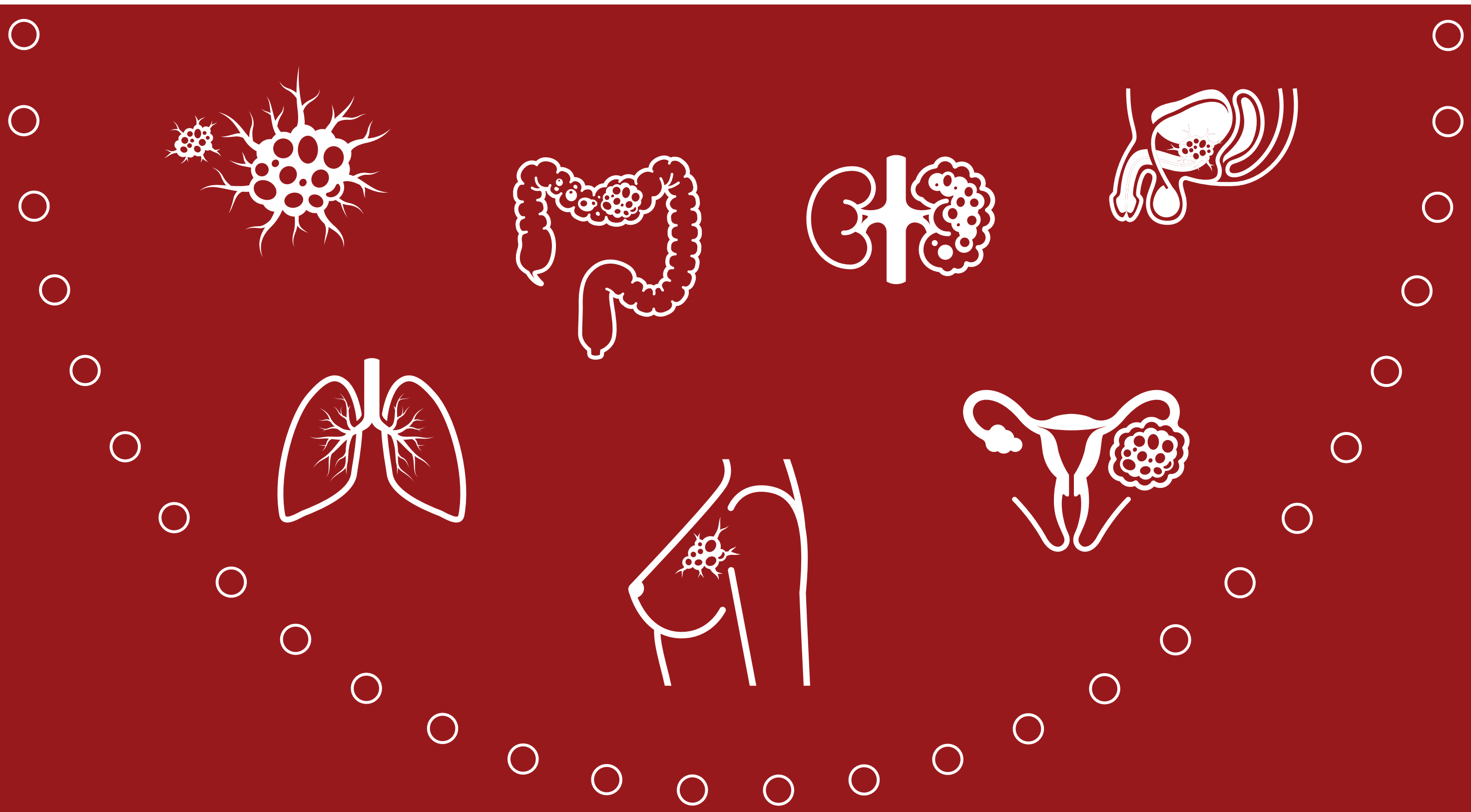

NATIONAL CANCER CONTROL PLAN
2019-2028

SURINAME

PAHO
Pan American Health Organization
World Health Organization
REGIONAL OFFICE FOR THE Americas

Ministerie van Volksgezondheid

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ABBREVIATIONS AND ACRONYMS

ARMU-LOV	Afbouw Regeling Medische Uitzendingen–Lokale Opbouw Voorzieningen
AZP	Academisch Ziekenhuis Paramaribo
BIRADS	Breast Imaging Reporting and Data System
BOG	Bureau Openbare Gezondheidszorg
BZSR	Basiszorgverzekering Self Reliance
COVAB	Centrale Opleiding voor Verpleegkundigen en beoefenaren van Aanverwante Beroepen
CT	Computer Tomography
EML	Essential Medicines List
FAOSTAT	Food and Agricultural Organization of the United Nations
FCTC	Framework Convention on Tobacco Control
HBV	Hepatitis B virus
HPV	Human papillomavirus
IARC	International Agency for Research on Cancer
IDB	Inter-American Development Bank
iFOBT	immunochemical fecal occult blood test
Linac	Linear Accelerator
LMICs	Low- and Middle-Income Countries
M&E	Monitoring and Evaluation
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOH	Ministry of Health
MOJ	Ministry of Justice
MOL	Ministry of Labor
MOS	Ministry of Sport and Youth
MOT	Ministry of Trade
MRI	Magnetic Resonance Imaging
MZ	Medische Zending
NCDs	Non-Communicable Diseases
NCI	National Cancer Institute
NGK	Nationale Geneesmiddelen Klapper
PAHO	Pan American Health Organization
PSA	Prostate-specific antigen
RGD	Regionale Gezondheidsdienst
RTCS	Radiotherapy Centre Suriname
SPAOGS	Stichting PostAcademisch Onderwijs Geneeskunde Suriname
SRCS	Scientific Research Center Suriname
UN	United Nations
UNASUR	Unión de Naciones Suramericanas
UNICEF	United Nations Children's Fund
WHO	World Health Organization

FOREWORD

Cancer is a leading cause of death globally. Cancer related mortality rates have increased significantly over the past decade and this disease is currently the second leading cause of death in Suriname. It is clear that cancer is a major public health problem in Suriname. Various types of cancer, however, are largely preventable. Others can be discovered, treate and cured at an early stage.

The World Health Organization recommend countries to implement the four basic components of cancer control - prevention, early detection, diagnosis and treatment, and palliative care - and thus avoid and cure many cancer, as well as palliating the suffering.

Cancer control requires coordination and cooperation between all relevant actors, both in the public and in the private sector, and requires a vision, a plan and strategies for the approach. With this plan, the Ministry of Health is taking the lead in an integrated and multi-sectoral approach to this public health issue in Suriname.

In compiling this cancer control plan, all relevant actors have given their input and promised their cooperation, so that this plan can be succesfully implemented. Therefore, this plan can rightfully be called a “National Cancer Plan”.

A.F. Elias

Antoine Elias
Minister of Health
Republic of Suriname

INTRODUCTION

Due to an ageing population, urbanization and adaptation of unhealthy lifestyles, noncommunicable diseases (NCDs) are increasing worldwide, contributing substantially to the global burden of disease. In low- and middle income countries, NCDs, including cancer, have replaced communicable diseases as a leading cause of death and disability. For the Latin America and Caribbean region, an estimated 1.7 million cases of cancer will be diagnosed in 2030, and more than 1 million cancer deaths will occur annually (Goss, 2013). In Suriname, more than 60% of all deaths in 2013 could be attributed to NCDs, especially cardiovascular diseases, cancer and diabetes. Cancer-related mortality rates have increased considerably the past decade, and cancer is currently the second leading cause of death, only preceded by cardiovascular diseases. Although the overall incidence of cancer in Suriname is lower than in more developed countries, the mortality burden is greater. This is mainly due to presentation at more advanced stages, and partly related to poorer access to cancer care. The rise in cancer incidence and the disproportional high mortality rate place a substantial demand on the health system and hamper the human, social and economic development of Suriname.

Cancer-related mortality and morbidity, however, is to a large extent avoidable (WHO, 2010). Around 40% of cancer cases can be prevented by modifying known risk factors such as tobacco use, unhealthy diets and infectious agents. More than 30% of cancer cases can be cured if detected at an early stage. Patients with late stage disease can benefit from improved palliative care. A comprehensive cancer control plan, aiming at prevention, early detection and improved care, could alleviate the cancer burden considerably.

The increasing cancer problem and its profound impact on society have been recognized by the international health policy community. In 2005, the World Health Assembly adopted a resolution on cancer prevention and control, urging member states to develop and implement a cancer control plan. This international commitment to fight cancer was reinforced in the 2011 UN resolution on action against the epidemic of NCDs (High level meeting, 2011). This resolution was endorsed by the government of Suriname. In 2012, at the 65th World Health Assembly in 2012, Member States agreed to adopt a global target of a 25% reduction in premature mortality from NCDs by 2025 (Pearce, 2014). On regional level, recognition of the growing NCD burden was reflected in the Declaration of Port of Spain, pronounced at the 2007 CARICOM Summit on Non-communicable diseases. Additionally, the 2010-2015 Regional Health Framework of the Caribbean Cooperation in Health III (CCC III) and the Caribbean Strategic Plan of Action for the prevention and control of NCDs were developed, providing a framework for comprehensive and integrated NCDs policies and programs throughout the Caribbean region (CARICOM, 2010; PAHO, 2011). In 2011, the Ministry of Health (MOH) developed a National Action Plan for the Prevention and Control of NCDs for the period 2015-2020, utilizing CCC III and the Caribbean Action Plan as a framework to address the main causes of premature death in Suriname, including cancer (MOH, 2011a). This Action Plan promoted the development of diseases specific control plans for each of the NCDs, and called for the creation of a comprehensive cancer control plan.

A comprehensive cancer control plan, according to WHO recommendations, should aim to reduce incidence, morbidity and mortality of cancer and improve the quality of life of cancer patients through the systematic implementation of evidence-based interventions for prevention, early detection, diagnosis, treatment and palliative care (WHO, 2006). The establishment of a National Cancer Control Plan (NCCP) will enable the government to formulate a comprehensive and systematic approach of the cancer problem, and will ensure an efficient and rational use of available resources. Priorities are cost-effectiveness, equity, affordability and sustainability. This can be facilitated by integrating the plan with existing programs for chronic diseases.

In 2015, a draft NCCP was developed under the direction of the MOH. A Working Group was established with representatives of the MOH and non-governmental organizations. The Inter-Development Bank (IDB), the National Cancer Institute (NCI) and the Pan American Health Organization (PAHO) provided resources and technical input for the development of this draft cancer control plan. The draft strategy incorporated a situational analysis based on epidemiological evidence and a review of relevant policies, programs and facilities. In addition, a concept action plan was formulated for the prevention, management and control of cancer, delineating specified goals, objectives and activities. The draft NCCP was presented to the MOH and approved as framework for further development and consultation with relevant stakeholders to gain consensus on the draft NCCP and to provide broadly based support for implementation of the plan. For this purpose, a consensus workshop was conducted to gather input on priority setting, goals and objectives, strategies, outcomes, activities and monitoring processes. Prior to this workshop, structured interviews were conducted based on predefined questionnaires to evaluate stakeholders view on cancer control and gain input for the components of the NCCP. The workshop was held in November 2017, involving representatives from the health sector, patients organizations, health insurers, health education and the MOH. During this workshop, participants identified components to include in the action plan and defined priorities within the following five components of the plan: prevention, early detection, diagnosis and treatment, palliative care and monitoring and evaluation. Additionally, recommendations were made for operationalization of the plan through incorporation of specified strategies, indicators and time frames. The refined NCCP, incorporating the extensive input of relevant stakeholders, thus provides a strategic approach for Suriname to address the increasing burden of cancer, serving as a roadmap for activities across all sectors to facilitate comprehensive and integrated cancer control.

MODEL OF CANCER CONTROL

The cancer control model aims at reducing risk on developing cancer, improving early diagnosis, establishing effective treatment and ensuring adequate palliative care. A national cancer control plan aims at the systematic implementation of evidence-based interventions for prevention, early detection, diagnosis, treatment and palliative care, as outlined by WHO guidelines for national cancer control programs (WHO, 2006). Overall goals of the plan are to control risk factors for cancer, reduce cancer morbidity and mortality, and improve quality of life of cancer patients and their family.

The National Cancer Control Plan was developed through a cancer control planning process, using WHO guidance on how to advocate, plan and implement effective cancer control programs (WHO, 2006). This planning process can be described as a schematic model integrating the components input, process, output, feedback and outcome (Figure 1.)

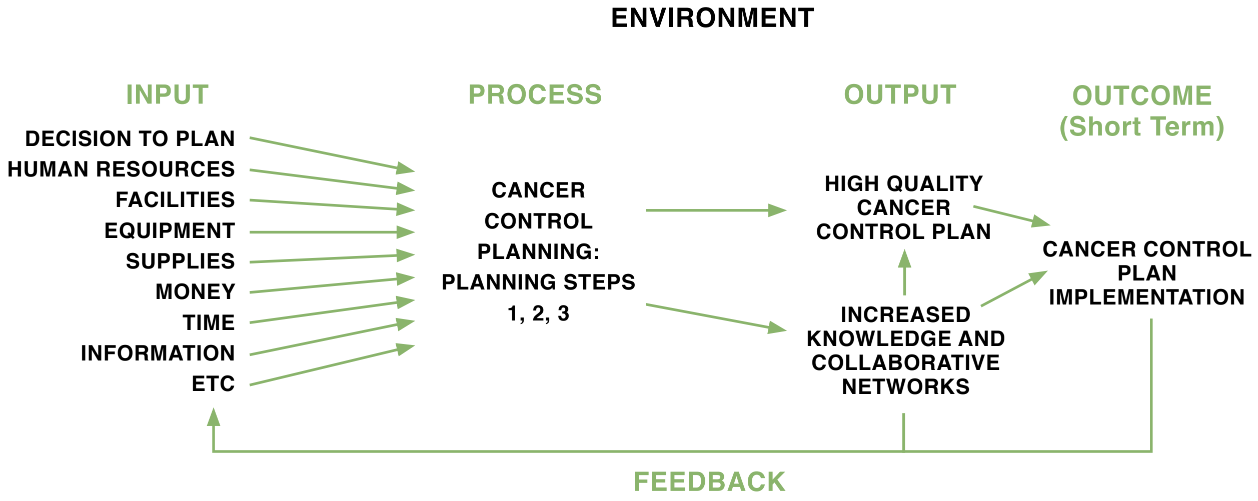


Fig.1 – Cancer control planning process. Source: WHO, 2006

The process itself comprises three planning steps, each necessary to provide answers to the following key questions:

- Where are we now? Assessment of the present state of the cancer problem, and cancer control services or programs.
- Where do we want to be? Formulating and adopting policy. This includes defining the target population, setting goals and objectives, and deciding on priority interventions across the cancer continuum.
- How will we get there? Identification of the steps needed to implement the policy, including monitoring processes and formulating targets, time frames and key partners.

The guiding principles of the National Cancer Control Plan are:

- Evidence-based and cost-effective
- Multisectoral and multi-stakeholders approach
- Integrated approach to prevention and control
- Capacity-building
- Incorporating age, gender, and ethnicity
- Emphasis on risk factor reduction and health promotion
- Reducing inequities in health

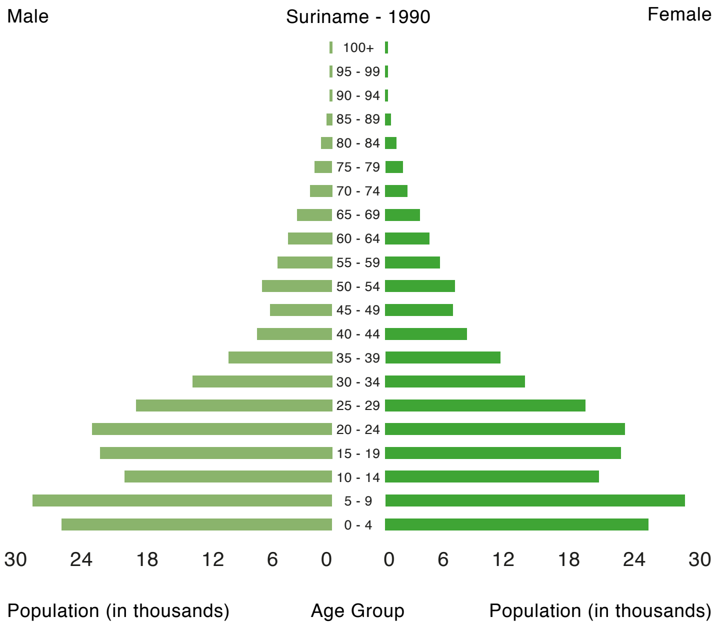
The National Cancer Control Plan thus adopts the principles of the National Action Plan for the Prevention and Control of NCDs for the period 2015-2020, the National Health Sector Plan 2011-2018 and the National Strategic Plan for Health and Wellbeing in Suriname 2019-2028, emphasizing a public health approach that is multi-sectoral and addresses social determinants of disease to strengthen health care for people, to develop enabling healthy environments and to support healthy individual behaviours (MOH, 2011a; MOH, 2011b; MOH 2019). The plan also aligns with WHO guidance to aim for political will and commitment, collaboration among key national organizations, participatory processes in program planning, critical assessment of the scientific evidence and costs of proposed programs, and an approach based on maximizing the desired outcome, principally reduction in mortality from cancer (WHO, 2006). In addition, the NCCP incorporates the updated WHO cost-effectiveness recommendations for NCDs approved at the 70th World Health Assembly in May 2017 (WHO, 2017), identifying four key drivers that impact cancer mortality:

- Early diagnosis programmes for cervical, breast, colorectal and oral cancers
- Development of partnerships, referral networks and of centres of excellence for improving the quality of cancer diagnosis, treatment and care services and facilitating multidisciplinary cooperation
- Training of health professionals at all levels of health care, and
- Strengthening of palliative care and promotion of cancer survivors' follow up and rehabilitation.

SITUATIONAL ANALYSIS

DEMOGRAPHICS

Suriname is a multi-ethnic society with an estimated total population for 2012 of 541638 and an annual growth rate of 0.9-1.0% (General Bureau of Statistics, 2013). The five main ethnic groups consist of Hindustani (27%), Maroon (22%), Creoles (16%), Javanese (14%) and Indigenous (4%). Approximately 74% of the population resides in the urban areas. The rural population lives mainly in the coastal region, with approximately 10% in the sparsely populated interior. Over the past decades, the average life expectancy has steadily increased, and is currently 75 years for women and 69 years for men (WHO, 2016). Suriname has an ageing population structure, as is illustrated in Figure 2. According to data of the 2012 Census, the 60+ age group increased almost 30% compared to 2004.



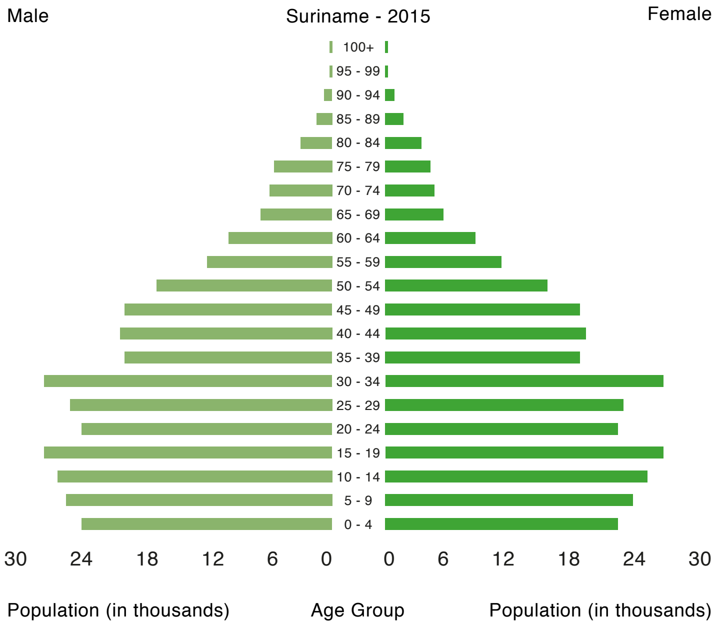


Fig 2. – The population pyramid of Suriname in 1990 and 2015

Suriname is classified as an upper middle-income country and has shown a steady economic growth this century, bringing the per capita income to more than US$9,000 in 2014. However, from 2015 onward there has been a large economic decline, resulting in a negative economic growth rate of 10% and an estimated per capita income in 2018 of US$5000 (Worldbank, 2019).

CANCER INCIDENCE

In the absence of a cancer registry, data on cancer incidence are derived from the Pathology Department of the Academic Hospital Paramaribo (AZP). The Pathology Department reports an average yearly crude incidence of histologically confirmed cases of 133 per 100,000 population for the period 2013-2014 (personal communication, Chan 2015). Estimates from the International Agency for Research on Cancer (IARC) are higher, reporting an age-standardized cancer incidence of 172 per 100,000 population (IARC, 2018a). This number will probably represent a better estimate of the true cancer incidence in Suriname, since IARC data are not based on histologically confirmed cases, but are estimated from national mortality estimates by modelling, using mortality: incidence ratios derived from cancer registry data in neighboring countries.

The incidence of cancer in Suriname has doubled since the period 1980-2000, when an average incidence rate of 70 per 100,000 population was reported (Mans, 2013). The most common cancer types in period 2013-2014 were breast (18% of all cases), prostate (12%), colorectal (11%) and cervical cancer (10%). An overview of the main cancer diagnoses in the period 2013-2014 by cancer type and by sex is provided in Figure 3.

The high incidence rate of head and neck cancers among men is notable. The majority of these cancers consists of non-oropharyngeal cancers, associated with the risk factors smoking and alcohol, both highly prevalent in Suriname (see Risk Factors). Data on lung cancer, however, show incidence rates in men of only 7.4 per 100,000, which is remarkable in view of the smoking habits in Suriname. This could be due to the omission of pursuing histological confirmation in the light of the poor prognosis of lung cancer, as well as the absence of advanced diagnostic techniques. Likewise, the low incidence rate of pancreatic cancer compared to reported incidence rates in neighboring countries (IARC, 2018b) is probably related to diagnostic challenges in the histological confirmation of pancreatic cancer cases. These findings illustrate the considerable limitations of cancer estimates based on histological data.

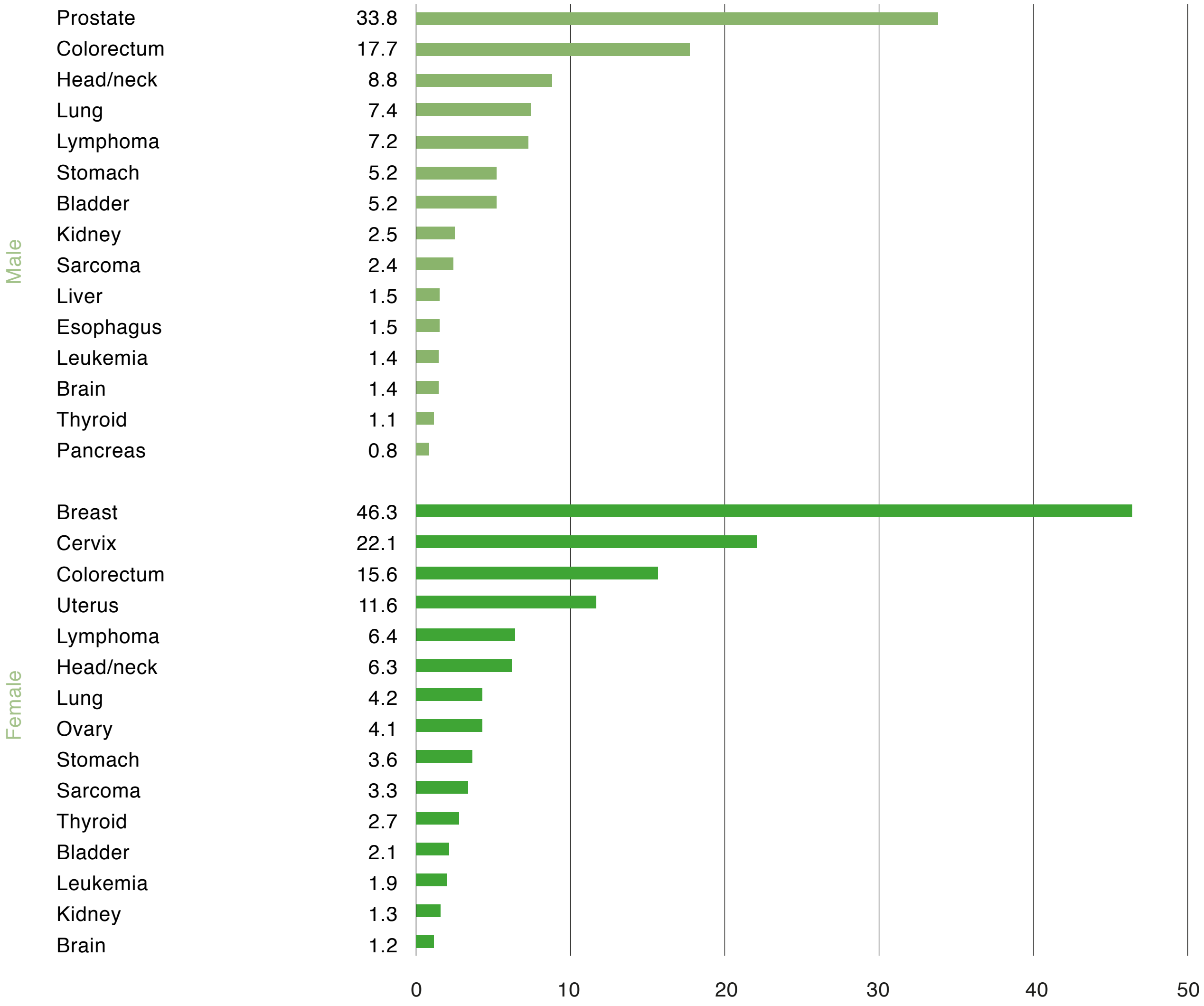


Fig. 3 – Average histologically confirmed crude annual incidence rate in 2013-2014 for cancer by type and by sex.
Source: Pathology Department Academic Hospital Paramaribo

Females are overall more affected than males in a ratio of 1.3:1, mainly due to the high rates of female-specific cancers. In the elderly (>70 year) however, more male than female cases are diagnosed, which is related to the high number of prostate cancer in older males. Due to the different age distribution of sex-specific cancers, the average age at cancer diagnosis is 5 years lower for females than for men (57,2 respectively 62,5 years), and highest cancer incidence in females occur in the 50-54 year age group compared to the 70-74 year age group in males, as illustrated in Figure 4. Almost 30% of cervical cancer cases and almost 20% of breast cancer cases are younger than 45 years.

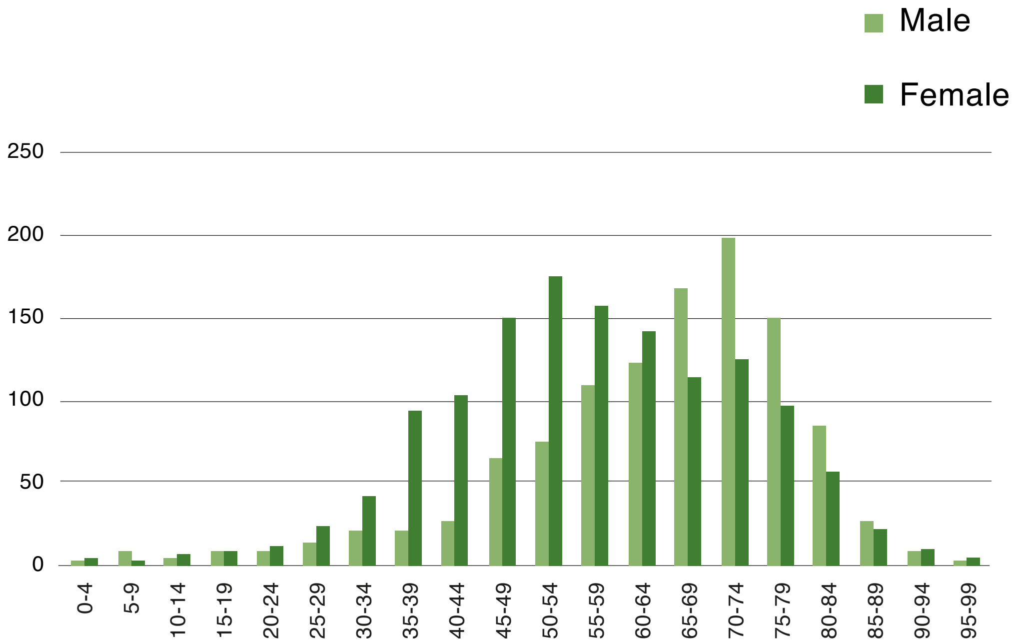


Fig. 4 – Crude annual incidence rate in 2013-2014 for cancer according to age group

Source: Pathology Department Academic Hospital Paramaribo

The increase in cancer incidence in the past decades is exemplified in Figures 5 and 6, showing data on incidence rates of breast cancer and colon cancer from 1980 respectively 1998 onwards.

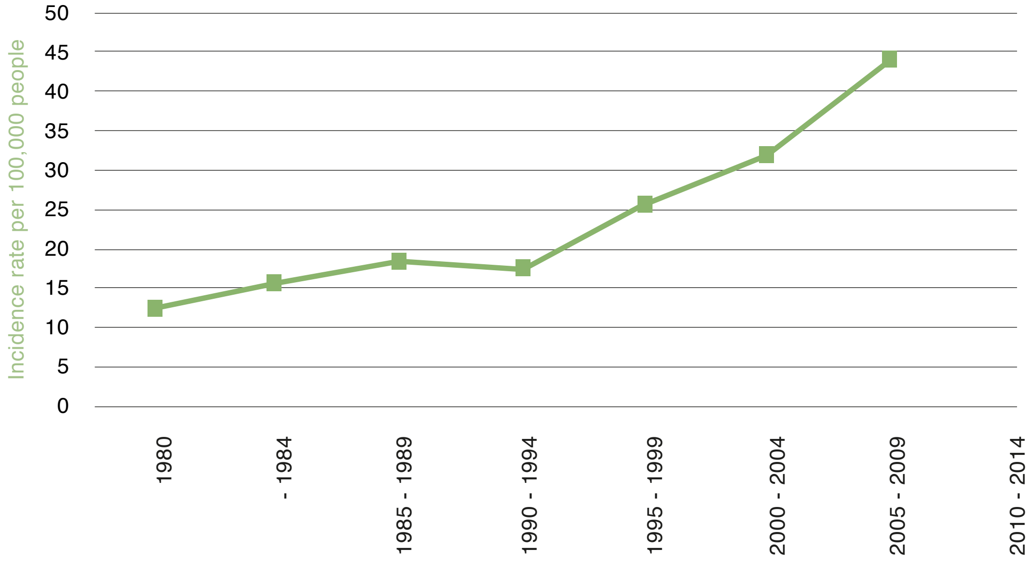


Fig. 5 – Crude annual incidence rate for breast cancer all ages, 1980-2014

Source: Irving, 2016.

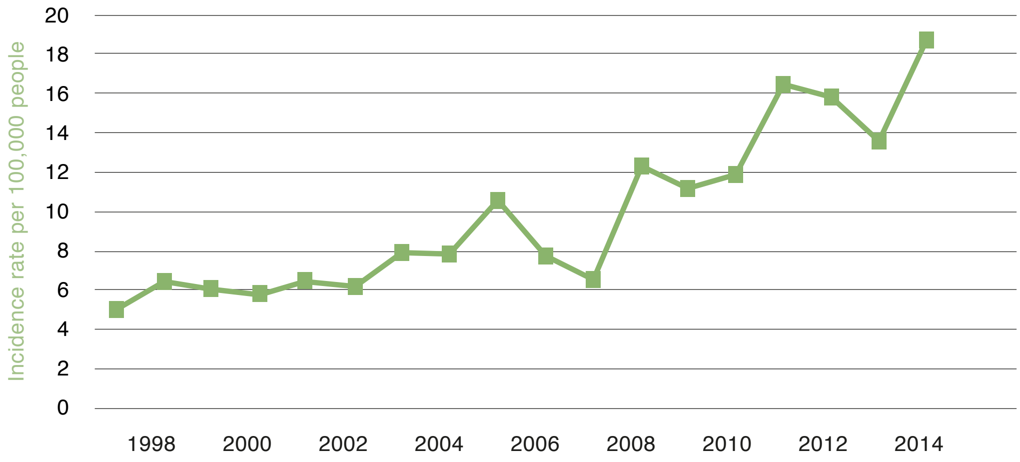


Fig. 6 – Crude annual incidence rate for colorectal cancer all ages, 1998-2015
Source: Pathology Department, Academic Hospital Paramaribo

The considerable rise in breast and colon cancer in Suriname may in part be explained by the rapid socioeconomic development and the growth and ageing of the population. However, improved diagnostic possibilities by the introduction of mammography in 2009 and the recruitment of the first gastroenterologist in 2010, will play a significant role in the observed increase in incidence rate.

Incidence rates for cervical cancer, a highly preventable disease, would have been expected to decrease in view of the growing economy. However, rates have not dropped since 1990 (Irving, 2012; Dams, 2016), probably related to the absence of organized prevention programmes. Currently, cervical cancer is still the 2nd most frequent female cancer in Suriname.

In children <15 years, 18 new cancer cases were recorded in the period 2013-2014, corresponding to a crude annual incidence rate of 1.7 per 100,000. The most common diagnosed malignancies are leukemia, followed by carcinoma, lymphoma and brain tumor. When comparing these findings to published data on the period 1980-2008 (Mans, 2014), incidence rates and cancer patterns in children seem not to have changed substantially in the past decades.

Data from the 2013-2014 period show marked differences in the ethnic distribution of cancer cases. Of the five main ethnic groups, the Creole population have the highest cancer incidence rate. This is evident in the high rates of breast and cervical cancer among Creole females (77.1 respectively 44.8 per 100,000 female population), as well as the high number of prostate cancer in Creole men (incidence rate 115 per 100,000 male population). Cervical cancer incidence is also high in the Indigenous (38.5 per 100,000 female population), while rates in the Maroon and the Hindustani population are almost half the average rate in the female population. Although interpretation of these data should be done with caution, because of possible misclassification due to different qualification methods in the histological and the population database, the findings are consistent with earlier studies reporting differentiated risk in ethnic groups (Mans, 2003; Irving, 2012).

Data on staging show that many patients have advanced disease at time of diagnosis. The majority of women with breast cancer diagnosed in the period 1994-2003 had relatively advanced stage at presentation, with 60% of tumors larger than 2 cm, and more than 40% with positive lymph nodes (Van Leeuwaarde, 2011). In the period 2008-2013, more than 80% of women with cervical cancer presented with late-stage disease (Dams, 2016). A review of histologically confirmed colon cancer cases in the period 2005-2014 showed lymph node involvement in more than 50% of cases (unpublished data).

CANCER MORTALITY

The increase in cancer incidence rates has resulted in higher cancer mortality rates in the past decades. Percentages of cancer-related mortality has risen from 6.4% in 1996 to 14.0% in 2013 with a mortality rate of 80.1 per 100,000 for all cancers (Ministry of Health, 2015). Since 2010, cancer is the second leading cause of death in Suriname,

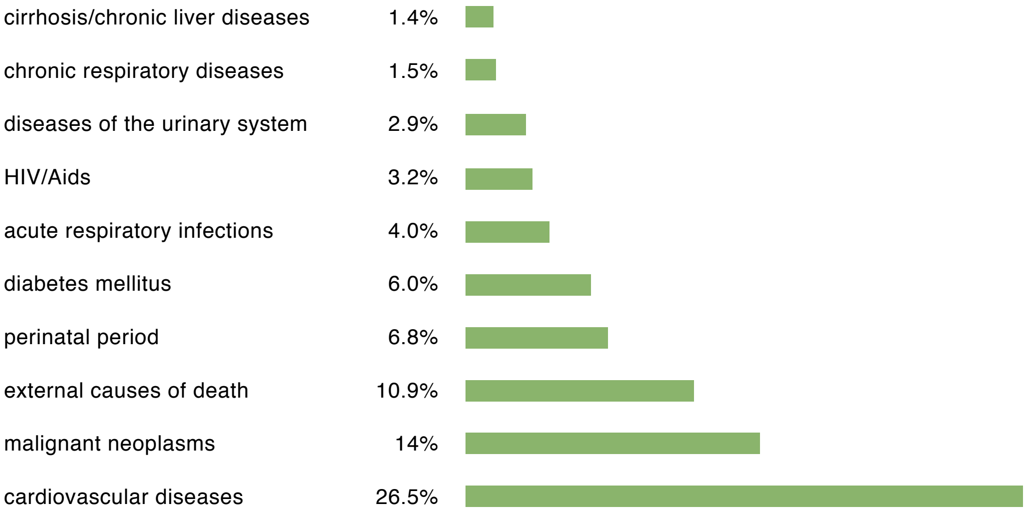


Fig. 7: The top 10 Causes of Death (%) in Suriname in 2013
Source: Ministry of Health; Bureau of Public Health- Epidemiology Department, 2015

Among males, prostate cancer is the most common cause of cancer-related death (16.3 fatalities per 100.000 male population), accounting for almost 20% of all male cancer deaths. Lung cancer ranks second (16.0 per 100.000 male population), followed by colon cancer (9.2 per 100.000 male population). In females, the highest mortality rate is recorded for breast cancer, followed closely by cervical cancer (12.0 respectively 9.6 fatalities per 100,000 female population). The high mortality rate for cervical cancer relative to its incidence rate is indicative of a poor prognosis due to late-stage presentation. The high number of lung cancer deaths among males contradicts the reported low incidence rate and further indicates under-reporting of lung cancer in Suriname.

For women the average age at death is 3 years lower than for men related to the earlier presentation of female-specific cancers. As a consequence, women lose more years of life as a result of cancer than men.

Analogous to the data on incidence rates, the mortality data show clear ethnic differences. Mortality rate in the Creole population is almost double the average rate in Suriname (148.4 vs. 80.1 per 100,000 population for all cancers), mainly due to higher rates for prostate, lung and breast cancer. More than half of all prostate cancer deaths occur in Creole men. The Javanese population also shows high numbers for cancer related deaths (119.5 per 100,000 population), which can be attributed to higher rates for lung and colon cancer. The Maroon population, on average, displays a low mortality rate. However, their rate for cervical cancer is relatively high accounting for 25% of all cervical cancer deaths, suggesting diagnostic and therapeutic barriers.

RISK FACTORS

A large part of cancer cases can be ascribed to modifiable lifestyle and behavioral risk factors, such as unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol. Assessment of their prevalence among the population is important to estimate risk of NCDs on a national level, and to guide the development of preventive policy and programs.

A survey in 2001 with 1,654 participants from four ethnic groups (Mixed, Creole, Hindustani and Javanese) showed that 70% were physically inactive, 30% smoked, 20% were obese (BMI>30) and 15% had high total cholesterol (Van Eer, 2001).

In 2013, the STEPS Noncommunicable Disease Risk Factors Survey was performed, a method developed by the WHO to obtain core data on NCD risk factors (Krishnadath, 2015). In total, 5,752 individuals ages 15-64 years in urban and rural areas participated in the survey and data were obtained on demographic characteristics, lifestyle, and risk factors through questionnaire and physical and biochemical measurements. The survey found that prevalence of obesity had increased to 47% of adult man and 63% of adult women. Almost 50% of the participants were physically inactive, 20% had hypertension, and 26% had high cholesterol. Smoking prevalence was low among women but had increased to 34% among men.

Data from other surveys confirm the high prevalence of behavioral risk factors in Suriname.

The Global School Health Survey 2009 among children aged 13-15 years showed that the majority (73%) of children have physical activity of less than one hour per day. The survey data indicated that 26% of these children were either overweight or obese ((WHO, 2009a). Data from the UNICEF Multiple Indicator Cluster Survey (MICS) from 2006 showed that girls under five were slightly more overweight than boys (3.3% compared to 2.4% above +SD) (UNICEF, 2006).

Food supply data indicated increased energy availability per capita over the past four decades (from 2000 kcal in 1961-1963 to ~2700 kcal in 2003-2005) (FAOSTAT, 2009). The increased energy availability appears to be related to corresponding increases in fat and sugar availability and possibly reflects changing food consumption patterns. The Global School Health Survey 2009 indicated a continuous high contribution of sugar, with 81% of children having consumed carbonated soft drinks one or more times per day (WHO, 2009a).

Data from the 2009 Global Youth Tobacco Survey (GYTS) reported that among 927 students aged 13-15 years, 19.2% of students were current users of tobacco products. In addition, the survey indicates that students are exposed to second hand smoke: 46.6% lived in homes where others smoked, 53.3% were exposed to smoke around others outside of the home and 49% had at least one parent who smoked (WHO, 2009b). The National Drug Prevalence Survey indicated a higher proportion of cigarette use in the age group over 35 years of age (Suriname Household Survey, 2008).

Harmful use of alcohol is another important risk factor. Results from the 2009 Global School Health Survey indicated that among the 1698 Surinamese students, aged 13-15 years, who responded, 73.8% had their first drink before the age of 14 and 32.6% consumed alcohol at least on one or more occasions in the past month. Among adults, a higher proportion of alcohol use was observed in the age group 26- 34 (36.8%) followed by the group 35-64 (33.9%) (Suriname Household Survey, 2008).

POLICY FRAMEWORK

The health policy of the government of Suriname is based on article 36 of the constitution of Suriname stating that every citizen has the right to health, and that it is the responsibility of the government to promote health by improving living and working conditions and by providing information to safeguard health. Leadership and governance of the health sector are the responsibilities of the Ministry of Health. The Ministry actively promotes the inclusion of health considerations in all policies and advocates implementation of health policies across all sectors to maximize health gains (PAHO, 2012).

The government has developed key national frameworks such as the ‘National Health Sector Plan 2011-2018’ and the ‘National Action Plan for the Prevention and Control of Non-communicable Disease, 2015-2020’ that provide strategic direction to the ways the national health systems and services are organized and delivered. Recently, the National Strategic Plan for Health and Wellbeing in Suriname 2019-2028 was published. The plans emphasize the need for a coordinated and integrated approach to prevention and control of NCDs, and calls for strengthening of the health system capacity for the integrated management of chronic diseases in order to reduce mortality rates due to NCDs. However, the plans do not provide specific goals and objectives for the comprehensive control of cancer (MOH, 2011a; MOH, 2011b; MOH 2019).

In 2008, at the request of the Surinamese government, the National Committee on Cervical Cancer drafted the “National Strategic Plan for Cervical Cancer Prevention and Control in Suriname 2010 – 2014,” with proposed guidelines, based on a situational assessment and with active participation of key stakeholders (MOH, 2008). Unfortunately, this document was never finalized, and has not been implemented.

No other screening programs have been developed, and screening is only performed on ad-hoc and referral basis.

Both the proposed NCD National Budget 2015-2020 as the proposed NCD National Action Plan 2014-2020 allocates funding for cancer policy. However, funding is not assigned to specified goals and objectives.

HEALTH SYSTEM

The public health system in Suriname is mainly supported by the government. Core institutions are the Central Office of the Ministry of Health (MOH), the Inspectorate and the Bureau of Public Health. The MOH and the inspectorate function at the level of global health planning and standard-setting, inspection and monitoring. The Bureau is responsible for public health program development. The government also takes part in provision of public health through government subsidized primary health care organizations for the poor and near poor, namely the Regional Health Service (RGD), which covers the coastal area and the Medical Mission which covers the population living in the interior.

Health expenditure in 2014 was 52% by the public sector, 46.5% by the private sector and 1.5 % by external resources (non-governmental organizations). The health expenditure per capita has increased substantially over the years from US$180 in 2006 to US$588 in 2014, amounting to 5.7% of total GDP (Worldbank, 2017).

Until 2014, the three major sources of financing for health care included:

- the State Health Insurance Fund (SZF) for civil servants and a small group of voluntarily insured, financed by wage tax contributions, subsidies from general tax revenues and voluntary premiums
- the Ministry of Social Affairs (MSA), responsible for the health care for the poor and near poor free of charge
- private firms, private health insurance and out of pocket payment.

A third of the population had no health care insurance, and either paid out of pocket or turned to the MSA for support in case of illness.

In 2014, the National Basic Health Insurance Act has come into effect, requiring everyone to take out insurance against the costs of basic healthcare. Key principles are mandatory insurance, mandatory acceptance and affordable premium for a uniform package that covers basic healthcare.

Children up to the age of 16 years and adults over the age of 60 (the official age for retirement in Suriname) who are of Surinamese nationality are exempt from payment. All adults aged 17-59 years who are not insured through their workplace or otherwise, should pay for their own insurance. If such is not possible, depending on the individual circumstances, government will partly or fully subsidize premium payment for an allocated period.

Implementation of the basic health insurance was first placed at a private insurance company but handed over to the SZF in 2016 because of financing issues. At the end of 2016, an estimated 78% of the population had health insurance of which 75% is provided by the SZF. Health insurance covers health care services in both public and private sector, but coverage is variable, depending on type of insurance.

CAPACITY FOR CANCER MANAGEMENT

General resources

Suriname has 30 hospital beds per 10,000 population, which is comparable to countries in the region. Four of the five hospitals are situated in Paramaribo and one is in Nieuw Nickerie. Four hospitals provide secondary care, while tertiary care is provided by the Academic Hospital Paramaribo (AZP) and the Radiotherapy Center, located on the premises of AZP.

All hospitals have medical laboratories. In addition, there are three private laboratories each offering services in the urban as well as the coastal region. The new Public Health Laboratory opened in 2010 and meets international quality and bio-risk standards (level II+) with upgraded technological capacity. In the interior, laboratory services are not available except for a few basic tests such as urinalysis and glucose tests.

Four of the five hospitals, including the one in Nieuw Nickerie, have radiology departments. There are four private radiology clinics, all located in Paramaribo. CT-scans are available in Paramaribo (3) and Nieuw Nickerie (1). MRI-scanning is only possible in the capital at the AZP and a private radiology clinic.

Primary health care is provided by Regional Health Services in the rural coastal areas, the Medical Mission in the interior, and either Regional Health Services or private clinics in the more densely populated urban region (Paramaribo, Wanica and Nickerie).

Regional Health Services (RGD) is a state foundation which offers health care via public primary care facilities that are staffed by general physicians and health practitioners who provide health care in the coastal area of Suriname. The RGD consists of 43 general clinical centers, staffing a total of 64 medical doctors and 200 nurse practitioners.

In the less densely populated areas of the interior, medical services are being offered through the non-governmental organization “Stichting Medische Zending (Primary Health Care Suriname)” (MZ). The MZ is subsidized by the government, and provides health care through a network of 56 public health centers operational in various areas of the interior of Suriname. All health centers are staffed by trained health assistants, microscopists and clinical aids responsible for daily availability of the health care services that are being supervised and guided by 15 regional clinical supervisors and regional managers (general practitioners). Both the RGD and the MZ provide additional dental care and preventive health services such as education and antenatal consultations. The MZ also offers midwifery services and cervical screening.

The private clinics are mainly located in the urban areas and are staffed by general practitioners (GP). They provide primary care to people who are either covered by SZF, private insurance or private firms, or pay out of pocket. Most GP’s in Suriname are employed in private practices.

There are on average 5 general practitioners per 10,000 population, which is considered low according to international standards aiming at 10 per 10,000 population (WHO, 2013c). Distribution over the country is highly unequal, ranging from 11 GP's per 10,000 in Paramaribo to just 1-2 per 10,000 in the interior. Training of physicians is provided by the Anton de Kom University in Paramaribo, graduating on average 20 physicians per year. Physicians do not need additional training for qualification as a general practitioner. In 2015, a formal post-education qualification program has started offering a one-year training program to newly graduated physicians. However, this training program is not yet officially required to be employed as a GP.

Secondary health care is provided by approximately 140 medical specialists, the majority of them working in the hospitals in Paramaribo. Training of medical specialists is provided in the four hospitals in Paramaribo, with mandatory additional training in the Netherlands. Until recently, oncology care was mainly provided by medical specialists with no specific oncology training. Over the last years, several oncology specialists have settled in Suriname, and some medical specialists have acquired additional oncology skills. Currently, there are oncology specialists in medical oncology (2), radiotherapy (2), gynecology (2) and surgery (3), providing the major part of oncology care. They all reside in Paramaribo and mainly work in the AZP and the Diakonessenhuis (DH). There are no specialists in pediatric oncology or hematology. Care in these specialties is provided by general pediatricians and the two medical oncologists. Oncology care in urology, ENT, neurology and pulmonology is covered by general medical specialists. In addition, the AZP has two neurosurgeons and one thoracic surgeon.

Endoscopic services are provided by two gastroenterologists, both employed in the capital, and also by several general internists. There is only one pathologist in Suriname, employed in the AZP in the central (and only) pathology lab. He is responsible for all cytological and histological studies in Suriname.

Nurses and nursing assistants are trained at the Central Training Institute for Nurses and Allied Professions (Foundation COVAB). There are approximately 17 registered nurses per 10,000 population. However, most of them (approximately 80%) work in secondary care facilities located in the urban regions and less than 20% in primary care, teaching, nursing homes, and public health. A few nurses are employed by the Medical Mission in association with its primary care program in the interior. Since 2011, COVAB offers a post-education oncology program for registered nurses. There are currently 12 qualified oncology nurses, all employed in the hospitals in Paramaribo.

In view of the shortage of trained public health professionals, a Master of Public Health program was initiated in 2010 through a collaborative agreement between the Faculty of Medical Sciences of the Anton de Kom University and the Tulane School of Public Health and Tropical Medicine in New Orleans, to meet perceived needs. Thus far, 44 students have graduated. However, only a few of the graduates currently hold a position within the public health sector.

Health education programs for health care workers are provided by the Stichting Post Academic Onderwijs Suriname (SPAOGS), and comprise a variety of subjects, including cancer. Post-education courses are mandatory for nurses since the Board of Nursing adapted an accreditation system a few years ago. Physicians do not yet have such a mandatory registration.

Cancer prevention

The national NCD Action Plan 2015-2020 identifies several priority actions to prevent and reduce the burden of chronic diseases and related risk factors (MOH, 2011a). Specific objectives for risk reduction relate to improvement of the conditions that enable the Surinamese people to adopt healthy behaviors especially healthy eating, active living, tobacco and alcohol control with the aim to reduce the incidence of NCDs. Corresponding activities have been identified, but in general not implemented yet. A major step toward risk factor modification was the passing of comprehensive tobacco control legislation in 2013, banning tobacco advertising and smoking in public areas among other measures. Control of implementation of the tobacco legislation is hampered by lack of monitoring and evaluation strategies.

Hepatitis B (HBV) vaccination has been included in the immunization schedule for the newborn since 2005. National vaccination coverage is reported to be > 90% (MOH, 2011b). In 2013, vaccination against the Human Papilloma Virus (HPV) was introduced through a school-based program offered by the Bureau of Public Health. According to key informants, limited preparatory education was provided to girls and legal guardians jeopardizing adequate coverage. In the absence of a dedicated monitoring and evaluation program, data on coverage are not available.

Protection against occupational exposure to carcinogenic compounds is provided by the Safety Act of 1947, ratified in 1981. Verification of compliance with the regulations is extremely difficult due to understaffing of the Ministry of Labour.

Screening and early diagnosis

Suriname has no national screening programs available. In 1998, the Ministry of Health launched a national screening program for cervical cancer for a pilot period of three years, using cytology as screening test. The results were disappointing showing very low screening and treatment coverage (Grunberg, 2008), and the program was not continued. In 2008, a National Strategic Plan for cervical cancer control was developed, but never implemented. Currently, routine cervical cancer screening using both cytology and VIA as screening method is offered by gynecologists, health care services of the Medical Mission, and by Foundation Lobi, a non-governmental organization providing preventive health care services in Paramaribo and the various districts. In addition, the Medical Mission has developed a training program to enable direct treatment in the interior for women with an abnormal VIA test (‘See and Treat’). A national screening and precancer treatment protocol was developed and adapted in 2018, after discussion with all relevant stakeholders (gynecologists, Medical Mission, Lobi Foundation, physicians). Screening coverage of eligible women is estimated to be less than 20%. A recent study by Foundation Lobi on attitudes toward cervical cancer screening revealed significant psycosocial and cultural hurdles among men and women (N. Bandhoe, personal communication, November 4, 2017). Mammography services for breast cancer screening are available in Suriname since 2009, in both the public and private health sector. None of these services have set up yet a quality assurance system for mammography as advocated by the PAHO (PAHO, 2016). Screening services are reimbursed by all insurances.

Diagnostic services for cancer are readily available in both the public and private health sector. Laboratory tests are offered by health care facilities throughout the coastal region. However, radiographic services such as ultrasound examination, and more sophisticated diagnostic tests such as tumor markers, mammography, endoscopy, CT scan and MRI are only available in the urban areas, mainly Paramaribo. Although diagnostic services are generally reimbursed, there are some important restrictions. None of the insurers provide compensation for ultrasound guided biopsies, stereotactic breast biopsies or surgical clip placement for breast cancer localization; CT scan and MRI are paid for only once per year. These limitations can result in high out of pocket costs for cancer patients.

Pathological services are provided by Pathology Department of the AZP. Hematoxylin & eosin (HE) staining and additional techniques, such as Periodic acid-Schiff (PAS) stain and immunohistochemistry, are available although not always performed because of insufficient coverage of services compromising adequate diagnosis. If needed, material can be sent for revision to pathology departments in the Netherlands. Due to considerable understaffing, waiting time for the final pathology report generally exceeds 2-3 weeks, and sometimes amounts to more than two months if special techniques are required.

The observed late presentation in a high percentage of cancer cases suggest that the diagnostic path has many hurdles for many patients. Accessibility, availability and financial issues will play a role, as well as low cancer awareness among patients and health care workers. In addition, studies have shown that poor knowledge, negative attitude and perception of cancer are important factors that affect patient delay, especially in developing countries (Okobia, 2006). Currently, there are no education programs in Suriname on prevention, screening or early diagnosis of cancer to increase knowledge, raise awareness and change attitude among the public. Primary health care workers have no established guidelines for referral of patients with suspected cancer, nor do they receive structured training on early cancer diagnosis.

Treatment

Chemotherapy, surgery and radiotherapy as standard cancer treatment modalities are all available in Suriname. Radiotherapy was introduced in 2012. Before 2012, radiotherapy was offered abroad but only to patients younger than 70 years and with potentially curative diseases.

The RTCS is equipped with two linear accelerators and one brachytherapy applicator, enabling conventional external beam radiotherapy and brachytherapy. Funding of radiotherapy treatment is exclusively supported by the government. Patients and health insurers are not yet charged with any costs.

Surgical cancer treatment is offered in all four hospitals in Paramaribo, the majority of oncological operations being performed in the AZP and the Diakonessen Hospital.

Chemotherapy is also available in all four hospitals in the capital. Two hospitals have a separate oncology unit for outpatient medical treatment, equipped by a separate consultation room and staffed by oncology nurses and a supervising medical oncologist.

Patients who are in need of diagnostic or therapeutic services that are not available in Suriname, can be sent to Colombia under the regulation named ARMU-LOV (Afbouw Regeling Medische Uitzendingen – Lokale Opbouw Voorzieningen) (Ministry of Health, 2004). This regulation contains strict selection procedures. Main criteria for selection are a good prognosis and an age limit of 70 years. Bone marrow transplantation, not available in Suriname, is not eligible for reimbursement. Requests for treatment abroad are reviewed by the Medical Committee, comprising family physicians and medical specialists. Costs for medical treatment and housing abroad are at the expense of the government. The amounts can be considerable ranging from 12.500 to 150.000 US$ per treated patient. Costs for travel and daily expenses are to be paid by the patient him- or herself. This appears not to be a major financial constraint. A study showed that in the period 2008-2011 nearly all women who were approved to receive radiotherapy for cervical cancer eventually did go to Colombia (Dams, 2016). This was probably due to the financial support that was generally provided by the Ministry of Social Affairs to women with insufficient resources.

Since the introduction of radiotherapy in Suriname, the number of adult patients sent to Colombia has decreased considerably. Main indications for treatment abroad are radioactive iodine ablation and complicated oncological surgery.

In the absence of a pediatric oncologist or hematologist, chemotherapeutical treatment of pediatric cancers is limited. Children diagnosed with cancer are often sent to Colombia for medical treatment, especially for acute leukemia. The required accompaniment of a caregiver can be a barrier both financially and socially, but the rate of abandonment of treatment is not known.

In 2012 a national multidisciplinary team was established by the government, consisting of representatives of the different oncology disciplines. During weekly meetings, the members review the clinical data of oncology patients and the accompanying imaging and pathological studies, whereupon they formulate a treatment advice, based on international guidelines, tailored to the medical possibilities in Suriname. The reporting of patients to the multidisciplinary team is on a voluntary basis. However, notification is mandatory if radiotherapy treatment is requested. Currently, approximately 70% of new oncology patients in Suriname are notified to the multidisciplinary team.

The multidisciplinary meetings have revealed several problems in oncology care. Diagnostic and therapeutic strategies appear to be often associated with considerable delay. The care process lacks well-defined procedures with clear time frames that could advance the necessary diagnostic and therapeutic steps. Patients get lost to follow up and return with advanced disease and a poorer prognosis. These observations are supported by a recent study showing that 11% of women with cervical cancer did not return after the diagnostic and staging procedure, or refused treatment (Dams, 2016). Reimbursement issues probably adds to the delay and the drop out. Professional support by health care workers, such as oncology nurses or patient navigators, could be of major value, but this is not provided yet on a regular basis in oncology care. A further concern is the observed lack of adherence of treating physicians to current international guidelines. This emphasize the necessity of discussing all cancer patients in a multidisciplinary setting, and of establishing accepted guidelines for cancer care in Suriname.

Antineoplastic drugs are listed in the Essential Medicine List (Nationale Geneesmiddelen Klapper -NGK), and as such eligible for coverage according to the National Basic Health Insurance Act of 2014. However, coverage is only up to a maximum amount of 800 US$ per year for people insured under this Act. Other health care insurance companies have also put financial restrictions, and often require prior approval before cancer drugs can be prescribed. These restrictions lead to treatment delay and compromise continuity of chemotherapeutical treatment.

The Essential Medicine List (EML) is prepared by the Steering Committee of Essential Medicines, whose members are appointed by the Ministry of Health and consists of oncology, pharmaceutical, primary care and public health professionals. The Committee applies the same guiding principles that underlie the WHO EML. The antineoplastic section was recently reviewed, but still covers only half of the medication that is included in the most recent WHO Model list of

Essential Medicines (WHO, 2019). Targeted therapy is not included yet in the EML. Main reason for this limited selection of antineoplastic is the high cost of new cancer drugs.

The Drug Supply Company Suriname (BVGS) is responsible for the procurement, storage, and distribution of drugs and health commodities to the country's public health facilities. Coverage of cancer drugs is estimated to be around 80%.

The use of traditional medicine is common practice in Suriname and widely accepted. Although it is estimated that many patients diagnosed with cancer turn to traditional healers or use their own house medicine, statistical data are not available.

Palliative and supportive care

Palliative and supportive care is an essential part of comprehensive cancer care. This applies particularly to countries such as Suriname, where patients frequently present with late-stage disease and curative treatment is no longer possible. Access to palliative care can be assessed by morphine-equivalent consumption of opioids per capita or per cancer-related death (WHO, 2014). Based on data from BVGS, opioid use in Suriname was 0.8 mg per capita. This number compares poorly to the average morphine equivalent use in more developed countries ranging from 300 mg per capita in the Netherlands to >600 mg per capita in the United States (PPSG, 2015).

Palliative care as a discipline is not included in the health system of Suriname. The Foundation of Post Academic Medicine Education Suriname (SPAOGS) provides palliative care modules in their programs for health care professionals. However, lack of knowledge on palliative care by health care providers is observed, leading amongst others to inadequate treatment with opioids due to misconceptions on risk of addiction. Fear of addiction and the association of opioid use with death keep patients from using opioids. Regulatory and administrative barriers, such as the need for frequent refills and restrictive prescription legislation, further hinder adequate and universal access to opioids.

Suriname's EML contains many of essential palliative drugs as recommended by the WHO (WHO, 2019). These drugs are available for the general public, but often carry additional costs due to logistic restraints such as limited quantity per recipe. Fentanyl patches are not in the EML yet, but will be included shortly.

There are several cancer patient organizations in Suriname providing supportive care: the Suriname Cancer Association, Pink Ribbon for women with breast cancer, and the Prostate Cancer Foundation for men with prostate cancer. They provide support, information and education, and organize lectures for patients and their families. There are no professional organizations for palliative and supportive care.

None of the hospitals offer structured programs for psychosocial support of patients and/or family members. Care by non-medical health professionals such as a dietician, physiotherapist or psychologist is only partly reimbursed by the insurance companies.

In 2016, the first hospice in Suriname was set up on the premises of the Diakonessenhuis Hospital to provide palliative care for terminally ill patients. Due to reimbursement issues, the hospice is not fully operational yet.

Cancer control

Although the National Action Plan 2015-2020 identifies the need for an integrated M&E system for better surveillance of NCDs, risk factors, consequences, and impact of public health interventions, Suriname has no monitoring and evaluation (M&E) systems yet for cancer or other NCDs. A National Cancer Registry is also not available.

The national multidisciplinary team collects data on cancer diagnoses and treatment, but these data are not integrated in an operational M&E system. Lobi Foundation collects data on screened women, and just recently started to enter these data in a database as a first step towards a cervical cancer screening M&E plan. The HPV-vaccination program has no M&E system in place.

The political commitment to improve cancer management has not resulted yet in specified cancer policy or the appointment of a dedicated cancer task force. Cancer research is very limited and carried out on an ad hoc basis, not based on identified knowledge gaps and resulting research priorities.

Quality assurance programs to evaluate effectiveness, efficiency and standards of provided cancer care have not been developed yet.

NATIONAL CANCER CONTROL PLAN

The National Cancer Control Plan 2019-2028 will position cancer as a public health problem on the public agenda, and thus mobilize governmental and inter sectoral action, and corporate social and individual responsibility for the control of cancer in Suriname.

GOALS

The goals of the cancer control plan can be specified as:

- Reduce the incidence of cancer through primary prevention by reducing the prevalence of modifiable risk factors
- Ensure effective screening and early detection to reduce cancer incidence and mortality
- Ensure effective diagnosis and treatment to reduce cancer morbidity and mortality
- Improve the quality of life for those with cancer and their family through support, rehabilitation and palliative care
- Improve the effectiveness of cancer control by ensuring generation, availability and use of knowledge and information for decision making

The overall goal purpose of this national plan is to promote the establishment of policies and implementation of strategies and activities aimed at the reduction of cancer in Suriname, and thus to improve life expectancy and well-being.

The specified goals and principles are reflected in the five strategic lines in the National Cancer Control Plan, as outlined below.

ORGANIZATION OF THE PLAN

The NCCP consists of five specified goals, each with corresponding strategic objectives and activities:

Goal 1. Reduce the incidence of cancer through primary prevention

Objectives:

1.1. Reduce the number of people who develop cancers due to tobacco use and second-hand smoke

Strategies:

1.1.1. Monitor and evaluate tobacco-control legislation
1.1.2. Develop National Program for implementation and enforcement of tobacco-control legislation
1.1.3. Increase taxation on tobacco on import and sales
1.1.3. Increase health promotion activities, advocacy, smoking cessation services

1.2. Reduce the number of people developing alcohol-related cancers

Strategies:

1.2.1. Develop alcohol-control legislation including age legislation and reduction of exposure to alcohol advertising
1.2.2. Increase taxation on alcohol import and sales
1.2.3. Increase health promotion activities, advocacy

1.3. Reduce the number of people developing physical inactivity and obesity-related cancers

Strategies:

1.3.1. Development and implementation of legislation for establishment of environments supportive for physical activity
1.3.2. Development and implementation of strategies to promote healthy diets and physical activity using DPAS (WHO Global Strategy on Diet, Physical Activity and Health) in schools, workplaces, faith-based and other settings
1.3.3. Develop programs to prevent the development of obesity in children
1.3.4. Increase taxation on sugar-added beverages
1.3.5. Promote healthy lifestyle behavior

1.4. Reduce the number of people developing nutrition-related cancers

Strategies:

1.4.1. Development and implementation of legislation and regulations, multi-sectoral policies, incentives, plans, protocols and programs that aim to improve dietary and healthy lifestyle behaviors
1.4.2. Reduce the promotion of unhealthy food and beverages choices to children
1.4.3. Improve access to acceptable and affordable healthy foods
1.4.4. Raise awareness for healthy food and beverages choices

1.5. Reduce the number of people developing infectious disease-related cancers

Strategies:

1.5.1. Increase coverage of HPV vaccination
1.5.2. Develop a monitoring and evaluation protocol for HPV vaccination
1.5.3. Reduce hepatitis B transmission
1.5.4. Expand access to a continuum of services for early diagnosis, care and treatment of hepatitis B and hepatitis C
1.5.3. Develop a National Immunization Database

1.6. Reduce the number of people developing skin cancer due to UV radiation exposure

Strategies:

1.6.1. Support health promotion campaigns; raise awareness on risk sun exposure

1.7. Reduce the number of people developing occupational–related cancers

Strategies:

1.7.1. Strengthening the legal framework to protect workers
1.7.2. Reduce exposure to and raise awareness of carcinogenic compounds in the workplace (benzene, solar/ionizing radiation, asbestos, silica)

Goal 2. Ensure effective screening and early detection to reduce cancer incidence and mortality

Objectives:

2.1. Increase percentage of patients presenting with early- stage of disease

Strategies:

2.1.1. Develop appropriate health education programming for general population, patients, and physicians
2.1.2. Ensure adequate follow up to treatment

2.2. Increase cervical cancer screening coverage percentage among eligible women

Strategies:

2.2.1. Develop a national cervical cancer screening program aligned with WHO guidelines, using a roll-out model
2.2.2. Conduct social, structural, psychological and cultural research to identify barriers to screening
2.2.3. Implement culturally and socially appropriate awareness campaigns based on research findings

2.3. Reduce percentage of presenting cases with advanced stage cervical cancer

Strategies:

2.3.1. Hold meeting with stakeholders to educate and introduce See and Treat screening method
2.3.2. Adopt the WHO guidelines on cervical cancer
2.3.3 Ensure adequate follow up to treatment
2.3.4. Incorporate HPV testing in the cervical cancer screening protocol

2.4. Reduce percentage of presenting cases with advanced stage breast cancer

Strategies:

2.4.1. Awareness campaign on breast cancer detection and treatment
2.4.2. Educate physicians on pros and cons screening, identification of high risk groups
2.4.3. Conduct social, structural, psychological and cultural research to identify barriers to screening
2.4.4. Ensure adequate diagnostic follow up and treatment for women with BIRADS 4 or more on mammogram
2.4.5. Set up a quality assurance system for mammography
2.4.6. Investigate feasibility of implementing a national breast cancer screening program

2.5. Reduce percentage of presenting cases with advanced stage colon cancer

Strategies:

2.5.1. Investigate the feasibility of a national colon cancer screening program
2.5.2. Educate the public and health workers on symptom recognition, and identification of high-risk groups
2.5.3. Ensure adequate diagnostic follow up and treatment for people with pre-colon cancer

2.6. Reduce percentage of presenting cases with late stage prostate cancer

Strategies:

2.6.1. Awareness campaign on prostate cancer – know your risk level for prostate cancer
2.6.2. Educate the public and physicians on symptom recognition, pros and cons screening, and identification of high-risk groups
2.6.3 Link identified high-risk individuals to PSA testing

2.7. Reduce percentage of presenting cases with advanced stage oral cancer

Strategies:

2.7.1. Awareness campaign on oral cancer – know your risk level for oral cancer
2.7.2. Educate the public and physicians on symptom recognition, and identification of high-risk groups

Goal 3. Ensure effective diagnosis and treatment to reduce cancer morbidity and mortality

Objectives:

3.1. Reduce late presentation of cancer cases

Strategies:

3.1.1. Implement psychological and cultural studies to identify knowledge, attitudes, and behaviors around cancer treatment

3.2. Reduce time between diagnosis and treatment

Strategies:

3.2.1. Develop and implement national guidelines with defined standards for diagnosis, treatment and care for those with cancer
3.2.2. Develop a website to provide guidelines, reports of the multidisciplinary meetings and feedback to physicians
3.2.3. Ensure adequate staffing numbers and staff training
3.2.4. Ensure adequate resources and facilities for effective diagnosis and treatment

3.3. Increase the percentage of cancer patients receiving appropriate treatment as delineated in national guidelines

Strategies:

3.3.1. Expand the National Medicine List with essential cancer drugs in accordance with the WHO Essential Medicine List
3.3.2. Investigate possibilities to obtain low-priced cancer medicines
3.3.2. Discuss all diagnosed cancer patients in multi-disciplinary meetings
3.3.3. Develop a minimal data set to measure performance and outcome of cancer treatment
3.3.4. Concentrate specialist oncology care in dedicated centers
3.3.5. Ensure adequate insurance coverage of cancer diagnosis and treatment

Goal 4. Improve the quality of life for those with cancer and their family through support, rehabilitation and palliative care.

Objectives:

4.1. Establish one integrated programs of supportive care and rehabilitation

Strategies:

4.1.1. Evaluate needs among patients, family and cancer survivors
4.1.2. Develop protocols and guidelines for support services for patients, family and caregivers
4.1.3. Include palliative care in curriculum for health workers
4.1.4. Ensure adequate coverage for palliative and supportive care
4.1.5. Establishment of at least one hospice

4.2. Ensure optimal and equal access to opioids for cancer patients

Strategies:

4.2.1. Expand the number of palliative drugs included in the essential medicines list according to WHO guidelines
4.2.2. Address regulatory barriers on opioids availability
4.2.3. Ensure protection against opioids stock-outs

Goal 5. Improve the effectiveness of cancer control

Objectives:

5.1. Develop national and regional research across the continuum of cancer control

Strategies:

5.1.1. Develop a strategic and regular process for facilitating research relevant to cancer control in Suriname

5.2. Develop one structure for a coordinated, whole of government and whole of society approach to national cancer control

Strategies:

5.2.1. Develop a national cancer registry with future links to region cancer registry hubs (Caribbean)
5.2.2. Link the cancer registry, vaccination, cancer screening, and NCD databases with the appropriate clinical and pathological databases
5.2.3. Develop and collect a standardized national minimal data set
5.2.4. Perform regular quality control assurance of registry data
5.2.5. Take stock of all present human and non-human resources and requirements across the continuum of cancer control
5.2.6. Develop a human resource plan addressing current deficits and future needs
5.2.7. Establish a Cancer Program Office within the MOH
5.2.8. Establish a National Cancer Institute for development and coordination of cancer policy

5.3. Develop one HPV vaccination and structured screening and cancer program registry and surveillance system

Strategies:

5.3.1. Develop one monitoring and evaluation system to capture at least 80% of HPV-vaccinated girls, individuals screened through structured screening programs, and cancer patients by 2020

5.4. Ensure the active involvement of 80% of identified, relevant stakeholders, specifically consumer representatives, in oncology policy formulation by year 2020

Strategies:

5.4.1. Perform a comprehensive environmental scan of all relevant stakeholders
5.4.2. Ensure participation of relevant stakeholders in the management of a National Cancer Institute

MONITORING AND EVALUATION OF THE PLAN

Adequate monitoring and evaluation of the plan is essential for its successful implementation. Focus will be on monitoring and follow up of goals and objectives, regular evaluation of the plan with adjustment of strategies if deemed necessary, and active participation of stakeholders. Key principle is competent management.

A good starting point would be to establish a cancer program office within the MOH led by a program coordinator. The office could set up a national commission on cancer with representatives of governmental and non-governmental organizations chaired by a national cancer coordinator appointed by the MOH. The coordinator could simultaneously serve as the focal point for cancer management. The commission should have appropriate mandate and accountability, and will be responsible for the development of cancer policy and improvement of cancer care. Tasks of the national commission on cancer are (adapted from WHO, 2016):

- oversee the development and revision of the written program plan
- assume responsibility for implementation of the plan
- obtain political commitment from the government
- coordinate the work of all agencies that can contribute to cancer control
- oversee the systematic development and coordination of specific cancer control activities, so as to ensure the best use of available resources for the whole population
- oversee financial aspects of the program, including budgeting and fundraising
- recommend legislative action to change cancer control policies
- oversee public education and participation
- oversee development of national diagnosis and treatment guidelines
- oversee professional education and development
- identify and recommend research priorities
- oversee the information systems
- oversee the monitoring and evaluation process

In the longer term, if funding permits, it would be advisable to establish a National Cancer Institute as an independent body of cancer policy.

Annex 1 presents the strategies, indicators, time frame and key persons according to the defined goals and objectives.

ANNEX 1. MONITORING AND EVALUATION OF THE NATIONAL CANCER CONTROL PLAN

GOAL 1 : REDUCE THE INCIDENCE OF CANCER THROUGH PRIMARY PREVENTION				
Objective 1: Reduce the number of people who develop cancers due to tobacco use and second-hand smoke (align with NCD action plan)				
Strategies	Indicators	Type	Time frame	Key persons
1. Monitor and evaluate tobacco-control legislation	*National program for enforcement of legislation in place*	Process	1-3 yr	MOH, MOJ
2. Increase health promotion activities, advocacy, smoking cessation services	*40% reduction in smoking prevalence among adults*	Outcome	5-10 yr	MOH
	40% reduction in tobacco consumption among youth	Outcome	5-10 yr	MOH
	40% reduction in prevalence of population exposed to second hand smoke	Outcome	5-10 yr	MOH
	90% cigarettes sold carry FCTC compliant labels	Outcome	3-5 yr	MOH, MOT
	100% smoke free public spaces	Outcome	1-3 yr	MOH
2. Increase health promotion activities, advocacy, smoking cessation services	*Reduction strategies and actions implemented in schools, workplaces and other settings*	Process	3-5 yr	MOH, MOE
	Nicotine devices included in the EML	Process	3-5 yr	MOH, NGK
3. Increase taxation	*Legislation on tobacco taxation implemented and enforced*	Process	1-3 yr	MOH, MOJ

Objective 2: Reduce the number of people developing alcohol-related cancers (align with NCD action plan)				
Strategies	Indicators	Type	Time frame	Key persons
1. Develop alcohol legislation including age legislation and reduction of exposure to alcohol advertising	*Legislation establishing minimum age for consumption and purchase of alcohol in place and enforced*	Process	1-3 yr	MOH, MOJ
	Regulations on alcohol advertising and promotion, especially aimed at children and young people, in place and enforced	Process	3-5 yr	MOH
	Legislation, multisectoral policies and programmes to prevent motor vehicle and pedestrian fatalities associated with drunk driving implemented	Process	3-5 yr	MOH, MOJ
	40% reduction in alcohol use among youths consuming alcohol	Outcome	5-10 yr	MOH
	20 % reduction in alcohol use among adults	Outcome	5-10 yr	MOH
	10 % reduction in motor vehicle and pedestrian fatalities associated with drunk driving	Outcome	5-10 yr	MOH
2. Increase health promotion activities, advocacy	*Reduction strategies and actions implemented in schools, workplaces and other settings*	Process	3-5 yr	MOH, MOL, MOE
3. Increase taxation	*Legislation on alcohol taxation implemented and enforced*	Process	1-3 yr	MOH

Objective 3: Reduce the number of people developing physical inactivity and obesity-related cancers (align with NCD action plan)

Strategies	Indicators	Type	Time frame	Key persons
1. Develop legislation for establishment of environments supportive for physical activity	*Legislation related to promotion of physical activity implemented*	Process	1-3 yr	MOH, MOJ
2. Develop strategies to promote healthy diets and physical activity using DPAS (WHO Global Strategy on Diet, Physical Activity and Health) in schools, workplaces, faith-based and other settings	*Programmes to promote physical activity implemented*	Process	3-5 yr	MOH
	Mass based low cost physical activity event hosted regularly	Process	3-5 yr	MOH
	10% increase in physical activity levels among general population	Outcome	3-5 yr	MOH
	"Health Promoting Schools" concept adapted and implemented in at least 50% of schools	Outcome	5-10 yr	MOH, MOE
	At least 20% increase in number of schools with healthy meal choices and physical education	Outcome	5-10 yr	MOH, MOE
2. Develop strategies to promote healthy diets and physical activity using DPAS (WHO Global Strategy on Diet, Physical Activity and Health) in schools, workplaces, faith-based and other settings	*At least 50% increase in the number of workplaces with healthy food choices and wellness programs*	Process	3-5 yr	MOH, MOL
3. Develop programs to prevent the development of obesity in children	*15% decrease in obesity and overweight in children and adults*	Outcome	5-10 yr	MOH
	Mechanisms to restrict advertising of unhealthy products to children in place	Process	3-5 yr	MOH
	Guidelines for management and treatment of overweight and obese children developed and implemented	Process	3-5 yr	MOH
4. Support lifestyle change	*At least 3 new spaces in communities that support physical activity*	Outcome	3-5 yr	MOH
	At least 6 new initiatives implemented that increase the level of physical activity in communities	Outcome	3-5 yr	MOH
	Public information campaign on a healthy lifestyle launched and operating	Outcome	1-3 yr	MOH

Objective 4: Reduce the number of people developing nutrition-related cancers (align with NCD action plan)				
Strategies	Indicators	Type	Time frame	Key persons
1. Development and implementation of legislation and regulations, multi-sectoral policies, incentives, plans, protocols and programs that aim to improve dietary and lifestyle behaviors	*Food-based dietary guidelines adopted and implemented in schools, workplaces and institutions*	Process	3-5 yr	MOH, MOE, MOL
	National standards for salt, fat and sugar content on imported and locally produced foods developed and implemented	Process	3-5 yr	MOH, MOT, MOA
	30% reduction in salt content in imported and locally produced foods	Outcome	3-5 yr	MOH, MOT, MOA
	20% decline in salt consumption	Outcome	3-5 yr	MOH
	Transfat free policies and strategies for elimination of transfat from food developed and implemented	Process	3-5 yr	MOH
	All imported and locally produced foods have required nutritional labeling	Outcome	3-5 yr	MOH, MOT
	Incentive and disincentive programs (taxes and subsidies) in place for producers and buyers in support of low calorie foods	Process	3-5 yr	MOH, MOT
2. Reduce the promotion of unhealthy food choices to children	*50% increase in percentage of youth <18 yr who eat 3 or more servings of fruit and vegetable a day*	Outcome	5-10 yr	MOH
3. Improve access to acceptable and affordable healthy foods	*50% increase in number of servings of fruits per day among adults*	Outcome	5-10 yr	MOH
4. Raise awareness for healthy food choices	*50% increase of number of servings of vegetables per day among adults*	Outcome	5-10 yr	MOH

Objective 5: Reduce the number of people developing infectious disease-related cancers (align with NCD action plan)				
Strategies	Indicators	Type	Time frame	Key persons
1.Increase coverage of HPV vaccination	*Education programs for parents and schools in place*	Outcome	3-5 yr	MOH, MOE
	80% of girls 13-17 yr have received at least 2 HPV vaccine doses	Outcome	5-10 yr	MOH, BOG
2. Develop a monitoring and evaluation protocol for HPV vaccination	*HPV vaccine records digitalized*	Process	1-3 yr	MOH, BOG
	Monitoring and evaluation protocol implemented	Process	3-5 yr	MOH, BOG
3. Reduce HBV transmission	*Hepatitis B birth-dose vaccination coverage of at least 80%*	Outcome	3-5 yr	MOH, BOG
	Hepatitis B vaccination is integrated in at least 50% of HIV services and services targeting people who inject drugs, men who have sex with men and sex workers	Outcome	3-5 yr	MOH, BOG
	Policy for injection safety in health care settings developed and implemented	Process	3-5 yr	MOH
	Hepatitis B vaccination coverage in health workers of at least 80%	Outcome	3-5 yr	MOH
4. Expand access to a continuum of services for early diagnosis, care and treatment of hepatitis B and hepatitis C	*Programmes for early diagnosis, care and treatment of hepatitis B and hepatitis C developed and implemented*	Process	3-5 yr	MOH
5. Develop a National Immunization Database	*Monitoring and evaluation protocol implemented*	Process	3-5 yr	MOH, BOG

Objective 6: Reduce the number of people developing skin cancer due to UV radiation exposure (align with NCD action plan)				
Strategies	Indicators	Type	Time frame	Key persons
1. Support health promotion campaigns; raise awareness on risk sun exposure	*Public information campaign on risk UV radiation exposure launched and operating*	Process	1-3 yr	MOH

Objective 7: Reduce the number of people developing occupational-related cancers (align with NCD action plan)				
Strategies	Indicators	Type	Time frame	Key persons
1. Strengthen the legal framework to protect workers	*Legislation developed and implemented*	Process	1-3 yr	MOH
2. Reduce exposure to and raise awareness of carcinogenic compounds in the workplace (benzene, solar/ionizing radiation, asbestos, silica)	*Carcinogenic Exposure Program (CAREX) implemented*	Process	3-5 yr	MOH, MOL
	Public information campaign on carcinogenic compounds launched and operating	Process	1-3 yr	MOH

GOAL 2 : ENSURE EFFECTIVE SCREENING AND EARLY DETECTION TO REDUCE CANCER INCIDENCE AND MORTALITY				
Objective 1: Increase percentage of patients presenting with early- stage of disease				
Strategies	Indicators	Type	Time frame	Key persons
1. Develop appropriate health education programming for general population, patients, and health workers	*Programmes for early detection of cancer integrated into primary health care services*	Process	3-5 yr	MOH, BOG, Lobi Foundation, SPAOGS, Patient organizations, RGD
	Programmes on health education for youth developed and implemented in schools	Process	1-3 yr	MOH, MOE
	Awareness programs through (social) media on early signs and symptoms of cancer in existence	Process	1-3 yr	MOH
2. Ensure adequate follow up to treatment	*Protocols for diagnostic strategies developed and implemented*	Process	1-3 yr	MOH, BOG, SPAOGS
	Surveillance program developed and operational	Process	1-3 yr	MOH, BOG, Lobi Foundation

Objective 2: Increase cervical cancer screening coverage among eligible women

Strategies	Indicators	Type	Time frame	Key persons
Develop a national cervical cancer screening program through a roll out model per district, aligned with WHO guidelines	*Screening programs developed and implemented in at least three districts aiming at a screening coverage of 40%*	Process, outcome	3-5 yr	MOH, Lobi Foundation, RGD, MM, PAHO
	Screening programs adjusted and implemented in remaining districts aiming at a screening coverage of 80%	Process, outcome	5-10 yr	MOH, Lobi Foundation, RGD, MM, PAHO
Conduct research to identify social, psychological and cultutal barriers to screening	*Existing PAHO-approved protocol for screening of barriers and community based approach adjusted for further implementation in the first three districts*	Process	1-3 yr	MOH, Lobi Foundation
Implement culturally and socially appropriate awareness campaigns based on research findings, preferably per district	*Educational and communication plan for awareness raising and mobilization per district developed and implemented*	Process	1-3 yr	MOH, Lobi Foundation, RGD, MM, PAHO

Objective 3: Reduce percentage of presenting cases with advanced stage cervical cancer

Strategies	Indicators	Type	Time frame	Key persons
1. Hold meeting with stakeholders to educate and introduce See and Treat screening method	*Symposium organized on See and Treat screening method*	Process	1 yr	MOH, Lobi Foundation, PAHO, SPAOGS, JHPIEGO
	Guidelines for See and treat developed and disseminated among at least 80% of eligible health workers	Outcome/Process	1-3 yr	MOH, Lobi Foundation, SPAOGS
2. Adopt the WHO guidelines on cervical cancer	*National screening protocol developed and implemented*	Process	1-3 yr	MOH, Lobi Foundation, PAHO, SPAOGS, RGD
3. Ensure adequate follow up to treatment	*Data base of screened women and positive cases in place and monitored*	Process	1-3 yr	MOH, Lobi Foundation, BOG, RTCS
	Protocols for diagnostic and therapeutic strategies developed and implemented	Process	1-3 yr	MOH, SPAOGS, Lobi Foundation
4. Incorporate HPV testing in the cervical cancer screening protocol	*Pilot project to investigate technical and financial feasibility developed and implemented*	Outcome	1-3 yr	MOH, Lobi Foundation, PAHO, RINC
	HPV testing performed in at least 80% of screened women 30-50 yr	Outcome	3-5 yr	MOH, Lobi Foundation, BOG

Objective 4: Reduce percentage of presenting cases with advanced stage breast cancer

Strategies	Indicators	Type	Time frame	Key persons
1. Awareness campaign on breast cancer detection and treatment	*Awareness and communication plan developed and implemented*	Process	1-3 yr	MOH, BOG, Lobi Foundation, patients organizations
2. Educate physicians on pros and cons screening, identification of high risk groups	*Programmes for early detection of breast cancer integrated into primary health care services*	Process	1-3 yr	MOH, SPAOGS, RGD
	Symposium/post graduate training sessions developed and implemented	Process	1-3 yr	MOH, SPAOGS
3. Develop survey protocol to identify determinants on advanced stage presentation	*Survey implemented and recommendations submitted*	Process	1-3 yr	MOH, consultant
4. Ensure adequate diagnostic follow up and treatment for women with BIRADS 4 or more on mammogram	*Protocols for diagnostic and therapeutic strategies developed, evaluated and implemented*	Process	1-3 yr	MOH, SPAOGS, VMS, consultant
5. Set up a quality assurance system for mammography	*Quality Assurance System implemented*	Process	1-3 yr	MOH, PAHO, radiologists
6. Investigate feasibility of implementing a national breast cancer screening program	*Pilot project developed and implemented*	Process	1-3 yr	MOH, Lobi Foundation, specialists, patient organizations

Objective 5: Reduce percentage of presenting cases with advanced stage colon cancer

Strategies	Indicators	Type	Time frame	Key persons
1. Investigate the feasibility of a national colon cancer screening program	*Pilot project developed and implemented*	Process	1-3 years	MOH, specialists
2. Educate the public and health workers on symptom recognition, and identification of high-risk groups	*Awareness and communication plan developed and implemented*	Process	1-3 years	MOH
3. Ensure adequate diagnostic follow up and treatment for people with pre-colon cancer	*Protocols for diagnostic and therapeutic strategies developed, evaluated and implemented*	Process	1-3 yr	MOH, SPAOGS, VMS, consultant

<table>
<tr><th colspan="5">Objective 6: Reduce percentage of presenting cases with late stage prostate cancer</th></tr>
<tr><th>Strategies</th><th>Indicators</th><th>Type</th><th>Time frame</th><th>Key persons</th></tr>
<tr><td>1. Awareness campaign on prostate cancer – know your risk level for prostate cancer</td><td><i>Awareness and communication plan developed and implemented</i></td><td>Process</td><td>1-3 yr</td><td>MOH, Lobi Foundation, patients organizations</td></tr>
<tr><td>2. Educate physicians on symptom recognition, pros and cons screening, and identification of high-risk groups</td><td><i>Symposium/post graduate training sessions developed and implemented</i></td><td>Process</td><td>1-3 yr</td><td>MOH, SPAOGS</td></tr>
<tr><td>3. Link identified high-risk individuals to PSA testing</td><td><i>Process and diagnostic protocol developed, tested and implemented</i></td><td>Process</td><td>1-3 yr</td><td>MOH, SPAOGS</td></tr>
</table>

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<tr><th colspan="5">Objective 8: Reduce percentage of presenting cases with advanced stage oral cancer</th></tr>
<tr><th>Strategies</th><th>Indicators</th><th>Type</th><th>Time frame</th><th>Key persons</th></tr>
<tr><td>1. Awareness campaign on oral cancer – know your risk level for oral cancer</td><td><i>Awareness and communication plan developed and implemented</i></td><td>Process</td><td>1-3 yr</td><td>MOH</td></tr>
<tr><td>2. Educate health workers on symptom and sign recognition and identification of high-risk groups</td><td><i>Symposium/post graduate training sessions developed and implemented</i></td><td>Process</td><td>1-3 yr</td><td>MOH, SPAOGS</td></tr>
<tr><td>3. Investigate feasibility of implementing HPV vaccination for boys</td><td><i>Pilot project developed and implemented</i></td><td>Process</td><td>1-3 yr</td><td>MOH, BOG</td></tr>
</table>

GOAL 3 : ENSURE EFFECTIVE DIAGNOSIS AND TREATMENT TO REDUCE CANCER MORBIDITY AND MORTALITY

Objective 1: Decrease late presentation

Strategies	Indicators	Type	Time frame	Key persons
Implement knowledge, attitudes and behavior studies to identify knowledge, attitudes, and behaviors around cancer treatment	*Studies (research protocol) developed and implemented*	Process	1-3 yr	MOH, SRCS, consultants

Objective 2: Decrease time between diagnosis and treatment

Strategies	Indicators	Type	Time frame	Key persons
1.Develop and implement national guidelines with defined standards for diagnosis, treatment and care for those with cancer	*National guidelines developed, tested and implemented*	Process	3-5 yr	MOH, VMS, SPAOGS
2. Develop a website to provide guidelines, reports of the multidisciplinary meetings and feedback to physicians	*Website developed, tested and operational*	Process	1-3 yr	MOH, RTCS, MDO
3. Ensure adequate staffing numbers and staff training	*Human resource plan for the health sector (focused on this NCCP) developed and implemented*	Process	3-5 yr	MOH
4. Ensure adequate resources and facilities for effective diagnosis and treatment	*Research on adequate resources and facilities for effective diagnosis and treatment for cancers implemented*	Process	1-3 yr	MOH

Objective 3: Increase the percentage of cancer patients receiving appropriate treatment as delineated in national guidelines

Strategies	Indicators	Type	Time frame	Key persons
1. Expand the National Medicine List with essential cancer drugs in accordance with WHO	*NML aligned with WHO EML*	Process	1-3 yr	MOH, EML commission
2. Investigate possibilities to obtain low-priced cancer medicines	*Collaboration with PAHO established for low priced medicines*	Process	1-3 yr	MOH, PAHO, BVGS, EML commission
3. Discuss all diagnosed cancer patients in multi-disciplinary meetings	*Resolution for formalization of MDO and its tasks approved and operational*	Process	1 yr	MOH, MDO, VMS
4. Develop a minimal data set to measure performance and outcome of cancer treatment	*Data set developed, tested and implemented*	Process	1-3 yr	MOH, PAHO
5. Concentrate specialist oncology care in dedicated centers	*National policy document on specialist oncology care developed, approved and operational*	Process	3-5 yr	MOH, PAHO, VMS, hospitals
6. Ensure adequate insurance coverage of cancer diagnosis and treatment	*Insurance package for cancer diagnosis and treatment developed, approved and implemented*	Process	3-5 yr	MOH, MOF, health insurers

GOAL 4 : IMPROVE THE QUALITY OF LIFE FOR THOSE WITH CANCER AND THEIR FAMILY THROUGH SUPPORT, REHABILITATION AND PALLIATIVE CARE

Objective 1: Establish one integrated programs of supportive care and rehabilitation

Strategies	Indicators	Type	Time frame	Key persons
1. Evaluate needs among patients, family and cancer survivors	*Survey on needs among patients, family and cancer survivors implemented*	Process	1-3 yr	MOH, PAHO, consultant
2. Develop protocols and guidelines for support services for patients, family and caregivers	*Protocols and guidelines developed, tested and implemented*	Process	1-3 yr	MOH, PAHO, consultant
3. Include palliative care in curriculum health care educational programs	*Curriculum for palliative care developed, tested and integrated in health care educational programs*	Process/outcome	3-5 yr	MOH, SPAOGS, COVAB, FMW
4. Ensure adequate coverage for palliative and supportive care	*Insurance package for palliative and supportive care developed, approved and implemented*	Process/outcome	3-5 yr	MOH, MOF, health insurers
5. Establishment of at least one hospice	*Hospice established*	Outcome	1-3 yr	MOH, MOF, health insurers

Objective 2: Ensure optimal and equal access to opioids for cancer patients				
Strategies	Indicators	Type	Time frame	Key persons
1. Expand the number of palliative drugs included in the essential medicines list according to WHO guidelines	*NML aligned with WHO-EML for palliative drugs*	Process	1-3 yr	MOH, PAHO, NML commission, Pharmaceutical Inspectorate
2. Address regulatory barriers on opioids availability	*Regulatory barriers on opioids removed*	Process/outcome	3-5 yr	MOH, PAHO, Pharmaceutical Inspectorate, health insurers
3. Ensure protection against opioids stock-outs	*Procurement plan on opioids drafted, tested and implemented*	Process	1-3 yr	MOH, BVGS, VVA

GOAL 5 : IMPROVE THE EFFECTIVENESS OF CANCER CONTROL				
Objective 1: Develop national and regional research across the continuum of cancer control by 2020				
Strategies	Indicators	Type	Time frame	Key persons
1. Develop a strategic and regular process for facilitating research relevant to cancer control in Suriname	*Research policy document developed, approved and implemented*	Process	3-5 yr	MOH, SRCS, FMW

Objective 2: Develop one structure for a coordinated, whole of government and whole of society approach to national cancer control by 2020				
Strategies	Indicators	Type	Time frame	Key persons
1. Develop a national cancer registry with future links to region cancer registry hubs (Caribbean)	*National cancer registry system developed, tested and implemented*	Process/outcome	1-3 yr	MOH, RTCS, PAHO, NCI
2. Combine cancer patient information from multi-disciplinary clinical meetings with pathology data	*Protocol for linking cancer patient data from multi-disciplinary clinical meetings with pathology data developed, tested and implemented*	Process	1-3 yr	MOH, PAHO, MDO, Pathology lab
3. Link the cancer registry, vaccination, cancer screening, and NCD databases with the appropriate clinical and pathological databases	*Protocol for linking cancer data and NCD-data bases with each other, developed, tested and implemented*	Process	3-5 yr	MOH, PAHO, MDO, Pathology lab
4. Develop and collect a standardized national minimal data set	*Protocols and guidelines for standardized data collection developed, tested and implemented*	Process	1-3 yr	MOH, PAHO, MDO, Pathology lab, FMW, BOG
5. Perform regular quality control assurance of registry data	*Coordinator for quality control assurance of registry data hired and functional*	Process	1-3 yr	MOH, MDO
6. Take stock of all present human and non-human resources and requirements across the continuum of cancer control	*Data on available resources and requirements collected and analysed*	Process	1-3 yr	MOH
7. Develop a workforce plan addressing current deficits and future needs	*Human resource plan for the health sector (focused on this NCCP) developed and implemented*	Process	1-3 yr	MOH, MOE, FMW, COVAB
8. Establish a cancer program office in the MOH	*Install a national commision on cancer*	Process	1 yr	MOH, PAHO
9. Establish a National Cancer Institute for development and coordination of cancer policy	*Appoint a focal point*	Process	1 yr	MOH
	Install working group to guide the establishment of a NCI	Process	3-5 yr	MOH, PAHO
	NCI established and operational	Outcome	3-5 yr	MOH

Objective 3: Develop one HPV vaccination and structured cancer screening program registry and surveillance system

Strategies	Indicators	Type	Time frame	Key persons
1. Develop one monitoring and evaluation system to capture at least 80% of HPV-vaccinated girls, individuals screened through structured screening programs, and cancer patients by 2020	*Monitoring and Evaluation protocols and guidelines developed, tested and implemented*	Process	1-3 yr	MOH, BOG, Lobi Foundation, MDO, Pathology lab

Objective 4: Ensure the active involvement of 80% of identified, relevant stakeholders, specifically consumer representatives, in oncology policy formulation by year 2020

Strategies	Indicators	Type	Time frame	Key persons
1. Perform a comprehensive environmental scan of all relevant stakeholders	*Survey on identification of all relevant stakeholders implemented*	Process	1-3 yr	MOH, consultant
2. Ensure participation of relevant stakeholders in the management of a National Commission on Cancer	*Appoint key relevant stakeholders in management of the NCC*	Process	1-3 yr	MOH

ANNEX 2. PROPOSED NATIONAL NCD ACTION PLAN M&E FRAMEWORK 2019-2028

Indicator	Type	Data Source	Responsible Agency	Baseline	Targets						
					Yr1	*Yr2*	*Yr3*	*Yr4*	*Yr5*	*Yr6*	*Yr7*
1. Age-standardized mortality rate per 100,000 population for deaths <70 years due to Ischemic Heart Disease (ICD10 I20-I25)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*33*	31.23	30.64	30.05	29.46	28.88	28.29	**27.70**
2. Potential Years of Life Lost (PYLL) rate due to ischemic heart disease (ICD10 I20-I25)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	418	396	388	381	373	366	358	351
3. Age-standardized mortality rate per 100,000 population for deaths <70 years due to cerebrovascular disease (stroke) (ICD10 0 –I69)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	30.16	29	28	27	27	26	26	25
4. Potential Years of Life Lost (PYLL) rate due to cerebrovascular disease (stroke) (ICD10 I60-I69)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*453.6*	429	421	413	405	397	389	381
5. Age-standardized mortality rate per 100,000 population for deaths <70 years due to malignant neoplasm (total) (ICD10 C00-C97)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*50.05*	47	46	46	45	44	43	42
6. Potential Years of Life Lost (PYLL) rate due to malignant neoplasm (total) (ICD10- C00-C97)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*860.4*	814	799	784	768	753	737	722
7. Age-standardized mortality rate per 100,000 population for deaths <70 years due to cervical cancer (ICD 10 C53)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*8.20*	7.8	7.6	7.5	7.3	7.2	7.03	6.88
8. Potential Years of Life Lost (PYLL) Rate due to cervical cancer (ICD10 C53)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*209.3*	198.1	194.4	190.6	186.9	183.1	179	176
9. Age-standardized mortality rate per 100,000 population for deaths <70 years due to lung cancer including trachea, bronchus and lung. (ICD10 C33- C34)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*5.01*	4.74	4.65	4.56	4.47	4.38	4.29	4.2
10. Potential Years of Life Lost (PYLL) rate due to lung cancer including trachea, bronchus and lung (ICD10 C33- C34)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*59.5*	56.31	55.25	54.19	53.12	52.06	51.00	49.9
11. Age-standardized mortality rate per 100,000 population for deaths <70 years due to female breast cancer (ICD10 C50)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*8.87*	8.39	8.24	8.08	7.92	7.76	7.60	7.44

12. Potential Years of Life Lost (PYLL) rate due to female breast cancer. (ICD 10C50)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*171.7*	162.50	159.44	156.37	153.3	150.24	147	144
13. Age-standardized mortality rate per 100,000 population for deaths <70 years due to cancers of the digestive system (ICD10 C15-C26, C48)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*13.58*	12.85	12.61	12.37	12.13	11.88	11.6	11.4
14. Potential Years of Life Lost (PYLL) rate due to cancer of the digestive system (ICD10 C15-C26, C48)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*190.3*	180.11	176.71	173.31	169.91	166.51	163	160
15. Age-standardized mortality rate per 100,000 population for deaths <70 years due to underlying cause being diabetes (IC10 E10-E14)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*31.69*	29.99	29.43	28.86	28.29	27.73	27.2	26.6
16. Potential Years of Life Lost (PYLL) Rate due to diabetes (ICD10 E10-E14)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*402.3*	380.75	373.56	366.38	359.20	352.01	345	338
17. Age-standardized mortality rate per 100,000 population for deaths <70 years due to lower respiratory diseases (ICD10 J40-J47)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*4.43*	4.19	4.11	4.03	3.96	3.88	3.8	3.72
18. Potential Years of Life Lost (PYLL) Rate due to chronic lower respiratory disease (ICD10 J40-J47)	*Impact*	*Epidemiology, Mortality Registry*	*Epidemiology, Mortality Registry*	*62.3*	58.96	57.85	56.74	55.63	54.51	53.4	52.3
19. Hospital discharge with diabetes (ICD10 E10-14) 25-64 y and ((ICD10 E10-14) ≥ 65y)	*Impact*	*Hospitals*	*Ministry of Health/Hospitals*	*2.4% (2008)*	2.19	2.15	2.12	2.08	2.05	2.01	1.98
20. Hospital discharge with diagnosis of COPD (ICD10 J40-J47)	*Impact*	*Hospitals*	*Ministry of Health/Hospitals*	*0.3% (2008)*	0.273	0.269	0.265	0.26	0.256	0.25	0.25
21. Hospital discharge with diagnosis of stroke (ICD10 I60-I69) 25-64 years and ((ICD10 I60-I69) ≥ 65y)	*Impact*	*Hospitals*	*Ministry of Health/Hospitals*	*0.5% (2008)*	0.456	0.449	0.441	0.434	0.426	0.42	0.41
22. Hospital discharge with diagnosis of Acute Myocardial infarction (ICD10 I21- age group 25-25. 64y I220 and ((ICD10 I21- I221 age group ≥ 65y)	*Impact*	*Hospitals*	*Ministry of Health/Hospitals*	*0.5% (2008)*	0.456	0.449	0.441	0.434	0.426	0.42	0.41
22. Percentage of annual NCD projected costs available for implementation	*Outcome*	*Costed annual work plan and available budget*	*Ministry of Health Planning Unit*	*N/A*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*
23. Prevalence (and Standard Deviation) of current daily smokers of tobacco among adults 25-34y, 35-44y, 45-64y	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*25.6% (2013)*	N/A	N/A	N/A	N/A	N/A	N/A	15.1

Male											
23. Prevalence (and Standard Deviation) of current daily smokers of tobacco among adults 25-34y, 35-44y, 45-64y Female	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*4.5% (2013)*	N/A	N/A	N/A	N/A	N/A	N/A	2.66
24. Prevalence (and Standard Deviation) of tobacco consumption among youth	*Outcome*	*Suriname National Household Drug Prevalence Survey GSHS*	*Ministry of Health in collaboration with BAD*	*12.1% (2009)*	N/A	8.70	N/A	N/A	N/A	N/A	7.56
25. Prevalence of population (and Standard Deviation) exposed to second hand smoke	*Outcome*	*Global Youth Tobacco Survey*	*Ministry of Health in collaboration with PAHO*	*49.8% (2009)*	N/A	41.08	N/A	N/A	N/A	N/A	30.19
27. Prevalence (and Standard Deviation) of binge drinking among adults MALE	*Outcome*	*National Household Drug Prevalence Survey & STEPS Survey*	*Ministry of Health in collaboration with BAD and the University*	47.9% (2009)	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	44.6
27. Prevalence (and Standard Deviation) of binge drinking among adults: FEMALE	*Outcome*	*National Household Drug Prevalence Survey & STEPS Survey*	*Ministry of Health in collaboration with BAD and the University*	19.7% (2009)	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	18.34
28. Percentage of youth 13-15 who eat fruits at least 1 time per day YOUTH	*Outcome*	*GHSH*	*Ministry of Health in collaboration with the University*	44.9% (2009)	*N/A*	74.95	*N/A*	*N/A*	*N/A*	*N/A*	100%
29. Mean number (and Standard Deviation) of servings of fruits per day ADULTS	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*1.1*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	***5***
30. Percentage of youth 13-15 who eat vegetables at least 1 time per day YOUTH	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	27.8% (2009)	*N/A*	67.18	*N/A*	*N/A*	*N/A*	*N/A*	100
31. Mean number (and Standard Deviation) of servings of vegetables per day ADULTS	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	***2.2***	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	***5***

32. Percentage of population (and Standard Deviation) of youth who eat 5 or more servings of fruit and vegetable a day YOUTH	*Outcome*	*GHSH*	*Ministry of Health in collaboration with the University*	31.1% (2009)	N/A	68.68182	N/A	N/A	N/A	N/A	100
33. Percentage of the population with a BMI that is between 21 and 25 *YOUTH*	*Outcome*	*GHSH*	*Ministry of Health in collaboration with the University*	*66.5% (2009)*	N/A	*66.5%*	N/A	N/A	N/A	N/A	*66.5%*
33. Percentage of the population with a BMI that is between 21 and 25 *ADULTS* ***Categories**: **Male, Female; ages 25-64 and by age group 25-34, 35-44, 45-54, 55-64;***	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	***ASK University/ STEPS for adult data by age categories***							
34. Prevalence (and Standard Deviation) of the population of adults with low levels of physical activity	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*44.4% (2013)*	N/A	N/A	N/A	N/A	N/A	N/A	39.96
35. Prevalence (and Standard Deviation) of physical inactivity among the youth	*Outcome*	*GHSH*	*Ministry of Health in collaboration with the University*	45.6% (2009)	N/A	44.18	N/A	N/A	N/A	N/A	42.75
36. Prevalence and Standard Deviation of Diabetes Mellitus (ICD10 E10-E14)	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*15% for males (2008)* *14% for Females (2008)*	N/A	N/A	N/A	N/A	N/A	N/A	*15% for males* *14% for Females*
37.Prevalence and Standard Deviation of Hypertension (ICD10 I10-I15)	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*22% for males (2008)* *20% for females (2008)*	N/A	N/A	N/A	N/A	N/A	N/A	*22% for males (2008)* *20% for females (2008)*
38. Prevalence and Standard Deviation of obesity among adolescents and adults	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*18% for Men* *32% for Women* *6.% for youth (2009)*	N/A	N/A	N/A	N/A	N/A	N/A	*18% for Men* *32% for Women* *6.% for youth (2009)*
39. Prevalence of persons with high cholesterol (≥5.1 mmol/l or on medication)	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*	*25%*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*25%*
40.Blood pressure screening rate among adults	*Outcome*	*STEPS Survey*	*Ministry of Health in collaboration with the University*		*N/A*	*N/A*	***Ask University for data***				

41. Percentage of the total population aged 18-55 persons on dialysis	*Outcome*	*Dialysis Centres*	*Ministry of Health in collaboration with Dialysis Centres*	*0.05% for 18-55 years of age (2007); denominator is total population 18-55*	*0.05% for 18-55 years of age*	*0.05% for 18-55 years of age*	*0.05% for 18-55 years of age*	*0.05% for 18-55 years of age*	*0.05% for 18-55 years of age*	*0.05% for 18-55 years of age*	*0.05% for 18-55 years of age*
42. Percentage of the total population aged 18-55 with Amputations from diabetic-related complications	*Outcome*	*Hospitals*	*Ministry of Health in collaboration with Hospitals*	*0.04 % for 18-55 years of age (2008); denominator is total population 18-55*	*0.04 % for 18-55 years of age*	*0.04 % for 18-55 years of age*	*0.04 % for 18-55 years of age*	*0.04 % for 18-55 years of age*	*0.04 % for 18-55 years of age*	*0.04 % for 18-55 years of age*	*0.04 % for 18-55 years of age*
43. Pap smear among women within the last 3 years (MDS) ***Target:100% taking into account recommendation of 1/2years***	*Outcome*	*STEPS Survey*	*MOH M&E Unit*		*N/A*	*N/A*	***Ask University for data***				
44. Mammogram use among women between 45-64 years (MDS)	*Outcome*	*STEPS Survey*	*MOH M&E Unit*		*N/A*	*N/A*	*3% in 2008 (from sites not a survey)*				
45. Mean (and Standard Deviation) of fasting blood glucose in the population (MDS)	*Outcome*	*STEPS Survey*	*MOH M&E Unit*	*5.8 (factsheet)*	5.8	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	5.8
46. Blood glucose check up rate among adults (MDS)	*Outcome*	*STEPS Survey*	*MOH M&E Unit*				***Ask University for data***				
47. Percentage of health facilities in which the Chronic Care Model has been implemented	*Outcome*	*Health Facility Survey*	*MOH Planning Unit*		*N/A The Definition of CCM yet to be finalized by the MOH*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
48. Percentage of public health facilities that are using national guidelines for the prevention and treatment of diabetes and hypertension	*Outcome*	*Health Facility Survey*	*MOH Planning Unit*		*N/A*	*N/A*	*N/A*	*50%*	*N/A*	*N/A*	*100%*
49. Disease registries established for priority NCDs	*Outcome*	*MOH Planning Unit*	*MOH Planning Unit*	*N/A*	*N/A*	*N/A*	*Single National Registry Established for all NCDs*	*N/A*	*N/A*	*N/A*	*N/A*
50. Annual data driven reports on the status of implementing the NCD strategic plan	*Outcome*	*MOH Planning Unit*	*MOH M&E Unit*		√	√	√	√	√	√	√
51. Establish NCD Commission	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*N/A*	√	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
52. NCD Commission functioning according to TOR	*Process*	*Meeting minutes*	*NCD Focal Point*		*N/A*	*N/A*	√	√	√	√	√
53. Number of multi-sectoral partnerships established -- focal points appointed from multi-sectoral by NCD commission members	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*N/A*	*N/A*	√	√	√	√	√

54. Number of NCD-related legislations passed (alcohol, tobacco and food)	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*Tobacco Legislation*	*N/A*	*Alcohol Legislation*				
55. Costed NCD plan developed	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*N/A*	*√*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
56. Regulations on tobacco advertising, promotion and sponsorship in place - existence of approved legislation	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*N/A*	*√*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
57. All cigarettes sold carry FCTC compliant labels	*Process*	*Survey of retail outlets*	*NCD Focal Point*		*N/A*	*N/A*	*√*	*√*	*√*	*√*	*√*
58. 100% smoke free public spaces – number of complaints on violations	*Process*	*Tobacco Bureau*	*BOG*			*Baseline to be established*					
59. Number of prevention interventions carried out annually – measure and count different types of interventions not activities (disaggregated by general population, youth, and schools.)	*Process*	*NCD Implementing Partners*	*NCD Focal Point*		*3*	*3*	*3*				
60. Number of medium to large public and private sector workplaces with wellness programmes in place.	*Process*	*Public and private sector organizations*	*MOH M&E Unit*		*1*	*1*	*3*				
61. Food-based dietary guidelines developed	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*N/A*	*√*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
62. National standards for salt, fat, trans-fat and sugar content on imported and locally produced foods developed	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*N/A*	*Standards for trans fat and salt*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
63. 30% reduction in salt content in imported and locally produced foods	*Process*	*Survey of retail outlets*	*MOH M&E Unit*		*N/A*	*N/A*	*Baseline Data Collected*				
64. Number of education interventions for the general population developed and implemented	*Process*	*NCD Implementing Partners*	*NCD Focal Point*		*5*	*5*	*5*				
65. Number of new spaces in communities that support physical activity	*Process*	*NCD Implementing Partners*	*NCD Focal Point*		*N/A*	*1*	*2*				
66. Number of new initiatives implemented that increase the level of physical activity in communities.	*Process*	*NCD Implementing Partners*	*NCD Focal Point*		*3*	*5*	*8*				
67. Public information campaign on a healthy lifestyle launched and operating	*Process*	*NCD Implementing Partners*	*NCD Focal Point*		*1*	*1*	*1*				
68. NCD guidelines for diabetes, hypertension and cancers periodically updated	*Process*	*MOH Planning Unit*	*NCD Focal Point*		*N/A*	*√*	*N/A*	*N/A*	*N/A*	*N/A*	*√*
69. Disease specific NCD implementation plans completed	*Process*	*MOH Planning Unit Documentation*	*NCD Focal Point*		*√*	*N/A*	*N/A*				

70. Guidelines for management and treatment of overweight and obese children developed.	Process	MOH Planning Unit	NCD Focal Point		N/A	N/A	√	N/A	N/A	N/A	N/A
71. Eye examination rate among adults with diabetes (MDS)	Process	STEPS Survey	MOH M&E Unit				Ask University for data				
72. Foot examination rate among adults with diabetes (MDS)	Process	STEPS Survey	MOH M&E Unit				Ask University for data				
73. Number of specialty care centres ("one stop shops") for NCDs in operation	Process	MOH Planning Unit	NCD Focal Point	2 (2013)	N/A	3	N/A				
74. Number of health care professionals trained in NCD management (by disease)	Process **300 FAMILY DOCS AND 300 NURSES**	Training Registration Forms	NCD Focal Point		N/A	75	150	225	300	400	600
76. At least **80 percent** of essential NCD drugs included on National Essential Medicine List	Process	National Essential Medicine List Commission	NCD Focal Point		80%	80%	80%	80%	80%	80%	80%
77. Monitoring & Evaluation plan for NCD prevention and control programs developed	Process	MOH M&E Unit	MOH M&E Unit		N/A	√	N/A	N/A	N/A	N/A	N/A
78. Prevalence burden of disease/ risk factor survey completed (e.g. Mini STEPS)	Process	Steps Survey	MOH M&E Unit		N/A	N/A	N/A	N/A	√	N/A	N/A
79. Mid-term evaluation of the NCD plan	Process	MOH M&E Unit	MOH M&E Unit		N/A	N/A	N/A	√	N/A	N/A	N/A
80. End of NSP evaluation of the NCD plan	Process	MOH M&E Unit	MOH M&E Unit		N/A	N/A	N/A	N/A	N/A	N/A	√

ANNEX 3. MONITORING AND EVALUATION PLAN FOR THE NATIONAL ACTION PLAN FOR THE PREVENTION AND CONTROL OF NCDS (2015-2020)

- **Priority Area 1: Public Policy and Advocacy**
  - **Objective 1.1: Enhance political commitment at national and local levels through multi-sectoral partnerships, policies and legislation**
    - Establish a national multi-sectoral commission for coordination and implementation of NCD prevention and Control
    - Develop NCD implementation plans for cardiovascular diseases, diabetes, cancer and chronic respiratory diseases
    - Develop and implement strategies for engaging multi-sectoral partnerships including the private sector to reduce NCDs
    - Lobby for legislation related to NCD risk factors including alcohol, trans fat and energy drinks
    - Develop NCD coordination structure within the MOH
    - Install a Focal point within the MOH for coordination of NCD
  - **Objective 1.2: Mobilize financial and organizational resources to support NCD prevention and control efforts**
    - Conduct costing exercises for NCD Strategic Plan
    - Allocate or reallocate financial resources to facilitate implementation of NCD Strategic Plan
    - Increase availability, access and affordability of essential NCD drugs

- **Priority Area 2: Health Promotion and Disease Prevention**
  - **Objective 2.1: Promote and support reduction of risk factors related to tobacco and alcohol use**
    - Reduce tobacco use through implementation and enforcement of FCTC legislation
    - Develop and implement tobacco-related public education programs
    - Review, update and implement alcohol and energy drink policies and regulations
    - Develop and implement public education programs on harmful alcohol use

  - **Objective 2.2: Promote the availability, accessibility, and consumption of healthy, tasty foods**
    - Develop and implement programs to promote healthy diet and lifestyles
    - Develop/adopt food-based dietary guidelines for school children
    - Adapt and implement the “Health Promoting Schools” concept
    - Develop national standards for the content of imported and locally produced foods (salt, trans-fat, and sugar).
  - **Objective 2.3: Promote physical activity to support healthy lifestyle and reduce risk factors**
    - Educate the general population on the benefits of healthy diets and physical activity as part of healthy lifestyles
    - Develop and implement legislation for the establishment of supportive environments for physical activity
    - Host low cost physical activity events
    - Develop and implement healthy-lifestyle program for overweight and obese children

- **Priority Area 3: Integrated Management of Chronic Diseases and Risk Factors**
  - **Objective 3.1: Integrate prevention and control of NCDs in primary health care using the Chronic Care Model**
    - Develop guidelines and protocols for screening, prevention and control of chronic diseases
    - Implement guidelines and protocols for screening, prevention and control of chronic diseases
    - Set up specialty care centers (‘one stop shop’) for NCDs
  - **Objective 3.2: Strengthen health care workforce to deliver and manage quality NCD programs**
    - Develop and implement training programs for health professionals in NCD prevention, control, management and evaluation

- **Priority Area 4: Surveillance, Monitoring and Evaluation**
  - **Objective 4.1: Strengthen capacity for surveillance and research of chronic diseases and risk factors**
    - Develop and implement NCD surveillance systems
  - **Objective 4.2: Monitor and evaluate the impact of NCD prevention and control interventions**
    - Carry out prevalence burden of disease/risk factor survey
    - Prepare data-driven reports on NCDs
    - Conduct mid-term evaluation of the NCD plan
    - Conduct end of term evaluation of the NCD plan

ANNEX 4. WHAT THE LITERATURE/EXPERT OPINION SAYS FOR CANCER SCREENING PROGRAM COST-EFFECTIVENESS

Evidence-Base

Cervical Cancer	WHO "Best Buys" recommends "screening (visual inspection with acetic acid [VIA] linked with timely treatment of pre-cancerous lesions)." (WHO, 2014) The WHO cervical cancer screening algorithm recommends using HPV testing, if there are no other screening programs in place and if it's feasible. Otherwise, VIA screening is recommended. (WHO, 2013) "VIA see and treat will lead to overtreatment, but the risk/benefit is good." Personal communication with Dr. John Flanigan of NCI on August 18, 2015
Breast Cancer	"Population-based breast cancer and mammography screening (50-79 years) linked with timely treatment." (WHO, 2014) IARC Breast Cancer screening guidelines found sufficient evidence for "Can be cost-effective among women 50–69 yr of age in countries with a high incidence of breast cancer ." However, they only found limited evidence to support "Can be cost-effective in low- and middle-income countries" (Lauby-Secretan, 2015).
Colorectal Cancer	"Population-based colorectal cancer screening, including through a fecal occult blood test, as appropriate, at age > 50, linked with timely treatment." (WHO, 2014) "In regions characterised by high income, low mortality and high existing treatment coverage, the addition of screening to the current high treatment levels is very cost-effective, although no particular intervention stands out in cost-effectiveness terms relative to the others. In regions characterised by low income, low mortality with existing treatment coverage around 50%, expanding treatment with or without screening is cost-effective or very cost-effective. Abandoning treatment in favour of screening (no treatment scenario) would not be cost effective. In regions characterised by low income, high mortality and low treatment levels, the most cost-effective intervention is expanding treatment." (Ginsberg, 2010)

Prostate Cancer	Cochrane meta-analysis findings “Meta-analysis of all five included studies demonstrated no statistically significant reduction in prostate cancer-specific mortality (risk ratio (RR) 1.00, 95% confidence interval (CI) 0.86 to 1.17)… Among men aged 55 to 69 years in the ERSPC study, the study authors reported that 1055 men would need to be screened to prevent one additional death from prostate cancer during a median follow-up duration of 11 years. Harms included overdiagnosis and harms associated with overtreatment, including false-positive results for the PSA test, infection, bleeding, and pain associated with subsequent biopsy.” (Ilic, 2013)
Lung Cancer	Cochrane meta-analysis findings “The current evidence does not support screening for lung cancer with chest radiography or sputum cytology. Annual low-dose CT screening is associated with a reduction in lung cancer mortality in high-risk smokers but further data are required on the cost effectiveness of screening and the relative harms and benefits of screening across a range of different risk groups and settings.” (Manser, 2013)

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PAHO

Pan American Health Organization

World Health Organization

REGIONAL OFFICE FOR THE Americas

Ministerie van Volksgezondheid