STATUS OF CANCER IN
OIC MEMBER COUNTRIES

ORGANISATION OF ISLAMIC COOPERATION

STATISTICAL, ECONOMIC AND SOCIAL RESEARCH AND TRAINING CENTRE FOR ISLAMIC COUNTRIES

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SESRIC

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Acronyms

ASR	Age-Standardized Rate
BMI	Body Mass Index
TQS	Tobacco Questions for Surveys
DNA	Deoxyribonucleic Acid
SHPA	OIC Strategic Health Programme of Action
VET	Vocational Education and Training
CDC	Centre for Disease Control and Prevention
CDs	Communicable Diseases
CVDs	Cardiovascular Diseases
EAP	East Asia and Pacific
ECA	Europe and Central Asia
FCTC	Framework Convention on Tobacco Control
ICHM	Islamic Conference of Health Ministers
IDB	Islamic Development Bank
IHR	International Health Regulations
LAC	Latin America and the Caribbean
MENA	Middle East and North Africa
NCDs	Non-Communicable Diseases
OIC	Organization of Islamic Cooperation
SA	South Asia
SSA	Sub-Saharan Africa
TCU	Tobacco Control Unit
WHO	World Health Organization

1. Introduction

Cancer is a generic term for a large group of diseases characterised by rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs. If the spread is not controlled, it can result in death. Cancer is caused by the interaction between internal factors (like inherited genetic mutations, hormones and immune conditions) and external factors (like tobacco use, physical inactivity, infections from certain viruses, and an unhealthy diet).

Cancer is the second major cause of mortality after cardiovascular diseases worldwide. With over 14 million new cases diagnosed in 2012, cancer caused about 8.2 million deaths worldwide. Developing countries are disproportionally affected by the high burden of cancer, accounting for 63% of new cancer cases and 71% of deaths in the world. Being a substantial part of developing countries, OIC countries accounted for around 17% of developing countries and 11-to-12% of the global burden of cancer (incidence and mortality) in 2012. Only five cancers caused about 40% of total cancer deaths in OIC countries. These cancers include lung, stomach, breast, colon and cervical cancers.

Many of these cancers are preventable by controlling major risk factors including tobacco use, consumption of alcohol, obesity and insufficient physical activity. Furthermore, if detected at an early stage, a significant number of cancers can be cured with surgery and chemotherapy. Over the years, OIC countries in collaboration with the subsidiary, specialized and affiliated OIC institutions and relevant international partners have exerted significant efforts to develop necessary policy framework and build national capacities to combat cancer. The OIC Strategic Health Programme of Action (OIC-SHPA) 2014-2023 is the most important OIC initiative in the domain of health, which was adopted by the 4th Islamic Conference of Health Ministers held in Jakarta, Indonesia. There are six thematic areas of cooperation identified under the OIC-SHPA and cancer prevention and control is an important constituent of thematic area 2: Diseases Prevention and Control.

Despite all noble efforts, however, health systems in many OIC countries especially in Africa and Asia are not equipped to detect and treat cancers whereas prevention policies are either weak or non-existent in these countries. Furthermore, treatment for cancer is often not widely available in many OIC countries. This situation is exacerbated further by the high cost of cancer treatment and medication coupled with the low coverage of social security and health insurance schemes.

Against this backdrop, this report looks at the status of cancer in a comparative perspective. Based on the latest available data on new cancer cases diagnosed and deaths caused by the cancer, Section 2 of the report provides a detailed comparative analysis of burden of cancer in OIC countries. Section 3 of the report focuses at cancer prevention and control by taking stock of existing national capacities and policies to identify the major gaps in prevention, monitoring and surveillance, early detection, and control and cure of cancer in OIC countries. Section 4 gives a brief account of recent multilateral initiatives at both intra-OIC and international level to combat cancer. The report concludes with policy recommendations aiming to enhance the implementation of interventions at both national and intra-OIC and international cooperation level to prevent and control the incidence of cancers in OIC countries.

2. Burden of Cancer

2.1 Incidence

According to the latest estimates from GLOBOCAN, over 14 million new cases of cancer (excluding non-melanoma skin cancers) were diagnosed among adult people (older than 15 years) worldwide in 2012. This figure is expected to climb up to 22 million annually within the next two decades (American Cancer Society, 2015). Economically developing regions of the world are disproportionally burdened by the incidence of cancer, accounting for 63% of new cases diagnosed worldwide. With over one and a half million new cases diagnosed in 2012, OIC countries accounted for 11% of the world and 17% of the developing countries total cancer cases. Among the OIC sub-regions, Middle East and North Africa (MENA) accounted for the highest share (25%) of new cancer cases diagnosed in 2012 followed by East Asia and Pacific (EAP, 22%) and South Asia (SA, 19%).

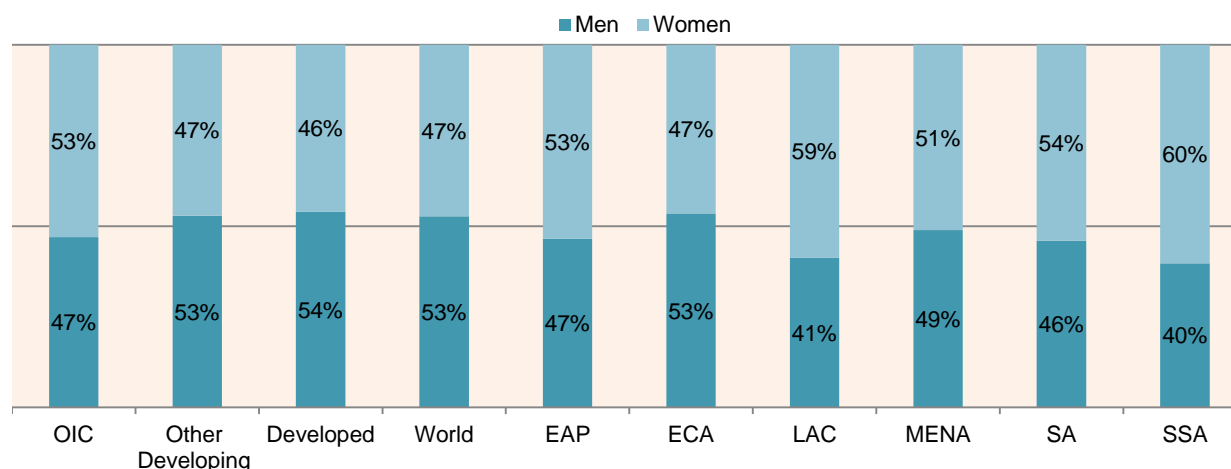**Figure 2.1:** Global and OIC Sub-Regional Distribution of New Cancer Cases, 2012
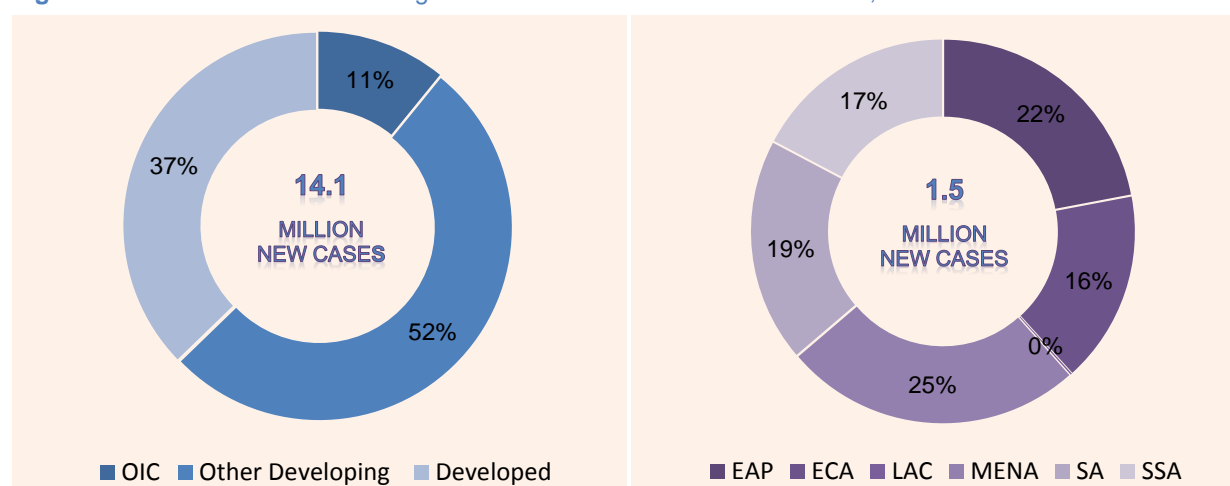
Considering the gender-based disaggregation of incidence of cancer, in absolute numbers, men are more likely to be diagnosed with the cancer worldwide, except in OIC countries. As shown in Figure 2.2, men accounted for the majority of new cancer cases worldwide, whereas in OIC countries women accounted for the largest share (53%) of cancer cases in 2012. At the OIC sub-regional level, women are more likely to be diagnosed with cancer in all regions except in the region of Europe and Central Asia (ECA) where men account for the largest share of new cases. Among the OIC regions, the highest discrepancy between men and women existed in Sub-Saharan Africa (SSA) region with a difference of 20 percentage points followed by Latin America and Caribbean (LAC, 18 percentage points) and SA (8 percentage points) .

Age-Standardized Rate (ASR) of Cancer Incidence

Age is a key determinant of cancer incidence, as the risk of cancer increases exponentially with increasing age. Therefore, it is important to use age-standardised incidence to evaluate and compare the relative burden of cancer between country groups. The latest estimates of age-standardized incidence of cancer worldwide reveal extensive regional variations and incidence among men remained generally higher than the women. As shown in Figure 2.3, the highest ASR among adult population was recorded in developed countries (284 per 100,000 population) with incidence being more common among men

(320) compared to the women (258). Globally, ASR among adults was 182 per 100,000 populations for both sexes and 205 for men and 165 for women. ASR among adults in OIC countries remained well below the incidence rates for other country groups. As a group, OIC countries registered the lowest ASR of 127 per 100,000 population for adults and 128 for both men and women in 2012.

Figure 2.2: Gender-Based Distribution of New Cancer Cases, 2012

■Men ■Women

|	OIC	Other Developing	Developed	World	EAP	ECA	LAC	MENA	SA	SSA
Women	53%	47%	46%	47%	53%	47%	59%	51%	54%	60%
Men	47%	53%	54%	53%	47%	53%	41%	49%	46%	40%

Source: GLOBOCAN online database, SESRIC Staff Analysis

As shown in Figure 2.3, ASR cancer varies significantly across the OIC sub-regions. For 2012, the highest ASR among adults was recorded in ECA (181 per 100,000 population) whereas the lowest incidence was recorded in SSA (103). The incidence of cancer among adults remained higher than the OIC average in all sub-regions with the exception of SA and SSA. The gender-based disaggregation of ASR also reveals significant variations across the OIC sub-regions. Contrary to the global trends, cancer incidence among women remained higher than the men in all sub-regions except ECA and East Asia and Pacific (EAP). In fact, ECA region registered the highest ASR among men (218 per 100,000 population) whereas on the opposite side of the scale it was only 89 in SSA region. ASR among men in ECA, LAC, EAP and Middle East and North Africa (MENA) remained higher than the OIC average. In case of women, the incidence rate ranged from 180 per 100,000 population in LAC to 115 in SA region. The age-standardized incidence of cancer among women remained higher than the OIC average in LAC, ECA and EAP regions.

At the individual country level, age-standardized incidence of cancer in OIC countries portrays a diverse picture. In 2012, Kazakhstan recorded the highest incidence rate among adults (237 per 100,000 population) followed by Turkey (205), Lebanon (197), Albania (178) and Uganda (166). These five countries also recorded the highest incidence rate among men in the same descending order (Figure 2.4). On the opposite side of scale, Niger recorded the lowest incidence rate among adults (63) followed by Gambia (68), Yemen (80), Oman (82) and Guinea-Bissau (83). For 2012, age-adjusted incidence of cancer among men ranged from 282 per 100,000 population in Kazakhstan to only 57 in Niger. In general, 20 OIC countries recorded incidence rate higher than the OIC average of 128. Though incidence rate among women remained comparatively low in OIC countries, it was higher than the OIC average (128) in 22 member countries. As shown in Figure 2.4, Kazakhstan recorded the highest incidence rate among women (217) followed by Guyana (194), Lebanon (193) and Burnie (179). On the bottom side, Gambia, Niger and Yemen recorded the lowest incidence rates in 2012.

Figure 2.3: Age-standardized Incidence of New Cancer Cases per 100,000 population, 2012
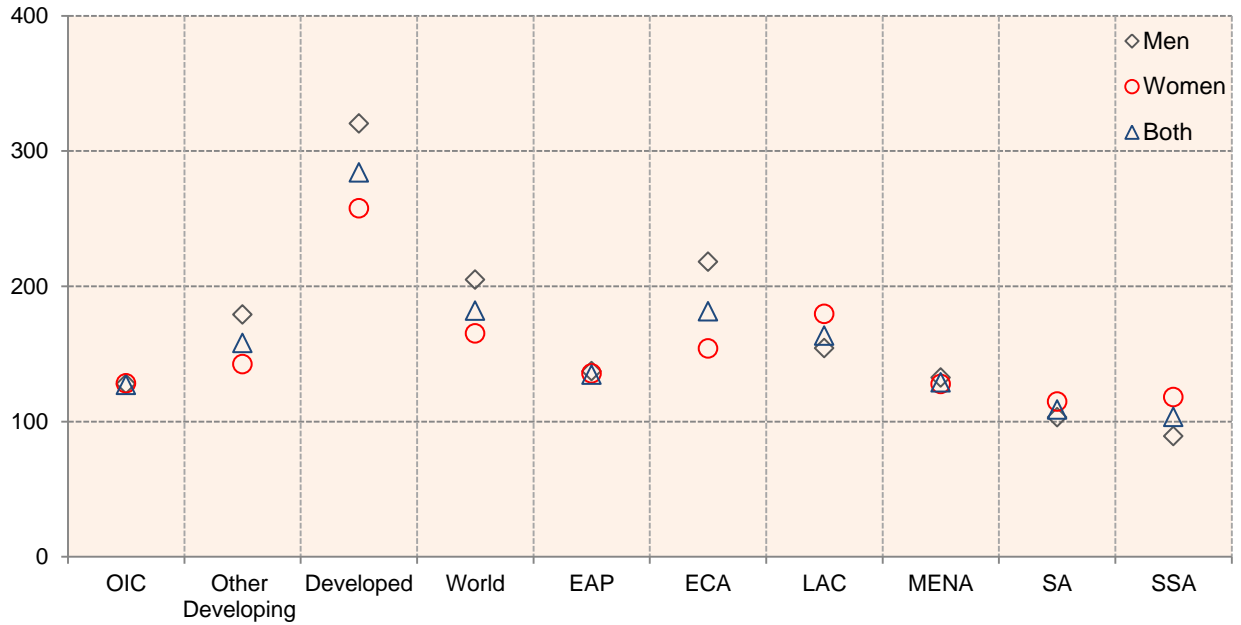
Source: GLOBOCAN online database, SESRIC Staff Analysis

**Figure 2.4:** OIC Countries with Highest and Lowest ASR for New Cases per 100, 000 population 2012
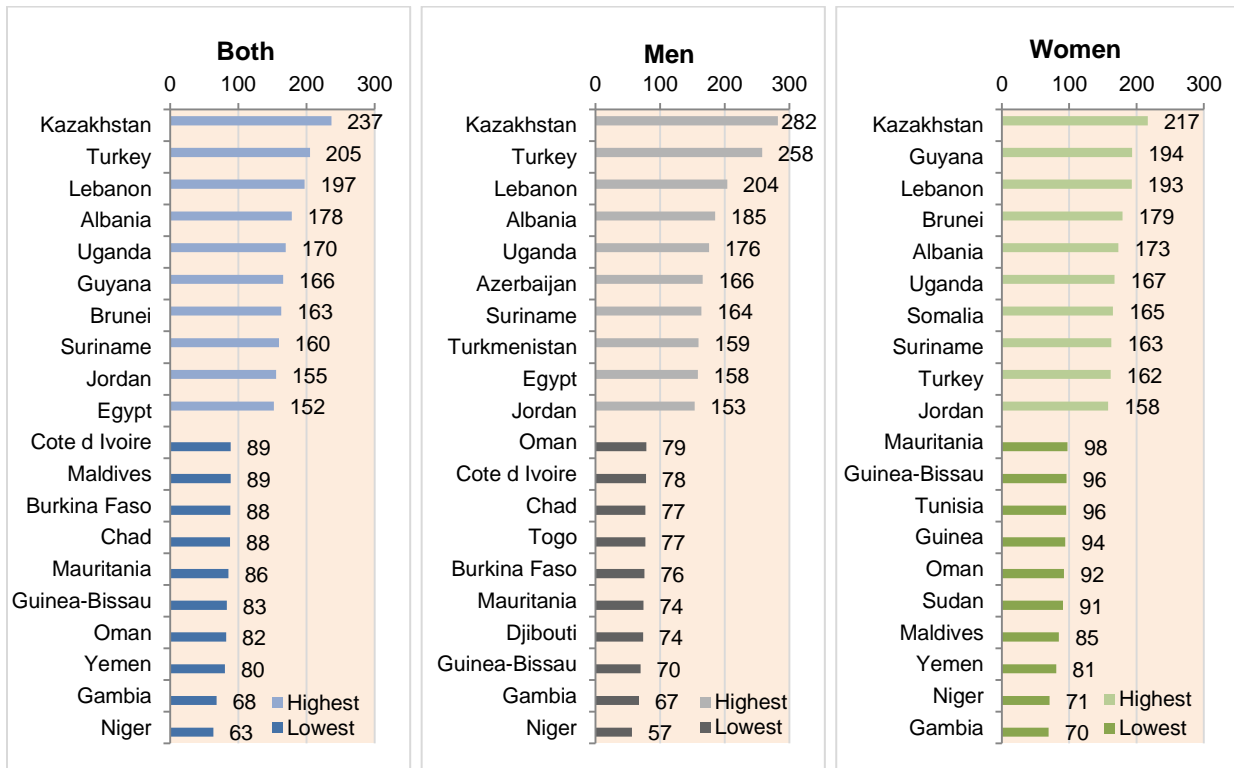
Source: GLOBOCAN online database

The Most Common Cancers

With 250 thousand new cases, breast cancer is by far the most prevalent cancer in OIC countries. The second most prevalent is lung cancer, with 105 thousand cases (94 thousand men and 11 thousand women), and then cervical cancer, with 90 thousand, colorectum cancer, with 85 thousand cases (48 thousand men and 37 thousand women), and prostate cancer, with 67 thousand cases. These top-5 cancers accounted for about 40% of all cases diagnosed in OIC countries in 2012.

There are widespread gender-based differences in incidence of the most common cancers across the world. While some of these differences are hormone-related others are largely because of behaviours like smoking and drinking. Among men in OIC countries (Figure 2.5), the five most common sites of cancer diagnosed in 2012 were lung (23.9% of the total), prostate (17.0%), colorectum (12.2%), liver (10.9%), and bladder (7.3%). These five cancers together accounted for about 72% of incidence among men in OIC countries. Among women (Figure 2.5), the five most common sites of cancer were breast (49.9% of the total), cervical (18.0%), colorectum (7.3%), ovary (5.0%), and stomach (2.5%). These five cancers together accounted for around 83% of incidence among women in OIC countries.

Figure 2.5: The Most Common Types of New Cancer Cases in OIC Countries, 2012
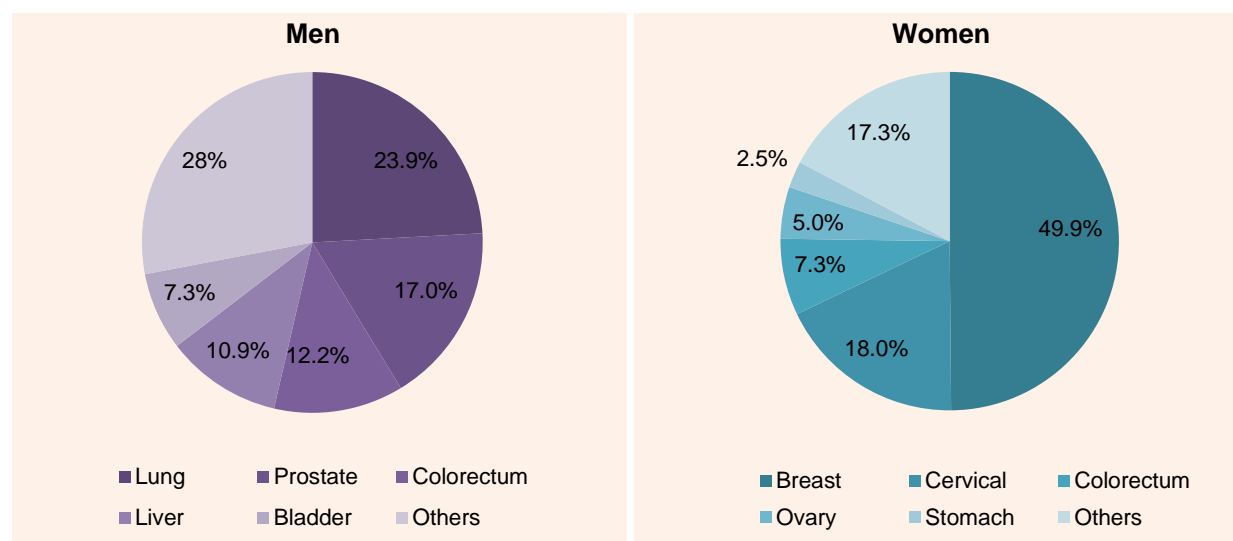
Source: GLOBOCAN online database, SESRIC Staff Analysis

A regional breakdown of the OIC cancer incidence by top-3 most common types of cancers among men and women is given in Table 1. The most common types of cancer vary across the OIC sub-regions. Among men, lung cancer was the most common cancer in four sub-regions, while prostate cancer was the most common in the remaining two regions. Among the former, lung cancer is the most common in ECA (19.7%) and EAP (14.2%) region. On the other hand, prostate cancer accounted for over 20% of total cases diagnosed among men in LAC. The greatest variation among men was observed in SSA, where the most common cancers were prostate, liver, and lymphoma.

For women, breast cancer was the most common cancer in all OIC sub-regions; however, the relative burden varies considerably across the sub-regions. As shown in Table 1, breast cancer accounted for the highest share of total cancer cases in SA (32.2%) followed by MENA (30.6%) and SSA (22.8%). Cervical cancer was the second most common type in four sub-regions, while colorectum cancer was the second most common cancer in remaining two regions. In general, incidence of cancers like colorectum,

stomach, liver and lip and oral cavity were common among both men and women. Among the OIC sub-regions, top-3 most common cancers among men and women accounted for about 52% of total cancer cases in LAC, 45% in EAP, 42% in ECA, and 41% in SA.

**Table 1:** The Most Common Types of New Cancer Cases in OIC Sub-Regions, 2012

		EAP	ECA	LAC	MENA	SA	SSA
Men	1st	Lung 14.2%	Lung 19.7%	Prostate 20.2%	Lung 9.9%	Lung 9.6%	Prostate 13.0%
	2nd	Colorectum 9.3%	Prostate 9.8%	Colorectum 6.8%	Bladder 8.8%	Lip oral cavity 9.3%	Liver 9.1%
	3rd	Prostate 7.4%	Stomach 8.6%	Lung 5.3%	Liver 6.0%	Oesophagus 5.9%	Lymphoma 4.4%
Women	1st	Breast 27.1%	Breast 19.8%	Breast 22.9%	Breast 30.6%	Breast 32.8%	Breast 28.2%
	2nd	Cervical 11.5%	Colorectum 5.8%	Cervical 22.1%	Colorectum 5.1%	Cervical 11.4%	Cervical 21.8%
	3rd	Colorectum 6.9%	Stomach 5.6%	Corpus uterine 5.4%	Ovary 3.1%	Lip oral cavity 5.8%	Liver 4.1%

Source: GLOBOCAN online database, SESRIC Staff Analysis

2.2 Mortality

Cancers are among the leading causes of morbidity and mortality worldwide, with 8.2 million cancer related deaths reported in 2012. A bulk of these deaths is occurring in developing countries, which accounted for 71% of deaths in 2012 (Figure 2.6). On the other hand, developed countries accounted for only 28.2% of the world. The relative share of developing countries in cancer related deaths is 8 percentage points higher than their share in new cases of cancer diagnosed in the world. This difference could be associated largely with the lack of capacities for the early detection and the low availability of affordable treatment in the majority of developing countries.

Figure 2.6: Global and OIC Sub-Regional Distribution of Deaths Caused by Cancer, 2012
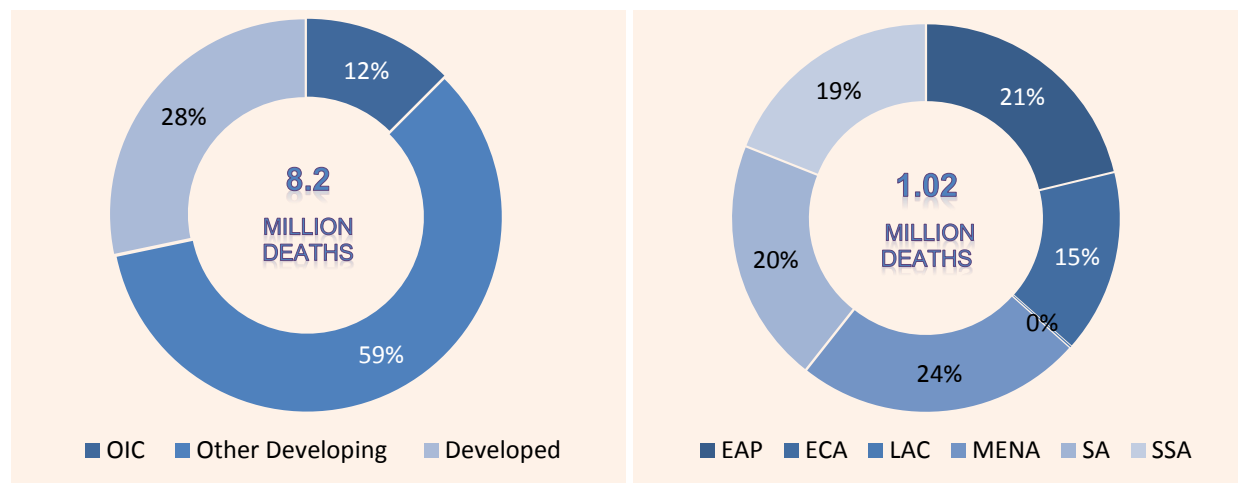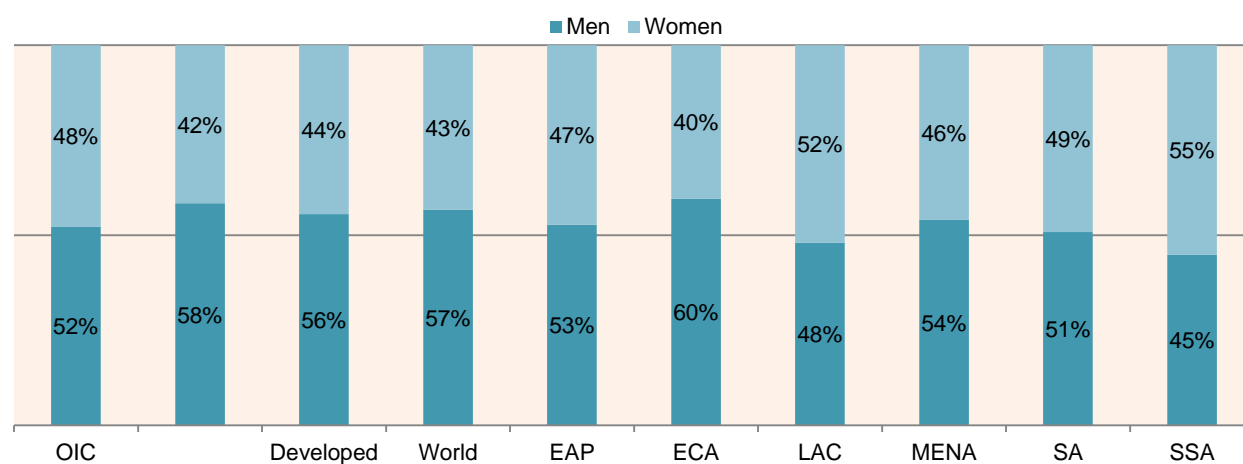

Source: GLOBOCAN online database, SESRIC Staff Analysis

Being a substantial part of developing world, OIC countries accounted for 17.4% of the developing countries and 12% of the global cancer deaths. In absolute numbers, cancers in OIC countries caused about 1.02 million deaths in 2012. Cancer related deaths in OIC countries are distributed more or less evenly across the OIC sub-regions (Figure 2.6). For 2012, MENA region accounted for the highest share of 24% followed by EAP (21%), SA (20%) and SSA (19%). The lowest share was recorded in ECA region.

Considering the gender-based disaggregation of cancer related deaths in 2012, men are more likely to die because of cancer worldwide, accounting for 57% of total deaths (Figure 2.7). The gender-based distribution of cancer related deaths is more homogenous in OIC countries compared to other groups, though the relative share of men remained higher. As shown in Figure 2.7, men accounted for 52% of total deaths caused by cancers in OIC countries compared to 58% in other developing countries and 56% in developed countries. In line with the global trends, men are more likely to die because of cancer in all sub-regions except LAC and SSA where women account for the largest share of deaths. Among the OIC sub-regions, the highest gender discrepancy existed in ECA with a difference of 20 percentage points between men and women followed by MENA (8 percentage points), and EAP (6 percentage points).

Figure 2.7: Gender Based Distribution of Deaths Caused by Cancer, 2012

Source: GLOBOCAN online database, SESRIC Staff Analysis

Age-Standardized Mortality Rate

Like the incidence, cancer mortality is also highly correlated with the age. Therefore, it is important to use age-adjusted mortality rate to make comparison among the country groups. As shown in Figure 2.8, age-standardized cancer mortality rates exhibit significant regional variations, though the differences are less pronounced than those for incidence are. Cancer mortality rate for the adult population was slightly above the 100 point mark worldwide except OIC countries, which registered a much lower rate of only 88 deaths per 100,000 population. There are widespread differences between ASR for men and women across the world. In general, men are 1.6 times more likely to die from cancer than the women are. Nevertheless, gender based difference in cancer mortality rate remained comparatively negligible in OIC countries. As shown in Figure 2.8, mortality rate for men in OIC countries (97 per 100,000 population) remained significantly lower than those for other country groups. Age-adjusted mortality rate for women is comparatively more homogenous worldwide, ranging from 80 to 83 deaths per 100,000 population across the country groups.

Age standardized cancer mortality rate varies considerably across the OIC sub-regions (Figure 2.8). For 2012, the highest ASR for adults was recorded in ECA (116 per 100,000 population) whereas the lowest rate was recorded in SSA (79). Mortality rate for adults remained higher than the OIC average in ECA, LAC and EAP. The gender-based disaggregation of ASR also reveals significant variations across the OIC sub-regions. In line with the global trends, mortality among men remained higher than the women in all sub-regions except SSA. For 2012, ECA registered the highest mortality rate for men (155 per 100,000 population) followed by LAC (111) and EAP (103). On the opposite side of scale, mortality rate was only 78 in SSA and 84 in SA. ASR for men in ECA, LAC, and EAP remained higher than the OIC average. In case of women, mortality rate ranged from 97 per 100,000 population in LAC to 75 in MENA. ASR for women remained higher than the OIC average in LAC, ECA and SSA regions. In general, the highest gender-based discrepancy in mortality rates was recorded in ECA where men are two times more likely to die from cancer than the women.

Figure 2.8: Age-Standardized Cancer Mortality Rate per 100,000 population, 2012
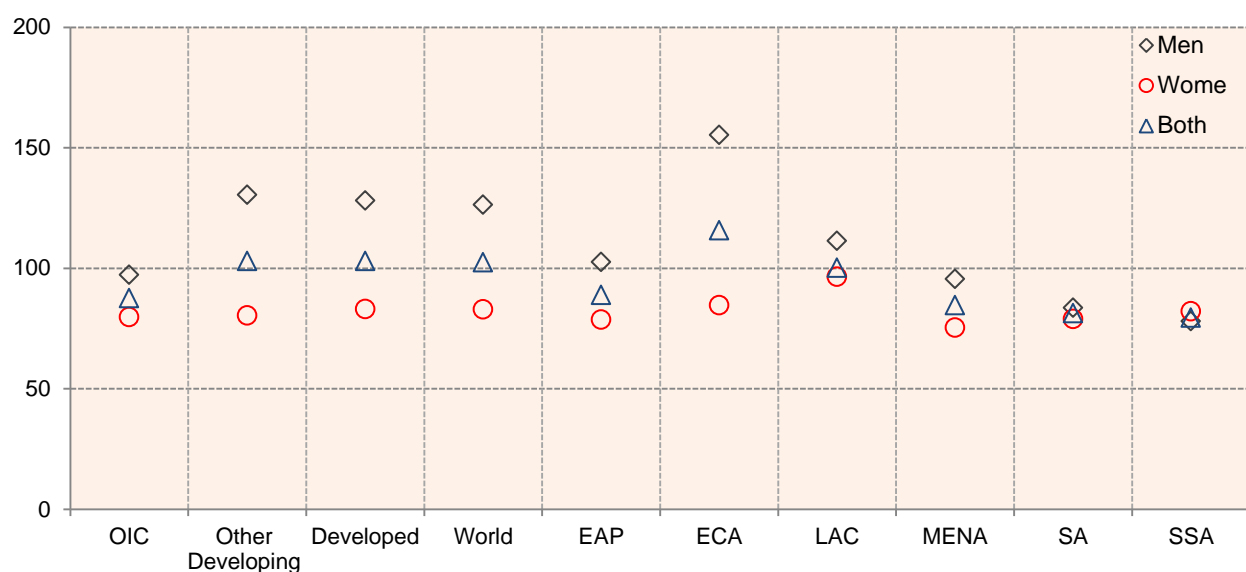
At the individual country level, age-standardized cancer mortality rate varies considerably across the OIC countries. As shown in Figure 2.9, Kazakhstan recorded the highest mortality rate among adults (140 per 100,000 population) followed by Uganda (134), Turkey (129), Mozambique (115) and Albania (112). Among these top-5 countries, Kazakhstan, Turkey and Uganda also recorded the highest cancer incidence rate in 2012. On the opposite side of scale, Maldives, Niger, Saudi Arabia and Bahrain recorded the lowest mortality rate among adults (54). For 2012, age-adjusted cancer mortality rate among men ranged from 203 per 100,000 population in Kazakhstan to only 46 in Kuwait. Once again, four out of top-5 countries were also ranked among the countries with highest incidence of cancer cases. In general, 19 OIC countries recorded mortality rate higher than the OIC average of 97. As shown in Figure 2.9, Mozambique registered the highest mortality rate among women (121) followed closely by Uganda (120), and Somalia (117). On the bottom side, Maldives recorded the lowest rate (42), followed by Tunisia (49), and Bahrain (51). Age-standardized mortality rate in 23 OIC countries was higher than the OIC average (79.7) in 2012.

Figure 2.9: OIC Countries with Highest and Lowest Cancer Mortality Rate per 100, 000 population 2012

Both

Country	Rate
Kazakhstan	140
Uganda	134
Turkey	129
Mozambique	115
Albania	112
Somalia	106
Egypt	103
Lebanon	103
Turkmenistan	102
Guyana	102
Yemen	64
Gambia	58
UAE	58
Oman	55
Kuwait	55
Gabon	55
Bahrain	54
Saudi Arabia	54
Niger	54
Maldives	54

Men

Country	Rate
Kazakhstan	203
Turkey	179
Uganda	153
Albania	131
Kyrgyzstan	125
Turkmenistan	124
Egypt	121
Lebanon	120
Azerbaijan	119
Palestine	114
Guinea-Bissau	64
Maldives	64
Gambia	63
Bahrain	61
United Arab…	58
Oman	58
Saudi Arabia	57
Gabon	55
Niger	54
Kuwait	46

Women

Country	Rate
Mozambique	121
Uganda	120
Somalia	117
Kazakhstan	105
Guyana	103
Mali	101
Albania	96
Afghanistan	93
Lebanon	90
Comoros	89
Libya	62
Yemen	60
Gabon	55
Niger	55
Gambia	54
Oman	54
Saudi Arabia	53
Bahrain	51
Tunisia	49
Maldives	42

Source: GLOBOCAN online database

The Most Deadly Cancers

With 143 thousand deaths of adult people (110 thousand men and 33 thousand women), lung cancer is by far the deadliest cancer in OIC countries. The second most deadly is stomach cancer, with 85 thousand deaths (51 thousand men and 34 thousand women), and then breast, with 74 thousand, colorectum cancer, with 64 thousand deaths (34 thousand men and 30 thousand women), and cervical cancer, with 47 thousand deaths. These top-5 deadliest cancers accounted for about 40% of all deaths caused by cancers in OIC countries in 2012.

There are widespread gender-based differences in death burden of the most common cancers across the world. Most of these differences are largely due to (un)availability of: proper policies for addressing the major risk factors, screening and early detection capacities and affordable medication and treatment in a country/region. For men in OIC countries, only five cancers caused nearly half of the total cancer deaths (Figure 2.10). These top-5 deadliest cancers include lung (20.6% of the total), stomach (9.5%), colorectum (6.5%), prostate (4.7%), and oesophageal (4.3%). For women, around 43% of total deaths were caused by only five cancers namely: breast (14.9% of the total), cervical (9.6%), stomach (7.0%), lung (6.8%) and colorectum (6.1%).

An OIC sub-regional breakdown of top-3 most deadly types of cancers among men and women reveals differences across the sub-regions (Table 2). Among men, lung cancer was the most common cause of death in four sub-regions, while prostate and stomach cancer were the major killers in LAC and SSA respectively. Among the former, lung cancer accounted for the largest share of deaths in ECA (32%) followed by SA (28%). On the other hand, prostate cancer accounted for about 24% of total cancer

deaths among men in LAC. Stomach cancer was the second most deadly cancer among men in three OIC sub-regions.

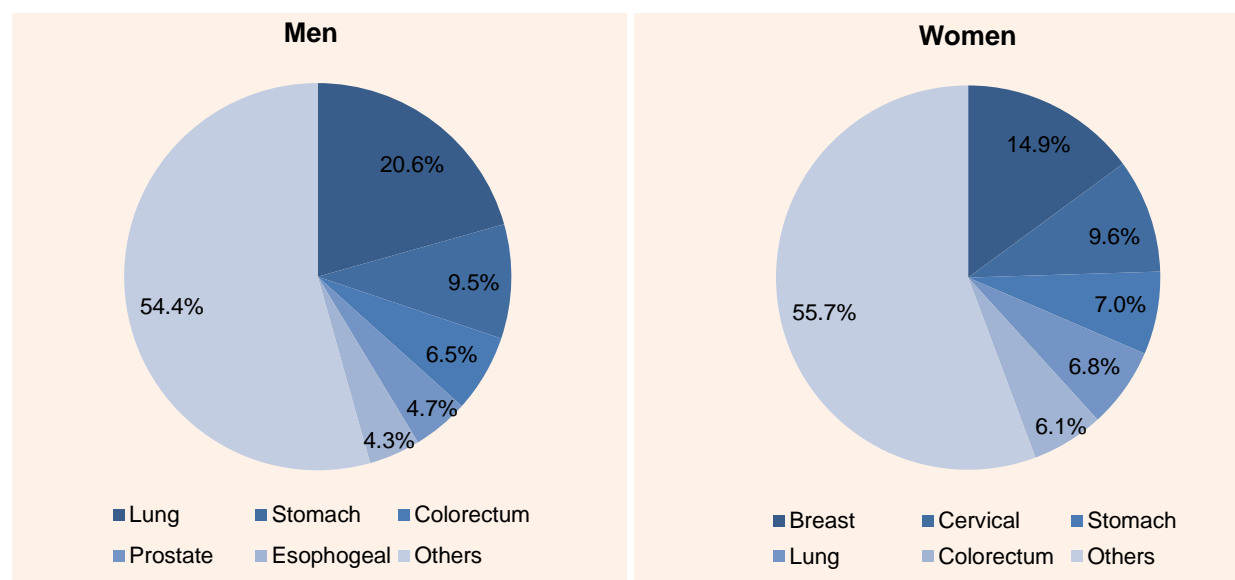**Figure 2.10:** The Most Deadly Cancers in OIC Countries, 2012

Source: GLOBOCAN online database, SESRIC Staff Analysis

In case of women, breast cancer accounted for the largest share of cancer related deaths in all OIC sub-regions except SSA where cervical cancer was the top killer. The relative death burden of breast cancer varies considerably across the sub-regions. As shown in Table 2, breast cancer accounted for 23% of total women deaths in LAC followed closely by SA (22%). Cervical cancer was the second most common killer in two sub-regions. In general, cancers like lung, stomach, and colorectum were common major killers for both men and women. Among the OIC sub-regions, top-3 deadliest cancers for men and women accounted for about 53% of total cancer deaths in LAC, 45% in ECA, 43% in SA, 36% in EAP, 31% in SSA and 28% in MENA region.

Table 2: The Most Deadly Cancers in OIC Sub-Regions, 2012

		EAP	ECA	LAC	MENA	SA	SSA
Men	**1st**	Lung 22%	Lung 32%	Prostate 24%	Lung 15%	Lung 28%	Stomach 10%
	2nd	Colorectum 7%	Stomach 12%	Lung 15%	Stomach 9%	Stomach 11%	Prostate 8%
	3rd	Stomach 7%	Colorectum 7%	Colorectum 12%	Prostate 5%	Esophageal 8%	Lung 7%
Women	**1st**	Breast 12%	Breast 16%	Breast 23%	Breast 15%	Breast 22%	Cervical 19%
	2nd	Cervical 12%	Lung 10%	Cervical 18%	Stomach 6%	Esophageal 9%	Breast 11%
	3rd	3rd	Lung 12%	Stomach 9%	Colorectum 14%	Lung 6%	Ovary 8%

Source: GLOBOCAN online database, SESRIC Staff Analysis

3. Cancer Prevention and Control

Chronic non-communicable diseases (NCDs) are the number one cause of death and disability in the world. The term NCDs refers to a group of conditions that are not mainly caused by an acute infection, result in long-term health consequences and often create a need for long-term treatment and care. These conditions include cancers, cardiovascular disease, diabetes and chronic lung illnesses among the major ones. Cancer is the second major cause of mortality in OIC countries after cardiovascular diseases. Lung cancer is the leading cause of mortality followed by stomach, breast, colorectum and cervical cancers. Many of these cancers are preventable by controlling major risk factors including tobacco use, consumption of alcohol, obesity and insufficient physical activity. Furthermore, if detected at an early stage, a significant number of cancers can be cured with surgery and chemotherapy.

Cancer is one of the most expensive diseases with significant socio-economic consequences. Globally, millions of dollars are spent annually for the treatment of cancer, which undermine the sustainability of national health care expenditures especially in the low and middle-income countries. On the contrary, underdeveloped health care systems with limited coverage of social security and health insurance affect many cancer patients that have to pay for medication and treatment from their pocket. As a result, many patients and their families across the developing world are pushed into a dangerous vicious cycle where poverty and cancer continually reinforce each other. In this context, this chapter aims to take stock of existing national capacities and policies to identify the major gaps in monitoring and surveillance, prevention, early detection, and control and cure of cancer in OIC countries.

3.1 Action Plan, Monitoring and Surveillance

Given its social, physiological and economic impacts on individuals and societies, it is highly critical to have nationwide cancer registry systems in order to monitor trends in cancer cases, number of patients and their treatment requirements. According to the WHO survey in 2013, only 10 out of 53 OIC countries with data have a national population-based cancer registry (Figure 3.1). In other words, 43 OIC countries were not able to track the number of cancer cases and patients due to lack of registry system. This leads to a number of problems from planning to treatment in these countries. For instance, the lack of a centralized registry system may cause ineffective provision of cancer medicines, which are usually, need to be imported in a timely manner. A delay in provision of cancer medicines due to lack of an effective monitoring and surveillance system may put life of many cancer patients at risk. Therefore, it is very crucial to develop such a capacity to combat the cancer in an effective and efficient manner.

The best way of fighting with cancer is to prevent before it occurs. To this end, the first step is developing a comprehensive operational national policy/strategy/action plan to combat cancer and to fight against its major risk factors. According to the WHO survey in 2013, 28 OIC countries responded positively about the existence of an operational policy/strategy/action plan for cancer in their respective countries (Figure 3.1, right). On the other hand, 23 OIC countries did not have an operational policy/strategy/action plan for cancer in the same year. This implies widespread lack of monitoring and surveillance related policies in OIC countries to effectively combat the cancer and provide treatment for patients with a view to improve their health status.

Figure 3.1: Population-Based Cancer Registry and Operational Action Plan in OIC Countries, 2013
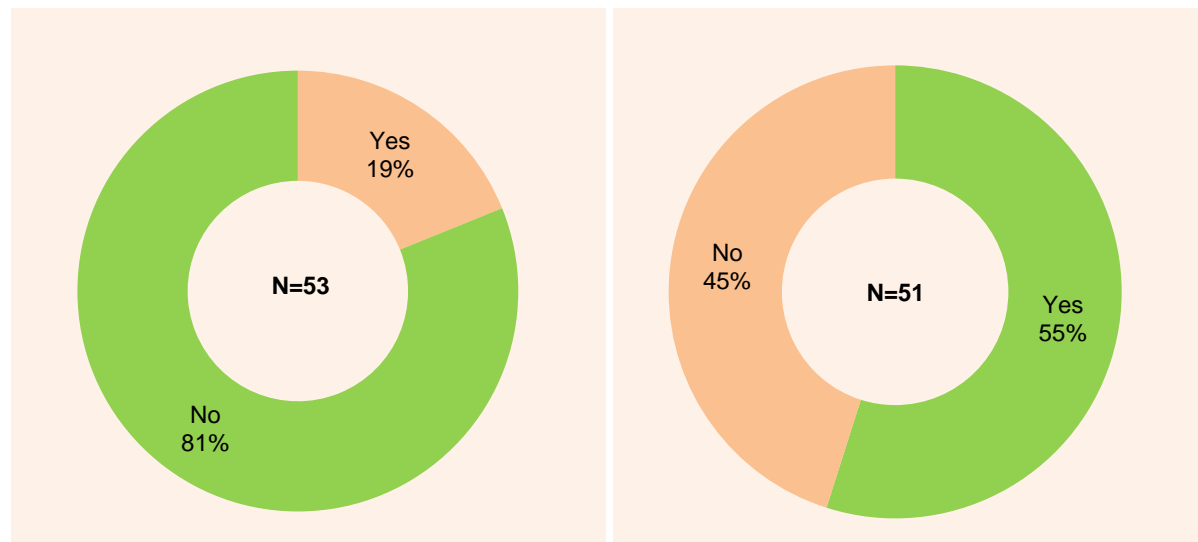
3.2   Risk Factors and Prevention Policies

Treatment of cancer is costly and not always ends up with desired results. On the other hand, cancer prevention policies targeting the major risk factors are affordable and far more effective. Many cancer types can be prevented by reducing exposure to common risk factors such as tobacco use, consumption of alcohol use, physical inactivity and unhealthy diet. According to the latest estimates, around one third of cancer deaths are due to some leading behavioural and dietary risks: high body mass index accompanied with low intake of vegetables and fruits, insufficient physical activity, tobacco and alcohol use (SESRIC, 2015). Tobacco use is the most important risk factor for cancer causing around 20% of global cancer deaths and around 70% of global lung cancer deaths. Therefore, fighting with these risk factors carries a critical importance for OIC countries in order to reduce cancer incidence and mortality. This sub-section looks at the current state cancer prevention policies in OIC countries.
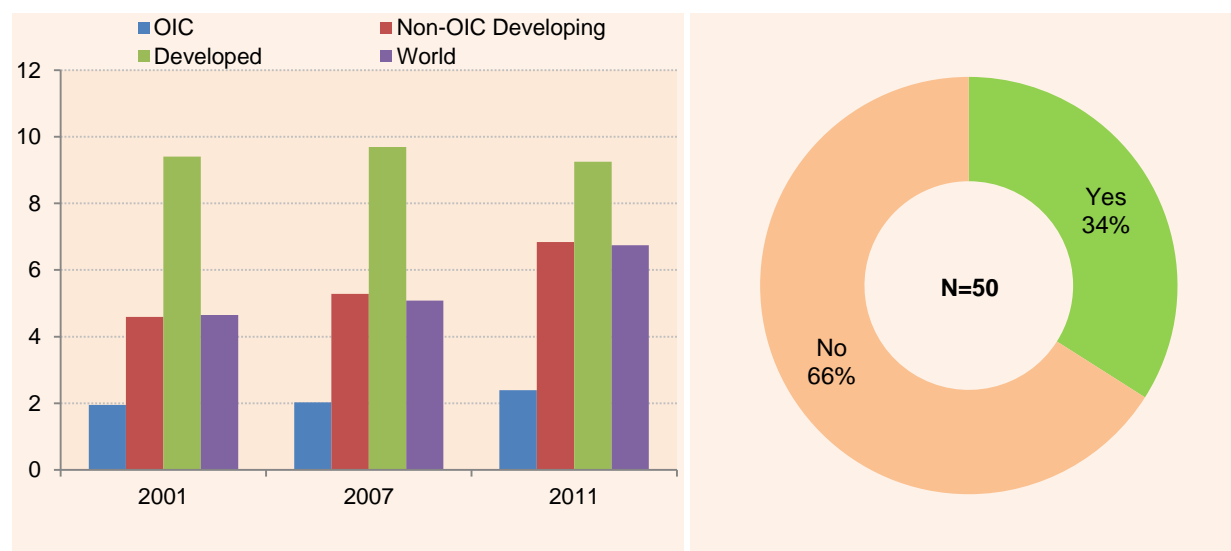
Use of Alcohol

Use of alcohol is a causal factor in more than 200 diseases including cancers. Globally, about 3.3 million deaths every year result from use of alcohol; this represents 5.9% of all deaths for all ages and 25% of deaths among 20-39 year old people, according to the estimates of WHO.

Researchers have identified that alcohol may increase the risk of cancer by damaging the DNA and proteins and impairing the body's ability to break down and absorb a variety of nutrients. In particular, alcohol intake increases the risk of liver, mouth/throat, breast, and bowel cancers (World Cancer Research Fund International, 2016 and American Cancer Society, 2016)

Despite the adverse effects of alcohol on health and its association with elevated risk for developing cancer, per capita consumption of alcohol is on rise worldwide, increasing from 4.65 litres in 2001 to 6.74 litres in 2011 (Figure 3.2). As a group, OIC countries also witnessed an upward trend from 1.95 litres to 2.38 litres in the same period whereas developed countries recorded a decrease from 9.4 litres to 9.2 litres. These figures imply that OIC countries are at a greater risk compared with 2001 in terms of use of alcohol. However, despite increase seen in alcohol use in OIC countries, among 50 OIC countries

with data only 17 of them have an operational policy/strategy/action plan to reduce the harmful use of alcohol (Figure 3.2, right).

Figure 3.2: Recorded Alcohol Per Capita (15+) Consumption (litres of pure alcohol) and Existence of Operational Policy/Strategy/Action Plan to Reduce Use of Alcohol in OIC Countries, 2013

Source: WHO Database, SESRIC Staff Analysis

This state of affairs necessitates that OIC countries make concerted efforts to develop and implement effective strategies to cope with the positive trend seen in the use of alcohol and to reduce associated risks of developing cancer. Some of the worldwide used strategies in this regard include:

- regulating the marketing of alcoholic beverages (in particular to younger people);
- regulating and restricting availability of alcohol;
- enacting appropriate drink-driving policies;
- reducing demand through taxation and pricing mechanisms;
- raising awareness of public health problems caused by harmful use of alcohol and ensuring support for effective alcohol policies;
- providing accessible and affordable treatment for people with alcohol-use disorders; and
- implementing screening and brief interventions programmes for hazardous and harmful drinking in health services.

In addition to global strategies listed above, OIC countries with the help of Islamic scholars can convey the unique message of Islam to the society that Islam prohibits the use of alcohol. If the message is delivered widely and effectively to the society, this strategy can help many Muslims across the OIC countries to stop alcohol intake.
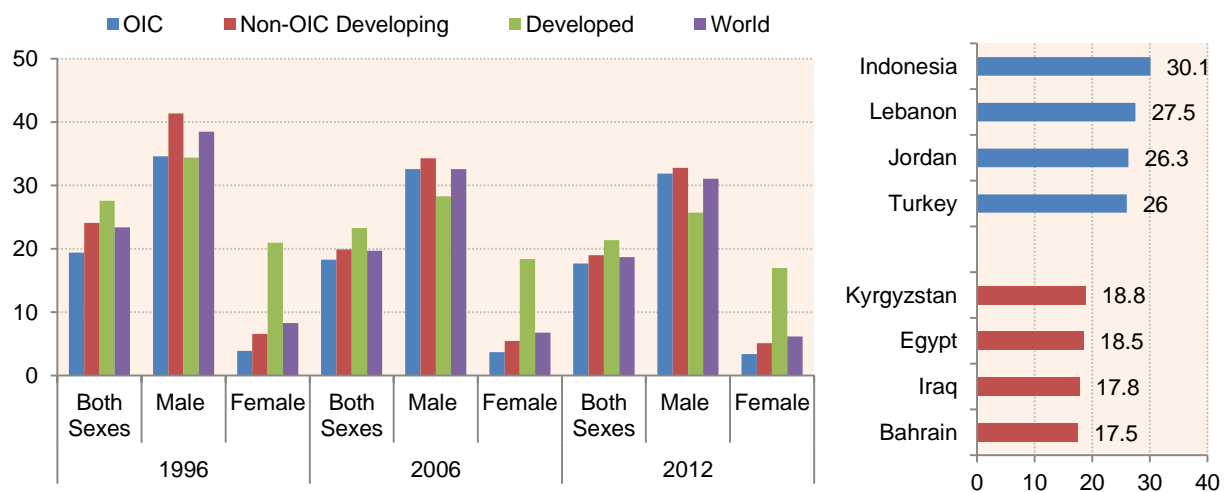
Tobacco Use

The WHO declares that tobacco kills up to half of its users. There are more than 4,000 chemicals in tobacco smoke, of which at least 250 are known to be harmful and more than 50 are known to cause cancer. Developing countries in general suffer the most from tobacco use. Nearly 80% of the world's one billion smokers live in low- and middle-income countries.

According to the Cancer Research UK (2016), smoking is the most important preventable cause of cancer in the world. The main way that smoking causes cancer is by damaging DNA, including key genes that protect people against cancer. Research has shown that for every 15 cigarettes smoked there is a DNA change which could cause a cell to become cancerous. Furthermore, smokers are also less able to handle toxic chemicals than those with healthy lungs and blood. Cigarette smoke also affects the immune system – increasing cells which can encourage tumour growth in the lungs and suppressing the ones which kill cancer cells (Cancer Research UK, 2016).

The risk of premature death and developing cancer from smoking depend on many factors, including the number of years a person smoke, the number of cigarettes he or she smokes per day, the age at which he or she began smoking, and whether or not he or she was already ill at the time of quitting. For people who have already developed cancer, quitting smoking reduces the risk of developing a second cancer. Although it is never too late to get benefit from quitting, the benefit is strongest among those who quit at a younger age (National Cancer Institute, 2016b).

Given the negative consequences of smoking and thanks to global efforts to reduce tobacco use, the prevalence of smoking went down from 23.4% in 1996 to 18.7% in 2012 worldwide (Figure 3.3, left). In OIC countries, the average prevalence of smoking also decreased from 19.4% to 17.7% in the same period (for both sexes). As in other country groups, male population is more exposed to smoking in OIC countries with an average of 31.9% in 2012. In the OIC group, on average, only 3.4% of all women were smoking in 2012. At the individual OIC country level, as shown in Figure 3.3 right, Indonesia had the highest smoking prevalence (30.1%) followed by Lebanon (27.5%) and Jordan (26.3%) in 2012 (for both sexes).

Figure 3.3: Prevalence of Smoking (% of Population, Aged 15+) (Left) and OIC Countries with Highest and Lowest Prevalence, 2012 (Right)

The average reduction seen in smoking in OIC countries is the result of several policy actions, as discussed below in details. In fighting with tobacco use as one of the main risk factor for developing cancer, 30 OIC countries reported existence of operational policy/strategy/action plan to decrease tobacco use out of 51 countries with data in 2013 (Figure 3.4, left). In a similar fashion, 33 OIC countries

out of 56 with available data banned the appearance of tobacco brands in TV and/or films in 2014 (Figure 3.4, right).

While 28 OIC countries were providing treatment for tobacco dependence in health clinics or other primary facilities in 2014, an equal number of member countries did not provide such a treatment (Figure 3.5, left). Furthermore, while 15 OIC countries were providing treatment for tobacco dependence at the hospital level, this service was not available in 31 OIC countries (Figure 3.5, right).

Figure 3.4: Existence of Operational Policy/Strategy/Action Plan to Decrease Tobacco Use in 2013, and Ban on Appearance of Tobacco Brands in TV and/or Films) in OIC Countries in 2014 (right)
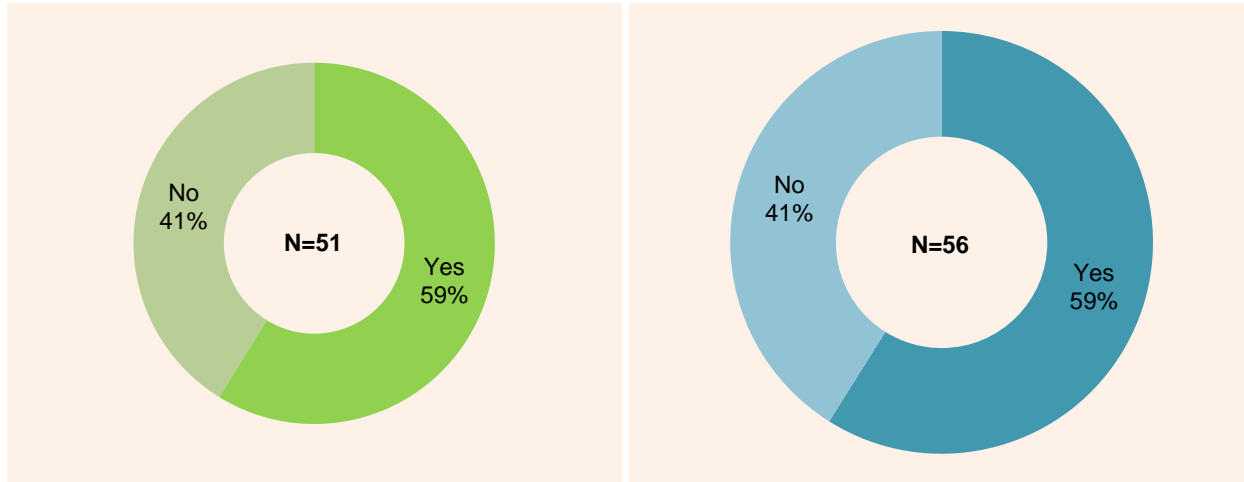
Source: WHO Database

Figure 3.5: Treatment for Tobacco Dependence Available in Health Clinics or Other Primary Care Facilities (Left), and Hospitals (Right) in OIC Countries, 2014
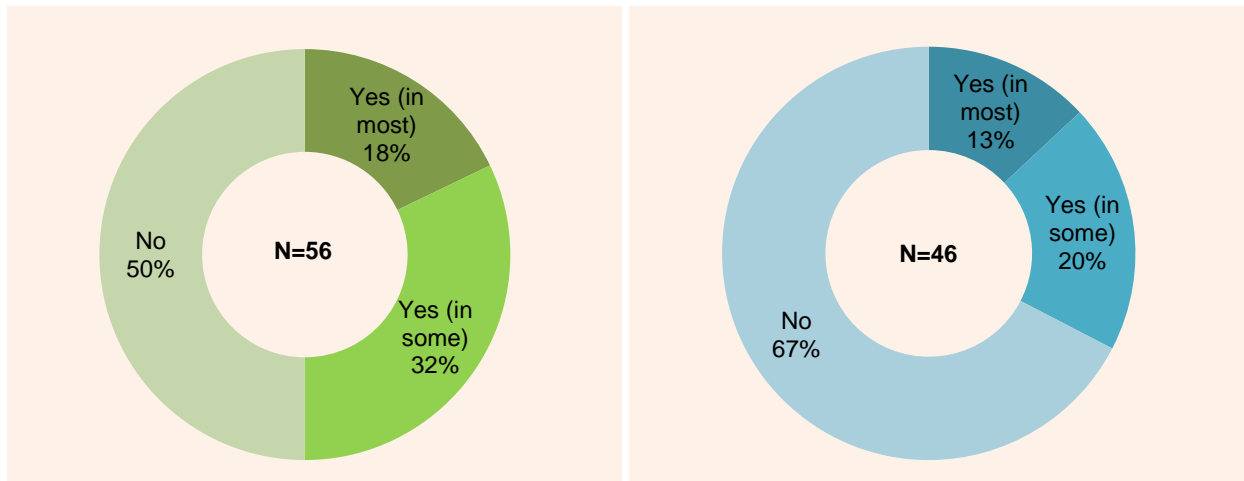
Source: WHO Database

Based on the available data, it is evident that many OIC countries are on the right track to fight against tobacco use by implementing effective policies and strategies. However, still a significant number of OIC countries need to take further actions in order to reduce the use of tobacco. In this regard, implementation of the WHO Framework Convention on Tobacco Control that entered into force in February 2005 is very crucial. In fact, FCTC is one of the most widely embraced treaties in the history of

the United Nations with 180 states, covering 90% of the world's population. In 2008, the WHO introduced a practical, cost-effective way to scale up implementation of provisions of the WHO Framework Convention on the ground called MPOWER. The six MPOWER measures include:

- **M**onitor tobacco use and prevention policies;
- **P**rotect people from tobacco use;
- **O**ffer help to quit tobacco use;
- **W**arn about the dangers of tobacco;
- **E**nforce bans on tobacco advertising, promotion and sponsorship; and
- **R**aise taxes on tobacco.

Insufficient Physical Activity

The WHO defines physical activity as any bodily movement produced by skeletal muscles that require energy expenditure – including activities undertaken while working, playing, carrying out household chores, travelling, and engaging in recreational pursuits. Both, moderate and vigorous intensity physical activity brings health benefits.

There is convincing evidence that physical activity is associated with a reduced risk of cancers of the colon and breast. Several studies also have reported links between physical activity and a reduced risk of cancers of the prostate, lung, and lining of the uterus (endometrial cancer). World Cancer Research Fund International (2016) states that there is a strong link between being physically active and a decreased risk of three cancers: Postmenopausal breast, Colorectal (bowel) and Endometrial (womb).

Insufficient physical activity is a key risk factor for non-communicable diseases (NCDs) such as cardiovascular diseases, cancer and diabetes and one of the 10 leading risk factors for death worldwide. Globally, 3.2 million deaths each year are attributable to insufficient physical activity, according to the WHO estimates.

Though physical activity has significant health benefits and contributes to prevent NCDs, more than 80% of the world's adolescent population is insufficiently physically active mainly due to a complex mix of socio-economic and socio-cultural factors related with lifestyles of people. With increased urbanisation, some additional factors like violence, high-density traffic, low air quality, pollution, and lack of parks, sidewalks and sports/recreation facilities have also started to influence physical activity.

According to latest estimates, on average, prevalence of insufficient physical activity in OIC countries was the highest (27.8%) among all country groups in 2010 (Figure 3.6). The world average was recorded at 25.5% in the same year. Across the OIC regions, the highest prevalence of insufficient physical activity was reported in EAP with an average rate of 38% whereas SSA had the lowest prevalence of insufficient physical activity (21.3%).

The lack of a nationwide operational policy/strategy/action plan to reduce physical inactivity is one of the core reasons behind relatively high prevalence of physical inactivity in OIC countries. As shown in Figure 3.7, among 51 OIC countries with data, only 23 members have an operational policy/strategy/action plan to reduce physical inactivity in 2013. In this context, OIC countries need to intensify their efforts to develop and implement effective strategies to motivate and encourage their people to be more physically active in their daily life.

Figure 3.6: Prevalence of Insufficient Physical Activity among 18+ Population (%), 2010 (Left) and Across OIC Sub-Regions, 2010 (Right)
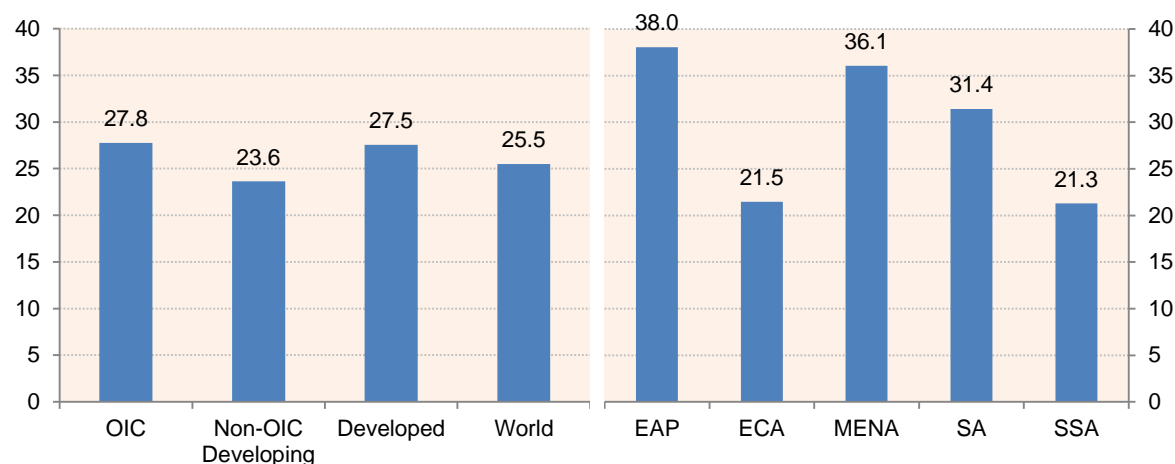
Source: WHO Database, SESRIC Staff Analysis

Figure 3.7: Existence of Operational Policy/Strategy/Action Plan to Reduce Physical Inactivity in OIC Countries, 2013
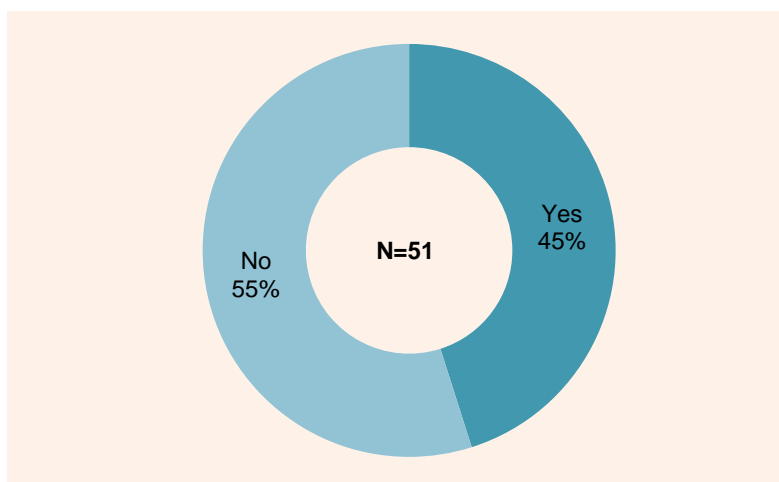
Source: WHO Database

Obesity

Obesity is defined as abnormal or excessive fat accumulation that may impair health. The WHO defines obesity as body mass index (BMI) greater than or equal to 30.[1] Obesity leads to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. Risks of coronary heart disease, ischemic stroke and type 2 diabetes mellitus increase steadily with increasing BMI. A higher BMI also raises the risk of cancer of the breast, colon, prostate, endometrium, kidney and gall bladder.

Body fatness influences the levels of a number of hormones and growth factors. Insulin and leptin are all elevated in obese people, and can promote the growth of cancer cells. In men, obesity is related to lower serum testosterone levels, which in turn may be associated with enhanced risk of or adverse outcome in

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[1] Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m2).

advanced prostate cancer. Obesity is a risk factor for non-alcoholic steatohepatitis (NASH), which may progress to cirrhosis, and therefore associates with an increased risk of developing liver cancer. In addition, obesity is a known cause of gallstone formation, and having gallstones increases the risk of gallbladder cancer. Excess body fat increases the risk of high blood pressure - a factor positively related to the development of kidney cancer. In summary, being overweight or obese increases the risk of 10 cancers: liver, advanced prostate, ovarian, gallbladder, kidney, colorectal, oesophageal, postmenopausal breast, pancreatic, and endometrial (World Cancer Research Fund International (2016).

Globally, obesity has more than doubled since 1980. In 2014, more than 1.9 billion adults (18 years and above) were overweight. Over 600 million (or 13% of adults aged 18 years) of these overweight people were obese. According to the WHO estimates, prevalence of obesity is over four times higher in high-income countries compared to the low-income countries.

As shown in Figure 3.8 (left), prevalence of obesity in OIC countries has increased from 15.2% in 2010 to 17% in 2014. In developed countries, the average prevalence rate reached to 21.8% in 2014. Among all country groups, OIC average was the lowest. Among the OIC sub-regions, MENA is exposed to obesity the most with an average prevalence rate of 29.9% whereas SA has the lowest prevalence with an average of only 5% (Figure 3.8, right). At the individual country level, prevalence of obesity ranged from 2.9% in Afghanistan to 42.3% in Qatar.

Figure 3.8: Prevalence of Obesity among 18+ Population (% of Population, left) and Across OIC Sub-Regions in 2014 (Right)
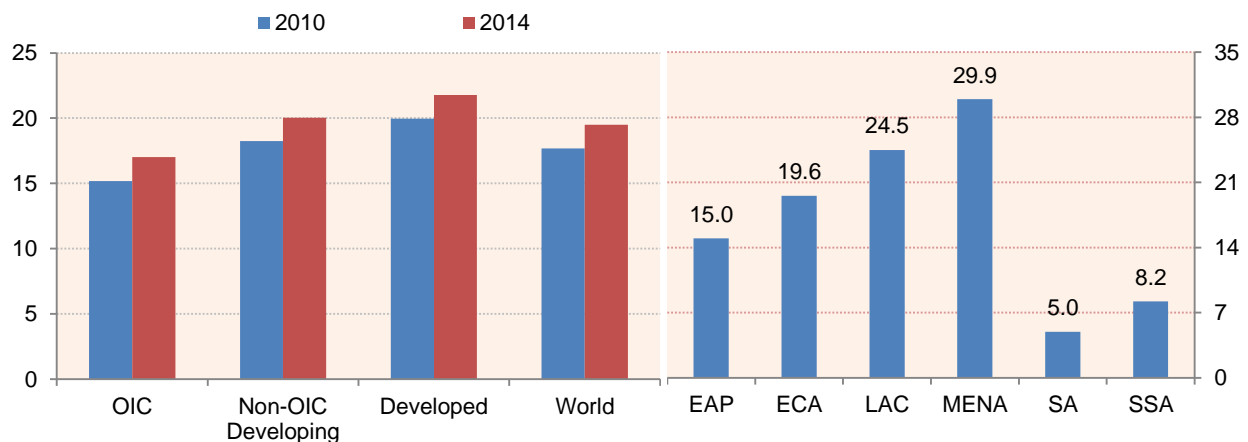
In fact, obesity is preventable by adopting a healthy life style. At the individual level, people can limit energy intake from total fats and sugars; increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts; engage in regular physical activity (60 minutes a day for children and 150 minutes per week for adults). The food industry can play a significant role in promoting healthy diets by reducing the fat, sugar and salt content in processed foods; ensuring that healthy and nutritious choices are available and affordable to all consumers; practicing responsible marketing especially those aimed at children and teenagers; and by ensuring the availability of healthy food choices and supporting regular physical activity practices at workplace. In this regard, authorities in OIC countries are responsible for designing policies to promote healthy diet, encourage increased physical activity and regulate food industry for the benefit of their people.

3.3   Early Detection and Treatment

Every cancer type requires a specific treatment regimen, which encompasses one or more modalities such as surgery, and/or radiotherapy, and/or chemotherapy. In this regard, early detection and correct diagnosis are essential for adequate, effective and successful treatment. More precisely, recognizing possible warning signs of cancer and taking prompt action leads to early diagnosis. Increased awareness of possible warning signs of cancer among the public can have a considerable impact on the disease. Some early signs of cancer include lumps, sores that fail to heal, abnormal bleeding, persistent indigestion as well as chronic hoarseness. Early detection is particularly relevant for cancers of the breast, cervix, mouth, larynx, colon, rectum and skin. In this context, this section aims to present the general availability of cancer screening facilities in OIC countries by using the data from Country Capacity Survey conducted by the WHO in 2013.

Screening

Cancer screening refers to the use of tests across a healthy population in order to identify individuals who have cancer, but do not yet have symptoms such as breast cancer screening using mammography, cervical cancer screening using cytology screening methods and colon cancer screening using colonoscopy.

General availability of breast cancer screening at the primary health care level indicates whether or not the country has breast cancer screening (by palpation or mammogram) generally available at the primary health care level. In 2013, 39 out of 51 OIC countries (76%) have general availability of breast cancer screening at the primary health care level (Figure 3.9). Such a ratio is comparable to the developed countries of 97% and the world average of 85%.

General availability of cervical cytology at the primary health care level indicates whether the country has cervical cytology generally available at the primary health care level. In 2013, 31 out of 50 OIC countries (62%) have general availability of cervical cytology at the primary health care level (Figure 3.9). Such a ratio is low compared to the developed countries of 100% and the world average of 78%.

On the other hand, general availability of colon cancer screening at the primary health care level indicates whether or not the country has colon cancer screening (by digital exam or colonoscopy) generally available at the primary health care level. In 2013, 26 out of 48 OIC countries (54%) have general availability of colon cancer screening at the primary health care level (Figure 3.9). This ratio is extremely low compared to the developed countries average of 100% and the world average of 71%.

Medication and Treatment

The research-based pharmaceutical industry plays a unique role in developing new medicines to treat and cure cancers. More precisely, improvements in existing cancer treatments have cut annual death rates by half (Analysis Group, 2013). Today, the cost of developing a single drug amounts to over USD 1.5 billion compared to USD 138 million in 1975 (EFPIA, 2014). This ten-fold increase shows different technical, regulatory and economic challenges facing R&D. Companies often experience lost R&D investments because pharmaceutical R&D is marked by high failure rates, especially for cancer treatments. In other words, an early-phase may have a promising outlook, but only preclinical and clinical trials will demonstrate its quality and safety. However, with the help of major medical discoveries, the research-based pharmaceutical industry has developed more than 3,400 medicines used

to treat cancer in 2013 (IFPMA, 2014). Leukaemia has the highest number of medicines (383) followed by lung cancer (142), skin cancers (105), breast cancer (95) and colon cancer (63).

Figure 3.9: Availability of Breast (by palpation or mammogram), Cervical cytology and Colon Cancer Screening at the Primary Health Care Level in OIC countries, 2013
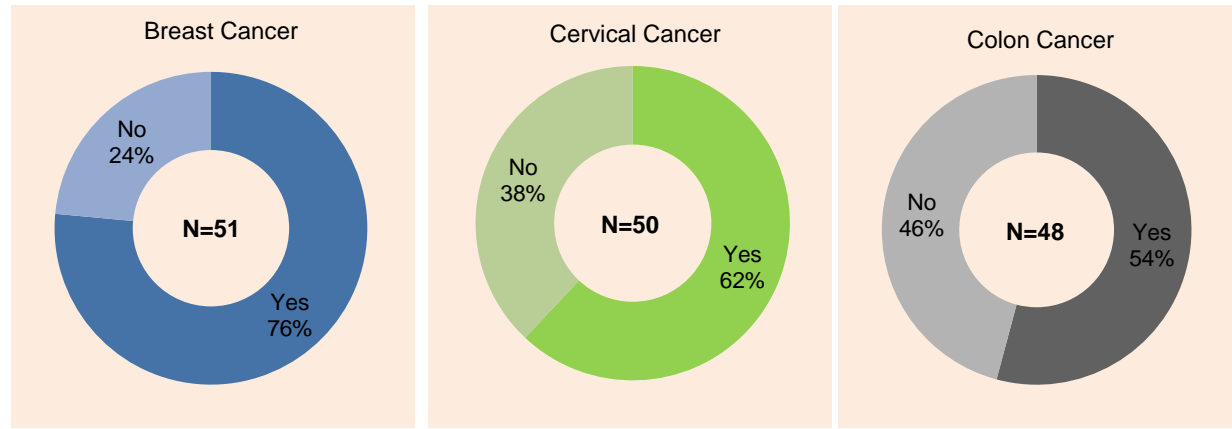
Source: WHO Country Capacity Survey 2013, SESRIC Staff Analysis

Radiotherapy is one of the most common treatments for cancers. This technique uses high-energy radiation of X-rays and gamma rays to shrink tumors and kill cancer cell. It is considered as the most cost effective treatment that cures more patients than all other drugs put together, according to the findings of Cancer Research UK. In this context, the availability of radiotherapy units in hospitals is a very important indicator of existing cancer cure and treatment capacities in a country/region.

According to the latest estimates of WHO, availability of radiotherapy units per 100,000 population in OIC countries is very low compared to other country groups. As shown in Figure 3.10, OIC countries as a group recorded less than one radiotherapy unit available for100, 000 population in 2013. In a sharp contrast, availability of radiotherapy treatment was significantly high in developed countries, with five units available per 100,000 population. In fact, OIC average remained even lower than the averages of other developing countries (1.6) and the world (2.0).

Figure 3.10: Availability of Radiotherapy Units per 100,000 population, 2013
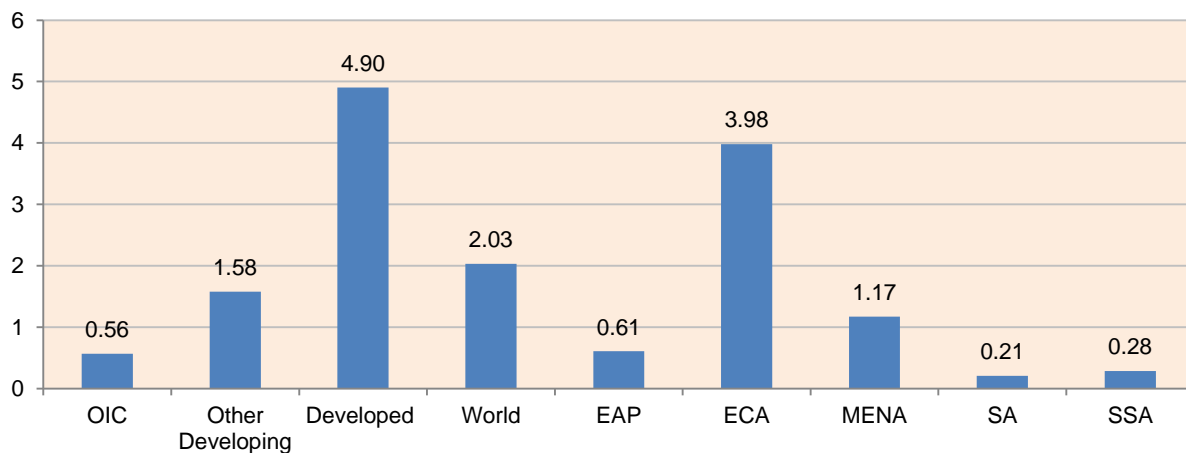
Source: WHO database, SESRIC Staff Analysis

The availability of radiotherapy treatment varies significantly across the OIC sub-regions. As shown in Figure 3.10, the density of radiotherapy units ranges from 4 units per 100,000 population in ECA to 0.21 units in SA. Among other sub-regions, density of radiotherapy units was 1.17 in MENA, 0.61 in EAP and 0.28 in SSA.

At the individual country level, Suriname and Turkey were ranked at the top with approximately four and two radiotherapy units per million respectively (Figure 3.11). In contrast, Uganda had the lowest density of radiotherapy units among OIC countries in 2013. In general, density of radiotherapy units was more than one in only nine OIC countries whereas this ratio was less than the OIC average in 20 member countries. Among these 20 countries, seven are from SSA, & are from MENA, three are from ECA and two are from SA region.

Figure 3.11: OIC Countries with Highest and Lowest Density of Radiotherapy Units, 2013
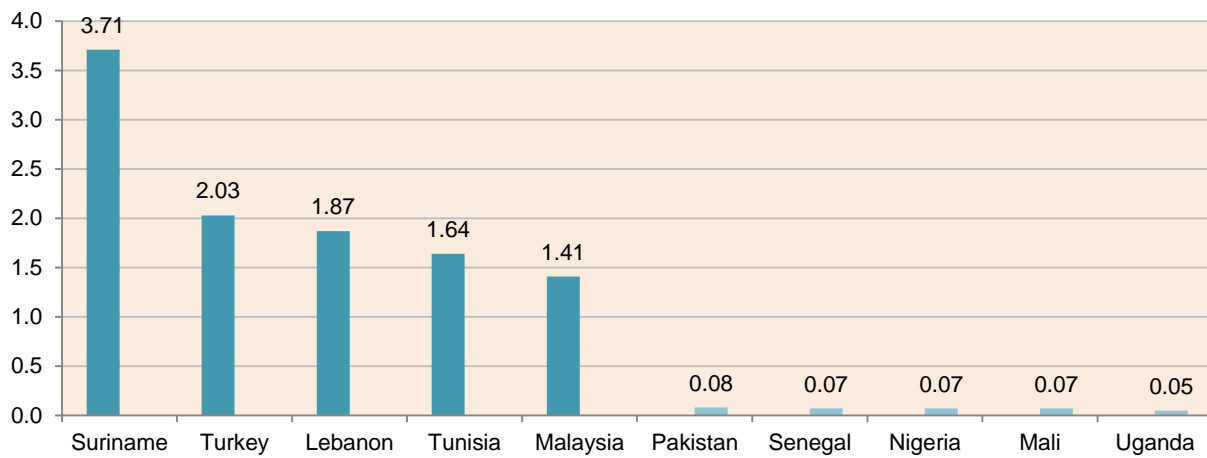
Source: *WHO database*

4. Global and OIC Initiatives to Combat Cancer

Cancer is an international health issue with serious social and economic implications for millions of people living especially in the low-and-middle-income countries. There are many international initiatives to stimulate action towards prevention and control NCDs including cancers. WHO and other regional and international organizations undertook a number of initiatives and issued several strategies and frameworks to promote healthy life style and address the major risk factors of cancers. **Global action plan for the prevention and control of NCDs 2013-2020** is the most important policy document that focuses on four NCDs (cardiovascular diseases, cancer, chronic respiratory diseases and diabetes) and on four shared behavioral risk factors (tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol). This action plan provides a road map and a menu of policy options for all Member States of the WHO and other stakeholders, to take coordinated and coherent action, at all levels, local to global, to attain the nine voluntary global targets, including that of a 25% relative reduction in premature mortality from cancers, diabetes or chronic respiratory diseases by 2025. The **Global Task Force on Expanding Access to Cancer Care and Control**, established in 2009, is another important platform. This task force has published its recommendations in an important report in 2011 to bringing cost down of cancer medicines, emphasizing how to deal with high-priced patented cancer drugs. The Task Force has mobilized many actors in the cancer field so far. **WHO Framework Convention on Tobacco Control (FCTC)**, since its adoption in 2003, brought tobacco control to the forefront in many sectors, including trade, finance and commerce. To achieve a more effective implementation of the FCTC, WHO introduced the MPOWER measures, which are intended to assist in the country-level implementation of effective interventions to reduce the demand for tobacco, contained in the FCTC. Some of the other initiatives include the Global Strategy on Diet, Physical Activity and Health, and the Global Strategy to Reduce the Harmful Use of Alcohol.

Five OIC Ministerial conferences have been held in the area of health with the participation of member countries and various international organizations. These conferences, among others, underlined the importance of tackling NCDs including cancers as well as international cooperation in this regard. During the First Islamic Conference of Health Ministers held in 2007, SESRIC brought the issue of tobacco use on its agenda and facilitated the adoption of **Ministerial Resolution on Tobacco Control in OIC member countries**. This resolution identified tobacco epidemic as one of the greatest global health threats associated strongly with increased mortality from diseases such as cardiovascular diseases, cancer and respiratory diseases and urged member countries to take several steps including adoption of the WHO-FCTC; development of adequate legislation as a core element in effective control of tobacco products; engagement of religious leaders to harness religious concepts against tobacco and substance use in prevention strategy; and cooperation with SESRIC and IDB to ensure the provision of suitable training programmes. In accordance with the resolution of first ICHM, SESRIC developed **Tobacco Free OIC Initiative** which aims to foster an OIC-wide coordinated approach to curb and control the spread of tobacco epidemic in OIC members. This initiative focuses on training and capacity building programs to facilitate the development and implementation of sustainable national tobacco control strategies in member countries. In this regard, SESRIC has organized several study visits for member countries: Azerbaijan, Egypt, Iran, Iraq, Indonesia, Kyrgyzstan, Kazakhstan, Palestine, Qatar and Saudi Arabia to learn from successful experience of Turkey in tobacco control. In 2010, SESRIC developed and launched the **IbnSina Health Capacity Building (IbnSina-HCaB) Programme** under the umbrella of its flagship programme on OIC Vocational Education and Training (OIC-VET). This programme aims to improve the health service delivery and practices in OIC countries by organising

short-term training programmes regarding needs and capacities of the Ministries of Health. The Centre analyses these needs and capacities through the responses of the related surveys and sends health experts among these countries to perform the needed training programmes. So far, many training courses have been organized covering the issues like prevention and control of diabetes, hospital and health care facility management, minimally invasive surgery and emergency medicines etc. **Integration of the Tobacco Questions for Surveys (TQS) into the National Surveys** in Organization of Islamic Cooperation (OIC) Member States is very recent initiative of SESRIC to technically support the OIC countries in their efforts to integrate the TQS into the on-going national surveys and improve the data collection on tobacco use. Currently, 15 OIC countries have been selected for a pilot study under the framework of this project.

OIC Strategic Health Programme of Action (OIC-SHPA) 2014-2023 is the major OIC initiative in the domain of health. SESRIC as the lead institution prepared this important document along with its implementation plan in collaboration with member countries, relevant OIC institutions and international health organizations. OIC-SHPA is a framework of cooperation among OIC member countries, relevant OIC institutions and international organizations in the domain of health. It aims to strengthen health care delivery system and improve health situation in OIC countries especially by facilitating and promoting intra-OIC transfer of knowledge and expertise. Based on the analysis of current health status of OIC countries and magnitude of their health problems, OIC-SHPA identified six thematic areas for joint action: (1) Health System Strengthening, (2) Disease Prevention and Control, (3) Maternal, New-born and Child Health and Nutrition, (4) Medicine, Vaccine and Medical Technologies, (5) Emergency Health Response and Interventions, and (6) Information, Education, Research and Advocacy. Thematic area 2: Disease Prevention and Control, covers both communicable and non-communicable diseases and proposes five programmes of action for their prevention and control. These programmes of action propose several actions and activities both at national and intra-OIC level to prevent, combat and control cancers by promoting community awareness and participation; improving health system capacity; increasing the outreach; establishing a sound monitoring and evaluation framework; and enhancing health diplomacy and engagement with regional and international organizations.

5. Concluding Remarks and Policy Recommendations

The state of cancer prevention and control remained significantly poor in many OIC countries. The challenge now facing the high-burden OIC countries is how to develop and implement effective policy measures to address the major risk factors like tobacco use, consumption of alcohol; obesity and insufficient physical activity and improve the coverage of cancer screening and treatment to combat deaths and disability caused by cancers.

An analysis of the current stance of cancer monitoring, surveillance and prevention policies in OIC countries revealed that many OIC countries do not have any population-based cancer registry system. This might be an indication that in these countries there is lack of a holistic approach to combat cancer. Among other negative consequences, for instance, the lack of a centralized registry system may cause ineffective provision of cancer medicines, which can threat health status of many cancer patients. In this regard, it is highly recommended to develop and enhance such a capacity as soon as possible. Experiences of OIC countries with a cancer registry system may be helpful to others. To this end, experience sharing and exchange of best practices modalities can be used among OIC countries.

Another missing component in many OIC countries in their efforts to prevent cancer and reduce cancer led mortalities is the lack of national operational policies/strategies and action plans. In 2013, only 10 OIC countries indicated that they developed such a policy/strategy and action plan for cancer. Without a comprehensive policy/strategy and action plan for cancer, efforts of different ministries and public institutions within a country usually remain ineffective and only may have a partial impact on prevention. It is therefore, strongly recommended to develop such a comprehensive guideline document(s) in order to make concerted efforts and ensure effectiveness of their efforts on cancer.

Cancer develops as a combined result of internal factors (i.e. genetic inheritance) and external factors (i.e. risk factors). The current level of technology does not allow modifying genetic map of human beings therefore internal factors can be accepted as given, although extensive research studies have being undertaken for a long-time. In contrast, on external factors (i.e. risk factors), every person has some control and through their policies governments can play some role on these factors. Therefore, by unleashing a fight against major risk factors (alcohol and tobacco use, obesity accompanied with unhealthy diet, and physical inactivity) that cause development of several types of cancer, it is possible to prevent cancer/reduce number of cancer cases, increase the effectiveness of cancer treatment with a view to improve the health status of patients, and ultimately decrease the number of cancer led mortality and morbidity.

Many prevention methods are not too costly and are easy to implement. There are also several treatment methods for different cancer types, thanks to the developments in the pharmaceutical industry and medical technologies. Therefore, it is possible to record a significant reduction in the number cancer cases seen in OIC countries and improve the health status of many cancer patients through effective prevention and treatment.

Fighting with the risk factors and promoting healthy life styles not only will reduce mortalities stemming from cancer but also reduce public and out-of-pocket spending on healthcare. In that context, policy-makers need to formulate effective strategies in order to promote and raise public awareness on healthy life styles. In order to achieve this, both in terms of prevention and control of cancer OIC countries need to develop and implement effective strategies. International guidelines and cooperation with international organisations will help a lot to save money and time for many OIC countries. In this context, the OIC Strategic Health Programme of Action (SHPA) 2014-2023 provides a window of

opportunity to enhance cooperation among OIC countries in disease prevention and control including cancer. The existing WHO Guidelines also propose strategies in combating with several communicable and non-communicable diseases including cancer that can be applicable to many OIC countries in this context.

All member states of the WHO have agreed to reduce insufficient physical activity by 10% by 2025. In order to encourage physical activity and reach this target, OIC members need to ensure that: walking, cycling and other forms of active transportation are accessible and safe for all; labour and workplace policies encourage physical activity; schools have safe spaces and facilities for students to spend their free time actively; physical education supports children to develop behaviour patterns that will keep them physically active throughout their lives; and sports and recreation facilities provide opportunities for everyone to do sports. In this regard, policy makers in OIC countries need to make necessary arrangements to promote more active life-style in order to have more healthy generations and to reduce the pressure on social security systems.

Building up mechanisms and platforms to share country experiences and transfer best practises among OIC countries in the domain of cancer prevention, screening and treatment will help many OIC countries to develop and adopt effective methods with a negligible cost. In this regard, the Reverse Linkage Programme of the Islamic Development Bank constitutes an important benchmark programme that needs to be explored and utilised by OIC countries.

The existence of heterogeneity in terms of development profiles of OIC countries also reflects in their performance in cancer prevention and control. In other words, the necessities and priorities of OIC countries can vary significantly in the domain of cancer prevention and control depending on their climate zone, genetic inheritance, quality of infrastructure, available public funds etc. Therefore, international guidelines and intra-OIC cooperation have their limits to help OIC countries in cancer prevention and control. In this regard, the lion share of the responsibility in cancer prevention and control remains with national policy-makers, experts and civil society in OIC countries. Therefore, training of policy-makers, experts and civil society needs to be an integral part of developing and implementing a successful cancer prevention and control strategy in order to equip them with the recent scientific knowledge, information and state-of the art technologies to combat with cancer. OIC countries can extensively benefit from the relevant training and capacity building programmes of the Statistical Economic and Social Research and Training Centre for Islamic Countries (SESRIC), which aims to foster intra-OIC cooperation especially through transfer of knowledge and exchange of expertise.

Screening programmes should be undertaken only when their effectiveness has been demonstrated when resources are sufficient to cover nearly the entire target group, and when prevalence of the disease is high enough to justify the effort and costs of screening. Moreover, several studies are currently evaluating low cost approaches to screening that can be implemented in low-resource settings. For example, visual inspection with acetic acid may be an effective screening method for cervical cancer in the near future. There is need for more studies that evaluate low cost methods to conduct mammography screening and clinical breast examination.

Furthermore, pharmaceutical industry relies heavily on research and development (R&D) activities. Proper R&D facilities for cancer should be built and researchers and technicians should be provided with necessary financial resources to develop an innovative pharmaceutical industry in the OIC member countries. At the intra-OIC level, member countries should collaborate with each other by sharing expertise for the development of pharmaceutical industry. At the same time, students mainly from least developed countries can be enrolled in pharmaceutical related academic disciplines in member

countries with substantial pharmaceutical base like Turkey, Egypt, Jordan and Malaysia to equip them with necessary knowledge and expertise in this field. At the international level, OIC countries should collaborate with the international agencies like WHO and World Bank to benefit from their expertise and financial contribution to build their domestic pharmaceutical industry. OIC countries should work towards regional harmonization and simplification of regulatory requirements to increase access to good quality, safe and effective medicines.

Moreover, access to cancer treatment is heavily dependent on the availability of affordable medicines. A regular supply of essential medicines in OIC countries is required to avoid medicine shortages that can cause avoidable suffering and death. Pharmaceutical companies in OIC countries should be encouraged to produce more affordable essential medicines locally. More precisely, support to the local manufacturers of medical products i.e. policies that reduce the cost of manufacture such as grants, subsidies, land, tax and duty exemptions for imported inputs for local production should be facilitated. OIC countries should support the development of technical specifications for medical devices including cancer prevention, diagnosis and treatment in order to provide information for decision-makers about the minimum requirements needed for a device to be procured. Many member countries also need to develop national guidelines and policies in accordance with international norms and standards on the procurement and distribution of cancer medicines and medical devices in order to ensure the safety, efficacy, and quality across the distribution channels.

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Statistical Annexes

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Table A.3: Cancer Plans, Monitoring and Surveillance

Table A. 4: Status of Prevention Policies

Table A.5: Early Detection and Treatment, 2013

Table A.1: Incidence of Cancer 2012

Country	New Cancer Cases			Age-Standardized Incidence Rate		
	Men	**Women**	**Both**	**Men**	**Women**	**Both**
Afghanistan	9511	10467	19978	112.4	119.5	115.2
Albania	3639	3504	7143	185	173.2	178.3
Algeria	16385	21523	37908	116.2	132.7	123.5
Azerbaijan	7154	6762	13916	165.8	124	141.9
Bahrain	463	435	898	112.8	121.9	112.4
Bangladesh	60696	62019	122715	109.4	100	104.4
Benin	2057	3043	5100	87.2	102.7	94.3
Brunei	231	290	521	149.5	179	163.2
Burkina Faso	2748	5012	7760	75.9	99.8	88.2
Cameroon	5450	8331	13781	81.2	114.1	97.6
Chad	2432	3646	6078	77.4	99.2	88.1
Comoros	165	297	462	81.9	121.8	101.5
Cote d Ivoire	5430	6572	12002	78.2	101	89
Djibouti	210	371	581	73.7	111.3	92.7
Egypt	52958	55653	108611	158.4	147.8	152
Gabon	438	602	1040	79.9	101.5	90.2
Gambia	292	265	557	67.3	69.6	68.2
Guinea	2337	2969	5306	88.9	94	90
Guinea-Bissau	311	503	814	70	96	83.1
Guyana	377	640	1017	144.4	193.5	165.9
Indonesia	138840	160833	299673	136.2	134.4	133.5
Iran	44838	39991	84829	134.7	120.1	127.7
Iraq	11489	14177	25666	144.6	131.7	135.3
Jordan	3115	3268	6383	153.3	157.8	155.4
Kazakhstan	18744	21675	40419	282.2	216.7	236.5
Kuwait	870	819	1689	89.8	123.3	102.1
Kyrgyzstan	2680	3123	5803	151.6	129.4	137.6
Lebanon	4321	4738	9059	203.9	192.8	197.4
Libya	3130	2947	6077	135.9	113.1	124.1
Malaysia	18125	19301	37426	144.9	143.4	143.6
Maldives	114	109	223	91.6	84.8	88.9
Mali	3119	6235	9354	83.8	135.6	111.4
Mauritania	690	1153	1843	74.4	97.7	85.7
Morocco	16829	18189	35018	122.7	114.4	117.8
Mozambique	8569	13445	22014	118.3	153	136.8
Niger	2499	3402	5901	56.7	71	63.4
Nigeria	37370	64709	102079	79	121.7	100.1
Oman	807	677	1484	78.6	92.4	82.1
Pakistan	63451	84590	148041	96	127.7	111.8
Palestine	1669	1795	3464	150.5	142.7	145.7
Qatar	640	377	1017	104	134.5	108.8
Saudi Arabia	8296	9226	17522	85.9	102.8	91.1
Senegal	2458	4318	6776	85.5	115	101.2
Sierra Leone	1082	1715	2797	83.8	97.7	92.3
Somalia	2807	4882	7689	111.9	165.2	139.1
Sudan	9554	10801	20355	92	91	91.1
Suriname	392	451	843	163.8	162.7	159.6
Syria	10405	11386	21791	148.3	145.2	145.9
Tajikistan	2629	2904	5533	128.7	112.3	119.1
Togo	1418	2255	3673	77.2	104.8	91.1
Tunisia	6745	5444	12189	127	95.7	110.6
Turkey	85821	62143	147964	257.8	161.6	205.1
Turkmenistan	2920	3075	5995	159.4	132.8	144
Uganda	14052	15328	29380	175.7	167.4	169.7
United Arab Emirates	1489	1446	2935	83.8	127.1	92.5
Uzbekistan	9836	12793	22629	96.9	103.5	99.7
Yemen	5270	6084	11354	81.2	80.7	80.4

Source: *GLOBOCAN 2012, International Agency for Research on Cancer (IARC)*

Table A.2: Cancer Mortality Estimates 2012

Country	Deaths Caused by Cancer			Age-Standardized Mortality Rate		
	Men	**Women**	**Both**	**Men**	**Women**	**Both**
Afghanistan	8040	7403	15443	103.4	92.9	97.7
Albania	2651	2099	4750	130.9	95.5	112.4
Algeria	10757	10943	21700	79.8	70.9	74.6
Azerbaijan	4983	3964	8947	118.7	73.3	93.2
Bahrain	195	153	348	60.9	50.6	54.3
Bangladesh	49119	42220	91339	89.9	71.9	80.8
Benin	1731	2042	3773	78.1	71.5	73.1
Brunei	119	108	227	81.3	77.1	78.4
Burkina Faso	2414	3801	6215	72.1	80.3	75.8
Cameroon	4237	5199	9436	66.9	73	69.5
Chad	2097	2637	4734	71.9	74.8	72.6
Comoros	143	206	349	75.1	89.4	81.4
Cote d Ivoire	4742	4557	9299	69.6	72.1	70.7
Djibouti	181	254	435	66.7	79.6	73
Egypt	39203	33097	72300	120.5	88.7	103.4
Gabon	298	321	619	54.9	55.4	54.6
Gambia	265	188	453	62.6	54.2	58.2
Guinea	2058	2168	4226	79.9	71	73.9
Guinea-Bissau	274	364	638	64.4	71.4	67.5
Guyana	264	333	597	110	103.2	101.8
Indonesia	102707	91821	194528	103.8	78.5	89.3
Iran	30115	23235	53350	90.4	72.7	81.9
Iraq	8451	9009	17460	113	86.7	96.6
Jordan	2095	1682	3777	105.2	85.5	95.5
Kazakhstan	12878	10942	23820	202.5	104.8	140.2
Kuwait	410	386	796	46.4	69.3	54.8
Kyrgyzstan	2101	1873	3974	125.2	81.2	99.9
Lebanon	2588	2243	4831	119.5	89.6	103.2
Libya	1990	1537	3527	88.9	62.2	75.1
Malaysia	11281	10397	21678	91.8	80.2	85.7
Maldives	80	49	129	63.8	42.3	53.7
Mali	2538	4388	6926	77.3	101.4	89.9
Mauritania	588	757	1345	68.3	68.2	67.2
Morocco	12462	10336	22798	92.3	66.8	78.4
Mozambique	6912	10105	17017	108.6	121.4	114.8
Niger	2139	2510	4649	53.7	55.2	53.9
Nigeria	30924	40647	71571	67.4	78	72.1
Oman	535	353	888	57.8	54	55.3
Pakistan	48449	52664	101113	75.4	83.6	79.6
Palestine	1169	1011	2180	113.8	89.1	100.5
Qatar	347	137	484	71.8	66.6	69.4
Saudi Arabia	4913	4221	9134	56.8	52.7	53.9
Senegal	2017	2836	4853	76	80.8	78.7
Sierra Leone	947	1264	2211	82.2	78.4	82.1
Somalia	2239	3252	5491	96	116.7	106.2
Sudan	7912	7598	15510	80.1	67	72.9
Suriname	274	248	522	113.8	87.7	97.7
Syria	7390	6541	13931	108.9	87	97.1
Tajikistan	2061	1826	3887	107.6	75.4	89.6
Togo	1208	1552	2760	68.3	74.8	71.2
Tunisia	4511	2828	7339	84.1	49.3	66
Turkey	58715	33111	91826	179	86.7	128.8
Turkmenistan	2135	1856	3991	123.8	84.8	102
Uganda	11150	10392	21542	152.7	120.3	134.2
United Arab Emirates	744	513	1257	57.9	64.9	58
Uzbekistan	7476	7438	14914	77.4	63.4	69.6
Yemen	4236	4186	8422	70.8	59.6	64.4

Source: *GLOBOCAN 2012, International Agency for Research on Cancer (IARC)*

Table A.3: Cancer Plans, Monitoring and Surveillance

Country	Existence of National, Population-Based Cancer Registry	Existence of Operational Policy/Strategy/Action Plan
	Status	Status
Afghanistan	No	No
Albania	No	Yes
Algeria	No	Yes
Azerbaijan	No	Yes
Bahrain	No	Yes
Bangladesh	No	Yes
Benin	No	No
Brunei	Yes	No
Burkina Faso	No	No
Cameroon	No	Yes
Chad	..	..
Comoros	No	No
Côte d'Ivoire	No	Yes
Djibouti	No	No
Egypt	No	No
Gabon	No	No
Gambia	Yes	No
Guinea	No	Yes
Guinea-Bissau	No	No
Guyana	..	..
Indonesia	No	Yes
Iran	No	Yes
Iraq	No	Yes
Jordan	Yes	Yes
Kazakhstan	Yes	Yes
Kuwait	Yes	No
Kyrgyzstan	No	Yes
Lebanon	No	..
Libya	No	No
Malaysia	No	Yes
Maldives	No	No
Mali	No	..
Mauritania	No	Yes
Morocco	No	Yes
Mozambique	No	Yes
Niger	No	No
Nigeria	No	No
Oman	Yes	No
Pakistan	No	No
Palestine	..	..
Qatar	Yes	Yes
Saudi Arabia	Yes	Yes
Senegal	No	No
Sierra Leone	..	..
Somalia	No	No
Sudan	No	Yes
Suriname	No	Yes
Syria	No	Yes
Tajikistan	No	Yes
Togo	No	Yes
Tunisia	No	No
Turkey	Yes	Yes
Turkmenistan	No	Yes
Uganda	No	No
UAE	Yes	No
Uzbekistan	No	Yes
Yemen	No	No

Source: WHO Database

Table A. 4: Status of Prevention Policies

Country	Existence Operational Action Plan to Reduce the Harmful Use	Existence of Action Plan to Decrease Tobacco Use	Ban on Appearance of Tobacco Brands in TV and/or Films	Treatment for Tobacco Dependence Available in Health Clinics/ Primary Care Facilities	Existence of Operational Action Plan to Reduce Physical Inactivity
Afghanistan	No	No	Yes	No	No
Albania	Yes	No	Yes	Yes, in some.	No
Algeria	Yes	Yes	No	Yes, in some.	Yes
Azerbaijan	No	No	Yes	No	No
Bahrain	Yes	Yes	Yes	Yes, in most.	Yes
Bangladesh	Yes	Yes	No	Yes, in some.	Yes
Benin	No	Yes	No	No	No
Brunei	Yes	No	Yes	Yes, in some.	No
Burkina Faso	No	Yes	Yes	No	No
Cameroon	No	Yes	No	No	Yes
Chad	..	..	Yes	No	..
Comoros	No	No	No	No	No
Côte d'Ivoire	Yes	Yes	No	No	Yes
Djibouti	No	No	Yes	No	No
Egypt	No	Yes	Yes	Yes, in some.	No
Gabon	No	No	No	No	No
Gambia	No	No	Yes	No	No
Guinea	Yes	Yes	Yes	Yes, in most.	Yes
Guinea-Bissau	No	No	No	Yes, in some.	No
Guyana	..	..	No	Yes, in some.	..
Indonesia	Yes	Yes	No	Yes, in some.	Yes
Iran	Yes	Yes	Yes	Yes, in some.	Yes
Iraq	..	Yes	Yes	No	Yes
Jordan	Yes	Yes	No	Yes, in some.	Yes
Kazakhstan	..	..	Yes	Yes, in some.	..
Kuwait	No	No	Yes	Yes, in most.	No
Kyrgyzstan	Yes	Yes	Yes	Yes, in most.	Yes
Lebanon	..	Yes	Yes	No	..
Libya	No	No	Yes	No	No
Malaysia	No	Yes	Yes	Yes, in some.	Yes
Maldives	No	..	Yes	No	No
Mali	No	No	Yes	No	No
Mauritania	No	Yes	No	No	Yes
Morocco	No	Yes	Yes	Yes, in most.	No
Mozambique	Yes	Yes	No	No	Yes
Niger	No	No	Yes	No	No
Nigeria	No	No	No	No	No
Oman	No	Yes	No	Yes, in some.	Yes
Pakistan	No	No	Yes	Yes, in some.	No
Palestine	..	..	..	..	..
Qatar	Yes	Yes	Yes	Yes, in some.	Yes
Saudi Arabia	No	Yes	No	Yes, in most.	Yes
Senegal	No	No	No	No	No
Sierra Leone	..	..	No	No	..
Somalia	No	No	No	No	No
Sudan	No	Yes	Yes	No	Yes
Suriname	Yes	Yes	Yes	Yes, in most.	Yes
Syria	No	Yes	Yes	Yes, in most.	No
Tajikistan	Yes	Yes	No	No	Yes
Togo	Yes	Yes	Yes	No	Yes
Tunisia	No	Yes	Yes	Yes, in most.	No
Turkey	No	Yes	Yes	Yes, in some.	Yes
Turkmenistan	Yes	Yes	No	Yes, in most.	Yes
Uganda	No	No	No	No	No
UAE	No	No	Yes	Yes, in some.	No
Uzbekistan	No	No	No	Yes, in some.	No
Yemen	No	No	Yes	No	No

Source: *WHO Cancer Country Profiles 2014*

Table A.5: Early Detection and Treatment, 2013

Country	General Availability of Breast Cancer Screening (by palpation or mammogram) at the primary health care level	General availability of cervical cytology at the primary health care level	General availability of colon cancer screening at the primary health care level	Radiotherapy units
	Status	**Status**	**Status**	**per million population**
Afghanistan	Yes	-	-	0
Albania	Yes	Yes	Yes	0,32
Algeria	Yes	Yes	-	0,43
Azerbaijan	Yes	Yes	Yes	1,59
Bahrain	Yes	Yes	Yes	-
Bangladesh	-	-	Yes	0,12
Benin	Yes	-	-	0
Brunei Darussalam	Yes	Yes	Yes	-
Burkina Faso	Yes	Yes	Yes	0
Côte d'Ivoire	-	-	-	0
Cameroon	Yes	Yes	Yes	0,13
Chad	No data received	No data received	No data received	
Comoros	Yes	Yes	Yes	0
Djibouti	Yes	-	-	-
Egypt	Yes	Yes	Yes	0,79
Gabon	Yes	Yes	Yes	0,6
Gambia	Yes	Yes	-	0
Guinea	-	-	-	0
Guinea-Bissau	Yes	-	-	0
Guyana	No data received	No data received	No data received	1,25
Indonesia	-	-	-	0,15
Iran (Islamic Republic of)	Yes	Yes	Yes	0,85
Iraq	Yes	Yes	Yes	0,18
Jordan	Yes	Yes	Yes	0,82
Kazakhstan	Yes	Yes	Yes	1,34
Kuwait	Yes	Yes	-	1,19
Kyrgyzstan	-	Yes	-	0,54
Lebanon	Yes	Yes	Yes	1,87
Libya	-	-	-	0,97
Malaysia	Yes	Yes	Yes	1,41
Maldives	-	-	-	0
Mali	Yes	Yes	-	0,07
Mauritania	-	Yes	Yes	0,26
Morocco	Yes	Yes	Yes	0,39
Mozambique	Yes	Yes	-	-
Niger	Yes	-	-	0
Nigeria	-	-	-	0,07
Oman	Yes	Yes	Yes	0,55
Pakistan	-	-	-	0,08
Palestine	-	-	-	-
Qatar	Yes	Yes	Yes	0,92
Saudi Arabia	Yes	-	-	0,1
Senegal	Yes	Yes	Yes	0,07
Sierra Leone	No data received	No data received	No data received	
Somalia	Yes	-	-	-
Sudan	-	Yes	-	0,18
Suriname	Yes	Yes	Yes	3,71
Syrian Arab Republic	Yes	Yes	Yes	0,32
Tajikistan	-	-	-	0,12
Togo	-	-	-	-
Tunisia	Yes	-	-	1,64
Turkey	Yes	Yes	Yes	2,03
Turkmenistan	Yes	Yes	Yes	-
Uganda	-	-	-	0,05
United Arab Emirates	Yes	Yes	Yes	0,64
Uzbekistan	Yes	-	-	0,62
Yemen	Yes	-	-	0,12

Source: WHO Database