.	The expected increment in number of posts as follows: HUS - 6 posts HSI - 9 posts IKN - 6 posts HWKKS - 5 posts HKL - 1 post Northern cancer centre - 10 posts	
		1.22 Radiation Therapists.	a. To enrol 10 radiation therapists every year in Advanced Diploma Program.	50 radiation therapists with Advanced Diploma by end of 2025	MOH (BPL)

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
			b. To enrol 10 to 15 radiation therapists for every 2 years. in Degree Program in Radiotherapy	30 radiation therapists with Degree by end of 2025	Head of Profession for Radiation Therapist
			c. To enrol one radiation therapist every year in Masters in Science (Radiotherapy) under HLP	4 radiation therapists with Masters in Science (Radiotherapy) by end of 2025	UKM
			d. To enrol one radiation therapist every 2 years in PhD in Science (Radiotherapy) (three-year program)	2 radiation therapists with PhD in Science (Radiotherapy) by end of 2025	
			e. To create post-Subject Matter Expert in Radiotherapy for level 1 (from grade U44 to U48)	Two radiation therapists to be gazetted as Subject Matter Experts in radiotherapy	JPA, BSKB
			f. To increase the intake for post-basic nursing every year	30% of the oncology nurses completed post basic training in Oncology.	MOH (Clinical oncology, Haematology, Paediatric Oncology, Gynae oncology), Private hospitals with oncology services, KSKB

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		1.23 Onco Trained Nurses.	a. To increase the intake for post basic nursing every year.	30% of the oncology nurses completed post basic training in Oncology.	MOH (Clinical oncology, Haematology, Paediatric Oncology, Gynae oncology), Private hospitals with oncology services, KSKB
			b. To train nurses in periphery hospitals for 2 weeks on chemotherapy administration at Oncology Centres.	All oncology patients should receive chemotherapy by nurses trained in chemotherapy administration at Oncology centres.	Oncology Centres, Hospital directors
		1.24 Pharmacists.	a. To credential at least 2 Oncology pharmacists in all states depending on the number of established Oncology Departments/ Clinical Oncology Units nationwide	Preceptorship training -At least 1 trained preceptor in each training centre	MOH (Pharmacy Services)

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
			b. To conduct in-house CDR training for all pharmacists working in Pharmacy Oncology Units (CDR unit) by oncology pharmacy preceptor.	All pharmacists working in Pharmacy Oncology Units (CDR unit) should undergo this training.	All MOH facilities with CDR services and qualified CDR cleanroom (17 facilities currently)
			c. Preceptorship training: At least 1 trained preceptor in each training centre.	8 trained preceptors in oncology centres	Pharmaceutical Services Program
			d. To ensure sufficient number of pharmacists in each Pharmacy Oncology Units. CDR unit: 20 preparation/day = 1 oncology trained pharmacist Oncology ward: 1 oncology pharmacist / ward	1 centre (160 preparations): 8 oncology pharmacists One Oncology pharmacist in every oncology ward in each centre	Pharmaceutical Services Program, MOH, JPA
			e. To create Subject Matter Expert in Pharmacotherapy in Oncology for level 4 (UF56 – JUSA C).	At least 1 Subject Matter Expert in each oncology related discipline.	JPA, BFF

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		E. Paediatric Oncology			
		1.25 Increase number of paediatric oncologists in each centre outside Klang Valley - 7 regional centres.	All regional centres have only one or two resident paediatric oncologists. The aim is to have 3 paediatric oncologists in all regional centres outside of Klang valley.	At least 9 more paediatric oncologists to existing number 14 (minimum 23 for the whole country)	MOH (BPP), JPA
		1.26 Creation of more posts for paediatric oncologist.	Number of hospitals which fulfil the posts.	At least 2 JUSA C posts and 1 UD56 post in each centre	MOH (BPL and Planning & Development Division), JPA
		1.27 Allocation of budget for short term training in various solid tumours so that the trained person can be a lead person for specific tumours e.g. lymphoma / brain tumours etc.	Availability of lead person for specific tumour.	2 per year	MOF, BPL

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		1.28 Increase oncology pharmacists per centre. • ·All oncology pharmacists to be credentialed • Curriculum of training program outlined and application for program approval	Number of trained pharmacists	2 oncology pharmacists per centre	Universities (local and international), MOH, JPA, Pharmacy Services
		1.29 Increase number of nurses with post basic oncology training.	Percentage of nurses with post basic oncology training	75% of nurses in each regional centre has post basic oncology training	Universities (local and international), MOH, JPA, Nursing Division
		1.30 Increase numbers of nurses following norms.	Number of nurses	1 nurse to 4 patients	Nursing Division, JKN
		F. Gynaecology Oncology			
		1.31 Human capital development through establishment of new posts and targeted training programs.	Number of new posts created in the various hospitals	At least 4 posts/year	MOH (BSM, BPP)

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		1.32 Increase the number Gynaecological Oncology Unit.	Establishment of Gynaecological Oncology Unit in all major Government Hospital/ States Hospital	Gynaecological Oncology Unit established	MOH
		1.33 Increase trained Gynae-Oncologist to meet the requirement throughout Malaysia	Number of O&G Departments with Gynaecological Oncology sub-specialty services (Currently all major hospital in all 14 states has at least one Trained Gynae Oncologist. In 2019 there are 23 Gynae Oncologist placed in government hospital in the country, 17 trainees undergoing training in the country)	73 Gynae Oncologists in 37 hospitals throughout Malaysia. We need another 50 Gynae-Oncologist to provide service for entire population of the country.	
		1.34 Improve training program in terms of selection of candidates, training program and proper assessment during exit certification by:			GO committee, JKPPOG, MOH

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		• Setting the standard criteria for trainers and training centres. Trainer - Certified by Gynaecological Oncology Committee, MOH and perform at least 50 major cases/ year • Increase intake of trainees. • Trainee must undergo test and assessment at the end of 3 years training.	Number of certified Gynae Oncology Trainer (currently 11 qualified trainers had been appointed) From 2020, proper assessment of trainee will be conducted: 1) 6 monthly assessment (assessment form fill-up by trainer) 2) Yearly surgical skill assessment 3) Final examination at the end of 3rd year in form of viva, MCQ and surgical skill assessment conducted by independent trainers from other training centre Number of trainee intake per year (current intake: 2 candidates/year) Number of Trainees completed training and received certification and NSR registration as certified Gynaecological Oncologist after this assessment	At least 20 GO Trainers in all MOH training centres. At least 4 intakes/year At least 2 trainees/year	

FOCUS AREA 10: Human Capacity Building and Development					
No	**Specific Objectives**	**Strategic Actions**	**Performance Indicator**	**Target**	**Coordinating / Collaborating Agencies**
		G. Medical Rehabilation			
		1.35 Dietitian - to create at least one post of Dietitian in each Rehabilitation Center (Dietetic Support)	a. Number of post	By 2025, all centres shall have at least one Dietitian post with flexible grade U41/44/48/52/54	JPA, MOH
			b. To create Subject Matter Expert in Dietetic Oncology	At least 1 Subject Matter Expert in each Rehabilitation Center.	JPA, MOH (Dietetics Speciality Committee)
		H. Research			
		1.36 Increase expertise in cancer research.	Number of researchers undergoing postgrad or postdoc training.	10 trained (at PhD level) cancer researchers by 2025	MOH, MOHE (IPTA, IPTS), NGOs

ABBREVIATIONS

ABBREVIATION	EXPLANATION
AJCC	American Joint Committee on Cancer
AML	Acute Myeloid Leukemia
ASR	Age-Standardised Rate
BCR-ABL	Breakpoint Cluster Region Abelson murine Leukemia
BER	Beyond Economic Repair
BKP	Bahagian Kawalan Penyakit (Disease Control Division)
BNE	Breast and Endocrine
BOR	Bed Occupancy Rate
BPF	Program Perkhidmatan Farmasi (Pharmaceutical Services Division)
BPK	Bahagian Pendidikan Kesihatan (Health Education Division)
BPKK	Bahagian Pembangunan Kesihatan Keluarga (Family Health Development Division)
BPL	Bahagian Pengurusan Latihan (Training Management Division)
BPM	Bahagian Pengurusan Maklumat (Information Management Division)
BPP	Bahagian Perkembangan Perubatan (Medical Development Division)
BSE	Breast Self-Examination
BSKB	Bahagian Sains Kesihatan Bersekutu (Allied Health Science Division)
BSM	Bahagian Sumber Manusia (Human Resiurce Division)
CAR-T	Chimeric Antigen Related T-cell
CBE	Clinical Breast Examination
CDC	Centers for Disease Control
CDR	Cytotoxic Drug Reconstitution
CME	Continuing Medical Education
CML	Chronic Myeloid Leukemia
CNE	Continuing Nursing Education
CNS	Central Nervous System
COU	Clinical Oncology Unit
CPG	Clinical Practice Guideline
CRC	Clinical Research Centre – now also known as Institute for Clinical Research (ICR)

ABBREVIATION	EXPLANATION
CRM	Cancer Research Malaysia
CRS	Cancer Rehabilitation Services
CT	Computerised Tomography
CTIAC	Cytology: Advance in Cytology
CYFRA 21-1	Cytokeratin 19 fragments
DALY	Disability-Adjusted Life Year
DDISH	Dual-colour Dual-hapten in-situ hybridization
DDR	Direct Digital Radiography
DSM	Department of Standards, Malaysia
ECOG	Eastern Cooperative Oncology Group
EGFR	Epidermal Growth Factor Receptor
EQA	External Quality Assessment
FCTC	Framework Convention on Tobacco Control
FIAC	Fellowship of International Academy of Cytology
FISH	Fluorescence in situ hybridisation
Ga-68	Gallium-68
GESM	Gynae Endoscopy Society Malaysia
GO	Gynae-Oncology
GPs	General Practitioners
HA	Hospital Ampang
HCP	Healthcare provider
HCTM-UKM	Hospital Canselor Tuanku Muhriz, Universiti Kebangsaan Malaysia
HE4	Human Epididymis Protein 4
HEPA	High efficiency particulate air
HER2	Human Epidermal Growth Factor Receptor 2
HKL	Hospital Kuala Lumpur
HLP	Hadiah Latihan Persekutuan (Federal Training Award)
HOD	Head of Department
HOSHAS	Hospital Sultan Haji Ahmad Shah
HPB	Hepato-Pancreatico-Biliary
HPE	Histopathological Examination
HPJ	Hospital Putrajaya
HPP	Hospital Pulau Pinang
HPV	Human Papilloma Virus
HPV DNA	Human Papilloma Virus DNA
HQ	Headquarter

ABBREVIATION	EXPLANATION
HQE	Hospital Queen Elizabeth
HQE II	Hospital Queen Elizabeth II
HR	Human Resource
HRPB	Hospital Raja Permaisuri Bainun
HRPZ II	Hospital Raja Perempuan Zainab II
HSA	Hospital Sultanah Aminah
HSBAS	Hospital Sultanah Bahiyah Alor Setar
HSI	Hospital Sultan Ismail
HSNZ	Hospital Sultanah Nur Zahirah
HTA	Health Technology Assessment
HTAA	Hospital Tengku Ampuan Afzan
HTAR	Hospital Tengku Ampuan Rahimah Klang
HTJS	Hospital Tuanku Jaafar Seremban
HUS	Hospital Umum Sarawak
HUSM	Hospital Universiti Sains Malaysia
HWKKS	Hospital Wanita dan Kanak-Kanak Sabah
IAEA	International Atomic Energy Agency
ICG	Fluorescent dye indocyanine green
ICR	Institute for Clinical Research
iFOBT	immunological Faecal Occult Blood Test
IHBR	Institute Health Behavioural Research
IHSR	Institute for Health Systems Research
IHC	Immunohistochemistry
IHM	Institute Health Management
IIT	Investigator initiated Trials
IKN	Institut Kanser Negara (National Cancer Institute)
IMR	Institute for Medical Research
IMU	International Medical University
IPHKL	Institut Paediatrik Hospital Kuala Lumpur
IPTA	Institut Pengajian Tingga Awam (Public Higher Educational Institutions)
IPTS	Institut Pengajian Tinggi Swasta (Private Higher Educational Institutions)
IR	Interventional Radiology
ISH	In situ hybridization
ISR	Industry Standard Research
JKN	Jabatan Kesihatan Negeri (State Health Department)

ABBREVIATION	EXPLANATION
JKPPOG	Jawatankuasa Pengurusan dan Perkembangan O&G
JKR	Jabatan Kerja Raya (Public Works Department)
JPA	Jabatan Perkhidmatan Awam (Public Services Department)
KOSPEN	Komuniti Sihat Pembina Negara
KPI	Key Performance Index
KSM	Kementerian Sumber Manusia (Ministry of Human Resources)
KSKB	Kolej Sains Kesihatan Bersekutu (College of Allied Health Sciences)
LBC	Liquid Based Cytology
LDCT	Low-dose Computed Tomography
LDP	Latihan Dalam Perkhidmatan (paid study leave)
LINAC	Linear Accelerator
LIS	Laboratory Information System
Lu-177	Lutetium-177
MAOMS	Malaysian Association of Oral and Maxillofacial Surgeons
MDA	Malaysian Dental Association
MDT	Multi-disciplinary Team
MGCS	Malaysian Gynaecological Cancer Society
MHTC	Malaysia Healthcare Travel Council
MIBG	meta-iodobenzylguanidine
MLT	Medical Laboratory Assistant
MMA	Malaysian Medical Association
NSR	National Specialist Registry
MNCR	Malaysia National Cancer Registry
MO	Medical Officer
MOF	Ministry of Finance
MOH	Ministry of Health
MOHE	Ministry of Higher Education
MOS	Malaysia Oncology Society
MPDPA	Malaysian Private Dental Practitioners Association
mpMRI	multiparametric Magnetic Resonance Imaging
MRD	Minimal Residual Disease
mRECIST	modified Response Evaluation Criteria in Solid Tumours
MRI	Magnetic Resonance Imaging
MyHDW	Malaysian Health Data Warehouse
MYPAP	Malaysia Patient Assistance Program

ABBREVIATION	EXPLANATION
NCCB	National Cancer Control Blueprint
NCD	Non-Communicable Disease
NGO	Non-government Organisation
NHMS	National Health and Morbidity Survey
NIH	National Institute of Health
NPANM III	National Plan of Action for Nutrition Malaysia III
NPC	Nasopharyngeal cancer
NSPCCP	National Strategic Plan of Cancer Control Programme
NSR	National Specialists Registry
O&G	Obstetrics and Gynaecology
OCRCC	Oral Cancer Research & Coordinating Centre
OGSM	Obstetrical and Gynaecological Society of Malaysia
OHP	Oral Health Programme
OSCC	One Stop Crisis Centre
PACS	Picture Archiving and Communication System
PAP	Papanicolaou test
PCR	Polymerase Chain Reaction
PERCIST	PET Response Criteria in Solid Tumours
PET	Positron Emission Tomography
PHW	Pictorial Health Warnings
PIK	Pusat Informatik Kesihatan (Health Informatic Centre)
PIVKA2	Protein induced by Vitamin K absence-II
PKD	Pejabat Kesihatan Daerah (District Health Office)
PNP	Patient Navigation Programme
PPP	Public-Private-Partnership
PRC	Pink Ribbon Centre
PRIS	Patient Registry Information System
PROGRP	Progastrin-releasing peptide
PRRT	Peptide Receptor Radionuclide Therapy
PSA	Prostate Specific Antigen
PSH	Pekerja Sambilan Harian (daily part-time staff)
PSMA	Prostate-specific Membrane Antigen
PSMA-RLT	Prostatic-specific membrane antigen directed radioligand therapy
QALY	Quality Adjusted Life Years
QUAADRIL	Quality Assurance Audit for Diagnostic Radiology Improvement and Learning

ABBREVIATION	EXPLANATION
RCPA	Royal College of Pathologists Australasia
RCPath	Royal College of Pathologists UK
RECIST	Response Evaluation Criteria in Solid Tumours
RFA	Radiofrequency Ablation
RIS	Radiology Information System
RIT	Radioimmunotherapy
RM	Ringgit Malaysia
RMK-10	Rancangan Malaysia ke-10
RMK-12	Rancangan Malaysia ke-12
SBRT	Stereotactic Body Radiotherapy
SIRT	Selective Internal Radiation Therapy
SMDC	Small Molecule Discovery Centre
SME	Subject Matter Expert
SPA	Suruhanjaya Perkhidmatan Awam (Public Services Commission)
SPECT	Single Photon Emission Computed Tomography
SST	Somatostatin
STR	Short Tandem Repeat
T&CM	Traditional and Complementary Medicine
TACE	Transarterial chemo-embolisation
TKI	Tyrosine Kinase Inhibitor
TNM	Tumour, Nodes, Metastases
UKM	Universiti Kebangsaan Malaysia (National University of Malaysia)
UM	Universiti Malaya (University of Malaya)
UMMC	University of Malaya Medical Centre
UPM	Universiti Putra Malaysia
USM	Universiti Sains Malaysia
WHO	World Health Organisation
YLD	Years lived with disability
YLL	Years of live lost

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ISBN 978-967-2469-30-8