

National Cancer Control Plan of Maldives 2022–2026



Endorsement Number

Plan/23/-MoH/2023/19

Endorsed by:



Aishath Samiya,

Permanent Secretary

13 February 2023

Verified for endorsement:



Aminath Shaina Abdulla

Policy Implementation and International Relations Division

13 February 2023



Ministry of Health
Republic of Maldives

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any means, electronic, mechanical, photocopying, recording or otherwise without written permission of Ministry of Health, Republic of Maldives. Short excerpts from the publication may be reproduced in respect to any fair dealings for the purpose of research or review, provided due acknowledgement is made.

Contents

Foreword by Minister of Health	v
Foreword by WHO Representative	vi
Abbreviations	vii
Stakeholders	viii
Acknowledgments	ix
Background	1
Burden of cancer in Maldives	1
Estimates of cancer burden in Maldives	4
Prevalence of risk factors for cancer in Maldives	5
Approach to developing the National Cancer Control Plan (NCCP)	8
Enablers	8
Interventions to address risk factors in Maldives	9
Cancer care services and facilities in Maldives	10
National cancer control plan	14
Aim	14
Strategic objectives	14
Enablers	15
Actions	15
Strategic objective 1. Scale up prevention through health promotion	15
Strategic objective 2: Ensure early detection and timely diagnosis	18
Strategic objective 3: Promote evidence-based treatment without financial burden	21
Strategic objective 4: Expand coverage of palliative and supportive care	24
Strategic objective 5: Establish cancer registry and conduct research	25
Recommended next steps	26
Annex 1. National cancer control plan of Maldives, 2022–2026	28
Actions and activities in specific years, by strategic action areas	28

Figures

Fig. 1. Number of new cancer cases in adults, 2020 4

Fig. 2. New cancer cases, 2020, as percentage of total..... 4

Fig. 3. An overview of the National cancer control plan of Maldives14

Tables

Table 1. Top 20 leading causes of death in Maldives, 2014 2

Table 2. Estimates of cancer-related risk factors among adults in Maldives 5

Table 3. Summary of health personnel and services available outside Malé Atoll ...12

Foreword by Minister of Health



The burden of cancer is growing. In 2020, one in six deaths were caused by cancer, that is nearly 10 million deaths worldwide. Cancer is a disease of extraordinary complexity, and families affected by the disease suffer extreme emotional, mental and financial burdens in addition to bereavement. For these reasons, cancer prevention, control, treatment, and care, has been classified as key health priorities of this government.

Detailed research and evidence on the local cancer situation is limited or anecdotal. However, it cannot be refuted that addressing cancer-causing risk factors will contribute positively to Maldives achieving our national development targets. Likewise, country-specific cancer data will only greatly enhance both preventive interventions as well as patient-care services. Moreover, cancer control planning is necessary in any resource setting to respond to country-specific cancer needs, such as early identification, treatment, and providing holistic support and care to people affected by it.

Thus, a comprehensive national strategy for cancer control has been long over-due. The National Cancer Control Plan, which is aligned with international commitments, recommendations, and best practices, provide much-needed direction for cohesive multi-sectoral interventions including resource mobilization. This plan highlights critical investments and sustainable resource allocations that are essential to reducing cancer incidents as well as mortalities through better treatment outcomes. The plan also emphasizes the importance of addressing cancer by strengthening primary healthcare at both rural and urban settings, particularly the role of community engagement.

On that note, I wish to acknowledge the World Health Organization for their contributions, as well as, both local and international stakeholders for their input that has helped us in compiling and developing this comprehensive plan. The Ministry of Health is committed to working collaboratively with all stakeholders to achieve the objectives listed in the NCCP, and setting the future direction for cancer prevention, control, and treatment in Maldives.



Ahmed Naseem – Minister of Health

Foreword by WHO Representative



The Republic of Maldives has made remarkable socioeconomic progress during the past two decades and is now an upper-middle-income country. Notable achievements have been made in the health sector, particularly the increase in life expectancy, improvement of infant, child and maternal health, control of communicable diseases including elimination of diseases such as malaria, measles and lymphatic filariasis, and high rates of immunization coverage.

Despite these triumphs, the country continues to face new challenges, such as growing numbers of noncommunicable diseases, accounting for more than 80% of total deaths, demand for better-quality services, heavy reliance on expatriate health professionals, limited health access for the increasing migrant population and vulnerability to the impact of climate change.

Cancer remains highly prevalent in the country and the Government of Maldives has given priority to this area and renewed its commitment towards reducing this burden. Therefore, a National Cancer Control Plan is the essential and logical next step to bring together all stakeholders and to help in advancing comprehensive cancer control in the country.

WHO Maldives is pleased to collaborate with Ministry of Health Maldives to develop the National Cancer Control Plan of Maldives 2022–2026 through the extensive engagement of various stakeholders. This is our blueprint to advance cancer prevention, management and monitoring in the country.

Though the background work on the Cancer Control Plan had started early on, the document has been completed and finalized with the excellent support of WHO-IAEA joint mission. With this plan, we are committed to prove that cancer can be controlled as a public health priority by making strategic investments. It describes priority policies and programmes in cancer control and evidence-based interventions along the cancer continuum.

I thank His Excellency Minister of Health, all partners, and stakeholders for their support in the development of this document. WHO looks forward to working closely with Ministry of Health and all partners towards setting priorities, implementing actions, investing wisely, and providing cancer care for all.

A handwritten signature in blue ink that reads "Nazneen Anwar".

Dr Nazneen Anwar – WHO Representative

Abbreviations

CSG	Cancer Support Group (Maldives)
CSM	Cancer Society Maldives
CVD	cardiovascular disease
FCTC	Framework Convention on Tobacco Control
HBV	hepatitis B virus
HMH	Hulhumale Hospital (Maldives)
HPA	Health Protection Agency (Maldives)
HPV	human papillomavirus
IAEA	International Atomic Energy Agency
IARC	International Agency for Research on Cancer
ICD	International Classification of Disease
ICD-O	International Classification of Disease for Oncology
IGMH	Indira Gandhi Memorial Hospital
MFDA	Maldives Food and Drug Authority
MOE	Ministry of Education (Maldives)
MOH	Ministry of Health (Maldives)
MSAP	Multi-sectoral action plan (Maldives)
NCCP	National Cancer Control Plan (Maldives)
NCD	noncommunicable diseases
NCR	National Cancer Registry (Maldives)
NSPA	National and Social Protection Agency (Maldives)
PEN	Package of Essential Noncommunicable (PEN) Diseases
PET-CT	Positron emission tomography – computed tomography
PHC	primary health care
PIIR	Policy Implementation and International Relations Division (Maldives)
RAH	Regional and Atoll Health Services Division (Maldives)
SOP	standard operation procedures
STO	State Trading Organization (Maldives)
TCB	Tobacco Control Board (Maldives)
WAMCO	Waste Management Corporation Limited (Maldives)
WHO	World Health Organization

Stakeholders

Health Protection Agency

Aasandha Company

ADK Hospital

Cancer Society Maldives

Dhamanaveshi Hospital

Hulhumale Hospital

Indira Gandhi Memorial Hospital

National Social Protection Agency

Ministry of Health

World Health Organization

Acknowledgments

This plan was developed with the close collaboration between the World Health Organization, Country Office, Maldives and the Ministry of Health, Maldives, as well as with the contribution from other stakeholders.

The initial draft was prepared by W.H.O consultant Dr. Sheba Adam Zahir with assistance from Dr. Aishath Aroona Abdulla, Hulhumale Hospital. The plan was further developed through consultation with experts and stakeholders. Public and private healthcare facilities, professional associations, local and international non-governmental organizations, including Union for International Cancer Control and Cancer Society of Maldives, reviewed the initial draft.

A joint mission of the World Health Organization (WHO) and the International Atomic Energy Authority (IAEA), and the WHO Country Office helped to further refine the plan.

The Ministry of Health, and Health Protection Agency, wish to acknowledge and appreciate the participation and invaluable contributions from all stakeholders, and are especially thankful to the World Health Organization, for facilitating and supporting this endeavour

Background

The Republic of Maldives is an upper-middle-income country which continues to experience rapid development and economic growth. The latest census data in 2022 estimates that total resident population of Maldives is 568362 (1). Between 2000 and 2020, life expectancy at birth increased from 69 to 78 years for males and from 71 to 81 years for females (2).

Maldives has achieved the goal of universal primary education (Millennium Development Goal (MDG) 2) and maintained a high literacy rate for several years. The present literacy rate is 97.4% for males and 98.0% for females. Maldives achieved five out of eight MDGs, ahead of the 2015 deadline. A strong foundation has been created towards achieving the global Sustainable Development Goals (SDGs). The Government of the Republic of Maldives spends 9% of its GDP on health, the highest in the South-East Asia Region (3).

Cancer has become one of the leading causes of death globally and it is becoming increasingly evident that Maldives is no exception to this epidemiological transition. The leading causes of mortality have shifted from communicable diseases to noncommunicable diseases (NCDs) in Maldives. Cohesive management strategies led by the government and health facilities alongside efficient monitoring and timely reporting has led to total eradication of several communicable diseases in the country. Notable achievements have been made in controlling communicable diseases. For example, the country has been certified as free of malaria, and vaccine-preventable diseases including polio, neonatal tetanus, whooping cough and diphtheria are no longer present. Measles has also been eliminated, and Maldives was declared malaria free by WHO in 2015 (4), and free from lymphatic filariasis in 2016 (5).

These are excellent and concrete examples of how effective planning, surveillance and implementation of protocols in key areas of health concern across the country has benefited the population. The burden of disease has now shifted to NCDs, namely cardiovascular diseases, cancer, diabetes and chronic respiratory diseases.

Burden of cancer in Maldives

Noncommunicable diseases (NCDs) are the leading cause of death in Maldives; they account for 85% of total deaths (6). In 2018, the reported leading causes of death were cardiovascular diseases (CVDs) (ischaemic diseases and hypertensive diseases), followed by cancer, chronic respiratory diseases and diabetes. Prevalence of hypertension and diabetes continue to remain high.

The full burden of cancer on Maldives is unclear, as its cancer registry is at an early stage of development. According to the WHO cancer country profile, 2020, cancer is

estimated to account for 40% of premature deaths due to NCD – a considerable social and economic burden. Due to an increase in the aging population, the prevalence of cancer in Maldives is likely to increase in the coming decade as the risk of developing cancer rises with age. This risk can be further exacerbated by unhealthy behaviours and habits. A third of all cancers could be prevented through control of risk factors such as tobacco smoking, chewing of areca nut with or without tobacco, unhealthy diet and physical inactivity. A further third of cancers could be cured through early detection and prompt and adequate treatment of the disease (7).

Maldives Health Statistics 2020 (8) provides an overview of the profile of NCDs in Maldives, based on health statistics. Table 1 presents the leading causes of death in Maldives based on Global Burden of Diseases sub-groups in 2020.

Table 1. Top 20 leading causes of death in Maldives, based on Global Burden of Diseases sub-groups 2020

Rank	GBD sub-groups	All Deaths		GBD sub-groups	Female Deaths		GBD sub-groups	Male Deaths	
		#	%		#	%		#	%
1	Other cardiovascular diseases	166	13%	Other cardiovascular diseases	71	14%	Other cardiovascular diseases	95	13%
2	Cerebrovascular diseases	105	8%	Other respiratory diseases	45	9%	Ischaemic heart disease	63	9%
3	Ischaemic heart disease	102	8%	Cerebrovascular diseases	45	9%	Cerebrovascular disease	60	8%
4	Other respiratory diseases	80	6%	Ischaemic heart disease	39	7%	Other respiratory diseases	35	5%
5	Lower respiratory infections	68	5%	Other infectious diseases	35	7%	Lower respiratory infections	35	5%
6	Chronic obstructive pulmonary disease	58	5%	Chronic obstructive pulmonary disease	34	7%	COVID-19 related conditions	32	4%
7	Other infectious diseases	48	4%	Lower respiratory infections	33	6%	Chronic obstructive pulmonary disease	24	3%
8	COVID-19 related conditions 48 4%	48	4%	COVID-19 related conditions 48 4%	16	3%	Drownings	19	3%
9	Hypertensive heart disease	29	2%	Hypertensive heart disease	13	2%	Liver cancer	17	2%
10	Other malignant neoplasms	26	2%	Breast cancer	11	2%	Trachea, bronchus, lung	17	2%

							cancers		
11	Nephritis and nephrosis	26	2%	Endocrine disorders	11	2%	Other malignant neoplasms	16	2%
12	Liver cancer	25	2%	Other malignant neoplasms	10	2%	Hypertensive heart disease	16	2%
13	Endocrine disorders	22	2%	Other digestive diseases	10	2%	Nephritis and nephrosis	16	2%
14	Drownings	20	2%	Nephritis and nephrosis	10	2%	Other infectious diseases	13	2%
15	Trachea, bronchus, lung cancers	20	2%	Liver cancer	8	2%	Other unintentional injuries	12	2%
16	Other digestive diseases	17	1%	Mouth and oropharynx cancers	7	1%	Endocrine disorders	11	2%
17	Other unintentional injuries	16	1%	Other Congenital anomalies	5	1%	Other perinatal conditions	8	1%
18	Other perinatal conditions	12	1%	Other perinatal conditions	4	1%	Other neuropsychiatric disorders	8	1%
19	Other neuropsychiatric disorders	12	1%	Other neuropsychiatric disorders	4	1%	Inflammatory heart diseases	8	1%
20	Breast cancer	12	1%	Lymphomas, multiple myeloma	4	1%	Other digestive diseases	7	1%

Source: Maldives Health Statistics, 2020, based on Global Burden of Disease categories.

Estimates of cancer burden in Maldives

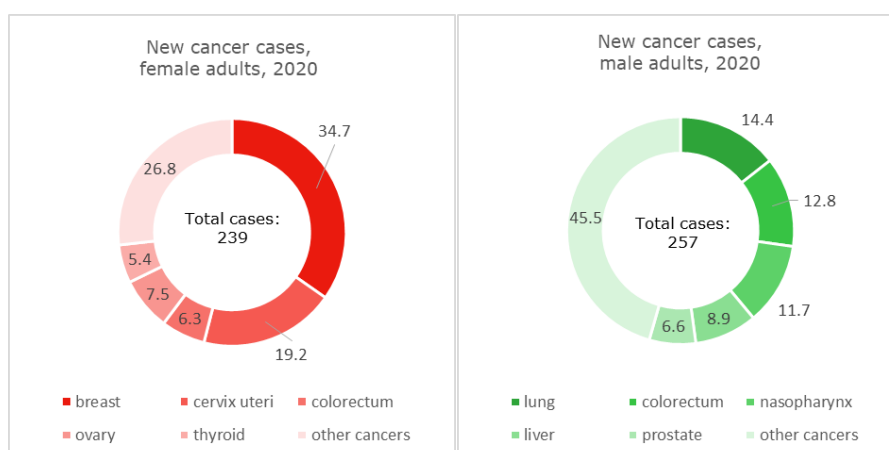
In 2021, the International Agency for Research on Cancer (IARC)/WHO Global Cancer Observatory presented estimates of cancer by incidence and mortality by site for the year 2020. According to these estimates, Maldives had about 496 new cancer cases and 264 deaths in 2020. Furthermore, according to this data, the five-year prevalence of cancer cases are estimated to be 1190 for all ages. (9).

Fig. 1. Number of new cancer cases in adults, 2020



Source: Global Cancer Observatory, March 2021.

Fig. 2. New cancer cases, 2020, as percentage of total



Source: Global Cancer Observatory, March 2021.

Prevalence of risk factors for cancer in Maldives

Increased exposure to established risk factors is playing a major role in the cancer burden worldwide, with growing evidence of the influence exerted by environmental and lifestyle choices in the development of cancer. The STEPS survey on NCD risk factors in Maldives – a population-based survey of adults aged 15–69 – was carried out from December 2020 to December 2021 (10). A total of 3233 adults participated. The overall response rate was 65%. The estimates of key cancer-related risk factors are shown in Table 2.

Table 2. Estimates of cancer-related risk factors among adults in Maldives

Results for adults aged 18–69 years (incl. 95% CI)	Both Sexes	Males	Females
Tobacco use			
Percentage who currently smoke tobacco	23.1% (20.8-25.5)	35.6% (29.2-42.0)	7.6% (1.2-14.0)
Percentage who currently smoke tobacco daily	20.1% (18.0-22.3)	33.5% (28.4-38.7)	3.5% (1.6-5.4)
For those who smoke tobacco daily			
Average age started smoking (years)	18.0 (16.8-19.1)	17.9 (16.7-19.1)	18.6 (- -)
Percentage of daily smokers smoking manufactured cigarettes	92.5% (90.2-94.7)	96.1% (94.0-98.3)	46.8% (23.9-69.7)
Mean number of manufactured cigarettes smoked per day (by smokers of manufactured cigarettes)	13.0 (11.5-4.4)	13.7 (12.3-15.1)	3.5 (2.5-4.5)
Current smokeless tobacco users	3.8 (2.8-4.7)	3.4 (2.1-4.8)	4.2 (2.6-5.8)
Current daily smokeless tobacco users	3.3 (2.4-4.2)	2.8 (1.9-3.7)	3.9 (2.0-5.7)
Alcohol consumption			
Percentage who are lifetime abstainers	96.1% (93.7-98.5)	92.8% (88.7-96.9)	99.9% (99.8-100.0)
Percentage who are past-12-month abstainers	2.5% (0.7-4.3)	4.6% (1.5-7.7)	0.0% (0.0-0.1)
Percentage who currently drink (drank alcohol in the past 30 days)	0.6% (0.1-1.1)	1.1% (0.1-2.0)	0.0% (0.0-0.1)
Percentage who engage in heavy episodic drinking (6 or more drinks on any occasion in the past 30 days)	0.3% (-0.1-0.7)	0.5% (-0.3-1.3)	–
Diet			
Mean number of days fruit consumed in a typical week	2.9 (2.3-3.6)	2.9 (2.1-3.7)	3.0 (2.4-3.6)
Mean number of servings of fruit consumed on average per day	0.7 (0.7-0.8)	0.7 (0.7-0.8)	0.7 (0.6-0.8)

Results for adults aged 18–69 years (incl. 95% CI)	Both Sexes	Males	Females
Mean number of days vegetables consumed in a typical week	3.1 (2.3-3.9)	3.0 (2.1-3.8)	3.4 (2.6-4.1)
Mean number of servings of vegetables consumed on average per day	0.6 (0.4-0.7)	0.5 (0.4-0.7)	0.6 (0.4-0.8)
Percentage who ate less than 5 servings of fruit and/or vegetables on average per day	98.2% (97.5-99.0)	98.3% (97.4-99.2)	98.2% (97.1-99.3)
Percentage who always or often add salt to their food before eating or as they are eating	6.8% (2.4-11.1)	8.2% (4.3-12.2)	5.0% (0.2-9.7)
Percentage who always or often add salty sauce to their food before eating or as they are eating	13.5% (11.2-15.9)	15.0% (12.8-17.3)	11.7% (6.6-16.8)
Percentage who always or often eat processed foods high in salt	11.8% (6.9-16.7)	11.3% (5.2-17.4)	12.4% (8.7-16.1)
Physical activity			
Percentage with insufficient physical activity (defined as <150 minutes of moderate-intensity activity per week, or equivalent)	19.5% (11.1-27.9)	18.7% (11.0-26.4)	20.4% (10.4-30.4)
Median time spent in physical activity on average per day (minutes) (presented with inter-quartile range)	152.1 (42.9-360.0)	141.4 (49.3-394.3)	171.4 (42.9-330)
Percentage not engaging in vigorous activity	61.2% (54.5-67.8)	45.3% (36.6-54.0)	79.4% (73.7-85.1)

Source: STEPS Survey 2021.

Sun exposure

Long-term exposure to sun can lead to the development of skin cancers. There is a need for improved reporting on the types of skin cancer prevalent in Maldives. There may be scope for increasing awareness of the risks associated with long-term sun exposure and of simple preventative measures.

Environmental exposures

It is important to consider the level of exposure to environmental toxins occurring in Maldives as there is now evidence from many studies in other countries linking the development of cancer with exposure to environmental chemicals. This is complicated to quantify as it can be difficult to separate their specific effects from the impact of lifestyle and genetic factors. Exposure to these toxins can occur from:

- outdoor air pollution, e.g. vehicle emissions in heavily populated areas, the burning of industrial and household waste;
- the burning of medical waste, which releases chemicals such as dioxin and furans into the environment;
- occupational hazard from the chemicals used in boat building, construction, agriculture;
- vapours released when making fish paste or drying fish; and

- inadvertent consumption of foods contaminated by chemicals in the environment.

Approach to developing the National Cancer Control Plan (NCCP)

The Multi-sectoral Action Plan for the Prevention and Control of Noncommunicable Diseases (MASP NCD) 2021–2031 in Maldives (11) is targeted at general NCD control and prevention. Given the high burden of cancer, it was decided that a national cancer plan should be developed to focus specifically on reducing the burden of cancer in alignment with the government's pledge towards a 25% reduction in NCDs by 2030, and working towards targets in Sustainable Development Goal (SDG) 3 of the 2030 Agenda.

The National Cancer Control Plan (NCCP) is the first targeted cancer control strategy proposed for the country. It aims to respond to the challenges faced in administering optimal care for cancer patients by focusing on core areas of cancer control. It is imperative to act urgently with emphasized focus on preventative measures and increasing early detection rates.

Enablers

National commitment to global targets for NCD control was pledged at regional and international forums and meetings, such as:

- commitment to tobacco control through the adoption of MPOWER policy measures (12), under the WHO Framework Convention on Tobacco Control (FCTC) (13);
- Political declaration of the High-Level Meeting of the United Nations General Assembly on the Prevention and Control of NCDs (September, 2011) (14);
- Implementation roadmap for the prevention and control of noncommunicable diseases in South-East Asia 2022–2030 (15);
- Global action plan for the prevention and control of noncommunicable diseases 2013–2020 (16) endorsed through World Health Assembly resolution WHA66.10;
- time-bound commitment to the global target of reducing the NCD burden by 25% in 2030 through the achievement of nine voluntary targets (17);
- Ministerial declaration to strengthen health system response to address noncommunicable diseases at the primary health care level at the Sixty-ninth Regional Committee in 2016 (18);
- cancer prevention and control activities endorsed through resolution at the Seventieth World Health Assembly, WHA70.12 (19); and
- commitment to accelerating the nation's response to addressing noncommunicable diseases for the health and well-being of present and future generations, as resolved at the United Nations (UN) General Assembly, October 2018 (20).

Interventions to address risk factors in Maldives

The Ministry of Health (MOH) recognizes the importance of promoting health and has been taking measures to reduce the NCD disease burden on the country. Many plans have been developed, but their implementation has been suboptimal.

The 25 by 25 campaign was launched in Maldives in March 2018 with support from WHO (21). The nationwide campaign was launched to reach the target of minimizing the risk of noncommunicable diseases by 25% before 2025 with a focus on raising awareness of healthy behaviour for the prevention of NCDs such as CVDs, cancer, diabetes and chronic lung diseases. In an effort to align with the global campaign of reducing the NCD burden by 25% by the year 2030, the 25 by 25 campaign was rebranded as 25 by 30 and relaunched in November 2022 (22).

The Multi-sectoral Action Plan for the Prevention and Control of Noncommunicable Diseases (MASP NCD) 2021–2031 in Maldives (11) was developed to guide the country in reaching the nine targets set out by the 25–30 global campaign. The MSAP was formulated through collaboration with key stakeholders and laid out a timeline of actions to be taken. It noted that previous plans had not been implemented to their full effect. Similarly, effective monitoring of the implementation of the MSAP for NCDs 2016–2020 appears to be lacking and it has therefore been a challenge to ascertain whether the targets outlined are being met.

It is important to highlight that although the plans thus far have not been implemented to their full effect, key milestones have been achieved. These are:

1. the Tobacco Control Act (2010) (23);
2. graphic warnings on cigarette packs and a ban on the sale of single stick cigarettes (24);
3. the creation of an NCD unit at the Health Protection Agency that focuses solely on the monitoring and controlling of NCDs;
4. sensitizing political bodies on NCDs and the risks it poses to the country;
5. the pilot phase of the PEN programme being initiated at a national level;
6. commitment to NCD prevention and reduction by 2030 (22); and
7. the development of the National Cancer Registry (NCR) in 2016.

Specific health system interventions

The WHO Package of Essential NCD interventions (PEN) (25) was introduced into the Maldivian health system in 2017 with a focus on strengthening primary health care services by introducing NCD clinics, as well as improving the utilization of pre-existing NCD services. Phase 1 was comprised of workshops designed to enhance the knowledge and skills of health care workers across the country with the aim of improving NCD services. The information covered, which reflected areas such as counselling and advice on key modifiable risk factors such as smoking, unhealthy diet and physical inactivity, was provided to nominated health professionals in each atoll,

who subsequently assumed the responsibility of disseminating the information to the required health care workers in the respective areas. This allows the practices laid out in the PEN programme, such as referral pathways for suspected cases of cancers, to be implemented in areas of the country that may have limited access to health care services and will ideally lead to increased early diagnosis rates.

HPV vaccination

Human papillomavirus (HPV) is capable of infecting epithelial cells in the mouth, tongue, throat, tonsils and genitals, amongst others. HPV infection has been linked to the development of nearly all cervical cancers with two specific forms, HPV 16 and HPV 18, accounting for about 70% of all cases. HPV 16 is also the leading cause of oropharyngeal (throat) cancer. Maldives introduced HPV vaccination in 2019. Coverage of first dose in the first year was 88% (26).

Cancer care services and facilities in Maldives

Screening and early detection services

At the level of the community and primary health centre, there is no organized programme for screening and early detection of the common cancers. The community health workers of the public health units and the doctors and nurses of the health facilities are not trained or involved in cancer screening, nor are they involved in awareness creation about cancers and their risk factors. Although all health services are covered under Aasandha, the limitation of Maldives not using any “diagnostic related groups”, a category for cancer prevention and control is not found in Aasandha coverage statistics. However all screening and treatment related cancer is covered within the Maldives and all services not available in Maldives is provided through Aasadha, outside the country.¹

HPV vaccination is given by the public health unit at the primary health centres to adolescent girls. However, the Health Protection Agency (HPA) conducts health screenings upon request to selected workplaces or governmental offices. Well woman clinics are also run at all the tertiary hospitals, where screening facilities are available for breast and cervical cancer.

Cancer control activities, including cancer screening by voluntary organizations, are carried out independently, not in collaboration with the government health agencies.

¹ The state enterprise Aasandha Company was first established in 2011 and is mandated to administer and manage the national health insurance scheme now known as (From 24th February 2014) “Husnuvaa Aasandha” by facilitating access to affordable and free medical assistance for all Maldivian citizens. The scheme includes coverage of specified inpatient and outpatient treatments and medication from all public hospitals and health centres, as well as health facilities empanelled by Aasandha. The scheme, fully financed by the government, has enabled access to health care for all across the nation. (Information from Aasandha Company website.)

Services for management of cancers

The situation in the atoll/regional hospitals with regard to cancer prevention and control lacks holistic and comprehensiveness requiring practical and implementable actions. Though these hospitals have the capacity to carry out diagnostic tests for cancer, these are generally not done due to lack of trained health care personnel or non-availability of simple diagnostic services such as cytology and biopsy. There are no guidelines for referral of suspected cancers to higher centres. As a result, suspected patients are forced to travel to one of the three cancer treatment facilities at three tertiary level hospitals, ADK, Treetop and the Indira Gandhi Memorial Hospital (IGMH) located in Greater Malé Area. These tertiary hospitals and Hulhumalé Hospital (HMH) which is a secondary hospital located at Greater Male' Area, are able to confirm the presence of some cancers.

However, although IGMH is a tertiary hospital, it lacks some important diagnostic and treatment services, such as immunohistochemistry, molecular pathology services, nuclear medicine services and radiotherapy. As a result, many patients have to be referred abroad for diagnostic and treatment, at a huge cost.

Certain surgeries related to cancer treatment are provided by all tertiary hospitals and in some regional hospitals, and chemotherapy services are available in majority of the atoll level hospitals, however, Maldives lacks national guidelines, treatment protocols. Further, institutions providing surgery related to cancer care, does not have institutional level multi-disciplinary tumor-board discussion. Thereby, Maldives requires adoption of evidence-based standard treatment guidelines and establish multidisciplinary tumour board discussions. Nuclear medicine services, including PET-CT scans, are not available but are being planned. There are many elements to be considered in setting up a PET-CT for its optimal use.

Radiation safety is limited to exposure monitoring in some hospitals. Organization and operational efforts are needed to ensure safe and effective radiation-related services.

Palliative care services

Palliative care needs of cancer patients are unmet, since the doctors and nurses are not trained to provide palliative care to patients in need. Tertiary hospitals in Greater Malé Region, and some atoll-level facilities, provide palliative care services, including oral morphine to cancer patients.

Data capture on cancer and cancer-control activities is not uniform and complete and it is not shared among the various organizations involved in various activities of cancer control and care.

Table 3 shows an overview of the facilities available country-wide. There are four mammography machines and a number of ultrasound machines located beyond Malé but a limited number.

Table 3. Summary of health personnel and services available outside Malé Atoll

Hospital	Surgeons	Radio-graphers	Radio-logists	Ultrasound scan machines	Mammo-graphy machines
Haa Alif Atoll	1	2	1	1	0
Kulhudhufushi Regional	1	2	2	3	1
Shaviyani Atoll	1	1	0	1	0
Noonu Atoll	2	1	1	3	0
Ungoofaaru Regional	1	4	1	1	1
Baa Atoll	1	1	1	2	0
Lhaviyani Atoll	2	3	1	2	0
Alif Alif Atoll	1	2	1	2	0
Alif Dhaal Atoll	1	0	0	1	0
Vaavu Atoll	0	1	0	1	0
Mulee Regional	1	2	1	1	0
Faafu Atoll	1	2	1	2	0
Dhaalu Atoll	1	2	1	1	0
Thaa Atoll	1	2	1	1	0
Gan Regional	2	4	2	2	1
Gaafu Alif Atoll	2	2	0	1	0
Dr Abdul Samad Memorial	2	3	2	1	1
Fuvahmulah Hospital	1	1	1	2	0
Addu Equitorial Hospital	4	5	3	3	1

Source: Ministry of Health, December 2022

Civil society organizations

Cancer Society Maldives (CSM) is a national nongovernmental organization formed for the purpose of reducing the incidence and impact of cancer in Maldives. The organization formed the Cancer Support Group (CSG) in 2016 to provide psychosocial support for cancer patients, survivors and care-givers. Weekly meetings are held every Tuesday, regularly attended by up to 20 people. During the COVID-19 pandemic, meetings were held online, with the frequency increased to two meetings a week. It provided an opportunity for people currently abroad for treatment and those living beyond Malé to join the CSG meetings. The meetings are now conducted as hybrid meetings, with people attending in person and virtually.

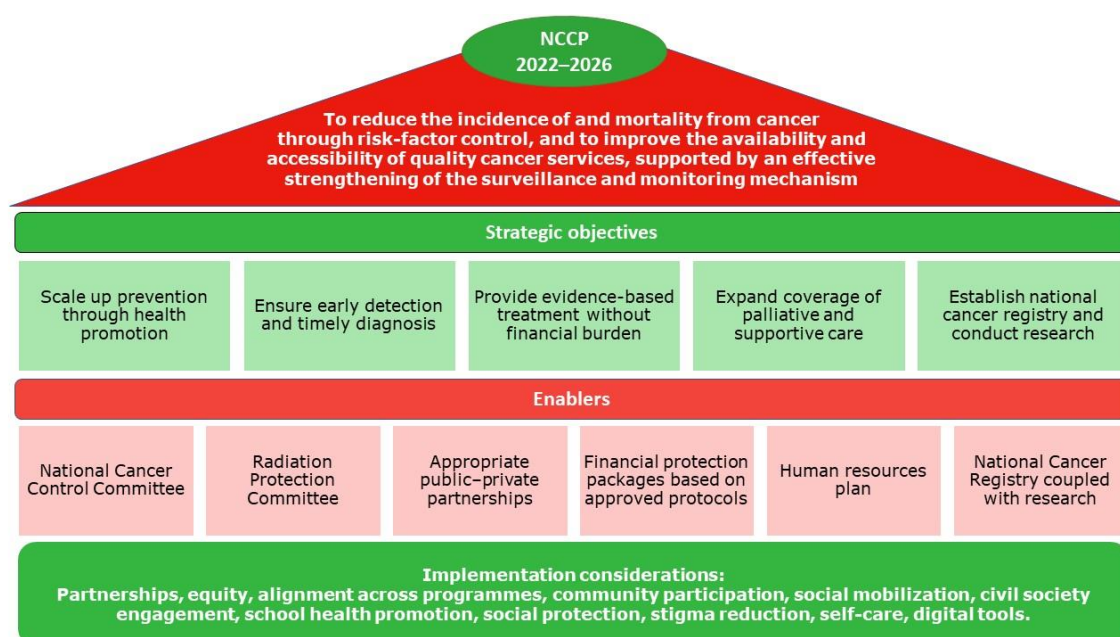
Since the formation of CSG in 2016, a Viber group has provided an online platform through which members can support each other. In 2022, after the CSG Viber group exceeded the maximum allowed 250 members, it changed to a Viber community, which allows for more members.

This platform provides a means by which patients currently seeking treatment abroad can communicate with CSG. Creating a community of this nature provides immeasurable support for people affected by this disease, whether they be patients, survivors or care-givers, and the efforts of CSM will likely lead the way in increasing the number of survivor groups across the country.

National cancer control plan

The National cancer control plan (NCCP) of Maldives, 2022–2026 was developed through group and individual discussions with stakeholders at meetings coordinated and governed by the HPA. The views and opinions expressed have been combined to formulate the country’s first NCCP, with the focus being on actions that could be brought about in the short term. Medium-term and long-term goals have also been set out in this plan. Fig. 3 presents an overview of the NCCP.

Fig. 3. An overview of the National cancer control plan of Maldives, 2022–2026



Aim

To reduce the incidence of and mortality from cancer through risk-factor control, and to improve the availability and accessibility of quality cancer services, supported by an effective strengthening of the surveillance and monitoring mechanism.

Strategic objectives

The NCCP proposes the following five strategic objectives:

1. Scale up prevention through health promotion;
2. Ensure early detection and timely diagnosis;
3. Provide evidence-based treatment without financial burden;
4. Expand coverage of palliative and supportive care; and
5. Establish national cancer registry and participate in collaborative research.

Enablers

National Cancer Control Committee, Radiation Protection Committee, appropriate public–private partnerships, financial protection packages based on approved protocols, human resources plan and monitoring & evaluation mechanism were all identified as enablers, as was a National Cancer Registry, which obtains reliable data and supports relevant research.

Actions

For each of the strategic objectives, a set of actions is identified, described below and summarized in the Annex, with timelines for implementation.

Strategic objective 1. Scale up prevention through health promotion

Between 30% and 50% of cancers are preventable and this is the most efficient and cost-effective way to address cancer control (27).

One third of cancers can be prevented by the adoption of healthy lifestyles, including the avoidance of tobacco and exposure to tobacco smoke, healthy dietary habits, adequate physical activity and maintaining a healthy weight. Whilst an individual ultimately governs their personal lifestyle choices, environmental and trade factors can greatly influence these decisions. Current scientific evidence supports the positive impact of policy measures for the regulation of risk factors alongside increased awareness of the effective reduction of lifestyle risk factors and resulting disease burden.

Action 1.1. Prevent cancer, control risk factors, and reduce stigma through awareness campaigns

Responsible agencies: NCD unit, Health Protection Agency (HPA) and Health Promotion Division (HPD), HPA regional and atoll health divisions of the MoH, health service development unit organizations working in cancer control and prevention

The public needs to be made more aware of the positive impact on cancer prevention of adopting a healthy lifestyle, as well as the beneficial effects of detecting cancer early, including screening and early diagnosis through timely recognition of suspicious symptoms. This should be done through effective, evidence-based methods of health promotion and education that tailor messages to the population of Maldives, taking into account cultural and societal differences from other parts of the world.

Information should be made readily available and easily accessible through a variety of media platforms used by both health professionals and the public (such as websites and social media) and other means of health promotion, such as awareness campaigns and public announcements. The most effective media platforms would be

social media, televised public announcements and local news outlets (online and televised). There are contradictory messages currently being conveyed to the public about different aspects of cancer control, such as the recommended age at which screenings should be commenced. To avoid confusion, the information being disseminated should first be standardized by the competent government agency.

Information specific to the risk factors linked to the most prevalent cancers should be made readily available to the public. Lifestyle risk factors associated with multiple cancer types, such as tobacco use and exposure, unhealthy diets, areca nut use, physical inactivity and obesity should also be prioritized, considering the patterns of common cancers such as oral cancer, breast cancer, cervical cancer, colon cancer and lung cancer.

Awareness of screening of the most common cancers and the importance of early detection in reducing morbidity and mortality is also needed. Targeted relevant campaigns about breast cancer and oral cancer should be organized for the age groups most at risk to increase their awareness of potential risk factors linked to the development of these cancers and early signs that require further investigation.

A lot of work is still needed to reduce the stigma around developing cancer in Maldives. Many see it as either shameful or as a death sentence, and this may prevent them seeking prompt medical attention.

As early detection is instrumental in administering successful treatment, this may result in patients suffering for longer than necessary or ultimately not surviving. Increasing general awareness through multiple media platforms – as well as making the statistics on cancer publicly available – could play a key role in reducing the stigmatization of this disease. Establishing cancer patient/survivor groups has been found to play a vital role in reducing disease stigmatization whilst educating the public, improving disease perception, and advocating to politicians for effective cancer prevention measures.

Action 1.2. Enforce measures outlined in the MSAP for NCDs to reduce tobacco product use and exposure to smoke

Responsible agency: Tobacco Control Board (TCB), HPA

As the results of the STEPS survey 2021 show (10), Maldivians typically start smoking at a younger age than the global average. The Global School-based Student Health Survey (GSHS) from 2014 records 11% of Maldivian children aged 13–17 years reporting they have used tobacco in the previous month (28). Tobacco is causative of several types of cancer and is associated with many more. Lung cancer and oral cancer are among the top five cancers affecting Maldivian males. Maldives lags behind most of its neighbours (and countries with otherwise similar levels of development) when it comes to implementing effective, evidence-based tobacco control measures (identified as MPOWER under the WHO FCTC to which Maldives is a signatory (13) and are lagging in meeting the targets proposed in the MSAP. These include

comprehensive smoking bans in all public places, effective tobacco taxation and conducting effective anti-tobacco campaigns. Alongside the continued emphasis on risk associated with tobacco, implementing effective, evidence-based measures, including tobacco cessation services, is essential in the overall reduction of tobacco usage.

Action 1.3. Limit or restrict the use of areca nuts and supari

Responsible agencies: The HPA in conjunction with the relevant authorities of the public buildings

Chewing areca nuts – a common practice in Maldives – has been identified as a causative risk factor for the development of oral cancers and has been shown to cause a pre-cancerous condition called oral sub-mucous fibrosis. Restrictive measures should be implemented to reduce the chewing of areca nut, such as the use of taxation, health warnings on packaging identifying this as a carcinogen, and banning the use of areca nut in public buildings such as health facilities, schools and government organizations (and events organized by them). Acknowledging the frequency of this habit in the country, it would be beneficial to educate the public on eliminating contrary beliefs that chewing areca nuts promotes oral health, and to introduce alternative spices for chewing, such as cinnamon and cardamom pods, which would have fewer adverse impacts on oral health. It may also prove effective for this information to be advocated at the level of primary health care.

Action 1.4. Promote healthy diets and regulate the importing and advertising of unhealthy foods.

Responsible agency: Maldives Food and Drug Authority (MFDA)

An unhealthy diet is generally being favoured and teamed with a sedentary lifestyle, as a consequence of which the primary risk factors for cancer of high BMI and poor dietary habits are now being identified in Maldives. Stricter regulations need to be enforced on the importing and advertising of products that promote an unhealthy diet. This will send a stronger message to the public, who may be unaware of the cancer risks associated with consuming these products. Introducing these regulations in conjunction with the NCD control campaigns currently being run will serve to provide a more unified stance on the importance of a healthy diet that is low in sugar and processed foods and high in fresh fruit and vegetables. It will also increase public acceptance of the regulations. A Food Act has been presented by the MFDA which would provide a platform for these regulations to be introduced into the country. A food-based dietary guideline (29) has been developed by the HPA and now needs to be implemented as part of the HPA nutrition program.

Additionally, incentives should be provided to farmers for the cultivation of fruit and vegetables. This would increase the supply of locally grown fresh foods and reduce the nation's dependence on imported goods. Local, healthy produce should be more affordable because no import duties would be levied. Subsidies could also be offered on certain imported fruit and vegetables not available in Maldives. And, in addition,

increased taxation could be placed on foods such as processed meat and sugar-rich and energy drinks.

Action 1.5. Sustain and expand HPV vaccination coverage and HBV vaccine for target groups

Responsible agency: MOH, HPA

HPV vaccination

High coverage has to be maintained for both doses and it can have a big impact on cervical and other HPV-related cancers (30).

Making hepatitis B vaccination available to unvaccinated and those who are Hep B negative on screening

The hepatitis B virus (HBV) is one of the most recognized carcinogens, classed as Group 1 by IARC. The Hep B vaccination was included in the Expanded Program on Immunization (EPI) in 1993, meaning those born before this may not have received the vaccine. Liver cancer is amongst the top five most common types of cancer in Maldives and there are some atolls known to have a high prevalence of HBV (31). This vaccine should be offered to all who are Hep B negative on screening (especially if they are born before 1993), as a causal link between immunization with this vaccine and liver cancer prevention has been identified (32). However, it is not widely available except through the EPI program, which is an issue that should be addressed with MFDA and State Trading Organization (STO) to make it available at regional level and in islands exhibiting a high prevalence of liver cancer or hepatitis B for target groups. Therefore, it may be a cost effective solution to include the vaccine under Aasandha coverage as there is a relatively small population that would require it in Maldives.

Strategic objective 2: Ensure early detection and timely diagnosis

The earlier a cancer is diagnosed and referred to treatment, the better the outcomes are likely to be. Identifying a cancer while it is still local – or even prior to that as pre-cancerous lesion – can substantially improve survival rates. There are measures that can be put in place even with limited resources available, such as scaling up the existing low-cost cervical cancer screening with a high-performance test equivalent to, or better than, the HPV test followed by treatment as quickly as possible after a positive result.

Action 2.1: Establish nationwide screening for breast, cervical, oral and colon cancer, and hepatitis B screening for liver cancer

Responsible agencies: HPA, treatment facilities

Certain cancers are amenable to early detection, some of which can be detected through screening programmes. Whilst opportunistic screenings carried out by organizations such as Cancer Society Maldives (CSM) have helped to identify a number of cases, a national targeted screening programme would be more efficient in identifying cases and in the use of available resources. However, cost and infrastructure limitations may impede the successful rollout of scheduled screening programmes. A more feasible approach may be to increase awareness of the early symptoms and signs of these cancers and work towards the successful implementation of solid referral pathways outlined in the WHO package of essential noncommunicable (PEN) disease interventions (33). These referral pathways are of particular importance in Maldives due to the existence of decentralized medical services, leading to some patients having to travel long distances for access to diagnostic facilities or follow-up examinations. Establishment and adherence to these referral pathways can decrease diagnosis times and thereby improve patient outcomes.

Oral cancer, the most prevalent cancer in Maldives, is a cancer for which disease prognosis is greatly improved through early detection. There is scope for the development of protocols for basic oral examination at dental clinics. Reference should be made to the PEN protocol for the early detection and referral of persons with suspected oral cancer. There are protocols already in place in Maldives, overseen by the Population Health Division of the Health Protection Agency for breast and cervical cancer screenings. These protocols should also be supplemented by information provided in the PEN protocols for assessment and referral of suspected breast and cervical cancer cases and aligned with the NCCP in terms of tumours to be prioritized, the strategy (early diagnosis and/or screening), target population, interval, and method. Hepatitis B screening is available in all atolls and most islands as it is mandated for antenatal services. These screening services can be easily utilized for early detection of HBV infection in other target groups, thereby facilitating treatment of those with active Hepatitis B infection and immunization of those without infection, and thus contributing to prevention of liver cancer. The training proposed by the PEN programme should also be expanded to include specific training on using cancer screening tools. Currently implemented training times are often not long enough to include the use of screening tools.

Further assessment is required to validate the costs of national screening levels against the potential impact it could make on the reduction of cancer incidence levels and increasing early diagnosis rates. This can only be done when the reporting system has been strengthened sufficiently to determine which cancers may warrant a regular national screening programme. Costs for improving facilities for walk-in

breast cancer and cervical cancer screening need to be ascertained. There may be scope for targeting appropriate age groups to capture pre-cancers and early cancers.

The primary health centre should take a lead on spreading awareness of cancer and its risk factors, including tobacco and areca nut, warning signals of cancer, and the benefits of prevention, screening and early detection of cancers among particularly at-risk groups and among the wider community and of the benefits of HPV and HBV vaccination. Community health workers, doctors and nurses should be trained to carry out screening for oral, breast and cervical cancers and for hepatitis and in providing basic palliative care.

Action 2.2: Increase utilization of well woman clinics

Responsible agency: health care providers

Breast cancer is the most prevalent cancer in females in Maldives, with the average age of Maldivian breast cancer patients seen to be 44 years. There are several well woman clinics at the hospitals in Malé and Hulhumalé. Examinations for breast and cervical cancers are provided for all women, and, in addition, mammograms are provided for women over the age of 40 years. Additional services offered include screens for hepatitis B, thyroid cancer and other tumour markers. These preventative services need to be covered by the Aasandha Company but are currently provided free of charge at government-led hospitals. This pre-existing service should be utilized to its full extent as it also educates people on lifestyle choices and ways to minimize exposure to risk factors. It could also be utilized to disseminate information regarding self-examination of the breast as per the national guidelines that have been developed. Increased awareness of these clinics and their services may help to increase their use and ultimately aid in the increased early detection of breast and other cancers.

Action 2.3: Extend the Aasandha coverage for screening and preventative measures

Responsible agency: National and Social Protection Agency (NSPA)

The existing Aasandha regulations do not include coverage of preventative measures such as screenings, lifestyle counselling (for diet, tobacco cessation, stress management, etc.), dietician consultations and psychological counselling. In order for these measures to be covered, the regulations governing Aasandha would need to be amended to cover the higher-risk population requiring these services. Most countries offer screenings for their population within the 40–69 year age group as part of their preventative measures. Scheduled screening programmes on an annual or bi-annual basis, as well as coverage for walk-in patients at health facilities at tertiary and regional level, would be a good starting point, and proposals for these amendments have been raised. If these screenings are covered by the Aasandha Company, they are likely to be more utilized by the public with consideration to health-care-seeking attitudes among Maldivians. It would also minimize out-of-pocket expenses to the patient. Long-term benefits would be provided for the health care budget by increasing the chance of early detection of cancers, as there would

be a subsequent reduction of treatment and palliative care costs and an improvement in productivity among the population. Evidence-based mechanisms should be used to determine the appropriate interventions to be funded by the Aasandha Company, which can only be fully achieved through the strengthening of the existing cancer reporting systems.

Strategic objective 3: Promote evidence-based treatment without financial burden

Cancer treatment covers a range of interventions, from therapy-based measures like surgery, chemotherapy, hormone therapy and radiotherapy to psychosocial and supportive services. Radiotherapy requires many prerequisites, such as radiation safety and physics infrastructure, specially trained human resources and costly machines. Efforts are ongoing to establish a comprehensive cancer hospital in the country.

Chemotherapy was first started at ADK hospital, Malé in 2015 – to provide continuation of treatment patients had commenced abroad and chose to receive in Maldives. Since then, its services have become available to referrals initiated at HMH, IGMH, Treetop Hospital and in many atoll-level hospitals. This development will allow the budget that was being spent on the additional costs associated with patients travelling abroad for treatment to be used for treatment within Maldives. As this is a new service for the country, there are administrative and logistical issues that need to be addressed to ensure that patients trust the locally offered health care services and fewer patients request referral abroad. It was estimated that MVR 1.75 billion was spent on overseas referrals in 2017 (34). Consideration should also be given to increasing the health workforce capacity, as this is critical to improving services in Maldives. Key personnel, such as surgical oncologists, clinical oncologists, biomedical laboratory scientists and oncology nurses, are lacking. An analysis should be carried out to determine the availability and skill level of health care professionals to provide cancer control services in Maldives.

The doctors and nurses in Atoll hospitals should be trained to administer chemotherapy safely and to manage the common side effects of cancer treatment. Introduction of teleconsultation facilities would greatly help in delivery of these services, thereby reducing referrals and travel for patients, and enhancing the confidence of the doctors. Standard operating procedures (SOPs) should be developed for screening and for referral for diagnosis and treatment. A patient navigation system should be set up to navigate patients through the hospital pathways and fast-track them for confirmation of diagnosis and treatment. This form of shared-care model could help build the capacity of the Atoll hospitals sufficiently for them also to evolve as more accessible centres for palliative care, early detection and referral of suspected cancers, and as resource centres for public awareness activities.

In relation to nuclear medicine, while considering enhancing capacity to accommodate the increased demand for PET-CT, decision-makers may seek guidance on the key strategic and implementation considerations necessary to maximize the value of resources. To avoid excess capacity or unnecessary usage, the procurement of a PET-CT unit at the facility level must be considered within the context of initial capital investment (including equipment, technology, and construction), service delivery, and allocation of human and financial resources. A PET-CT facility should be included when planning a Cancer Centre, as PET-CT has become a frequently used imaging technique to assess the stage of a cancer and the appropriate therapeutic response. The country must ensure a dependable supply of 18F-fluorodeoxyglucose by way of a formal agreement with some supplier outside the country, most likely from some city in India that has a reliable flight schedule with Maldives. the most common radiotracer used in PET-CT. A radiology information system, picture archiving and communications system, and digital imaging and communications systems also need to be included.

Action 3.1: Establish a referral pathway for cancer care

Responsible agency: HPA and treatment centres

A standard operating procedure (SOP) for screening and for referral for diagnosis and treatment needs to be developed. Strengthening atoll and regional hospitals to provide facilities for diagnostic confirmation of suspected cancers referred from the primary health centres will enable cancers to be identified at an earlier stage. Training doctors and nurses in these hospitals to administer chemotherapy safely, to manage the common side-effects of cancer treatment and to provide palliative care will greatly improve the treatment experience for the patient and their family.

Action 3.2: Include antineoplastic agents on the MFDA-approved drug list, and streamline procurement for drugs and consumables required for their administration

Responsible agency: MFDA and treatment centres

Cancer treatment is a continuous process with specific timelines which need to be adhered to. The unavailability of drugs and of the equipment required for their administration causes undue stress on what is already a challenging process for both patients and health care facilities and may have serious repercussions for the efficacy of treatments. One of the restrictions faced is due to drugs not being included in the Approved Drug List (35) or on the national Essential Medicine List (36) published by MFDA. Improved communication is needed between treatment centres, MFDA and STO to enable the streamlining of medical procurement procedures, not only for chemotherapy drugs but for the equipment such as chemotherapy port needles, and PVC-free IV fluid bags are required for its administration.

Furthermore, there is scope for the development of a regulatory mechanism such as health technology assessment, which would review and select cancer medicines to be included on the essential drugs list. This further facilitates the process of

procurement of these drugs and ensures the continuous supply of vital medication for patients for the most effective treatment regimens.

Action 3.3: Organize a system for cytotoxic waste disposal

Responsible agencies: MOH, WAMCO

Chemotherapeutic agents require special precautions for disposal to avoid risk of contamination. Guidelines need to be developed for the handling of cytotoxic waste and proper disposal methods urgently developed as some treatment centres currently have no means of safely disposing of waste material. A central, high-heat incinerator would serve this purpose best as only a few centres use such drugs and the incinerator could also be used for other toxic materials, thereby increasing its cost-effectiveness. It would not be feasible for these incinerators to be located at the treatment facilities themselves due to the proximity of treatment centres to residential areas.

This matter is currently under discussion with WAMCO, the state waste-management company, to use their existing mandate to procure a central incinerator in the waste disposal area. WAMCO staff would also require training on the handling of cytotoxic waste.

Action 3.4: Improve diagnostic facilities and management of the local laboratories

Responsible agencies: HPA, STO, health facilities

The atoll and regional hospitals should be strengthened to provide diagnostic confirmation of suspected cancers referred from the primary health centres so that the confirmed cases could be referred to IGMH for treatment.

Bone-marrow aspirations and biopsies are a relatively simple procedure which could be performed at tertiary-level hospitals in Maldives, and the laboratories also have the capacity to analyse them. However, the equipment required for the procedures, specifically the fine-needle aspiration needles, are difficult to procure. This results in the outsourcing of these procedures and tests, placing additional strains on an expanding health care budget, which could be avoided by addressing a relatively simple issue.

Most of the additional tests required by doctors are performed at the laboratories at the IGMH, thereby placing a greater burden on those laboratories. Issues with unavailability of stock was cited as one of the reasons why these tests are re-routed to the IGMH laboratory. Improved procurement procedures are needed for equipment, and better stock management practices should be agreed with STO.

Furthermore, existing diagnostic services could be improved through measures such as affiliating with reference laboratories and the introduction of tele-pathology. Tele-pathology allows for image sharing with reference laboratories for a variety of purposes such as confirming diagnosis, training and research.

Radiation safety is to be enhanced through measures that are to be implemented in a phased manner (37).

Strategic objective 4: Expand coverage of palliative and supportive care

Action 4.1: Provide psychosocial support for cancer patients

Cancer is a life-threatening chronic disease that destabilizes a patient's life, often bringing significant changes to the lives of their families with it. Treatment regimens usually invoke debilitating side effects, and this can result in both physical and cognitive changes. Psychosocial distress can appear in various forms, from social to functional to emotional. Adjustments need to be made (and expectations managed) as quality of life and functional status can be greatly affected, as well as physical appearances. Doctors, nurses and other related professionals should undergo training in providing psychosocial support for patients, alongside the recruitment of counsellors and the establishment of cancer patient support groups.

Palliative care is a humanitarian need which should be provided from the time of diagnosis and forms an important aspect of cancer treatment. It provides pain relief while addressing the psychosocial needs of the patient and their families. This is particularly crucial during the advanced stages of this disease, when patients may have little chance of being cured or they are already in the terminal phase of their cancer. Palliative care is usually comprised of multiple disciplines, including doctors, nurses and counsellors who work in concert to manage treatment options whilst maintaining or improving their quality of life throughout their illness. Making palliative care and end-of-life care available in Maldives is relatively inexpensive and enables a terminal patient to be with his/her family, resulting in better psychosocial support for patient as well as the family.

Action 4.2: Increase the availability of morphine

Good stock management of morphine is important as it is used for pain relief for patients. This is an area addressed in the PEN programme, which highlights the need for good communication and co-ordination between health facility managers and STO, the procurement agency for Maldives. Meanwhile, precautions must be also be taken to prevent misuse of these controlled drugs. Legal and regulatory mechanisms, procurement, and purchase and appropriate stocks and distribution mechanisms are important considerations.

Action 4.3: Train local health professionals in existing health facilities in Malé and atolls to provide palliative care

The main caregivers for patients tend to be families, who are usually ill-equipped to provide adequate care and support for cancer patients. Training local health professionals in administering care of this nature enables them to bridge this gap by providing holistic care for both patient and family. They focus on the physical, emotional, social and spiritual needs of the patient during their illness and are trained to adapt the type of care given, based on the changing requirements of the patient.

Strategic objective 5: Establish cancer registry and conduct research

Cancer registration process should be strengthened. Cancer should be made a reportable disease and all health facilities, laboratory and diagnostic centres should report all cancer cases to the cancer registry. The data of all cancer patients registered by Aasandha health insurance and other service providers, as well as civil registration and vital statistics (CRVS) data should be made available to the cancer registry. The data capture should be digitized in the CanReg5 software, and health professionals tasked with entering the data should be trained in the use of the International Classification of Diseases for Oncology (ICD-O).

Action 5.1: Strengthen cancer surveillance through the national cancer registry and declare cancer a reportable disease

Responsible agency: Health Protection Agency

The Maldives National Cancer Registry (NCR) was established in 2016 and thus far has registered approximately one third of all known cancer patients. Information sent to the HPA for the NCR is currently received as hard copies, rendering this a time-consuming and ineffectual way to collate information in a meaningful manner to monitor cancer in the country. This is evidenced by the lack of regular reporting by health facilities and other key institutions, despite the issuance of NCD guidelines by the HPA in 2012 for facilities to provide monthly reports on all NCDs, and the subsequent adaptation to report solely on cancer patients. Concerns over sharing confidential data has also proved a hindrance in obtaining vital information from key institutions such as the Aasandha Company.

In its present form, the NCR only gives an indication of the prevalence of cancer in Maldives and of mortality rates. Lack of data on incidence rates makes comparison with the regional and global cancer burden problematic. It has also not been possible to ascertain cancer staging of patients – key data required in formulation of strategic control plans. This highlights the need to establish a reliable database, capable of collecting, collating and analysing information on cancer patients, and to establish mechanisms for regular data sharing from all health care providers e.g. hospitals, clinics, the Aasandha Company.

CanReg5 is an open source, multi-user program, distributed under a General Public License, created by the IARC-WHO. The tool is user friendly, runs in different operating systems (Microsoft Windows, Linux, Apple OS), and allows interoperability and quality control. It has been specifically designed for the surveillance of cancer and can be customized for data collection in Maldives.

While it is not currently feasible to connect this to all health service providers, there is scope for this software to be installed initially at the HPA. This would allow reported data to be managed through this software, allowing for regular dissemination of statistical data to policy-makers, reporting centres and the public.

The government is in the process of implementing the first phase of the DHIS2 online system nationwide. There are proposals underway for the information collected by the CanReg5 software to be incorporated into the DHIS2 software. The IARC regional hub at Mumbai, India, can be approached for support for strengthening the cancer registry.

The Public Health Protection Act (2012) (38) makes provision for the Director General for Public Health to declare cancer a reportable disease, thus compelling data-sharing by health facilities and service providers. This would have a significant impact on strengthening cancer information systems. These measures would enable the HPA to monitor disease progression more efficiently by making reporting mandatory and in turn help address many of the issues to be faced as soon as possible.

Action 5.2: Ensure all health professionals receive training in ICD coding

Responsible agencies: HPA, health facilities

The International Classification of Diseases (ICD) is the international standard for reporting diseases and health conditions; the coding system, implemented in its current form by the WHO, is currently on its 11th revision. It provides a universal platform for the sharing and comparison of health information between hospitals, countries and regions. It lays the foundation for the identification of health trends and statistical analysis of diseases. Errors in this system have been identified within the health care system, one of the consequences of this being the misrepresentation of disease burden.

Training workshops and dissemination of ICD manuals available on the WHO website should be implemented for key professionals to enable improved cancer coding. This training should include ICD-O. This training should then be continued at facilities on a regular basis to limit errors that arise during disease coding.



Recommended next steps

As the National Cancer Control Plan (NCCP) was designed to work in conjunction with existing plans in the country, such as the Multi-sectoral action plan (MSAP), which targets NCD control as a whole, the framework designed for the implementation and monitoring of the MSAP can be used for the NCCP. Under the MSAP framework, a high-level NCD taskforce was formed, comprised of representatives from government agencies, NGOs and other relevant organizations. This same taskforce could also monitor the progression of the NCCP during meetings held on a quarterly basis throughout the year. The NCD division of the HPA can assign personnel to co-ordinate the implementation of the NCCP. The HPA should provide the NCD unit with detailed terms of reference to assist them in the execution of the NCCP. The responsibilities of the NCD unit should include:

- formulation of a detailed activity plan, which can be organized around the five-year cycles planned in the NCCP;
- preparation of a budget to support the activity plan;
- meeting the relevant agencies involved in actions targeted for that year;
- preparation of progress reports on a quarterly basis; and
- convening of regular meetings of the high-level NCD taskforce.

One of the first areas of immediate focus should be the continued development of the National Cancer Registry (NCR). The NCR is fundamental to the development of an effective cancer strategy for the country and should be closely monitored by a nominated person at the HPA. Regular statistics should be generated and made available for general information. The NCR is currently not functioning to its maximum potential, the main weaknesses being identified as a lack of regular data collection, incorrect or missing ICD codes and disease staging not being reported. There is also a delay in processing information being received at the HPA which could be addressed by increasing the number of personnel assigned to the NCD division.

Based on the information provided by the Aasandha Company, there were 2257 cancer patients between 2015 and 2016 who were not registered on the NCR. At present, incidence rates and survival rates are also not being calculated, which will pose challenges when assessing the effectiveness of preventative measures being implemented, and when evaluating improvements in the burden of disease being faced. The supplementation of cancer-staging information would further aid in evaluating the efficiency of current early diagnosis interventions. Meaningful analysis of the data that is being collected will strengthen the foundation of knowledge required by decision-makers in choosing the right courses of action and directing resources in the most effective manner. It is recommended that future reporting be amended to include the following:

- cancer staging of patients, which would identify patterns of late-stage diagnosis and identification of particular demographics;
- indication of whether it is a suspected or confirmed case; and
- the patient's current place of residence and duration of residence in addition to their permanent address, which would allow for analysis of patterns of geographical distribution of cancers.

There are various objectives in the NCCP which have already been covered in other plans and which have already been initiated. It is imperative for the progression of these plans to be monitored in relation to achieving the goals of the NCCP. The NCD unit should address the progress of all objectives when preparing the update reports. A yearly assessment should be carried out by the NCD unit to evaluate progress, allowing for the revision of targets and actions if necessary. Effective implementation and regular monitoring of the actions laid out in this plan will strengthen the nation's stance against the increasing threat being posed by cancer.

Annex 1. National cancer control plan of Maldives, 2022–2026

Actions and activities in specific years, by strategic action areas

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
Strategic objective 1: Scale up prevention through health promotion							
Action 1.1: Prevent cancer, reduce risk factors, and reduce stigma through awareness campaigns							
1.1.1 Preparing and disseminating standard information, educational and communication material						NCD Unit, HPA Health Promotion Division, HPA organizations working in cancer control and prevention	Formation of a committee to prepare, review and endorse materials
1.1.2 Establishing website of HPA for sharing available information, educational and communication materials on a permanent basis						Health Promotion Division, HPA	Material selection needs to first be finalised in activity 1.2.1
1.1.3 Mobilizing cancer survivors and cancer patients in awareness programs						CSM, HPA, Health facilities	Number of cancer survivor groups participating in cancer control activities
1.1.4 Incorporating age-appropriate information on cancer prevention and cancer in school curriculums						HPA MOE	Standardized material needed for this from activity 1.2.1; evidence of cancer topics being taught in school

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
1.1.5 Publishing and regularly updating (annual) cancer statistics to create awareness among public and policy-makers of statistics regarding the most prevalent cancers, risk factors linked to the development of these cancers, and financial burden of care for cancer in Maldives						NCD unit, HPA Health Promotion Division, HPA PIIR / RAH (for health facility data) Aasandha Company for costing data	Collation of data from all health care providers and preparation of statistics; reports published and disseminated
Action 1.2: Enforce measures outlined in the MSAP for NCDs to reduce tobacco product use and exposure to smoke							
1.2.1 Taking measures specified in the MSAP for NCDs of Maldives							
Action 1.3: Limit or restrict the use of areca nuts and supari							
1.3.1 Limiting or restricting the use of areca nuts in public buildings such as government offices, hospitals and schools and government-organized functions						HPA NGOs	Legislation that limits or restricts the use of areca nut in public buildings
1.3.2 Ensuring health warnings appear on packaging identifying areca nut as a carcinogen						HPA MFDA	Regulation to be created about the sale and packaging of areca nut
1.3.3 Levy higher taxes on areca nut imports and sales						HPA MoFA	Regulation to be created about the sale and packaging of areca nut
Action 1.4: Promote healthy diets and regulate the importing and advertising of unhealthy foods							
1.4.1 Taking measures specified in the MSAP for NCDs of Maldives							
Action 1.5: Sustain and expand HPV vaccination coverage and HBV vaccine for target groups							
1.5.1 Including HPV vaccination in the National Vaccination Programme						HPA NGOs	Initiation of vaccination programme in females aged 9–13 years in March 2019

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
1.5.2 Making Hepatitis B vaccination available						HPA STO	Vaccine available in Malé and all Regional/Atoll level pharmacies
Strategic objective 2: Ensure early detection and timely diagnosis							
Action 2.1: Establish nationwide screening for breast, cervical, oral and colon cancer, and hepatitis B screening for liver cancer							
2.1.1 Training community health workers, doctors and to carry out screening for oral, breast and cervical cancers and for hepatitis B infection, along with adequate and sustained infrastructure for referral pathways						HPA	Ongoing implementation of the PEN package in Maldives
2.1.2 Making colonoscopy available in all tertiary-level hospitals for colon cancer screening						MOH – RAS Health care providers	Feasibility assessment to determine which facilities to increase initially
2.1.2 Establishing dental services with ability to take biopsies for suspected oral cancer at all regional and tertiary hospitals						MOH – RAS Health care providers	Feasibility assessment to determine which facilities to increase initially
2.1.3 Setting up additional facilities for walk-in breast cancer and cervical cancer screenings at regional level (including mammography and colposcopy)						MOH – RAS	Feasibility assessment to determine which facilities to increase initially
2.1.4 Conducting opportunistic oral cancer screening using PEN protocol at all health facilities						HPA Health care providers	SOP for oral cancer screening to be disseminated to all health facilities
2.1.5 Conducting VIA screening for cervical cancer at outreach camps for islands that do not have PAP smear facilities						HPA and health facilities who have this service	Determine the list of islands that do not have these facilities
2.1.6 Introducing age-specific cancer screening programmes for men and women						HPA MOH	Feasibility assessment to determine most suitable type of screening program

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
1.2.7 Integrating workplace cancer prevention programmes with screening programs						HPA, NGOs (CSM, SHE)	Standardized material needed for this from activity 1.2.1
Action 2.2: Increase utilization of well woman clinics							
2.2.1 Increasing awareness of available services and clinics						HPA	Increased utilization of services; increased early detection rates
Action 2.3: Extend the Aasandha Company coverage for cost-effective screening and preventative measures							
2.3.1 Amending existing regulations to extend coverage for preventative services including cancer screening, dietary counselling, tobacco cessation counselling and psychological counselling						NSPA	Formation of committee with the authority to make changes to level of services provided
2.3.2 Establishing Aasandha-covered packages for walk-in screenings for appropriate age groups of women and men						NSPA	Creation of packages which cover walk-in screenings for high-risk target groups
Strategic objective 3: Promote evidence-based treatment without financial burden							
Action 3.1: Establish a referral pathway for cancer care							
3.1.1 Developing standard operating procedures (SOPs) for screening and for referral for diagnosis and treatment.	23	24	25	26	27		
3.1.2 Strengthening atoll and regional hospitals to provide facilities for diagnostic confirmation of suspected cancers referred from the primary health centres							
3.1.3 Training doctors and nurses in these hospitals to administer chemotherapy safely, to manage the common side-effects of cancer treatment and to provide palliative care							

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
3.1.4 Introducing teleconsultation facilities to help in delivery of these services, thereby reducing referrals and travel for patients and enhancing the confidence of the doctors							
3.1.5 Setting up a patient navigation system to navigate patients through the hospital pathways and fast track them for confirmation of diagnosis and treatment							
Action 3.2: Include antineoplastic agents on the MFDA-approved drug list, and streamline procurement for both drugs and consumables required for their administration							
3.2.1 Including drugs and medical consumables on the approved drug list at MFDA						MFDA Treatment centres	Determination of regularly used drugs and equipment.
3.2.2 Procuring chemotherapy drugs through organizations licensed as pharmaceutical importers (e.g. STO or other reliable pharmaceutical importer)						Aasandha Treatment centres STO	Updated approved drugs list to be created in Activity 3.1.2
Action 3.3: Organize a system for cytotoxic waste disposal							
3.3.1 Discussing how to ascertain scope and identify responsible bodies for installing centrally accessible incinerator at national level						MOH / HPA Environmental Health section	Formation of a committee for assessing feasibility of central incinerator
3.3.2 Procuring and installing high-heat incinerator for disposal of chemotherapy agents						Identified central organization / MOH	High-heat incinerator installed and operational
3.3.3 Developing guidelines for the handling and safe disposal of cytotoxic waste						HPA EPA Ministry of Environment and Energy WAMCO	Guidelines developed for the handling and safe disposal of cytotoxic waste
3.3.4 Training for WAMCO staff in handling health care waste management						HPA Environmental Health section	Number of WAMCO staff trained in proper disposal methods

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
Action 3.4: Improve diagnostic facilities and management of the local laboratories							
3.4.1 Identifying and arranging procurement of essential equipment for biopsies and laboratory reagents and material necessary for cancer diagnosis, enhancing Nuclear Medicine aspects of cancer diagnosis by making available PET-CT facility. Securing timely access to (18)F-fluorodeoxyglucose. Ensuring adequate budgeting for service agreement for equipment.						MOH-RAS Health care facilities STO	List of essential equipment compiled in agreement with all parties
3.4.2 Establishing a radiology information system, picture archiving and communications system, and digital imaging and communications system							
3.4.3 Improving radiation safety measures <i>Short term</i> <ul style="list-style-type: none">• Appoint a Radiation Protection Officer in each facility where radiological services are provided (as initiated at IGMH).• Foster radiation safety culture as part of patient safety and quality of care policies following international standards.• Implement a personal dosimetry service (centralized monitoring) for all health workers occupationally exposed to radiation in all facilities.• Forming a task group (within QARD) who will familiarize themselves with the international radiation Basic Safety Standards (BSS) with the intention of establishing a regulatory infrastructure and all seven Thematic Safety Areas (see IAEA reference).• Reach out to neighbouring countries (within existing collaboration) to seek support from clinically qualified medical physicists to advise and establish quality control procedures for Radiological Services to make provisions for having medical physicist’s services in the country							

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
<p>(priority being facilities where CT scans and fluoroscopy-guided procedures)</p> <ul style="list-style-type: none"> Encourage task group to familiarize themselves with the roles and responsibilities of all health professionals (e.g. radiologists, radiographers, medical physicists). <p>Medium- to long-term actions to be considered:</p> <ul style="list-style-type: none"> Establish a regulatory body. Establish a Radiation Protection Programme. Develop a country-wide training programme in radiation protection for relevant stakeholders involved in medical use of radiation. Plan for appropriate health professional staffing for current existing and future expanding services (e.g. Nuclear Medicine, Radiotherapy using the staffing calculator provided by IAEA). Establish local clinically qualified medical physicists for all disciplines (Diagnostic Imaging, Nuclear Medicine and Radiotherapy). 							
Strategic objective 4: Expand coverage of palliative and supportive care							
Action 4.1: Provide psychosocial support for cancer patients							
4.4.1 Training doctors and nurses in treatment centres to provide psychosocial support						MOH-Training Division Health care facilities	Development of SOP for psychosocial support; number of trained personnel for providing psychosocial support
4.4.2 Recruiting counsellors for treatment centres for patients who need services						MOH-RAS Health facilities	Number of counsellors recruited and trained
4.4.3 Establishing cancer patient support groups (or collaborating with existing Cancer Survivor groups) at treatment centres and atolls						Health care facilities	Number of cancer survivor groups actively engaged

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
						NGOs working for prevention and control of cancers	
Action 4.2: Increase the availability of morphine							
4.2.1 Making morphine available in all tertiary and atoll-level hospitals						MOH-RAS Health care facilities MFDA	Addition of morphine to Essential Drug List; number of facilities where morphine is dispensed
Action 4.3: Train local health professionals in existing health facilities in Malé and atolls to provide palliative care							
4.3.1 Training doctors and nurses in tertiary, regional and atoll level hospitals to provide palliative care						MOH – Training Division Health facilities	Development of SOP for palliative care; number of personnel trained on palliative care
4.3.2 Providing palliative care at all tertiary hospitals (without referring abroad)						MOH - RAS Health facilities	Number of cases averted from referral abroad
4.3.3 Providing palliative care in atoll-level hospitals						MOH-RAS Health facilities	Number of atoll hospitals providing palliative care
Strategic objective 5: Establish cancer registry and conduct research							
Action 5.1: Strengthen cancer surveillance through the National Cancer Registry (NCR) and declare cancer a reportable disease							
5.1.1 Declaring cancer a reportable disease						Director General for Public Health	Regulation or Public Notice under the Public Health Protection Act
5.1.2 Acquiring CanReg5 at the HPA for data management of the NCR						NCD division, HPA	Setting up of local server at HPA; agreed hierarchy of users and access levels

Specific activities	Year					Responsible agencies	Indicators/supporting legislation
	2022	2023	2024	2025	2026		
5.1.3 Registering and collecting data from cancer treatment centres (NCR Form 2)						HPA Treatment Centres	Data verification with data obtained by Aasandha Company
5.1.4 Reporting cancer patients from health facilities other than treatment centres (NCR Form 1)						HPA Health facilities	Data verification with data obtained by Aasandha Company
Action 5.2: Ensure all health professionals receive training in ICD coding							
5.2.1 Training health care professionals in ICD coding, specifically ICD-O training						HPA Health care facilities	Data verification through Aasandha Company records and accurate records in Cancer Registry
5.2.2 Making extended training available at health care facilities for all personnel involved in entering ICD-O codes for diagnosis						HPA Health care facilities Aasandha Company	Data verification through Aasandha Company records

References

- (1) Maldives Bureau of Statistics. Census 2021. Statistical release I. Ministry of National Planning Housing & Infrastructure; 2021 (<http://statisticsmaldives.gov.mv/nbs/wp-content/uploads/2021/08/Population-2021.jpg>).
- (2) Maldives-WHO: country cooperation strategy 2018-2022. New Delhi: World Health Organization. Regional Office for South-East Asia; 2018 (<https://apps.who.int/iris/handle/10665/274459>).
- (3) Maldives-WHO: country cooperation strategy 2018-2022. New Delhi: World Health Organization. Regional Office for South-East Asia; 2018 (<https://apps.who.int/iris/handle/10665/274459>).
- (4) Malaria-free Maldives. New Delhi: WHO Regional Office for South-East Asia; 2016 (<https://apps.who.int/iris/handle/10665/250397>).
- (5) Maldives and Sri Lanka eliminate lymphatic filariasis [news release]. World Health Organization; 3 June 2016 ([https://www.who.int/southeastasia/news/detail/03-06-2016-maldives-and-sri-lanka-eliminate-lymphatic-filariasis#:~:text=Lymphatic%20filariasis%20\(LF\)%20is%20believed,abundance%20across%20the%20two%20countries](https://www.who.int/southeastasia/news/detail/03-06-2016-maldives-and-sri-lanka-eliminate-lymphatic-filariasis#:~:text=Lymphatic%20filariasis%20(LF)%20is%20believed,abundance%20across%20the%20two%20countries)).
- (6) Global Health Estimates 2020: Deaths by cause, age, sex, by country and by region, 2000-2019. Geneva, World Health Organization; 2020 (<https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death>, accessed 6 December 2022).
- (7) Beat cancer: prevent, detect early. Geneva: World Health Organization; 2015 (<https://www.who.int/southeastasia/news/detail/04-02-2015-beat-cancer-prevent-detect-early>).
- (8) Maldives Health Statistics 2020. Malé: Health Information Management and Research Division, Ministry of Health, Republic of Maldives; 2021 (<https://health.gov.mv/storage/uploads/BkoMELod/utbidxbkp.pdf>).
- (9) International Agency for Research on Cancer/WHO. Maldives [fact sheet]. The Global Cancer Observatory; March 2021. <https://gco.iarc.fr/today/data/factsheets/populations/462-maldives-fact-sheets.pdf>.
- (10) STEPS 2021, Maldives. NCD Microdata Repository. Forthcoming. (<https://extranet.who.int/ncdsmicrodata/index.php/catalog/661>).
- (11) Multi-sectoral action plan for the prevention and control of noncommunicable diseases (MASP NCD) 2021–2031 in Maldives. Malé: Ministry of Health; 2022.
- (12) MPOWER: a policy package to reverse the tobacco epidemic. Geneva: World Health Organization; 2008 (<https://apps.who.int/iris/handle/10665/43888>).
- (13) Resolution WHA56.1. WHO framework convention on tobacco control. In: Fifty-sixth World Health Assembly, Geneva, 19–28 May 2003. Resolutions and decisions, annexes. Geneva: World Health Organization; 2003:1–24 (WHA56/2003/REC/1; <https://apps.who.int/iris/handle/10665/259836>).
- (14) Political declaration of the high-level meeting of the General Assembly on the prevention and control of non-communicable diseases: draft resolution submitted by the President of the General Assembly. New York: United Nations; 2011 (A 66/L.1; <https://digitallibrary.un.org/record/710899?ln=en>).
- (15) Implementation roadmap for accelerating the prevention and control of noncommunicable diseases in South-East Asia 2022–2030. New Delhi: World Health Organization. Regional Office for South-East Asia; 2022 (<https://apps.who.int/iris/handle/10665/363549>. License: CC BY-NC-SA 3.0 IGO).
- (16) Resolution WHA66.10. Follow-up to the political declaration of the high-level meeting of the General Assembly on the prevention and control of non-communicable diseases. In: Sixty-sixth World Health Assembly, Geneva, 20–27 May 2013: resolutions and decisions. Geneva: World

Health Organization; 2013:16–20 (WHA66/2013/REC/1;
<https://apps.who.int/iris/handle/10665/150207>

- (17) Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: World Health Organization; 2013 (<https://apps.who.int/iris/handle/10665/94384>).
- (18) The decade for health workforce strengthening in the SEA Region 2015–2024: the first review of progress, challenges and opportunities. New Delhi: World Health Organization. Regional Office for South-East Asia; 2016 (<https://apps.who.int/iris/handle/10665/246273>).
- (19) Resolution WHA70.12. Cancer prevention and control in the context of an integrated approach. Geneva: World Health Organization; 2017 (<https://apps.who.int/iris/handle/10665/275676>).
- (20) Resolution 73/2. Political declaration of the third high-level meeting of the General Assembly on the prevention and control of non-communicable diseases. New York: United Nations; 2018 (A/RES/73.2; <https://digitallibrary.un.org/record/1648984?ln=en>).
- (21) Collective effort needed to tackle NCDs: Health Minister. PSM News (<https://psmnews.mv/en/32653>).
- (22) Maldives launches 25-30 Campaign to reduce NDCs [sic] by 2030. PSM News; 2022 (<https://psmnews.mv/en/111754>).
- (23) Act no. 15/2010. Tobacco control act (<https://globaltobaccocontrol.org/sites/default/files/2021-12/Maldives%20-%20Tobacco%20Control%20Act%2015%202010.pdf>)
- (24) Tobacco control laws. Legislation by country. Maldives (<https://www.tobaccocontrollaws.org/legislation/maldives/summary>).
- (25) Implementation tools: package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings. Geneva: World Health Organization; 2013 (<https://apps.who.int/iris/handle/10665/133525>).
- (26) ICO/IARC Information Centre on HPV and Cancer. Maldives human papillomavirus and related cancers Fact Sheet 2021 (https://hvpcentre.net/statistics/reports/MDV_FS.pdf).
- (27) Cancer prevention. Geneva: World Health Organization (https://www.who.int/health-topics/cancer#tab=tab_2).
- (28) Global School-based Student Health Survey (GSHS). Maldives. 2014 fact sheet. Geneva: World Health Organization; 2014 (<https://www.who.int/publications/m/item/2014-gshs-fact-sheet-maldives>).
- (29) National food based dietary guidelines for Maldives. Malé: Health Protection Agency, Ministry of Health; n.d.
- (30) Bruni L, Albero G, Serrano B, Mena M et al. Human papillomavirus and related diseases in Maldives. Summary report 2021. ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre); 2021 (<https://hvpcentre.net/statistics/reports/MDV.pdf>).
- (31) Unpublished stats, Communicable disease control program, Health Protection Agency.
- (32) Change M-H. Hepatitis B virus and cancer prevention. Recent Results Cancer Research. 2011;188:75-84 (<https://pubmed.ncbi.nlm.nih.gov/21253790/>).
- (33) WHO package of essential noncommunicable (PEN) disease interventions for primary health care. Geneva: World Health Organization; 2020 (<https://apps.who.int/iris/handle/10665/334186>).
- (34) National Health Accounts 2015-2017. Malé: Ministry of Health, Republic of Maldives; n.d. (<https://health.gov.mv/storage/uploads/dZoW1gYP/lmbpylyg.pdf>).
- (35) Approved drug list MTG/RE-AL/Li 0009/2021-0008. Maldives Food and Drug Authority. Ministry of Health (<https://health.gov.mv/storage/uploads/BxopZYvP/o2p82t9z.pdf>).
- (36) Essential Medicine List 2021. Maldives Food and Drug Authority. Medicine and Therapeutic Goods Division. Ministry of Health. Republic of Maldives; 2021 (<https://health.gov.mv/storage/uploads/pDqKPWoO/piklrlys.pdf>).

- (37) Setting up a cancer centre: a WHO–IAEA framework. Vienna: International Atomic Energy Agency; 2022 (<https://www.iaea.org/publications/15052/setting-up-a-cancer-centre-a-who-iaea-framework>)
- (38) Public Health Protection Act. Law 7/2012. Government of Maldives. (<https://extranet.who.int/mindbank/item/2150>, accessed 6 December 2022).