NATIONAL CANCER CONTROL PROGRAMME

ACTION PLAN

2010 - 2014

CANCER CAN BE PREVENTED
# TABLE OF CONTENTS

## 1. EXECUTIVE SUMMARY

1.1. Introduction  
1.2. General Objectives  
1.3. Specific Objectives for the four year Cancer Plan  
1.4. Priorities of the Cancer Plan  
1.5. Managerial Activities  
1.6. Conclusion  

## 2. SITUATION ANALYSIS OF CANCER SERVICES

2.1. Mauritius: Country Profile  
2.2. Mauritius: Health Profile  
2.3. Epidemiology of Cancer in Mauritius  
2.4. Overall Disease Policy re: Treatment, Prevention and Control.  
2.5. Cancer Surveillance  
2.6. Cancer Registry  

## 3. JUSTIFICATION OF THE CANCER PLAN

## 4. FUTURE PLANS OF ACTION FOR CANCER SERVICES: INFRASTRUCTURE AND RESOURCES

## 5. HEALTH STRATEGIES IN PREVENTION AND CONTROL OF CANCER IN MAURITIUS

5.1. Implementation of the National Cancer Control Programme  
5.2. Improving and Supporting the Oncology Services and other organisations involved in Cancer Activities  
5.3. Primary Prevention  
5.4.1 Health Education on Cancer  
5.4.2 Immunization Programme for Hepatitis B  
5.4.3 Prevention of Tobacco Related Cancers  
5.4.4 Prevention of Cervical cancer  

5.5 **Secondary Prevention - Screening**

5.5.1 Goals for Screening  
5.5.2 Screening for Cancer of Cervix  
5.5.3 Screening for Cancer of Breast
5.6. Cancer Treatment

5.6.1 Radiotherapy
5.6.2 Chemotherapy
5.6.3 Surgery
5.6.4 Palliative Care
5.6.5 Manpower Requirement and Training.
5.6.6 Associated Services Concerned with Cancer
5.6.7 Manual “Cancer Therapy in Mauritius”

6 Human Resources and Development

6.1 Objectives of Human Resource Development
6.2Existing and Projected Human Resource
6.3 Staff Development in Oncology Nursing

7 Infrastructure and Material resource Development

7.1 Infrastructure
7.2 Major Equipment Requirements
7.3 Building and Space Requirement
7.4 Drugs and Haematology support services
7.5 Educational Material

8 Legislation to Support Cancer control Programme

8.1 Aim of legislation
8.2 Objectives
8.3 Tobacco Related Cancers

9 Research Priorities

10 Programme Action Plan

11 Collaboration in Prevention and Control of Cancer

12 Evaluation of the Programme

13 Program budget

14 References

15 National Cancer Action Plan Task Force Members
1. EXECUTIVE SUMMARY

1.1. INTRODUCTION

Cancer has become the third major health threat after diabetes and cardiovascular diseases in the Republic of Mauritius.

Nearly 1400 new cases of cancers and 950 cancer deaths occur each year. In 2008, cancers accounted for 11.9% of all deaths in the country. There were, in total, 2286 and 3280 new cases of cancer in men and women respectively between 2005-2008, and 58% of all female cancers occurred in the age group of 15-60 years, while 1.7% of all cases occurred in children below the age of 14 years. The total number of new cases has risen by 41% and 40% in men and women respectively between 1992 and 2008. There has been a doubling of the incidence rate of female breast cancer between the periods 1989-1992 and 2005-2008.

In order to slow down this alarming trend, it is essential to have a National Cancer Programme which defines objectives and priorities, sets out strategies and coordinates activities in the main areas of Cancer Control i.e. cancer prevention, screening and early diagnosis, therapy and palliative care, in line with the recommendations of the World Health Organisation.

The incidence and prevalence of the different types of cancers vary in different parts of the world. In Mauritius, breast cancer in females and cancer of the colon & rectum in males are the commonest, while in children, acute leukaemia is the commonest cancer.

The population should be informed about the common cancers and about the risk factors and lifestyles that predispose individuals to develop such cancers. Avoiding risk factors and lifestyles will help to reduce the incidence of some of the preventable cancers in the population.

Tobacco smoking is unequivocally associated with a variety of cancers mainly those of the lungs, mouth and throat. The development of uterine cervix cancer in women is related to sexual lifestyles and the Human Papilloma virus.

Many cancers are curable, e.g. uterine cervix, breast, colon, mouth and throat, blood cancers and many childhood cancers, if they are diagnosed early. For this to be a reality in Mauritius, it is necessary that the public is made aware of early symptoms and signs, health professionals are educated about cancer, and treatment facilities are provided to enable effective therapy. A new Women’s Hospital which will include cancer care for women is in the pipeline.

In general, one-third of all cancers are preventable, one-third are treatable and the remaining one-third are at present incurable. Palliative care provision, which includes the control of pain and relief of symptoms, needs to be structured and patient-centred. This aspect of cancer control costs little and yet is important in improving the quality of life of cancer patients.
During the preparation of this Action Plan, several major aspects of the Action Plan have already been formulated and have reached the stages of implementation. A multidisciplinary Breast Tumour Board has been set up at Victoria Hospital consisting of surgeons, pathologists, oncologists and radiologists. A National cervical cancer screening coordinator is in charge of re-engineering the new colposcopy services to be provided for cervical cancer based at Victoria Hospital. A Children Cancer Unit has been inaugurated in May 2009 at Victoria Hospital and work is in progress for extension to a state of the art 13 bedded children cancer Ward. Two new Specialists have been recruited in the Department of Radiotherapy. New equipment has been received in the Department of Nuclear Medicine at J. Nehru Hospital for cancer diagnosis and new diagnostic endoscopy facilities have been set up at SSRN Hospital.

Mauritius, with its vision of becoming a regional medical hub, will need a Comprehensive National Cancer Center, which will offer modern care to all cancer patients of the country. The setting up of a National Cancer Institute will be the way forward to bring along the changes in cancer care and to enable the country to confront the future predictable challenges of cancer in the Republic of Mauritius before it becomes the main scourge of the country’s health.

WHAT IS A NATIONAL CANCER CONTROL PROGRAMME?

A national cancer control programme is a public health programme designed to reduce the incidence and mortality of cancer and improve the quality of life of cancer patients through the systematic implementation of evidence-based strategies for primary prevention, early detection, treatment, and palliation, making the best use of available resources.

At present, cancer deaths in Mauritius account for approximately 11% of all deaths registered annually.

The health economic consequences are therefore significant and a National Cancer Control Programme should be funded to implement effective measures. For such a programme to succeed, there should be a commitment by the government to the objectives of the programme. Policy measures required to achieve those objectives should be put in place.

The 4 basic steps which would be required for the successful implementation of the National Cancer Control Programme in the Four-Year Cancer Plan in Mauritius are:-

1. Assessment of the magnitude of the cancer problem: incidence and prevalence
2. Setting measurable cancer control objectives
3. Monitoring and Evaluating possible strategies
4. Identification of the priorities for the cancer Control programme

The Statistics of the Ministry of Health and Quality of Life, the National Cancer Registry and epidemiological studies are reliable sources of data to estimate the extent of the cancer problem.

The resources required for the Four-Year cancer programme include infrastructure, financial and human resources. The government, non-governmental organizations (NGOs) and the public and private sector through Corporate Social Responsibility should be involved in developing these resources.
1.2 GENERAL OBJECTIVES

The overall aim of the Four-Year Cancer Programme is to formulate, plan and implement a coordinated and cost-effective program for the prevention, treatment and control of cancer in the Republic of Mauritius.

The Objectives of the Mauritius Cancer Programme are:
1. To prevent cancer through public education
2. To reduce the morbidity and mortality due to cancer
3. To promote early detection of cancer
4. To provide adequate therapy
5. To develop an effective palliative care service

Specific Objectives For The Cancer Programme
• To determine the incidence and prevalence of cancer in Mauritius
• To promote public awareness about cancer i.e early symptoms and prevention strategies.
• To promote early diagnosis and referral, and provide effective therapy and palliative care.
• To provide adequate infrastructure, equipment and drugs for the treatment of cancer patients.
• To promote scientific, epidemiological and clinical research in cancer in Mauritius
• To mobilize resources from government, the private sector and Non-governmental organizations (NGOs) for the Cancer Programme
• To co-ordinate all cancer activities
• To advise the Government on legislation needed for the Cancer Programme
• To monitor and evaluate the Cancer Programme
• To develop strategies for better implementation.

1.4. PRIORITIES OF THE FOUR YEAR MAURITIUS CANCER PROGRAMME

1.4.1. Strengthen Cancer Registry in Mauritius

1.4.2 Provide Cancer Education to the Public and School Children:

Methods will include the use of posters, articles in the press, talks on radio and television, and visits to schools, meeting places and work places. Incorporation of educational materials on cancer prevention suitable for primary and secondary school syllabus. Funds will be made available for a well designed cancer awareness programme.

1.4.3 Prevention of Cancer
Prevention means minimizing or eliminating exposure to cancer causing agents, and offers the cheapest opportunity for long term cancer control. The public, non-governmental organizations and the government must participate in eliminating factors in the environment that contribute to the occurrence of cancer. The exact causes of many cancers are unfortunately not known.
In Mauritius, priority will be given to the following areas:

(a) Cancer of Uterine Cervix through sexual health education and screening
(b) Breast Cancer through lifestyle changes
(c) Tobacco-related cancers. The public needs to be continually reminded about the high risk of cancers related to the regular use of tobacco
(d) Alcohol and diet. Excessive consumption of alcohol, especially in those who smoke as well, carries a high risk of cancers in the mouth, throat, pancreas and oesophagus. The public will be informed of the benefits of a balanced low-fat diet containing fruits and vegetables.

1.4.4 Early Detection and Treatment.

Many types of cancers common in Mauritius are amenable to early detection, at a stage when they are most likely to be cured and the treatment less radical. These include cancers of the cervix, the breast and colon. Mauritius already has the basic infrastructure and facilities for therapy of cancer using surgery, chemotherapy and radiotherapy. More effort should be made to improve the service through training of more personnel, provision of adequate medication, modern infrastructure, and modernisation of radiotherapy equipment, as well as their proper maintenance, and ensure quality control.

1.4.5 Palliative and Supportive Care

Palliative Care is inadequate in Mauritius. There is no purpose-built Hospice or palliative care unit or dedicated pain control unit in the public sector. Morphine is available in both the public hospitals and private clinics but not adequately prescribed by medical staff. The aim will be to progressively extend palliative care practices to all hospitals and Area Health Centres and provide home-based care after training of the necessary workforce.

1.4.6 Training of Health Personnel.

There is need for continuing education for the medical & nursing staff and other workers in the health service, with respect to, especially, the holistic and humane approach to the cancer patient and, on the other hand, to modern high technology cancer therapy.

1.4.7 Infrastructure / Equipment.

Recommendations will be made for essential radiotherapy equipment required. The need to train an adequate number of Radiotherapy technicians and provide them with the tools and means to properly maintain these expensive machines must be emphasised. There is need for more outpatient and inpatient ward space to cope with the rapidly increasing number of cancer patients.
1.4.8 Drugs

A separate budget for regular and adequate supply of drugs for cancer treatment should be made available. A Chemotherapy Committee needs to monitor the supply and usage of chemotherapy drugs. This Committee will make recommendations on the types of tumours, which can be treated with chemotherapy, especially with the escalating cost of new drugs for cancer.

1.4.9 Research

Clinical, epidemiological and scientific research on cancer in Mauritius will be encouraged. These studies should include defining the possible causes of cancer, prevention, methods of achieving early diagnosis and improvement in therapy, and changing lifestyles of the population. The roles of the Mauritius Research Council, the University of Mauritius, the Mauritius Institute of Health and the National Cancer Registry need to be coordinated in this respect by creation of a Clinical Research Council.

1.5 Managerial Activities Required by the Cancer Plan.

The main types of managerial activities that will be required in the Cancer Plan are:

1. Integration of the Cancer Programme within the NCD Programme
2. Implementation of the Programme
3. Fund Raising.
4. Public Education
5. Professional Education and Development
6. Information systems
7. Quality Assurance
8. Research and Policy Development
9. Monitoring and Evaluation

1.6 Conclusion

The Cancer Plan for Mauritius will be most effective when it is integrated into the country’s Health Sector Strategic Programme. This will allow coordinated action on common risk factors for several diseases, for example tobacco as the cause of both cancer and cardiovascular diseases. The Ministry of Health should provide leadership in collaboration with NGOs interested in cancer services. The Mauritius Cancer Society will need to be revived.

A comprehensive cancer program will require a multisectoral approach to include several Ministries because factors that contribute to the causes of cancer have a broad base in society. Plans to minimize cancer hazards should be incorporated into agriculture and industry, and any potential carcinogenic exposures should be identified and standards established and enforced for their control.

It must be emphasized that the successful implementation of the cancer plan will require a commitment by the government to the objectives of the programme and the provision of extra resources. Adequate budget should be allocated for the Cancer programme.
2. ASSESSMENT OF CURRENT SITUATION IN RELATION TO CANCER SERVICES

2.1 Country Profile of Mauritius

Area 2040 sq. km

Age Structure

<table>
<thead>
<tr>
<th>AGE (years)</th>
<th>MALES</th>
<th>FEMALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 4</td>
<td>49 940</td>
<td>48 131</td>
</tr>
<tr>
<td>5 – 14</td>
<td>105 864</td>
<td>103 394</td>
</tr>
<tr>
<td>15 – 49</td>
<td>341 953</td>
<td>339 742</td>
</tr>
<tr>
<td>50 - 59</td>
<td>56 174</td>
<td>59 337</td>
</tr>
<tr>
<td>60 - 64</td>
<td>15 608</td>
<td>17 984</td>
</tr>
<tr>
<td>65 +</td>
<td>32 697</td>
<td>45 745</td>
</tr>
</tbody>
</table>

2.2. Mauritius Health Profile

Crude death rate per 1000 = 7.3
Crude birth rate per 1000 = 13.8
Life expectancy at birth (2008) = 69.1 years (males) / 76.1 years (females)
Infant mortality rate (2006) = 13.5 per 1000 live births
Maternal mortality rate (2006) = 0.18 per 1000 live births
Children immunization coverage (2006) = 89.3 per 100 live births
Population:Doctor ratio = 876 inhabitants per doctor
## KEY ECONOMIC AND HEALTH INDICATORS
### (Republic of Mauritius)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Domestic Product (GDP) at market prices</td>
<td>Rs 233.7 billion</td>
</tr>
<tr>
<td></td>
<td>US 7.7 billion</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>Rs 184,000</td>
</tr>
<tr>
<td></td>
<td>US 6,133</td>
</tr>
<tr>
<td>Inflation Rate</td>
<td>6.9%</td>
</tr>
<tr>
<td>Estimated Total Health Expenditure (public &amp; private)</td>
<td>Rs 10.8 billion</td>
</tr>
<tr>
<td></td>
<td>US$ 0.36 billion</td>
</tr>
<tr>
<td>Government Expenditure on Health (GEH)</td>
<td>Rs 4.9 billion</td>
</tr>
<tr>
<td></td>
<td>US$ 0.16 billion</td>
</tr>
<tr>
<td>GEH as % of Total Government Expenditure</td>
<td>6.9 %</td>
</tr>
<tr>
<td>Per capita Government expenditure on Health</td>
<td>R 3,979</td>
</tr>
<tr>
<td></td>
<td>US$ 132</td>
</tr>
<tr>
<td>Per capita Total Expenditure on Health</td>
<td>Rs 8,752</td>
</tr>
<tr>
<td></td>
<td>US$ 291</td>
</tr>
<tr>
<td>Public Health Expenditure as % of GDP</td>
<td>1.8 %</td>
</tr>
<tr>
<td>Total Population</td>
<td>1,234,042</td>
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<tr>
<td>Infant Mortality Rate per thousand live births</td>
<td>14.4</td>
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<tr>
<td>Under-Five Mortality Rate per thousand live births</td>
<td>16.6</td>
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<tr>
<td>Maternal Mortality Rate per thousand live births</td>
<td>0.37</td>
</tr>
<tr>
<td>Life Expectancy-Males</td>
<td>69.1</td>
</tr>
<tr>
<td>Life Expectancy-Females</td>
<td>76.1</td>
</tr>
<tr>
<td>No. of beds in public hospitals</td>
<td>3,500</td>
</tr>
<tr>
<td>No. of beds in private clinics</td>
<td>582</td>
</tr>
<tr>
<td>Doctor-population ratio per thousand population</td>
<td>1.14</td>
</tr>
<tr>
<td>Nurse-population ratio per thousand population</td>
<td>2.61</td>
</tr>
</tbody>
</table>
2.3.1 Epidemiology of Cancer in the Republic of Mauritius

According to data from the Health Statistics Unit of the Ministry of Health and Quality of Life, cancer accounted for a total of 4,666 discharges (including deaths) from hospitals in 2006. It was responsible for 11.9% of mortality compared to 22.6%, 21.7% and 9.3% for diabetes, heart diseases and cerebrovascular diseases respectively.

The Department of Radiotherapy at Victoria Hospital recorded a total of nearly 1,000 new cases of cancer presenting to the public sector for the year 2009 with 19,682 outpatient attendences in the same year. National cancer Registry data show that the incidence of cancer is nearly 1,400 cases per year with approximately 950 cancer deaths occurring each year.

The commonest sites of cancer, based on the latest report by the National Cancer Registry, are in males: Colon-rectum (14%), Prostate (10.5%), Oral cancer (8%) and Lung (9.6%). Among females, Breast cancer (38%) is the most prevalent site of cancer followed by cancer of the uterine cervix (10%), Colon-rectum (4.8%) and Ovaries (5.6%). Mean age for cancer incidence is 56.4 years in males and 59.7 years in females.

The table below shows the commonest cancers in both sexes (2005-2008).

<table>
<thead>
<tr>
<th>MALES</th>
<th>Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon</td>
<td>320</td>
<td>14</td>
</tr>
<tr>
<td>Prostate</td>
<td>241</td>
<td>10.5</td>
</tr>
<tr>
<td>Lung</td>
<td>220</td>
<td>9.6</td>
</tr>
<tr>
<td>Oropharynx</td>
<td>186</td>
<td>8.1</td>
</tr>
<tr>
<td>Lymphoma/Leukaemia</td>
<td>192</td>
<td>8.4</td>
</tr>
<tr>
<td>Stomach</td>
<td>182</td>
<td>8</td>
</tr>
<tr>
<td>Bladder</td>
<td>112</td>
<td>4.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FEMALES</th>
<th>Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>1239</td>
<td>37.8</td>
</tr>
<tr>
<td>Cervix</td>
<td>334</td>
<td>10</td>
</tr>
<tr>
<td>Colon</td>
<td>159</td>
<td>4.8</td>
</tr>
<tr>
<td>Ovary</td>
<td>183</td>
<td>5.6</td>
</tr>
<tr>
<td>Uterus</td>
<td>166</td>
<td>5.0</td>
</tr>
<tr>
<td>Leukaemia</td>
<td>73</td>
<td>2.2</td>
</tr>
</tbody>
</table>

Between 2005 and 2008, there were 2,286 new male cancer cases registered and 3,280 new female cancer cases. Breast cancer in females accounted for a total of 1,239 new cases and childhood cancers for 96 new cases during that period. There were 1,950 male cancer deaths and 1,900 female cancer deaths recorded between 2005-2008.
High risk Factors for Cancer

Although the exact causes of cancer are unknown, the development of cancer is often associated with life styles, diet and environmental conditions. Cancers of the lung, throat and mouth, oesophagus have been directly linked to tobacco smoking. Cancer of the cervix has been linked to sexual transmission and certain Human Papilloma Virus subtypes. Diet has also been linked to causation of cancer of the bowel, stomach and breast. Infection with hepatitis B and C viruses is associated with liver cancer.

2.4 Overall Disease Policy

The public health system in Mauritius is completely free to all citizens: patients do not have to pay for the cost of any drug therapy or radiotherapy or surgery. The work of the Non Communicable Disease Unit of the MoHQoL unit focuses primarily on diabetes, hypertension, hyperlipidaemia, cardiovascular diseases and cancer.

2.5. Cancer Surveillance

The cancer incidence and prevalence data is important to ascertain the extent of the cancer problem in Mauritius. Data will also be collected to evaluate morbidity in addition to mortality due to cancer. Cancer surveillance system takes place through the following channels:

- The routine health information system based within the MOHQoL
- The Central Laboratory National Cancer Registry (pathology-based)
- The Radiotherapy Department Patient Register

2.5.1. Routine Health Information System

The Central Health Information System is based at the Ministry of Health. The unit is responsible for collection of routine health information including Regional Hospital medical record data.

The National Cancer Registry of the Republic of Mauritius is based at the Central Pathology Laboratory, Candos. It registers all pathologically-diagnosed cancer cases in the public sector. Since 2000, private pathological laboratories also provide data for comprehensive cancer registration.

2.5.2 Death Registration

Data on deaths due to cancer or any other cause is recorded by Civil Status Office (Prime Minister’s Office).
2.6. NATIONAL CANCER REGISTRY

The idea of starting a Cancer Registry was put forward in 1989 and the first publication for 1989-1996 cancer statistics was issued in 1999. It has been continually functional and updated since. The latest published statistics on the cancer incidence and mortality for 2005-2008 have been released providing one of the most comprehensive cancer data collection for an African country.

Function of the National Cancer Registry
The main functions of a cancer registry should be as follows:

To assess the incidence of cancer by achieving complete registration of all diagnosed cancers.

To provide information on cancer trends to help in assessing future needs of cancer services.

To try to identify risk factors associated with cancer

To provide data for epidemiology and other research

The National Cancer Registry

The Registry is currently operating in restricted space with limited staff at Central Laboratory, Candos. There is one clerical staff who is responsible for the day to day running of the registry. Data is collected from several sources both public and private sector. The information resulting from analysis of this data is of international standard and have been presented to International Meetings and Forums.

3. JUSTIFICATION and RATIONALE of the Cancer Programme

3.1 Justification
Many cancers with known causes can be prevented and their incidence will eventually fall. Many patients with cancer can be cured of their disease with adequate therapy, if detected early. Patients with incurable cancers should expect to receive a good quality of life.

3.1.1 Cancer Prevention
Certain cancers may be easily preventable, e.g. cervical cancer (by promoting sexual health), lung and other tobacco-related cancers (by control of smoking)

3.1.2 Early Diagnosis
The outcome of cancer treatment are generally improved when cancers are detected at an early stage, as in cervical and breast cancer. Cancer may be diagnosed early by proven screening methods. Public awareness campaigns to alert the public to cancer symptoms will also lead to earlier diagnosis.
3.1.3 Curative Therapy
More cancers can nowadays be cured, especially cervical, breast, head and neck, leukaemias and children’s cancers. One or more of the treatment modalities of surgery, radiotherapy and chemotherapy may be necessary. This requires adequate manpower with sufficient training, also the necessary equipment and provisions for its maintenance, and adequate supply of drugs to be delivered within an appropriate infrastructure.

3.1.4 Palliative Care
Some cancers such as liver, kidney, lung, stomach, pancreas, are at present incurable in the majority of cases. It is however important to offer such cases best symptomatic and supportive treatment (i.e. palliative care). The majority of such patients should be able to enjoy a good quality of life and remain pain-free for the rest of their lives.

3.2 Rationale
Mauritius is fortunate in already having a dedicated Radiotherapy unit attached to a regional hospital with medical and surgical specialists, nursing and paramedical personnel. Cancer-related activities will however be most effective if they are well co-ordinated. Early diagnosis and referral will not help unless treatment facilities are available, maintained and upgraded. Thus the rationale of the cancer action Plan is primarily to coordinate activities in prevention, promote early diagnosis and referral, and improve treatment and palliative care.

3.6. CURRENT STATUS OF CANCER SERVICES: INFRASTRUCTURE & RESOURCES

There are three major ways of treating cancer, namely by surgery, chemotherapy and radiotherapy. Others include hormonal therapy and immunotherapy. These are available in Mauritius, but not all necessarily in the public sector. Treatment facilities especially for Radiotherapy and Chemotherapy are centered at the Radiotherapy Unit at Victoria Hospital. Chemotherapy may also be administered in Rodrigues.

4.2.1 Surgery
There are a number of general surgeons and gynecologists in Mauritius, but no surgical oncologist or dedicated breast surgeon yet. Most of the surgeons and gynecologists operating on cancer patients have received no specialist oncological training. Not all cases are discussed within a multidisciplinary board of specialists before surgery.

4.2.2 Radiotherapy
There is only one Radiotherapy centre in Mauritius. The current infrastructure was setup in 1968, and later, further structural modification was carried out to house a linear accelerator, a simulator and planning section in 1994. A low dose remote controlled brachytherapy machine is functional since 2007. One of the two Cobalt units has been replaced in March 2009. The linear accelerator is due to be replaced. Six Radiotherapists have been trained abroad in Radiotherapy and Chemotherapy. There is a Medical Oncologist accredited from UK since 2003.
4.2.3 Chemotherapy
A good standard of chemotherapy care is already practised in Mauritius. More than 40 chemotherapy drugs are readily available free of charge to hospital patients. The objectives over the next four years will be to increase the access to modern chemotherapy drugs and to provide curative chemotherapy and eventually stem-cell transplant for curable types of cancers affecting especially children.

Chemotherapy protocols according to European ESMO and American NCCN guidelines have been adapted to the Mauritian context and are being implemented according to cancer-types. All chemotherapy are prescribed by Specialists only. Chemotherapy care for children are supervised jointly by an oncologist and a paediatrician.

There are nurses who are involved in administering chemotherapy either for in-patients or out-patients. However, they need continuous nursing education for update in chemotherapy, cancer and its complications. Flow cabinets are available for the safe reconstitution of chemotherapy drugs. Intravenous Chemotherapy is currently administered on the wards for inpatients and in a Chemotherapy Day Unit for outpatients. Portacath venous systems are available in baby, children and adult sizes and are inserted by two trained surgeons at present, including a paediatric surgeon.

There is only one centre in Mauritius for the treatment of patients with cancer. It would be advisable to decentralise chemotherapy for some patients for many practical reasons, such as limited space at Victoria Hospital and transport. However, such a measure would require more trained staff to administer chemotherapy under supervision in other regional hospitals.

A system of categorization of tumours needs to be devised for treatment purposes as chemotherapy drugs are expensive and potentially toxic. One category should include cancers in which a good response is anticipated for instance, lymphoma, leukemia, tumours of testes, childhood tumours, breast cancers. A second category should list tumours in which chemotherapy is not beneficial. Patients with these tumours should not be subjected to cytotoxic drugs, but can best be treated with other appropriate methods.

Chemotherapy regimes appropriate for use have already been devised by a ‘sub-committee for cancer diagnosis and treatment’ following the NCCP workshop in 2006.

Regular monitoring of usage and expenditure of all chemotherapy drugs will be carried out. A separate oncology (cytotoxic) drug budget will be requested from the Ministry of Health and Quality of Life.

4.2.4 Other Forms of Treatment
Hormonal therapy e.g Tamoxifen, and Immunotherapy e.g Interferon, are available. Vesananoid is available for Acute Promyelocytic leukaemia. Mauritius has benefited from the International GIPAP programme to provide the drug Glivec to eligible patients mainly with Chronic Myeloid Leukaemia. Newer drugs such as aromatase inhibitors and other modern targeted therapies will need to be considered for addition to the formulary in individual cases. All chemotherapy drugs are provided freely to all patients in the public sector.
4.2 Ward facilities for patients

The ambulant relatively fit patients undergoing radiotherapy and chemotherapy are treated on an out patient basis. About 30 patients attend the outpatient Chemotherapy Day Unit on a daily basis and a further 90 patients undergo radiotherapy daily.

There are 2 wards at the Radiotherapy Unit set aside for male and female cancer patients with a bed capacity of 57 beds but more often than not, cancer patients inappropriately occupy beds in other medical and even surgical wards in the hospital.

Children with leukaemias are treated in one of the paediatric wards at Victoria Hospital with basic isolation facilities within a general paediatric ward. Other children are treated in an area within the female ward in the radiotherapy Unit. A new state of the art Children Cancer Unit was opened in May 2009 and is being extended to a full dedicated ward in 2010.

Adolescents with cancer are treated together with adults. There is no dedicated ward or hospice for terminally ill cancer and non-cancer patients in Mauritius.

4 HEALTH STRATEGIES AND APPROACHES IN PREVENTION AND CONTROL

Strategies for controlling cancer in Mauritius in the 4 year cancer plan will include:-

• Implementation of the National Cancer Control Programme
• Primary Prevention
• Secondary Prevention
• Upgrading of Treatment care and facilities
• Strengthening Palliative Care

Development of a National Cancer Control Programme
A workshop on “Planning and Development of a National Cancer Control Programme” in the Republic of Mauritius was organised by the Ministry of Health and Quality of Life in September 2006. A Cancer Action Plan Task Force was set-up in January 2007 and four multi-disciplinary sub-committees provided proposals on:
1. Palliative Care Programme, including capacity building and training, multidisciplinary palliative care team, networking with NGOs, Review of the Dangerous Drug Act, and setting-up of Palliative Home Care
2. Re-engineering of the Cervical Cancer Screening Programme
3. Cancer Treatment guidelines based on published International protocols
4. Cancer Prevention Strategies
5.1 **Supporting Organizations Involved in Cancer Activities**

The NCCP will facilitate co-ordination, prevent duplication and enhance national distribution of existing resources. The Radiotherapy Department at Victoria Hospital will act as the focal point, since at the moment it is the only specialised cancer unit in Mauritius. Cancer prevention is currently based at primary care level. Supportive services are offered by ‘Link to life’, an NGO. There two other NGOs dealing with leukaemias and children’s cancers and another one with cancer counselling and palliation.

5.3 **National Cancer Control Committee.**

The objectives of the above committee are to:

- Implement, monitor and evaluate the National Cancer Programme for the control of cancer. This programme will have an intial four year plan.

- The National Cancer Control Committee will form several sub-committees to work on various areas of cancer control. These subcommittees have already submitted proposals for cancer prevention, palliative care, cervical cancer and main cancer therapy guidelines.

5.4 **Mauritius Cancer Association**

The Mauritius Cancer Association is a foundation established under the Mauritius Cancer Society Act 1970. However, it has not been active for some time and needs reviving as soon as possible to coordinate the activities of all cancer-associated organisations in the country. The objectives of the Society need to be updated.

5.5 **Primary Prevention**

Primary prevention offers the greatest opportunity for long term cost effective cancer control. Health protection measures are those which can be taken by government and private sector to shield people from harm e.g. limiting alcohol and banning of smoking in public places, pollution.

Health promotion are activities that individuals and communities can use to develop healthy life styles e.g. diet, exercise.

5.5.1 **Health Education on Cancer**

At the present time, there is a coordinated national cancer education programme for the public integrated within the NCD programme. A plan for Cancer Education in Mauritius will include the following objectives:

- Formulation of a cancer education plan. This plan is to reflect the National Plan and focus on priority cancers e.g. cervix, breast, colon and tobacco-related cancers.
- Organize mass media cancer education.
- Establish a Cancer Action Week to increase public awareness, eg around World Cancer Day and Breast Awareness month in October.
- To develop nation-wide awareness of World Tobacco Day.
5.5.2 **Aim of Health Education**

The aim of health education about cancer is to help individuals in reaching their optimal health potential by lowering their risk of developing disease such as cancer. Health education involves raising public awareness and educating the public on ways to reduce their risk of cancer and ways to detect cancer early. This requires a behavior change, which often occurs over a long period of time and is difficult to quantify.

5.5.3 **Educating School Children**

To assist schools in cancer prevention projects such as anti tobacco & sexual education which is already in progress by the Non-Communicable Disease Unit of the M.o.H & Q.o.L.

5.5.4 **Education of the Public**

Public education activities are aimed at increasing community awareness of the known preventive measures as well as the importance of early detection of cancer. A plan for educating the public includes the following:

Develop information modules about the prevention of cancer e.g. Facts and Myths about cancer, and Healthy Living. Conduct preventive programs using these information modules in the work place and in different organisations

Teach the community health worker how to give talks on the prevention of cancer.

Produce posters, written leaflets, use the media, TV on preventive measures against cancer.

5.5.5 **Immunization Programme for Hepatitis**

Many primary liver cancers are attributable to hepatitis B virus, an infection which can be prevented by vaccination. Mauritius has incorporated Hepatitis B vaccine into its extended programme since 1997 and is considering the new Human Papilloma Virus vaccines.

**Main Objectives**

HBV vaccination to be considered for other age groups

**Objectives for Implementation:**

1. Collaboration with those interested in hepatitis control
2. Educate high risk groups on vaccination.
3. Consider Vaccination of all children against hepatitis B

**Evaluation:**

There will be a reduction in the incidence of Hepatitis-B, a reduction in the number of HBV carriers and a gradual decline in the incidence of primary liver cancer.
5.5.6 Prevention of Tobacco Related Cancers

Rationale:

Tobacco causes lung cancer and is also attributed to cancers of the oral cavity, pharynx, oesophagus and bladder. In Mauritius, 200 deaths each year are estimated to be related to smoke-related cancers. Smoking is also responsible for causing chronic lung disease and cardiovascular disease. Passive exposure to tobacco also increases the risk of cancer. According to the estimates of the American Cancer Society’s Cancer prevention Study II the death toll from tobacco will rise from one million in mid 1960’s to three million by mid 2020’s. 70% of which will occur in developing countries.

Justification for Plan Action
The plan of action is to inform and protect Mauritians from the harmful effects of tobacco. Objectives of this plan include education, legislation and policy.

Education
Initiate anti-smoking campaigns to school-children from primary school onwards. Promote public awareness of smoking health hazards use and passive smoking and danger to children who should benefit from a smoke-free environment to grow up.

Legislation and Policy
New Tobacco Regulations in force since 2009 include a warning label that tobacco causes lung cancer and other cancers along with other health hazards.

Evaluation:
There will be a noticeable decline in the number of children and adults who take up smoking. There has been in fact a continuous fall in the percentage of people smoking from 31% in 1988 to 18% in 2004, more noticeable amongst males. In the long term, there should be a reduction in the incidence and mortality of tobacco related cancers and other diseases.

5.6 Primary Prevention
Education of the public and health personnel about cancer is of paramount importance. A co-ordinated approach is needed between the Government and Non-governmental Organizations (NGOs) to organise cancer prevention strategies in the following areas:

1. Tobacco
Tobacco use remains the single largest preventable cause of cancer and premature deaths in Mauritius. It is estimated that at least 200 new cancers each year are causally related to tobacco smoking in the country. Currently efforts are being made to discourage people from smoking and new anti-tobacco legislation will be implemented.

2. Diet
The WHO estimated that diet is a contributing risk factor to nearly one third of all preventable cancers globally. Everyone is encouraged to eat a healthy balanced diet. The Health Promotion Unit in the Ministry of Health is always highlighting this fact. The posters regarding the importance of healthy balanced diets are displayed in various places like hospitals. A National Action Plan for Nutrition has been finalised.
Screening and Early Diagnosis

4.5.1 Cancer of the Breast

In view of the relatively high proportion of breast cancers occurring in the younger than 45-year age group in Mauritius, mass population-screening by mammography is not currently advisable. Breast awareness and self-examination campaigns to target women above the age of 30 years need to be reinforced. Women above the age of 30 years are currently being encouraged to attend for clinical breast examination at the primary care facilities. Targeted Mammography should be considered in women in the age-group 50-59 years to include those at higher risk e.g familial cases initially as a pilot project. A digital mammography service is highly recommended. A dedicated Breast Health Unit should be setup to provide comprehensive advice and care to women with breast lumps. Such a unit will include specialists from the radiological, cytological, surgical, and radiotherapy departments.

4.5.2 Childhood Cancers

There were a total of 133 new cancers in children in the age group 0-14 between 2001-2004, with 52 new Leukaemia cases, the most common type of childhood cancer and also one of the most curable. Historically, paediatricians have been treating children with leukaemias in Mauritius in general paediatric wards. The chemotherapy drugs are generally available but good supportive care, in terms of management of infections and blood problems, is sometimes lacking. The management of these diseases is very complex and demands oncological and/or haematological expertise along with the appropriate isolation facilities to prevent life-threatening infections occurring in these immunocompromised patients. A preliminary review of Leukaemia services had been carried out in May 2001 by Professor Jeff Szer. Priority should be given to setting up a dedicated Leukaemia Unit soon, as many of these patients have curable cancers.

5.6 Secondary Prevention

Secondary prevention involves early detection and diagnosis of cancer. Early detection includes that every individual continually monitoring him/herself for signs and symptoms of cancer e.g. B. S.E, testicular examination. Screening may be done periodically by health professionals e.g. Papanicolaou Smear or VIA, Clinical breast examination, Digital rectal examination for prostate and rectal cancers, according to specific guidelines to be introduced.

5.6.1 Screening

Screening is aimed at detecting early cancer before the individual would be able to detect its presence i.e before the symptomatic stage. For some cancers such as cancer of the cervix and breast, the pre-symptomatic stage of the disease may extend for several years and provide an opportunity for screening.
5.6.2 Goals for Screening

Resources such as finance, manpower and technology are limited and therefore influence the choices and goals for screening. The goals for cancer screening are to:

- Develop public awareness campaigns to encourage individuals to assume responsibility for their own health.
- Identify and priorities those cancers most likely to be detected early by screening methods e.g. cervix, breast.
- Educate health care professionals to be aware of the signs and symptoms of cancer
- Develop a policy of referral for diagnosis, treatment and follow-up in all cases.

5.6.3 Cytology Screening for Cancer of Cervix

Rationale:
Cancer of the cervix is the second most common cancer in women in Mauritius. Many of these women do not attend for screening test in their life-time. Since the PAP smear can be a technically difficult test, Visual Inspection of cervix by Acetic Acid (VIA) should also be encouraged.

Plan
Implement a cervical cancer of screening programme using the VIA methodology at Victoria Hospital with the aim to reach the majority of women aged 35-55 years.

Objectives for Implementation
1. Establish health education for awareness of early sign and symptoms
2. Establish a policy for screening of women over 35 years.

Strategies:
- Identify women age 30 – 60 years
- Set up a pilot project at Victoria Hospital
- Ensure equipment is available for VIA and colposcopy
- Train at least two cytotechnicians
- Establish laboratory with quality control at international level
- Ensure adequate co-ordination between identification of abnormality and referral system for diagnosis, treatment and followup

Evaluation:
A decrease in the proportion of cases of invasive cervical cancer with presenting advanced disease should be expected. Long term effects of this plan will show a decrease in the incidence and mortality of cervical cancer.
5.6.4 Screening for Cancer of Breast

Rationale:
Cancer of the breast is the most common cancer in women accounting for 34% of all female cancers in Mauritius. A population-based mammography screening programme is presently not cost-effective for Mauritius as there is a relatively high proportion of premenopausal cases but age targeted opportunistic mammography is expected to reduce the mortality from breast cancer in the age group 50-59 where the disease is most prevalent. A hospital based study showed that more than half of cases in Mauritius present with pT2 breast lesions (i.e. 2 - 5 cm in diameter). Breast Self Examination (B.S.E.) is encouraged and is being taught in Area Health Centres as part of the Chronic Diseases Prevention Programme.

Plan:
Implement an educational programme on B.S.E
Encourage women to attend for clinical breast examination by mailing written information
Setup a pilot Mammography Screening Unit to target high risk groups eg. Postmenopausal women with familial breast cancer

Main Objective:
All women aged 25 and upwards will receive instruction on B.S.E.

Objectives for Implementation:

- Establish health education for awareness of screening
- Train primary health care workers to teach B.S.E. and to refer suspicious cases to specialist units in hospitals.
- Acquisition of a Digital Mammography equipment with facilities for biopsy

Evaluation:
A decrease in the proportion of cases of invasive breast cancer presenting with advanced disease should be expected in the future. This plan will show a gradual decrease in the mortality of breast cancer in the long-term.

5.7 Treatment Facilities

Treatment facilities are centered at the Radiotherapy Unit at Victoria Hospital in Candos. Long distances plus costly and time-consuming transportation limit easy access to the cancer treatment centre. Simple adjuvant chemotherapy could be undertaken by trained staff in other regional hospitals.

5.6.1 Surgery (see 4.2.2.)

5.6.2 Radiotherapy (see 4.2.3)

5.6.3 Chemotherapy – A high standard of chemotherapy is already practiced in Mauritius. The objective over the next 5 years will be to improve this standard.
1. At the moment, all out-patient chemotherapy is administered in a Chemotherapy Day care Unit by trained non-specialist nurses. In-patient chemotherapy is administered in two wards, one male and one female (including children), but there is often a severe shortage of available beds resulting in delays in treatment.

2. Treatment protocols have been devised for the Mauritian context based on International published guidelines and are due to be implemented.

3. A separate drug budget is necessary for chemotherapy drugs

4. Specialist chemotherapy nurses should be trained

5. Chemotherapy usage will be reviewed to give the greatest possible benefit to patients and to ensure the most useful utilization of available resources.

5.6.6 **Manpower requirements and areas of Training**

In the 4-Year cancer Plan, we should aim to increase the number of Oncologists, Physicists, Surgeons, Gynecologists and Pathologists with interest in Oncology:

- One radiation oncologist per 200,000 population and One Medical Oncologist per million population and one Clinical Haematologist per million population
- One specialist to be trained in each of the following areas: Surgical oncology and Pathology, Clinical Oncology and Clinical Haematology.
- Four medical Physicists to be trained.
- Two Therapy Radiographers to be trained each year

5.6.7 **Palliative Care/Terminal Care**

The need for a comprehensive Palliative Care Programme in Mauritius has been elaborated during a Cancer Control Workshop which took place in 2006. Most of the Palliative care work including prescription of opiate analgesia is currently being done by the oncologists at Victoria Hospital.

A Palliative Care Programme will have to include Education and Dissemination of information and maximising delivery of care to those in greatest need with new emphasis on home based and community care.

The aim would be to disseminate information on palliative care throughout the health system and to develop or extend the practice of palliative care using the existing infrastructure as far as possible. Methods used would include:

- Educational programs
- In the medical school curriculum
- In the nursing school curriculum
- Training workshops and CMEs
- Use of WHO palliative care manuals
Requirements would include:
- Ministry of Health ensuring drug and equipment continuous availability at all levels e.g. tramadol, morphine, Fentanyl transdermal patches, syringe pumps, ostomy appliances.
- Release of Nurses/Doctors to attend training sessions
- Provision of educational materials
- Curricula reviews from Training Institutions
- Ready access to simple analgesics
- Setting up of a Pain Control Clinic and a Community-based Palliative Care Team

5.6.8. Services Concerned With support of the Cancer Patient

Rationale:

The goal of cancer rehabilitation is to assist the patients to reach their optimal level of well being. A cancer help line and counseling services e.g through NGOs should be available.

Problems:
- Patient’s difficulty in accessing specialised cancer rehabilitation services

Plan:
To have access to clinical psychologists with interest in cancer care and paramedical staff trained in dealing with emotional and psychological support of the cancer patient

Main Objectives
To ensure that cancer patient have access to rehabilitation services mainly through NGOs.

Objectives for Implementation:
- Educate all levels of health care professionals on the rehabilitation services available
- Establish a counseling and support service (Social Services)

Manual “Oncology in Mauritius”

The manual will give an overview of all aspects of cancer, including principles of treatment, features of individual tumours, treatment modalities, palliative care and supportive services adapted to local context. The manual will be intended mainly for doctors and nurses but should provide valuable information to all health workers, including nursing and medical students.
6. Human Resources and Development

6.1 Aims and Objectives
The aims and objectives of Human Resources development are:-

- To train adequate manpower for Cancer control
- To train existing health workers in the management of cancer patients
- To ensure additional cancer services are provided to all regions in the country

6.2 Existing and Projected Human Resources

<table>
<thead>
<tr>
<th></th>
<th>EXISTING</th>
<th>REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicists</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Therapy Radiographers</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Maintenance Technicians</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Charge Nurses</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Ward Manager</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Nursing Officers</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Health Care Assistants</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Cancer Registry / Records Clerks</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

6.2.1 Staff Requirement to be able to provide services to other regions of Mauritius

Oncologists and oncology nurses will be required as described below.
In addition, in-service training for local health workers will be organized in the area of Cancer Prevention, Supportive and Palliative Care

6.3. Staff Education and Professional Development in Oncology

There is a need to provide cancer nurses with the knowledge, skills and attitude in oncology nursing care, which demands different needs and approaches compared to mainstream nursing care.

At present there are no nurse in the country who are specifically trained in oncology nursing. The need for oncology nurses can be illustrated by considering the number of cancer patients seen. The following are the average attendances:-

1. Out patient attendance
   Radiotherapy centre – 75 patients daily
   Chemotherapy Day Unit – 30 patients daily

2. In patients
   Radiotherapy Centre over 70 patients daily with more than 10 outliers in other wards

There has been no increase in cancer bed numbers since establishment of the Radiotherapy Centre in 1968. The radiotherapy wards have 57 beds for cancer patients yet patients have to be cared for in non-cancer wards of the hospital on a daily basis.
Training of Nurses in Oncology

It is essential to enhance the skills of nurses in the following areas:

1. Participation in cancer education of the patient, the family and the community
2. Counseling and arranging the follow-up of patients
3. Assisting with palliative care and symptom control in patients
4. Participating in the reconstitution and administration of cytotoxic drugs
5. Giving nursing care to patients undergoing cancer treatment

Recommendations

It is recommended that nurses be trained in the following oncology programs:

1. 2 nurses to be trained to form the core group of future trainers
2. Initially 4 posts to be established; thereafter one new posts per year for the duration of the 4 year cancer plan. This will enable at least one trained nurse to be posted to each of the other 4 hospitals in the country, apart from Victoria Hospital.
3. The administrative authorities to realise the importance and urgency of specialisation in oncology nursing.

Major Equipment Requirements

The demand for radiation therapy is increasing rapidly and has been such that the existing equipment is inadequate. Furthermore some of it requires replacement.

The equipment listed below is considered to be essential for the successful implementation of this programme and provision of routine radiotherapy services.

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>QUANTITY</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt 60</td>
<td>2</td>
<td>One replacement implemented 2009</td>
</tr>
<tr>
<td>Linacs with electron</td>
<td>1</td>
<td>To add new to existing equipment 2013</td>
</tr>
<tr>
<td>Simulators</td>
<td>1</td>
<td>To replace existing equipment 2011</td>
</tr>
<tr>
<td>Mouldroom Equipment</td>
<td>1</td>
<td>Adequate</td>
</tr>
<tr>
<td>Physics Equipment</td>
<td>1</td>
<td>Calibrator and dosimeter 2010</td>
</tr>
<tr>
<td>Brachytherapy</td>
<td>1</td>
<td>Available since 2007</td>
</tr>
</tbody>
</table>
Buildings and Space Requirements
More facilities and increase in workload will result in need for more patient space: both out-
patients and inpatients. Also the projected increase in staff will mean more space
requirements for staff. Major equipment also require space.

Listed below are projected additional space requirements:

- Outpatient waiting area and toilet facilities in the radiotherapy department
- New Radiation Physics Department to be set up
- New Chemotherapy Day Unit with 30 beds
- New Consulting Rooms (4 additional)
- Two new Staff rooms for doctors and radiographers

Provision will need to be made for increased bed capacity for patients especially the
following areas:-

- Palliative Care
- Leukaemia
- Childhood Oncology

New space has became available at Victoria Hospital with the opening of the new OPD
block, thereby releasing space in the old Casualty - Pharmacy block and paediatric
outpatient. This area could be converted into a purpose-built oncological department.

However, in the long term, master plans for a purpose built Cancer Hospital will become a
necessity in the not too distant future

DRUGS
To ensure a regular supply and efficient usage of cytotoxic drugs, an effective cytotoxic drug
policy is essential. Several issues are being addressed here:

1. Selection of a cytotoxic drug formulary (chemotherapy Committee is necessary)
2. Procurement of drugs
3. Distribution of drugs Chief Pharmacist
4. Policy/guidelines on drug usage (NCCP subcommittee)
5. Regular assessment of drugs utilized - Chemotherapy Service
6. Regular assessment of expenditure/budget (Chief Pharmacist)
7. Coordination of all the above

The aim over the next 4 years is to strengthen each section of the policy relating to
cytotoxic drugs. Mechanisms for all the above sections are already in operation, but need
better coordination. Factors such as reputation/reliability of supplier should also be of
major consideration.
For Palliative Care

Morphine is the most important drug in this context. It is necessary to formulate and implement an effective cancer pain policy on:

Procurement of adequate supplies of morphine (injections, tablets, slow release forms)  
Familiarisation of medical and nursing staff to the prescription and use of analgesics for moderate to severe pain and pharmacology of these drugs

Community based palliative care is under-developed and needs manpower training

Books/Booklets
Copies of the following should be supplied to all hospitals
- WHO booklets covering various aspects of cancer
- Health leaflets to be produced by the MoHQuL  
  Reference cancer text books are to be obtained and housed at the Radiotherapy Department

Journals
A list of required journals need to be drawn up.  
Photocopies of certain articles to be distributed to other hospitals on a regular basis.

Educational Material for patients and relatives
All available material of this nature will be compiled at the radiotherapy unit or HIEC office:
- Revision of material where appropriate
- Writing of new material where necessary e.g radiotherapy and chemotherapy booklets
- Ensuring information is available in easily understood format

8. Legislation to Support the Cancer Control Programme

8.1 Aim of Legislation

The main aim of legislation is to protect the public from the harmful effects of predisposing factors to cancer such as tobacco or environmental factors.

Objectives
1. To prevent young people from developing the habit of smoking and to encourage those who have already started to stop the habit.
2. Reduce smoking in the adult population
3. To reduce the hazards in the environment

Activities
- New Amendment to legislation of Public Health Act: Tobacco Regulations 2008
**Monitoring the Environment**

There is need to strengthen existing laws to encourage effective monitoring of the environment.

There should be statute to ensure constant monitoring of individuals working in hazardous areas, such as those dealing with pesticides and potentially carcinogenic agents e.g asbestos, and those exposed to occupational risks e.g radiographers.

The wide use of pesticides needs to be better monitored and controlled.

A study on environmental pollution should be undertaken urgently.

### 9.0 RESEARCH PRIORITIES

These may be grouped under the following headings:-

- Statistics on incidence and prevalence of cancer
- Research into cancer prevention
- Research into early cancer detection
- Research into cancer treatment

### 9.1 Statistics on Incidence and Prevalence of Cancer in Mauritius

The reports of the National Cancer Registry constitute an invaluable tool for monitoring trends in the incidence and mortality of various tumours. It will be important to assess whether the common cancers in the country are being detected at an earlier stage or are less frequent, as a result of increased cancer awareness and primary prevention.

### Statistics of Research

A register of research projects that have been or are being carried out in Mauritius should be available at the Mauritius Research Council.

### 9.2 Research into Cancer Prevention in Mauritius

Efforts are needed to implement strategies aimed at preventing certain cancers, which are prevalent in Mauritius. These include:

a) Tobacco-related cancers, i.e Lung, Oral, Neck and Oesophageal Cancers
b) Human Papilloma virus prevalence in cervical and oropharyngeal cancers
Research into Early Detection of Cancer

It is recognised that both the public and health workers should be educated on early symptoms and signs of cancers, and that efforts should be concentrated on:

- Carcinoma of cervix
- Carcinoma of breast
- Carcinoma of prostate
- Carcinoma of the colon
- Carcinoma of the mouth

Research into Cancer therapy in Mauritius

**Cervical Cancer**

Studies in the prevalence of subtypes of HPV should be conducted in Mauritius before considering the widespread introduction of HPV vaccine. Different methods of screening by Papanicolaou smears and Liquid-based cytology can be part of a research project. New diagnostic techniques by molecular PCR should be investigated.

**Children’s Cancer**

Children’s cancer represents a highly curable group of tumours, especially acute lymphoid leukaemias. Epidemiological Research may look into case clustering and possible viral/environmental causes.

**Lymphoma and Leukaemia**

Research has to be done to explore the optimal treatment regimens for these potentially curable malignancies to achieve the best possible survival rates and long term cure rates.

**Breast Cancer**

The multi-ethnic diversity of the population in Mauritius should be exploited to look into population genetics for predisposition to breast cancer and ovarian cancer.

**Colorectal cancer**

Research into clinical presentation of colorectal cancers and duration of symptoms before diagnosis. The possibility for primary prevention involving aspirin could be undertaken.
Cancer Programme Action Plan

10.1 Introduction

The Action Plan is intended to outline the major activities involved, in each case stating the objective(s), the methods to be used, the bodies or organizations responsible and the approximate timing and budgeting estimation where possible. In many cases, the organization involved often overlap. This emphasizes the importance of coordination and the multi-disciplinary and multi-sectorial approach.

10.2 Prevention of Cancer

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods</th>
<th>Body /Organizations</th>
<th>Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>To reduce incidence of cervical cancer</td>
<td>Cervical screening organisation</td>
<td>Cervical Screening Programme</td>
<td>Ongoing</td>
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</tr>
<tr>
<td></td>
<td>Educate public on risk factors</td>
<td>Health Promotion unit MOH</td>
<td>ongoing</td>
<td></td>
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<tr>
<td>To reduce incidence of breast cancer</td>
<td>Lifestyle &amp; diet changes Prevention programme</td>
<td>MOH Health Promotion Unit</td>
<td>ongoing</td>
<td>See Sexual and reproductive health AP</td>
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<tr>
<td>To reduce incidence of carcinoma of lung, mouth and larynx</td>
<td>Reduce tobacco consumption</td>
<td>Health Promotion unit MOH /MIH</td>
<td>Ongoing</td>
<td></td>
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<tr>
<td></td>
<td>Public education</td>
<td>MoH</td>
<td>Ongoing</td>
<td></td>
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<tr>
<td></td>
<td>Tobacco legislation</td>
<td></td>
<td>Implemented 2008</td>
<td>New legal framework</td>
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## Prevention of Cancer

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods</th>
<th>Body organization</th>
<th>Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>To encourage patients to present early</td>
<td>Mass Education of Public Media</td>
<td>MOH</td>
<td>On going</td>
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<td></td>
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<td>NGO</td>
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<td>MBCTV-Radio</td>
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<tr>
<td>Early detection of cancer of cervix</td>
<td>Screening protocol for cancer of cervix</td>
<td>Cervical screening programme</td>
<td>Ongoing</td>
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<tr>
<td>Early detection of cancer of breast</td>
<td>Encourage breast self and clinical examination</td>
<td>Health Promotion Unit MoH</td>
<td>On going</td>
<td></td>
</tr>
<tr>
<td>Early detection of colorectal cancers</td>
<td>FOB protocol Endoscopy units</td>
<td>MoH</td>
<td>From 2009</td>
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<td></td>
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<td>SSRN</td>
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## Education On Cancer Control

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods</th>
<th>Body/Organizations</th>
<th>Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>To educate the public about all aspects of cancer</td>
<td>Media materials e.g. TV, posters, radio, newspapers</td>
<td>MoH NGOs</td>
<td>On going</td>
<td></td>
</tr>
<tr>
<td>Educate health professionals about cancer</td>
<td>Production of oncology manual CME</td>
<td>MoH MIH</td>
<td>2010</td>
<td>On going process</td>
</tr>
<tr>
<td>To educate health workers about Palliative Care</td>
<td>Training modules National seminars and workshops</td>
<td>WHO MIH MoH UoM</td>
<td>2010 – 2012</td>
<td></td>
</tr>
</tbody>
</table>
### Specialist Training of Doctors

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods</th>
<th>Body/Organisation</th>
<th>Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist training of doctors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist in Clinical Oncology</td>
<td>Approved Degrees/ diplomas and other courses</td>
<td>MOH, MIH, WHO, Online modules</td>
<td>2010-2012</td>
<td></td>
</tr>
<tr>
<td>Breast Surgery, Surgical Oncology and Haematology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist in Palliative Medicine</td>
<td>Training for one current Specialist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2011-2013</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2012-2013</td>
<td></td>
</tr>
</tbody>
</table>

### Nurse Training

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods</th>
<th>Body/Organizations</th>
<th>Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training of nurses in oncology</td>
<td>Initial group to be trained externally to form core group</td>
<td>UICC/WHO, Melbourne University</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>Specialist oncology nurses training</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inclusion of more oncology in basic nursing curriculum</td>
<td>Subsequent groups to be trained in Mauritius</td>
<td>MOH – Nursing MIH</td>
<td>2011</td>
<td></td>
</tr>
</tbody>
</table>


### 10.4. Palliative Care for Cancer Patients

<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>METHODS</th>
<th>BODY/ORGANIZATIONS</th>
<th>TIMING</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>To upgrade radiotherapy equipment</td>
<td>Regular reports on status of radiotherapy equipment and maintenance</td>
<td>Head of Radiotherapy Unit Medical Physicist</td>
<td>ongoing</td>
<td></td>
</tr>
<tr>
<td>To provide a regular supply of drugs for oncology</td>
<td>Regular reports on consumption, costs budget</td>
<td>MOH – DPS Medical Stores Dept.</td>
<td>In Progress</td>
<td></td>
</tr>
<tr>
<td>To review drug formulary and usage</td>
<td></td>
<td>Oncology Drug Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To improve and extend palliative care to all regions of Mauritius</td>
<td>Home care/ Hospices Palliative Care services in all regional Hospitals and community</td>
<td>Private institutions</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>To extend supportive care to cancer patients</td>
<td>Counseling, supportive and rehabilitation services NGOs</td>
<td>Establishment of PAIN unit and PAIN CONTROL team New Psychology Service</td>
<td>2010</td>
<td>2010</td>
</tr>
</tbody>
</table>
### Coordination of Cancer Activities

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods</th>
<th>Body/Organization</th>
<th>Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>To coordinate activities of all bodies concerned with Cancer</td>
<td>Workshops Cancer Task Force to set up</td>
<td>Cancer Coordinator</td>
<td>On going</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MOH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of multi-sector approach</td>
<td>Director Health Services as focal point with a NCCP coordinator</td>
<td>MOH</td>
<td>On going</td>
<td></td>
</tr>
</tbody>
</table>

### Data Collection on Cancer

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Methods</th>
<th>Body/organizations</th>
<th>Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>To determine incidence, prevalence and other clinical data about cancer</td>
<td>Pathology reports</td>
<td>National cancer Registry</td>
<td>On going</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discharge summaries</td>
<td>Radiotherapy Unit Register</td>
<td>In progress</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual report</td>
<td>MOH – Health Statistics Unit</td>
<td>On going</td>
<td></td>
</tr>
</tbody>
</table>
11. National / International collaboration for Cancer Control

The Ministry of Health plans to organise a cancer network to collaborate with local, regional and international governmental and non-governmental organizations. There is a need for local and international technical and financial support if the cancer control program is to succeed and to be sustainable.

Areas of technical and financial assistance are listed below:

- Training for personnel involved in cancer Control
- Developing a data bank on cancer control i.e. books and publications.
- Assistance in developing the four year Plan on cancer (WHO)
- Support in developing research in cancer control with international cancer centres
- Assistance in developing cancer control protocols (WHO)
- Collaboration between Health Services and Academic Institutions
- Link-up with International Reference Laboratories for specialised investigations

12. Evaluation of the National Cancer Control Programme

Outcomes of the Cancer Cancer Control Programme can be evaluated in terms of short and long term planning. Annual evaluation and data management shall be made at local level and national level. Annual reports will reflect on achievements, failure to meet objectives, constraints and future plans. Workshops will be used as platforms for reviewing strategies and coming up with recommendations for future activities. A Cancer Task Force / Committee need to be set up to ensure the monitoring and implementation of the Action Plan.
13. PROGRAMME BUDGET

1. Publicity and Education
   - Media (Radio, TV, newspapers, posters)
   - Support pamphlets
   - Seminars, medical courses, workshops

2. Early detection
   - Digital Mammography Unit
   - Cervical Screening and Colposcopy Therapy Unit
   - Colonoscopy

3. Cancer Registry

4. Diagnosis
   - Radiology - Mammography
   - Echography machines
   - CT scans, PET-CT scan
   - Laboratory – Immunohistochemistry, Flow cytometry, Cytogenetics, PCR

5. Surgery
   Breast Surgeon / Surgical Oncologist

6. Treatment
   - Radiotherapy equipment, including new Cobalt 60 machine
   - Chemotherapy Drugs
   - Accessories e.g wigs, portacaths, breast prosthesis

7. Rehabilitation
   - Physiotherapy and equipment
   - Accessories for walking aids and moulds

8. Training/education
   - Medical experts
   - Nursing staff
   - Administration staff
   - Technical staff

9. Technical assistance
   - IAEA (imPACT)
   - WHO
   - IARC, IACR, AFROX
   - International Universities
14. References:


2. Annual Health Statistics 2008, Island of Mauritius. Health Statistics Unit, Ministry of Health and Quality of Life, Mauritius


8. Review of Leukaemia services in Mauritius, Professor Szer, May 2001
15. National Cancer Action Plan Task Force Members

Chairman: Dr K Pauvaday (Director Health Services)

Members:

Dr S. Manraj, Consultant in Charge Lab. Services & National Cancer Registry Coordinator
Dr Yap San Min, Consultant in Charge Radiotherapy, Victoria Hospital
Dr K Ng Cheng Hin, Consultant Surgeon in Charge, JN Hospital
Dr Dustagheer, Radiologist, Nuclear Medicine Department, J. Nehru Hospital
Dr Gunnessee, Consultant Plastic Surgeon, Victoria Hospital
Dr T. Mangar, Paediatrician, Jeetoo Hospital
Mrs Jankee, Director Pharmaceutical Services
Dr S.B. Poorun, Radiation Oncologist, Victoria Hospital
Dr T. Hemoo, Radiation Oncologist, Victoria Hospital
Dr A. Mohith, Medical Oncologist, Victoria Hospital
Dr S Sewsurn, Radiation Oncologist, Victoria Hospital
Dr Y. Saccaram, Radiation Oncologist, Victoria Hospital
Dr Ramdaursing, Specialist Gynaecologist, National Cervical Screening Coordinator
Mr D. Gaoneadry, PAS MoH
Dr (Mrs) Aboobakar, RPHS
Dr Deelchand, RDHS
Dr Ramdin, Occupational Health Physician
Dr (Mrs) A. Surnam, NCD Coordinator
Dr (Mrs) Mangur, NCD Coordinator
Dr Ramhith, NCD Coordinator
Dr (Miss) Joonas, Chief Clinical Scientist
Mr S. Kowlessur, Health Promotion Coordinator
Mrs Lingaya, Principal Radiographer, Victoria Hospital
Mrs Putty, Nursing Officer, Victoria Hospital
Mrs L. Moossa, Research Officer, Mauritius Institute of Health
Mr N Gopaul, MRC
Mr S Desai, Link to Life NGO
APPENDIX 1

MoHQL Additional Cancer Budget 2010-2014

APPENDIX 2

RECOMMENDATIONS OF NCCP 2006 WORKSHOP

These recommendations were analysed by the Cancer Task Force of MoH and by the working subcommittees and form the backbone of the National Cancer Action Plan 2010-2014.

APPENDIX 3

REPORTS FROM POST-WORKSHOP SUBCOMMITTEES: :

1. ‘Cancer prevention’ subcommittee
2. ‘Cancer screening & early detection’ subcommittee
3. ‘Cancer diagnosis and treatment’ subcommittee
4. ‘Cancer palliative care’ subcommittee

APPENDIX 4

Cancer incidence and Cancer Mortality 2005-2008

[Report of the National Cancer Registry - December 2009]
APPENDIX 5

CANCER CONTROL PROGRAMME 2010-2014

4 year estimate for Staffing and Training

<table>
<thead>
<tr>
<th>ITEM</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERSONNEL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiologist for mammography</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Clinical Oncologist/ Haematologist</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cytologists</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Therapy and Diagnostic Radiographers</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Medical Physicists</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Community Palliative care Nurses</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Oncology Nurses</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lab.Pathologist/ Haematologist</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Breast Surgeon</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Appendix 6

STAKEHOLDERS WITH DIRECT INVOLVEMENT IN ASPECTS OF CANCER CONTROL IN THE REPUBLIC OF MAURITIUS

Participants in the workshop “Planning and Development of a National Cancer Control Programme” held in September 2006

Government agencies:
- Ministry of Health and Quality of Life
- Ministry of Education & Human Resources
- Ministry of Gender Equality, CD & FW
- Ministry of Social Security, NS & RI

NGOs:
- Link to Life,
- The Leukaemia Foundation
- Enfants et Lumieres
- Blood Donors Association,
- VISA Association Mauritius
- MFPWA
- Palliative Care (Mauritius)

University of Mauritius
- Department of Health Sciences

Belle Rive Medical School

Private Clinics
- Clinique Darné, Clinique Mauricienne, Medpoint Clinic,
- City Clinic, Medisave clinic, Clinique du Nord
- Clinique de Lorette, Clinique Ferriere, Clinique du Bon Pasteur

Private institutions and Corporates through CSR (SUN RESORTS LTD)

Mauritius Cancer Society

International institutions: WHO / IAEA / IACR / IARC/
APPENDIX 7

Main recommendations of Professor Jeff Szer (Royal Melbourne Hospital, Australia) review of Leukaemia Services in Mauritius, May 2001:

1. The diagnosis and management of leukaemia needs to be centralised in a single institution in Mauritius in order to foster experience, encourage research, and enable uniformity of management protocols to optimise outcomes.

2. A basic requirement for the development of such a centre would be the training of medical and nursing staff in the management of these patients and the recruitment of appropriate specialist staff to initiate a new program.

3. Diagnostic laboratory facilities should be brought up to standard so that minimal essential facilities are made available. Such facilities should include flow cytometry and cytogenetics and molecular diagnostics.

4. The Blood Transfusion Service needs a defined and ongoing budget to encourage and facilitate a regular and safe red cell and platelet supply for these patients. Consideration should be given to the installation of a blood cell irradiator.
### NATIONAL CANCER CONTROL PROGRAMME

### ADDITIONAL BUDGET 2010-2014

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>ESTIMATED COSTS (MRU)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FY 2010-11</td>
</tr>
<tr>
<td>1. Celebration of World Cancer day</td>
<td>500 000</td>
</tr>
<tr>
<td>2. Production of leaflets on Cancer</td>
<td>400 000</td>
</tr>
<tr>
<td>3. Sensitisation campaigns - Breast awareness month</td>
<td>200 000</td>
</tr>
<tr>
<td>4. Acquisition of 2 digital mammography</td>
<td>8 000 000</td>
</tr>
<tr>
<td>5. Setting up of a colonoscopy unit</td>
<td>100 000</td>
</tr>
<tr>
<td>6. Acquisition of colposcopy equipment</td>
<td>3 000 000</td>
</tr>
<tr>
<td>7. Leukaemia immunotyping for 50 patients annually</td>
<td>250 000</td>
</tr>
<tr>
<td>8. Acquisition of 1 apheresis machine</td>
<td>2 000 000</td>
</tr>
<tr>
<td>9. Production of Oncology Manual (CME)</td>
<td>200 000</td>
</tr>
<tr>
<td>10. Cancer software</td>
<td>500 000</td>
</tr>
<tr>
<td>11. Computers for cancer information</td>
<td>100 000</td>
</tr>
<tr>
<td>12. HIEC campaigns through TV/radio/posters</td>
<td>750 000</td>
</tr>
<tr>
<td>13. Upgrading of Radiotherapy wards</td>
<td>500 000</td>
</tr>
<tr>
<td>14. Training workshop palliative care</td>
<td>125 000</td>
</tr>
<tr>
<td>15. Training of 1 surgeon in Breast/cancer surgery</td>
<td>800 000</td>
</tr>
<tr>
<td>16. Training of 2 cytologists abroad (2 months)</td>
<td>200 000</td>
</tr>
<tr>
<td>17. Training of 1 radiologist abroad (3 months)</td>
<td>100 000</td>
</tr>
<tr>
<td>18. Training of 2 Nursing officers in cancer</td>
<td>200 000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>15 025 000</strong></td>
</tr>
</tbody>
</table>

*Note: For training abroad, financial assistance will be sought from agencies e.g. WHO, IAEA. Infrastructural cost of new cancer centre is not included.*
National Cancer Control Programme Strategic Plan 2010-2014

1. **Reduce the incidence of cancer through primary prevention**

<table>
<thead>
<tr>
<th>Objectives/ outcomes</th>
<th>Methods</th>
<th>Stakeholders</th>
<th>Phase / Timing 2009-2012</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in smoking prevalence</td>
<td>Taxation + smokefree legislation (WHO FCTC)</td>
<td>MoH, NCD, NGO, Schools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction in rate of people taking up smoking</td>
<td>strategies to reduce smoking initiation among youngsters</td>
<td>NCD, Schools, MoE</td>
<td>World Cancer Day 4 Feb</td>
<td>Rs 0.5 M</td>
</tr>
<tr>
<td>Increased awareness Of healthy nutritious food</td>
<td>National AP for nutrition</td>
<td>MoH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduce incidence of cervical cancer</td>
<td>Health Education on sexual reproductive health To Assess need for HPV vaccine Promote condom usage</td>
<td>MoH, MoE, MFPA, NGO, AHC Central Lab. MoH, MoE, NGO, MoW, MoY</td>
<td>Cervical cancer leaflets x 20 000 Research Project ongoing</td>
<td>Rs 0.4 M Rs 1 M</td>
</tr>
<tr>
<td>Assess links between infectious agents and cancer e.g cervix, liver and stomach</td>
<td>Evaluate HPV serotype and prevalence Hep B vaccination in expanded immunization programme Research in H. Pylori AIDS strategic framework</td>
<td>Central Lab MoH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced exposure to, and raised awareness of, carcinogenic agents in the workplace &amp; environment</td>
<td>collection of data on occupation-related cancers optimal use of Pesticide To phase out dangerous chemicals Health Promotion at workplace</td>
<td>Occupational Health Unit MoA, OHU, AREU DCCB, MoH OHU</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

45
2. **Screening and early detection to reduce cancer incidence and mortality**

<table>
<thead>
<tr>
<th>Objectives/outcomes</th>
<th>Methods</th>
<th>Stakeholders</th>
<th>Phase / Timing</th>
<th>Cost</th>
</tr>
</thead>
</table>
| Identify interventions to improve survival | strategies to increase early detection + diagnosis: colposcopy (cervical) BSE (breast) | 1. New Cervical Screening Pilot Project  
2. Breast Unit | 2009 ongoing | |
| Reduce breast cancer mortality | New Breast Cancer Unit  
Breast Awareness Month (October)  
Targeted Mammography for high-risk | Training in Breast Surgery  
Health Promotion Unit, NCD, NGO  
Digital Mammography pilot phase | 2010 every year  
Aim at 8,000 screened women/year | MoH  
Rs 0.1 M  
Equipment Rs 8M x 2 |
| Early detection of colon cancer | Colonoscopy for at risk groups  
Occult blood (FOB) | Availability of colonoscopy unit At SSRN | 2009 | |
3. **Effective Diagnosis and Treatment of cancer**

<table>
<thead>
<tr>
<th>Objectives/ outcomes</th>
<th>Methods</th>
<th>Stakeholders</th>
<th>Phase / Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Children Cancer Ward/ National Cancer Centre</td>
<td>Project at VH</td>
<td>MoH, PPP( Sun Resorts)</td>
<td>2010-2015</td>
<td><strong>Rs 10 M</strong></td>
</tr>
<tr>
<td>New Colposcopy Unit</td>
<td>Expand cervical cancer screening programme</td>
<td>Gynaecologists at VH</td>
<td>2009-2013</td>
<td><strong>Colposcopy Equipment Rs 3 M</strong></td>
</tr>
<tr>
<td></td>
<td>Colposcopy / screening study at VH and HPV study</td>
<td>MoH Molecular Pathology</td>
<td>2009-2012</td>
<td></td>
</tr>
<tr>
<td>New Breast Health Unit</td>
<td>Digital Mammography (+stereotactic biopsy facility)</td>
<td>Breast Surgeon x 1 Radiologist x 1 Radiographers x 2 Cytologist x 1 Physicist x1</td>
<td>Training of breast surgeon</td>
<td><strong>Mammography Rs 8 M</strong></td>
</tr>
<tr>
<td>Link-ups with international reference labs</td>
<td>For special tests not locally available Accurate Leukaemia diagnosis Lab. Accreditation &amp; QA</td>
<td>Clinicopathology committee Flow cytometry or PCR</td>
<td>2010-2012</td>
<td>Leukaemia immuno-typing X 50 patients</td>
</tr>
<tr>
<td>Standardise pathology reporting</td>
<td>Adopt international norms</td>
<td>Tumour Board</td>
<td>ongoing</td>
<td></td>
</tr>
<tr>
<td>Standardise Treatment</td>
<td>Clinical guidelines and protocols (ESMO/NCCN)</td>
<td></td>
<td>ongoing</td>
<td><strong>10% increase drug budget</strong></td>
</tr>
<tr>
<td>Supportive Therapy</td>
<td>New Apheresis Machine GCSF New cancer drugs</td>
<td></td>
<td>2011-2013</td>
<td><strong>Rs 3 M</strong></td>
</tr>
</tbody>
</table>
### 6. To improve Cancer Control through Research and Surveillance

<table>
<thead>
<tr>
<th>Objectives/outcomes</th>
<th>Activities/Methods</th>
<th>Stakeholders</th>
<th>Time Frame</th>
<th>Target indicators</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Strengthen National Cancer Registry (NCR) for Surveillance</strong></td>
<td>Update NCR form</td>
<td>MIH, CHL</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase use of NEW NCR form</td>
<td></td>
<td>✓ ✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve manpower for NCR</td>
<td>MOHQL</td>
<td>✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduce use of GIS</td>
<td></td>
<td>✓ ✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shift to CANREG5</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B. Conduct cancer Research activities in priority fields</strong></td>
<td>Carry out survival study for prevalent cancer sites</td>
<td>MOHQL, MIH, WHO</td>
<td>✓ ✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carry out a detailed epidemiological survey of female breast cancer in Mauritius</td>
<td>MOHQL, MIH, UOM WHO, IARC, NIH</td>
<td>✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Introduce use of GIS for analysing cancer distribution</td>
<td></td>
<td>✓ ✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conduct feasibility study for introduction of HPV vaccine in Mauritius</td>
<td>MOH, WHO, IARC</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Train NCR officer/s in Health Research Methodology</td>
<td>MOHQL, MIH, UOM</td>
<td>✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C. Develop a National Cancer Information Centre</strong></td>
<td>Research Plan for cancer control</td>
<td>MIH, UICC, Link to Life</td>
<td>✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D. Develop core clinical data sets for prevalent sites (besides breast and cervical cancer)</strong></td>
<td>ENT - Neurosurgery - Lung</td>
<td>IARC WHO</td>
<td>✓ ✓ ✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E. IACR International Conference 2011 (Mauritius)</strong></td>
<td>Preparatory work for National Cancer Registry</td>
<td>MOHQL, MIH, CHL</td>
<td>✓ ✓ ✓</td>
<td>Rs 1M</td>
<td></td>
</tr>
</tbody>
</table>
### ADDITIONAL BUDGET 2010-2014

#### ACTIVITIES

<table>
<thead>
<tr>
<th>ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Celebration of World Cancer day</td>
</tr>
<tr>
<td>2. Production of leaflets on Cancer</td>
</tr>
<tr>
<td>3. Sensitisation campaigns - Breast awareness month</td>
</tr>
<tr>
<td>4. Acquisition of 2 digital mammography</td>
</tr>
<tr>
<td>5. Setting up of a colonoscopy unit</td>
</tr>
<tr>
<td>6. Acquisition of colposcopy equipment</td>
</tr>
<tr>
<td>7. Leukaemia immunotyping for 50 patients annually</td>
</tr>
<tr>
<td>8. Acquisition of 1 apheresis machine</td>
</tr>
<tr>
<td>9. Production of Oncology Manual (CME)</td>
</tr>
<tr>
<td>10. Cancer software</td>
</tr>
<tr>
<td>11. Computers for cancer information</td>
</tr>
<tr>
<td>12. HIEC campaigns through TV/radio/posters</td>
</tr>
<tr>
<td>13. Upgrading of Radiotherapy wards</td>
</tr>
<tr>
<td>14. Training workshop palliative care</td>
</tr>
<tr>
<td>15. Training of 1 surgeon in Breast/cancer surgery</td>
</tr>
<tr>
<td>16. Training of 2 cytologists abroad (2 months)</td>
</tr>
<tr>
<td>17. Training of 1 radiologist abroad (3 months)</td>
</tr>
<tr>
<td>18. Training of 2 Nursing officers in cancer</td>
</tr>
</tbody>
</table>

#### ESTIMATED COSTS (MRU)

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>FY 2010-11</th>
<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Celebration of World Cancer day</td>
<td>500 000</td>
<td>500 000</td>
<td>500 000</td>
<td>500 000</td>
<td>2 000 000</td>
</tr>
<tr>
<td>2. Production of leaflets on Cancer</td>
<td>400 000</td>
<td></td>
<td></td>
<td></td>
<td>400 000</td>
</tr>
<tr>
<td>3. Sensitisation campaigns - Breast awareness month</td>
<td>200 000</td>
<td>100 000</td>
<td>100 000</td>
<td>100 000</td>
<td>500 000</td>
</tr>
<tr>
<td>4. Acquisition of 2 digital mammography</td>
<td>8 000 000</td>
<td>8 000 000</td>
<td></td>
<td></td>
<td>16 000 000</td>
</tr>
<tr>
<td>5. Setting up of a colonoscopy unit</td>
<td></td>
<td>100 000</td>
<td>100 000</td>
<td>150 000</td>
<td>350 000</td>
</tr>
<tr>
<td>6. Acquisition of colposcopy equipment</td>
<td>3 000 000</td>
<td></td>
<td></td>
<td></td>
<td>3 000 000</td>
</tr>
<tr>
<td>7. Leukaemia immunotyping for 50 patients annually</td>
<td>250 000</td>
<td>500 000</td>
<td>500 000</td>
<td>500 000</td>
<td>1 750 000</td>
</tr>
<tr>
<td>8. Acquisition of 1 apheresis machine</td>
<td></td>
<td>2 000 000</td>
<td></td>
<td></td>
<td>2 000 000</td>
</tr>
<tr>
<td>9. Production of Oncology Manual (CME)</td>
<td></td>
<td>200 000</td>
<td></td>
<td></td>
<td>200 000</td>
</tr>
<tr>
<td>10. Cancer software</td>
<td></td>
<td>500 000</td>
<td></td>
<td></td>
<td>500 000</td>
</tr>
<tr>
<td>11. Computers for cancer information</td>
<td></td>
<td>100 000</td>
<td></td>
<td></td>
<td>100 000</td>
</tr>
<tr>
<td>12. HIEC campaigns through TV/radio/posters</td>
<td>750 000</td>
<td>500 000</td>
<td>500 000</td>
<td>500 000</td>
<td>2 250 000</td>
</tr>
<tr>
<td>13. Upgrading of Radiotherapy wards</td>
<td>500 000</td>
<td>500 000</td>
<td></td>
<td></td>
<td>1 000 000</td>
</tr>
<tr>
<td>14. Training workshop palliative care</td>
<td>125 000</td>
<td></td>
<td>125 000</td>
<td></td>
<td>250 000</td>
</tr>
<tr>
<td>15. Training of 1 surgeon in Breast/cancer surgery</td>
<td>800 000</td>
<td></td>
<td></td>
<td></td>
<td>800 000</td>
</tr>
<tr>
<td>16. Training of 2 cytologists abroad (2 months)</td>
<td>200 000</td>
<td>200 000</td>
<td></td>
<td></td>
<td>400 000</td>
</tr>
<tr>
<td>17. Training of 1 radiologist abroad (3 months)</td>
<td>100 000</td>
<td>200 000</td>
<td></td>
<td></td>
<td>300 000</td>
</tr>
<tr>
<td>18. Training of 2 Nursing officers in cancer</td>
<td>200 000</td>
<td>200 000</td>
<td></td>
<td></td>
<td>400 000</td>
</tr>
</tbody>
</table>

**TOTAL** | 15 025 000 | 3 500 000 | 4 500 000 | 1 775 000 | 32 200 000

*N.b For training abroad, financial assistance will be sought from agencies e.g WHO, IAEA
Infrastructural cost of new cancer centre is not included*
4: **Improve Quality of Life of cancer patients (Palliative care)**

<table>
<thead>
<tr>
<th>Objectives/ outcomes</th>
<th>Methods</th>
<th>Stakeholders</th>
<th>Phase / Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training in palliative care &amp; pain control</td>
<td>Diplomas Home Care Pain clinics Psychologist</td>
<td>MoH NGOs IAEA MoSS</td>
<td>See palliative care/ pain control team below</td>
<td>Community Palliative care Nurses x 2</td>
</tr>
<tr>
<td>Patient education</td>
<td></td>
<td>MoH</td>
<td>2010-2013</td>
<td><strong>Rs 0.2 M</strong></td>
</tr>
<tr>
<td>Home based Palliative care programme</td>
<td>CMEs Review DDA Accessory supply (colostomy, prosthesis, diet)</td>
<td>NGOs Regional Hospitals / AHC Community</td>
<td>2010-2013</td>
<td>Extend opiate drug list</td>
</tr>
</tbody>
</table>

5: **Improve Delivery of Cancer services through Planning**

<table>
<thead>
<tr>
<th>Objectives/ outcomes</th>
<th>Methods</th>
<th>Stakeholders</th>
<th>Phase / Timing</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate levels of recruitment, training, and professional development</td>
<td>stocktake of present cancer control workforce</td>
<td>MoH WHO</td>
<td>ongoing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Capacity Building</td>
<td>ImPACT/ IAEA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oncology Pharmacist</td>
<td>Training of chemotherapy pharmacist</td>
<td>Oncology Centre MoH</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>✆Cytopathologists Cytotechnicians x 2</td>
<td>Cervical /Breast Screening Quality assurance</td>
<td>Cytology Lab</td>
<td>2011</td>
<td>Training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Therapeutic Radiographers x 2/year</td>
<td>Mammography Radiotherapy</td>
<td>IAEA</td>
<td>2011-2014</td>
<td>Training</td>
</tr>
<tr>
<td>✆Hospital physicists x 3</td>
<td>QA diagnostic equipment</td>
<td>IAEA WHO</td>
<td>2010</td>
<td>Training</td>
</tr>
<tr>
<td>Heath care Assistants x 4</td>
<td>Customer Care</td>
<td>MoH</td>
<td>2010-2013</td>
<td>0</td>
</tr>
<tr>
<td>Pathologists/ Haematologist x 1</td>
<td>Prof Szer’ report (appendix )</td>
<td>Central Lab / blood bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✆Cancer Nursing workforce capacity</td>
<td>Define scope of Oncology Nurse / Diploma in Cancer Nursing</td>
<td>MIH MoH</td>
<td>Recruitment and retention of workforce involved in support aspects of cancer</td>
<td>Training</td>
</tr>
<tr>
<td>Palliative Care Nursing</td>
<td>New roles for nurse practitioners in palliative care</td>
<td>Melbourne University/ WHO</td>
<td>2010-2011</td>
<td>Training</td>
</tr>
<tr>
<td>Educate health professionals about cancer</td>
<td>Production of Oncology Manual CME</td>
<td>MoH</td>
<td>2011-2012</td>
<td><strong>Rs 0.1 M</strong></td>
</tr>
</tbody>
</table>