2020

QATAR CANCER INFORMATION CENTER (QCIC)

ANNUAL CANCER REPORT

2020

وزارة الصحـــــة العامـــــة
Ministry of Public Health
State of Qatar • دولـــة قطـــر

البرنامـج الوطـــني للسرطان
Cancer National Program

2020

Annual Cancer Report 2020

State of Qatar

Cancer National Program
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DISCLAIMER

Information included in this report reflects the data at the time of closing the database for cleaning and analysis on March 2022. QCIC continues to receive more data and updates, so any missing or incomplete information, will be completed later, and can be provided upon specific requests by email to qncr@moph.gov.qa.

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ABREVIATIONS

ASIR	Age-Specific Incidence Rate
ASR	Age Standardized Rate
CNP	Cancer National Program
CNS	Central Nervous System
cTNM	Clinical Tumor Node Metastases stage
CTR	Certified Tumor Registrar
EMRO	Eastern Mediterranean Regional Office (World Health Organization)
GI	Gastro-Intestinal
GLOBOCAN	Global Cancer Observatory (GCO) database
HMC	Hamad Medical Corporation
ICD 10	International Classification of Disease 10th Revision
ICD O-3	International Classification of Disease for Oncology 3rd Revision
MDT	Multi-Disciplinary Team
MoPH	Ministry of Public Health
MTA	Medical Treatment Abroad
NCCCR	National Center for Cancer Care and Research
NCS	National Cancer Strategy
NHL	Non-Hodgkin Lymphoma
NHS	National Health Strategy
NOS	Not otherwise specified
PHCC	Primary Healthcare Corporation
QNCR	Qatar National Cancer Registry

FOREWORD - MOPH

In the vast world of healthcare, where science meets compassion and data weaves into human stories, we are leading the charge in a significant mission: the battle against cancer. As we present the Annual Cancer Report for 2020, it is with great pride and humility that we share the remarkable strides made by the Qatar National Cancer Registry (QNCR) and the Cancer National Program at MOPH.

This report encapsulates a chronicle of resilience, innovation, and a collective commitment to understanding, preventing, and treating cancer in our diverse and dynamic community. At its core, it reflects the dedication of healthcare professionals, researchers, and the broader community who contribute to the continuum of care. The report's content paints a panoramic view of our collective efforts acknowledging the collaborative spirit that fuels our progress. It offers a clear picture, unveiling the heartbeat of our work, revealing the profound impact of the Qatar Cancer Information Center (QCIC) in shaping our narrative.

Within all these pages, we delve into the intricate nuances of cancer incidence among Qataris and non-Qataris, unraveling the threads that bind us in our pursuit of health equity. The trends of cancer from 2010 to 2020 reveal a dynamic landscape shaped by advancements in medicine, evolving demographics, and the spirit of a nation that persists in the face of challenges. We cast our gaze beyond borders, exploring an international perspective that broadens our understanding and inspires collaboration. The report navigates the delicate terrain of pediatric cancer incidence, offering hope for the youngest members of our community and underscoring our commitment to their well-being. In recognizing the somber reality of cancer-related mortality among Qataris, we acknowledge the importance of our work. This report serves not only as a testament to our achievements but also as a catalyst for renewed determination to confront the challenges that lie ahead.

Each detailed section on specific types of cancer is a tribute to the diversity of human experience. It magnifies the complexities and nuances inherent in our mission, urging us to approach each case with empathy, understanding, and a commitment to excellence. From breast cancer, the most common of all cases, to the intricacies of colorectal, leukemia, thyroid gland, prostate, non-Hodgkin lymphoma, liver and intrahepatic bile ducts, trachea, bronchus, and lung, to the intricacies of urinary tract cancer, we explore the landscape with precision and purpose.

The data management, material and methods, and references sections symbolize the meticulous groundwork that underpins our endeavors. As we navigate the intricate landscape of cancer incidence, we are guided by a profound truth that each statistic represents a life, a family, and a story. Our journey is not only about numbers but about the lives we touch and the stories we shape. Breast cancer emerges as a poignant chapter, the most common of all cases, followed by the intricate narrative of colorectal cancer, a testament to the unique challenges each patient faces.

This Annual Cancer Report is more than a compilation of data. It is a narrative of hope, resilience, and shared commitment to building a healthier future. It is an invitation to reflect, collaborate, and envision a tomorrow where the burden of cancer is alleviated, and the light of well-being shines brightly on all.

In gratitude for the collective spirit that propels us forward and in anticipation of the brighter chapters that lie ahead, we present this Annual Cancer Report with pride and dedication.

Together, let us continue to illuminate the path toward a healthier, cancer-resilient Qatar.

Sheikh. Dr. Mohammad Bin Hamad Al Thani

Vice Chair, National Cancer Governance Board

Director of Public Health

Ministry of Public Health

FOREWORD - HMC

The year 2020 will be remembered by most people across the globe as the year of the COVID19 pandemic. This virus caused an unprecedented number of mortalities across all continents and changed the delivery of healthcare in the short and longer term.
In the State of Qatar, healthcare providers responded rapidly to ensure that all necessary precautions were taken to manage COVID19 positive cases. As a result of our country's leadership and the expertise of healthcare available within the country, the State of Qatar had one of the lowest mortality rates in the world attributed to COVID19.

The number of cancers diagnosed in the State of Qatar in 2020 had decreased from previous years, some of which is a direct consequence of the pandemic, as patients were hesitant to visit PHCC and hospitals and screening services were put on hold during the pandemic. This resulted in some cases being diagnosed at a more advanced stage. Thankfully, due to the fantastic teamwork across the healthcare system in Qatar, cancer services continued to deliver the required care to cancer patients. As the pandemic became more manageable and healthcare services slowly returned to their normal activities and workflows, the NCCCR embarked on several ambitious projects to the benefit of our patients.

The Radiation Oncology Department at NCCCR is the first in the region to install and use the "Ethos System". Ethos is an adaptive radiotherapy solution employing artificial intelligence to create new treatment plans for every session of radiotherapy treatment based on daily anatomical variation. The use of Ethos is of particular importance to clinical sites where daily changes, organ fillings and motions are critical.

The Pharmacy Department at NCCCR recently opened a state-of-the-art Sterile Compounding Pharmacy Unit dedicated to the compounding of chemotherapy and intravenous medications, adhering to the stringent standards set out by the United State Pharmacopeia (USP), the gold standard for Sterile Compounding Units. Adherence to these standards guarantees quality, purity and integrity of products, thus contributing to positive patient outcomes. This new unit has also increased the pharmacy capacity for the compounding of chemotherapy with the ability to compound 200 chemotherapies per day.

In addition to the above, NCCCR has expanded its daycare and inpatient bed capacity, with refurbishment and expansion of the urgent care unit, OPD Clinic expansion and establishment of survivorship and follow up clinics in the Ambulatory Care Center. The supporting foundations for all this work are embedded in a robust cancer registry system. I would like to extend my sincere thanks to the Qatar National Cancer Registry and all the data contributors across the healthcare system in the State of Qatar. Their tireless work and dedication to data entry and management enables the production of these exceptional reports on an annual basis.

Dr. Mohamed Salem Al Hassan

Medical Director & Chief Executive Officer of the National Center for Cancer Care and Research Chair of Corporate Cancer Services, NCCCR

01

OVERALL CANCER INCIDENCE

2020

Overall Cancer Incidence

EXECUTIVE SUMMARY

Qatar National Cancer Registry (QNCR), at the Ministry of Public Health records the incidences of cancer cases in the State of Qatar, with a population of 2,833,679 in 2020.

In the year 2020, QNCR documented 2,042 new cancer cases. Among these cases, 19% were Qatari nationals, while 81% were Non-Qataris. The overall incidence of cancer in 2020 decreased by 19% from the previous year, which was attributed to the impact of the pandemic to the usual cancer screening and referral pathways.

The distribution of cases based on behavior, gender, and nationality is detailed in the following table.

Table 1: Number of cases distributed by behavior, gender and nationality

Cancer Behavior	Non-Qatari			Qatari			Grand Total
	F	M	Total	F	M	Total	
Malignant, primary site (invasive)	645	934	1579	227	144	371	1950
Carcinoma **in situ**	31	25	56	11	10	21	77
Uncertain (Reportable for intracranial and CNS sites only)	2	10	12	0	2	2	14
Benign (Reportable for intracranial and CNS sites only)	1	0	1	0	0	0	1
Grand Total	**679**	**969**	**1648**	**238**	**156**	**394**	**2042**

The crude incidence rate was found to be 72.06 *per 100,000* while Age Standardized Rate ASR was 152.28 *per 100,000* population at risk. Distribution of cases by basis of diagnosis showed that 94.17% of the cases where microscopically confirmed:

Table 2: Basis of Diagnosis

Basis of Diagnosis	N	%
Positive histology	1737	85.06%
Positive cytology	185	9.06%
Radiology and other imaging techniques without microscopic confirmation	44	2.15%
Positive laboratory test/marker study	32	1.57%
Death Certificate Only	30	1.47%
Clinical diagnosis only	11	0.54%
Positive microscopic confirmation, method not specified	1	0.05%
Unknown whether or not microscopically confirmed	1	0.05%
Direct visualization without microscopic confirmation	1	0.05%
Grand Total	**2042**	**100%**

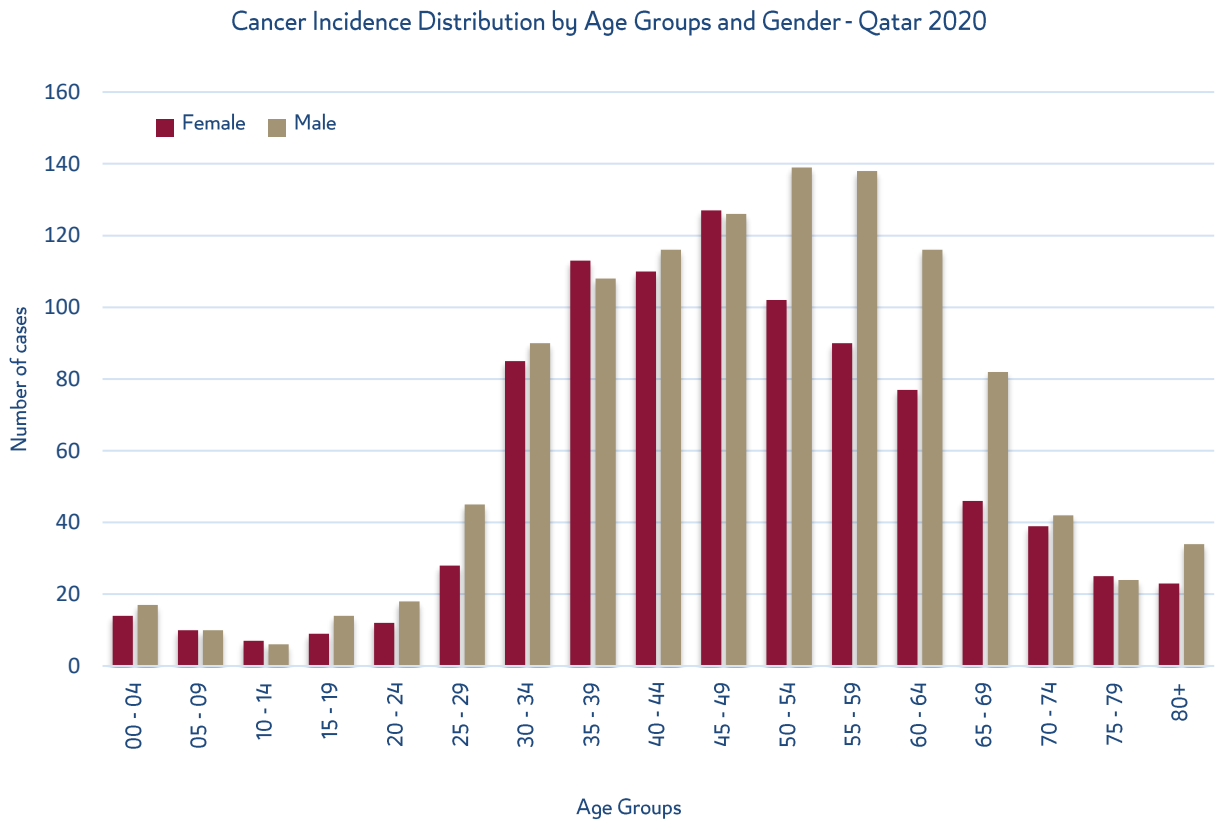
SEER Summary stage, the epidemiological staging system, showed that we had 32.86% of the cases were localized, 29.14% distant, and 23% were regional.

Table 3: SEER Summary stage

SEER Summary Stage	N	%
Localized only	671	32.86%
Distant site(s)/node(s) involved	595	29.14%
Regional lymph nodes only	252	12.34%
Unknown if extension or metastasis (unstaged, unknown, or unspecified)	219	10.72%
Regional by BOTH direct extension AND regional lymph nodes	86	4.21%
In situ	77	3.77%
Regional, NOS	71	3.48%
Regional by direct extension only	70	3.43%
Benign, borderline	1	0.05%
Grand Total	**2042**	**100.00%**

Distribution by age group indicates that the peak of incidence was among the patients between the ages of 45-49 for female cases, and ages 50-54 and 55-59 for male cases.

Figure 1: Distribution of cancer by age groups



The following table 4. presents the most common cancers diagnosed during 2020 amongst all nationalities and genders. Breast was the most common of all cancers with 15.96% of all cases, followed by colorectal (8.91% of the cancer cases).

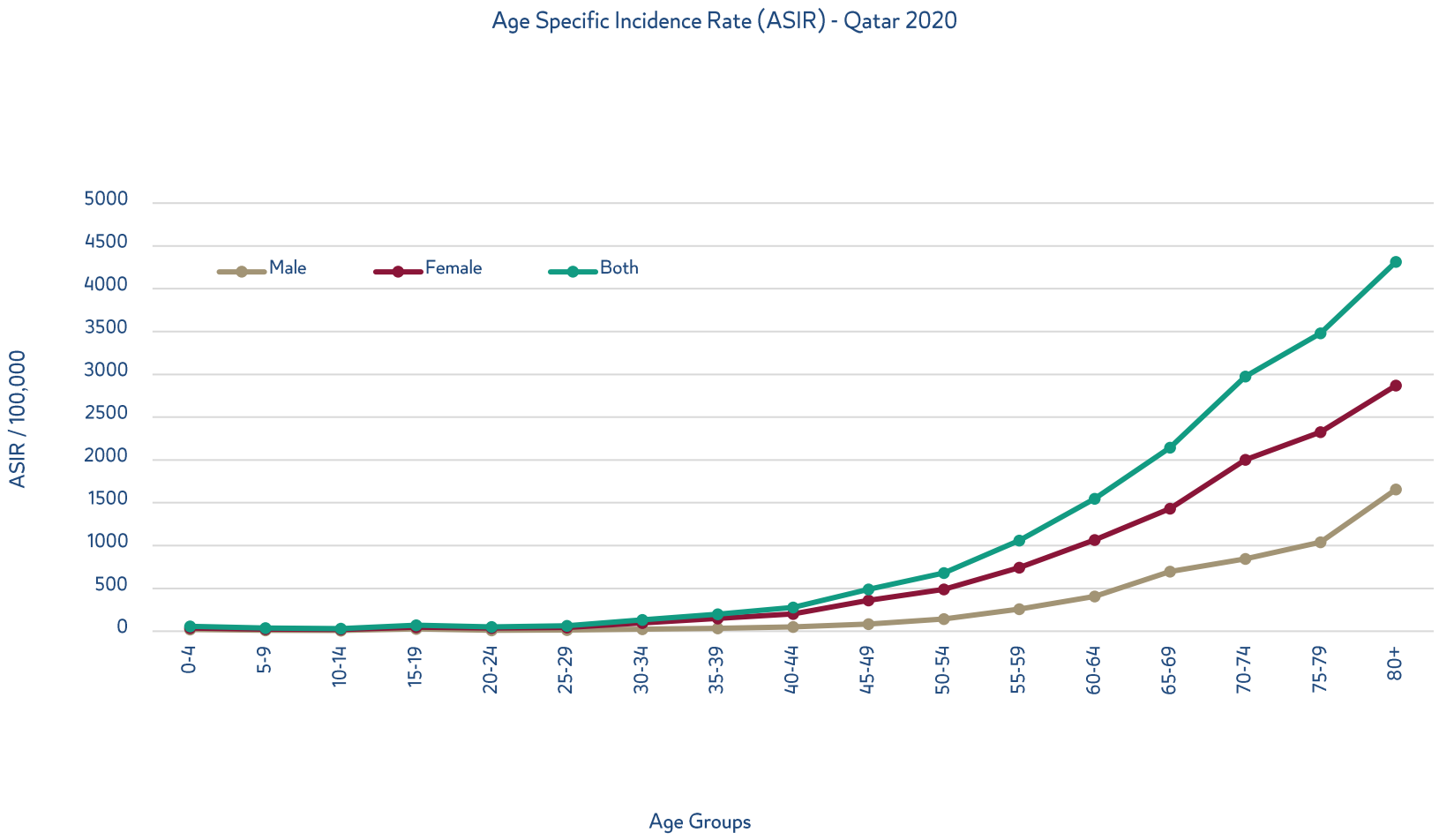
Table 4: Most common cancers, all genders and all nationalities

ICD 10 Codes	Primary Site	N	%
C50 / D05	Breast	326	15.96%
C18-C21 / D01	Colorectal	182	8.91%
C73 / D09.3	Thyroid gland	165	8.08%
C91-C95	Leukemia	144	7.05%
C61 / D07.5	Prostate	84	4.11%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	81	3.97%
C82-C85, C96	Non-Hodgkin Lymphoma	79	3.87%
C70-C72	Brain & CNS	79	3.87%
C44 / D04	Non-Melanoma skin cancer	73	3.58%
C22 / D01.5	Liver and intrahepatic bile ducts	71	3.48%

Table 5: Summary of cancer burden

Age-Groups (5 year)	Male		Female		Both	
	N	ASIR	N	ASIR	N	ASIR
0-4	17	20.63	14	17.72	31	19.21
5 - 9	10	12.45	10	12.94	20	12.69
10 - 14	6	9.16	7	11.18	13	10.15
15 - 19	14	27.78	9	19.50	23	23.82
20 - 24	18	11.49	12	25.93	30	14.78
25 - 29	45	14.64	28	30.79	73	18.32
30 - 34	90	24.28	85	72.88	175	35.91
35 - 39	108	32.79	113	115.55	221	51.73
40 - 44	116	50.12	110	152.58	226	74.46
45 - 49	126	82.73	127	277.74	253	127.76
50 - 54	139	144.39	102	344.96	241	191.52
55 - 59	138	257.92	90	484.94	228	316.39
60 - 64	116	407.69	77	658.23	193	480.69
65 - 69	82	696.98	46	736.47	128	710.68
70 - 74	42	846.26	39	1157.27	81	972.04
75 - 79	24	1039.41	25	1287.33	49	1152.67
80 +	34	1656.92	23	1213.72	57	1444.13
Total (N)	**2042**					
ASR *per 100,000 (WHO population)*	**152.28**					
Crude incidence rate *per 100,000*	**72.06**					
Cumulative risk of incidence [0-74]	**14.19**					

Figure 2: Age-Specific Incidence Rate (ASIR) for both genders of all nationalities



CANCERS ACROSS ALL NATIONALITIES AND GENDERS

When stratifying anatomic primary sites for all cancer cases diagnosed in 2020, it is Malignant neoplasm of thyroid gland that appears to be the most common type with 8.08% of cases, however breast cancer that anatomically presents as either upper-outer, upper -inner quadrants and unspecified collectively account almost 13% of all cancer cases.

Table 6: Top ten Anatomic Distribution of Cancer all gender, all nationalities

ICD-10 Code	Anatomic [Primary Site] ICD 10	Female		Male		Total	
		N	%	N	%	N	%
All Primary Sites		**917**	**100.0%**	**1125**	**100.0%**	**2042**	**100.0%**
C73	Malignant neoplasm of thyroid gland	112	12.21%	53	4.75%	165	8.08%
C509	Breast, unspecified	159	17.34%	3	0.00%	162	7.93%
C50	Malignant neoplasm of breast	103	11.23%	0	0.31%	103	5.04%
C61	Malignant neoplasm of prostate	0	0.00%	84	10.11%	84	4.11%
C220	Liver cell carcinoma	10	1.53%	54	6.36%	64	3.13%
C64	Malignant neoplasm of kidney, except renal pelvis	14	1.53%	39	0.00%	53	2.60%
C71	Endometrium	48	5.23%	0	3.52%	48	2.35%
C920	Malignant neoplasm of brain	15	1.64%	32	2.22%	47	2.30%
C187	Sigmoid colon	17	1.85%	26	3.06%	43	2.11%
C34	Acute myeloblastic leukemia [AML]	13	1.42%	30	0.00%	43	2.11%

Infiltrating duct carcinoma, NOS was the most common type of histology described amongst all patients diagnosed in 2020, accounting for 12.54% of histology results, followed closely by Adenocarcinoma, NOS with 11.95% of all cancer patients reported.

Table 7: Top ten Histology Distribution of Cancer all gender, all nationalities

Histology	N	%
Infiltrating duct carcinoma, NOS (C50)	256	12.54%
Adenocarcinoma, NOS	244	11.95%
Papillary adenocarcinoma, NOS	134	6.56%
Squamous cell carcinoma, NOS	125	6.12%
Acinar cell carcinoma	72	3.53%
Hepatocellular carcinoma, NOS (C22.0)	56	2.74%
Neoplasm, malignant	50	2.45%
Acute myeloid leukemia, NOS	38	1.86%
Diffuse large B-cell lymphoma, NOS	38	1.86%
Renal cell carcinoma, NOS (C64.9)	37	1.81%

MOST COMMON CANCER IN MALES

The most common cancer in males was colorectal cancer with 10.67% of the registered male cancer cases, followed by leukemia cancer with 10.04%, prostate cancer came third with 7.47% of the male cancer cases.

Table 8: Most common cancers in males of all nationalities

ICD 10 Codes	Primary Site	N	%
C18-C21 / D01	Colorectal	120	10.67%
C91-C95	Leukemia	113	10.04%
C61 / D07.5	Prostate	84	7.47%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	61	5.42%
C22 / D01.5	Liver and intrahepatic bile ducts	59	5.24%
C82-C85, C96	Non-Hodgkin Lymphoma	58	5.16%
C70-C72	Brain & CNS	55	4.89%
C73 / D09.3	Thyroid gland	53	4.71%
C67 / D09.0	Bladder	50	4.44%
C44 / D04	Non-Melanoma skin cancer	49	4.36%

MOST COMMON CANCER IN FEMALES

Breast cancer was the most common cancer with 35.11% of the registered female cancer cases. Thyroid gland cancer was the second most common with 12.21%.

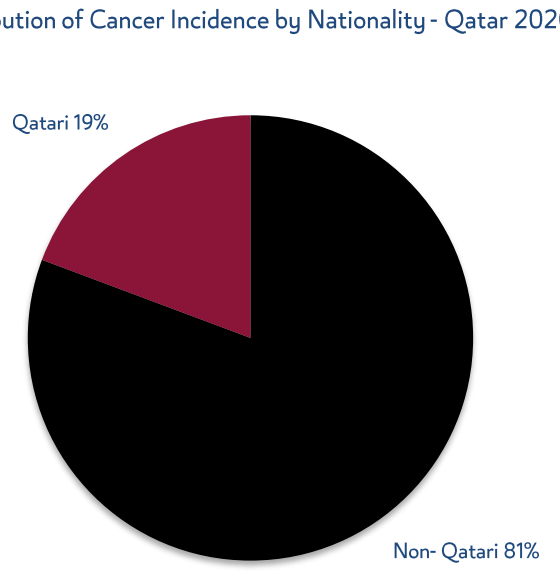
Table 9: Most common cancers in females of all nationalities

ICD 10 Codes	Primary Site	N	%
C50 / D05	Breast	322	35.11%
C73 / D09.3	Thyroid gland	112	12.21%
C18-C21 / D01	Colorectal	62	6.76%
C54-C55 / D07.0	Uterus	55	6.00%
C53 / D06	Cervix uteri	39	4.25%
C91-C95	Leukemia	31	3.38%
C56	Ovary	26	2.84%
C70-C72	Brain & CNS	24	2.62%
C44 / D04	Non-Melanoma skin cancer	24	2.62%
C82-C85, C96	Non-Hodgkin Lymphoma	21	2.29%

DISTRIBUTION BY NATIONALITY

In the year 2020, 394 (19%) new cases of cancer were registered amongst Qataris and 1648 (81%) new cases were in non-Qataris.

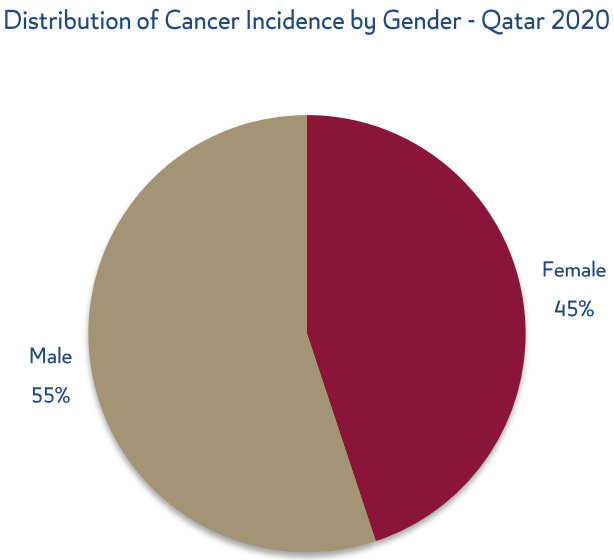
Figure 3: Cancer incidence distribution by nationality



DISTRIBUTION BY GENDER

In 2020, newly registered cancer cases among males of all nationalities were found to be 1125 (55%) cases of total cancer cases, while females accounted for 917 (45%) new cases.

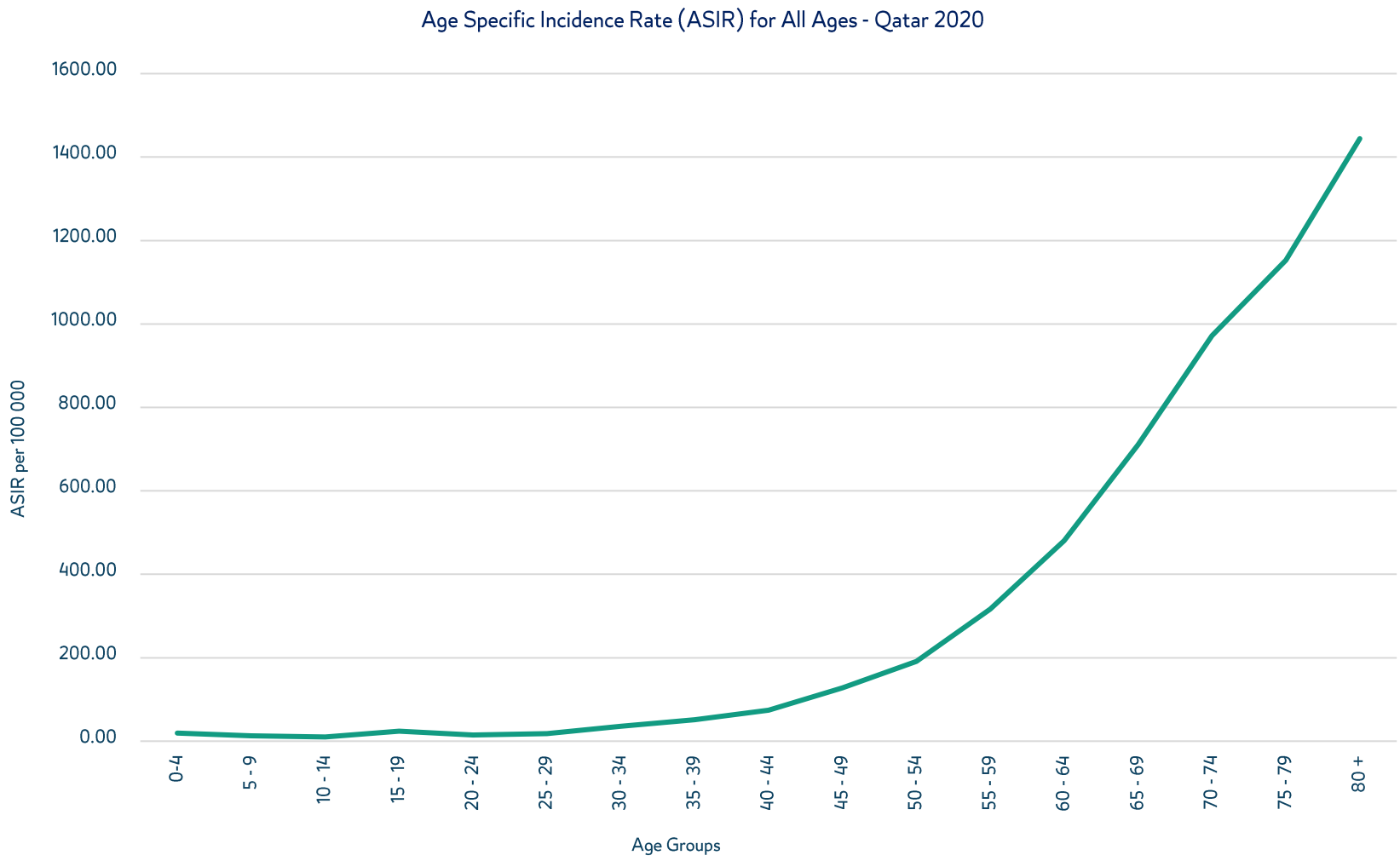
Figure 4: Cancer incidence distribution by gender



AGE SPECIFIC INCIDENCE RATE ASIR

The Age Specific Incidence Rate (ASIR) shows an increasing distribution of cancer cases within older age groups.

Figure 5: Age Specific Incidence Rate (ASIR) for all cancers



02

CANCER INCIDENCE AMONGST QATARIS

2020

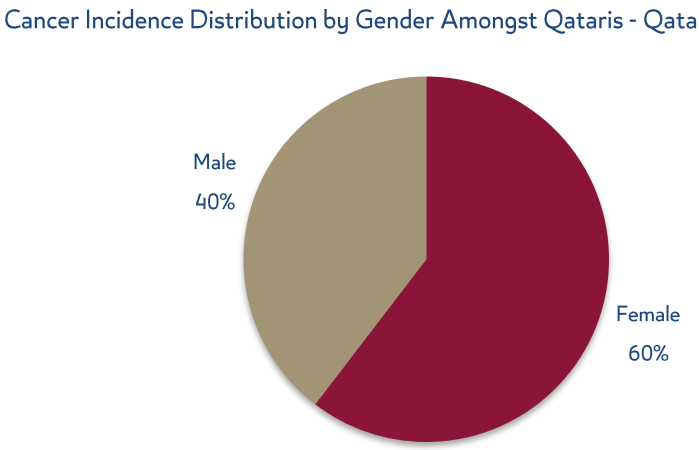
CANCER INCIDENCE AMONGST QATARIS

A total of 349 cancer cases were registered amongst Qataris, which accounted for 19% of all cancer cases newly diagnosed during 2020.

DISTRIBUTION BY GENDER

Of the 2020 cancer diagnosis, 238 (60%) new cases were diagnosed in female Qataris, while 156 (40%) new cases were diagnosed in Qatari males.

Figure 6: Cancer incidence by gender among Qataris



MOST COMMON CANCERS ACROSS ALL GENDERS OF QATARIS

In the Qatari population, the most common cancers newly diagnosed in 2020 were the breast cancer with 17.26% of all Qatari cancer cases, followed by colorectal cancer with 10.91%.

Table 10: Most common cancers across all genders of Qataris, 2020

ICD 10 Codes	Primary Site	N	%
C50 / D05	Breast	68	17.26%
C18-C21 / D01	Colorectal	43	10.91%
C73 / D09.3	Thyroid gland	33	8.38%
C54-C55 / D07.0	Uterus	27	6.85%
C67 / D09.0	Leukemia	23	5.84%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	18	4.57%
C61 / D07.5	Prostate	17	4.31%
C22 / D01.5	Liver and intrahepatic bile ducts	14	3.55%
C82-C85, C96	Non-Hodgkin Lymphoma	13	3.30%
C64-C66	Kidney	13	3.30%

MOST COMMON CANCERS AMONGST MALE QATARIS

Colorectal cancer is the most common amongst male Qatari's which accounts for 21 (13.46%) followed by prostate cancer which accounts for 17 (10.90%).

Table 11: Most common cancers among male Qataris

ICD 10 Codes	Primary Site	N	%
C18-C21 / D01	Colorectal	21	13.46%
C61 / D07.5	Prostate	17	10.90%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	14	8.97%
C22 / D01.5	Liver and intrahepatic bile ducts	11	7.05%
C91-C95	Leukemia	11	7.05%
C67 / D09.0	Bladder	10	6.41%
C70-C72	Brain & CNS	7	4.49%
C82-C85, C96	Non-Hodgkin Lymphoma	7	4.49%
C81	Hodgkin lymphoma	7	4.49%
C73 / D09.3	Thyroid gland	6	3.85%

MOST COMMON CANCERS AMONGST FEMALE QATARIS

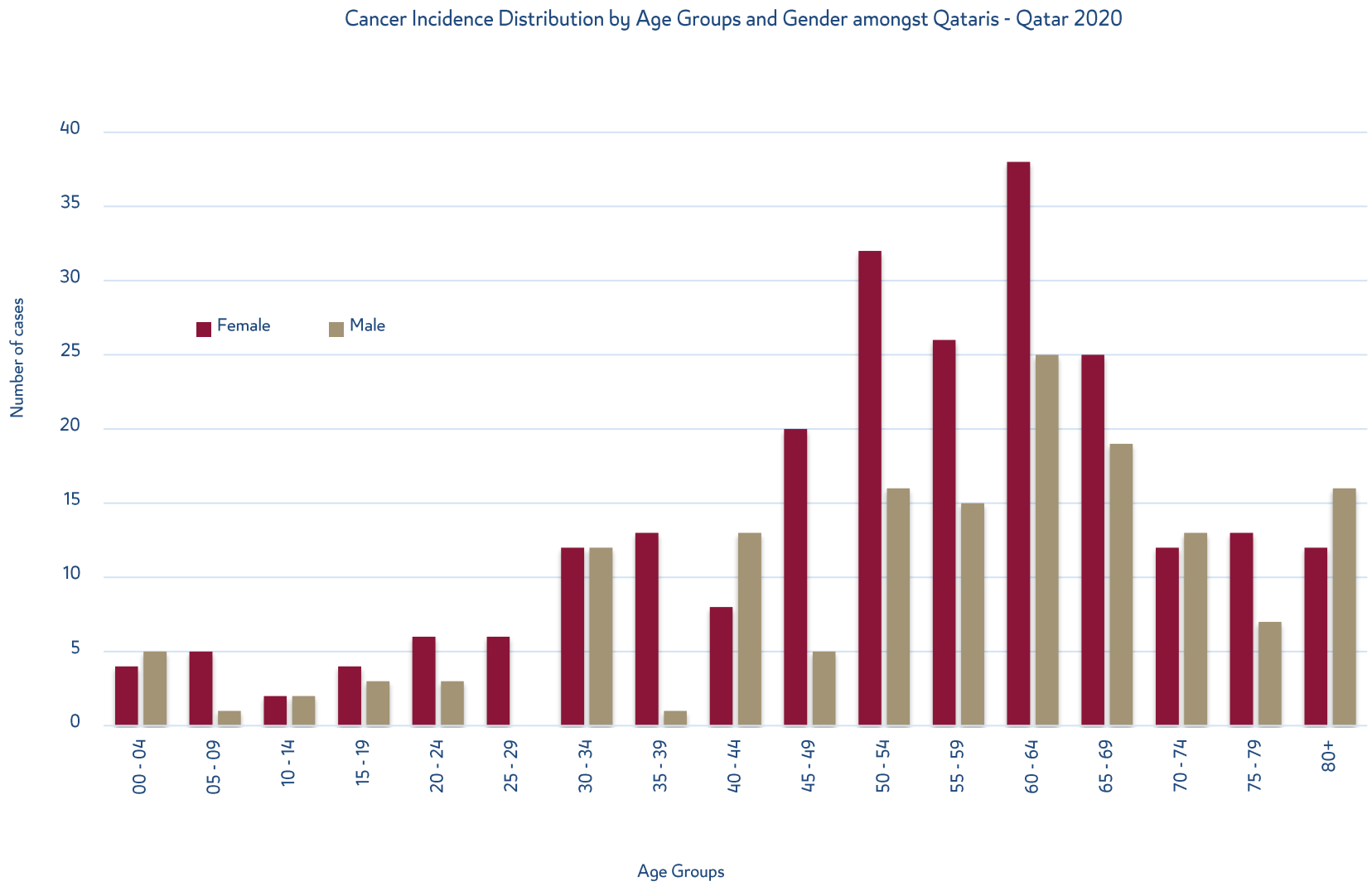
The most common cancer amongst female Qataris was breast cancer with 67 (28.15%) new cases. The second most common was thyroid gland with 27 (11.34%) new cases.

Table 12: Most common cancers among female Qataris

ICD 10 Codes	Primary Site	N	%
C50 / D05	Breast	67	28.15%
C73 / D09.3	Thyroid gland	27	11.34%
C54-C55 / D07.0	Uterus	27	11.34%
C18-C21 / D01	Colorectal	22	9.24%
C91-C95	Leukemia	12	5.04%
C53 / D06	Cervix uteri	10	4.20%
C64-C66	Kidney	7	2.94%
C56	Ovary	7	2.94%
C82-C85, C96	Non-Hodgkin Lymphoma	6	2.52%
C25 / D01.7	Pancreas	4	1.68%

DISTRIBUTION BY AGE

Figure 7: Cancer distribution by age groups amongst Qataris

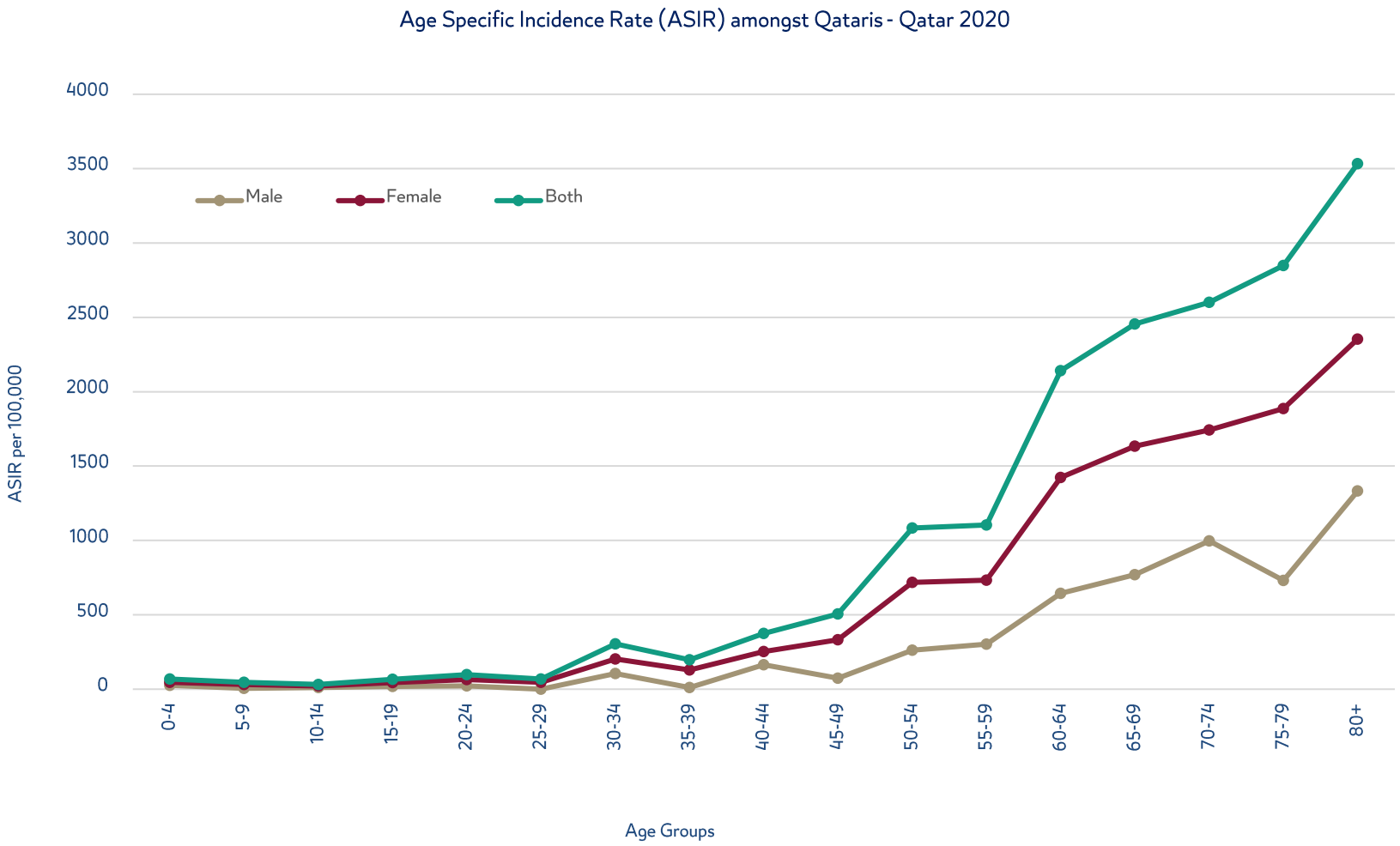


Amongst Qataris, the crude incidence rate is found to be 121.87 *per 100,000* and Age Standardized Rate ASR was 181.15 *per 100,000* population at risk.

Table 13: Summary of cancer burden in Qataris

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	5	25.00	4	20.54	9	22.80
5-9	1	4.97	5	25.83	6	15.20
10-14	2	10.55	2	10.80	4	10.67
15-19	3	18.64	4	25.62	7	22.08
20-24	3	21.48	6	43.88	9	32.56
25-29	0	0.00	6	45.89	6	22.79
30-34	12	105.68	12	97.36	24	101.35
35-39	1	10.63	13	118.20	14	68.60
40-44	13	165.12	8	87.16	21	123.16
45-49	5	74.35	20	258.87	25	173.00
50-54	16	262.77	32	455.13	48	365.85
55-59	15	301.87	26	430.53	41	372.46
60-64	25	644.66	38	778.21	63	719.10
65-69	19	769.23	25	864.75	44	820.74
70-74	13	996.93	12	745.80	25	858.22
75-79	7	730.69	13	1156.58	20	960.61
80+	16	1332.22	12	1022.15	28	1178.95
Total (N)	**394**					
ASR per *100,000 (WHO population)*	**181.15**					
Crude incidence rate *per 100,000*	**121.87**					
Cumulative Risk of Incidence [0-74]	**17.01**					

Figure 8: Age Specific Incidence Rate (ASIR) amongst Qataris 2020



03

CANCER INCIDENCE AMONGST NON-QATARIS

2020

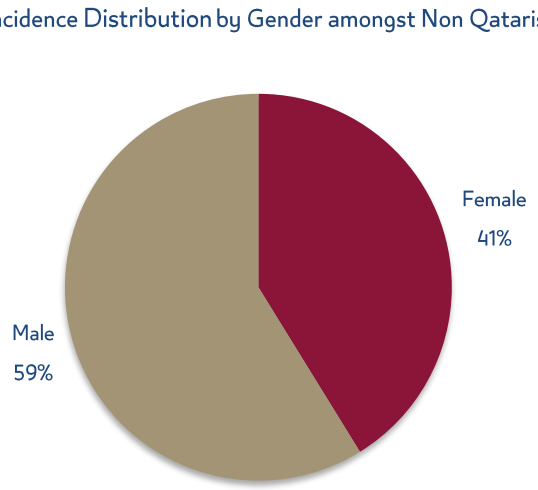
CANCER INCIDENCE AMONGST NON-QATARIS

A total of 1648 newly diagnosed cancers were reported during 2020 among the non-Qatari population.

CANCER INCIDENCE BY GENDER AMONGST NON-QATARIS

During 2020, 969 (59%) cases were newly diagnosed in males, while 679 (41%) new cases were diagnosed in females.

Figure 9: Cancer incidence by gender among Non-Qataris



MOST COMMON CANCERS ACROSS ALL GENDERS OF NON-QATARIS

In the non-Qatari population newly diagnosed with cancer during 2020, breast cancer was the most common with 258 (15.66%) new cases, followed by colorectal with 139 (8.44%) new cases.

Table 14: Most common cancers across all genders of non-Qataris

ICD 10 Codes	Primary Site	N	%
C50 / D05	Breast	258	15.66%
C18-C21 / D01	Colorectal	139	8.43%
C73 / D09.3	Thyroid gland	132	8.01%
C91-C95	Leukemia	121	7.34%
C70-C72	Brain & CNS	68	4.13%
C44 / D04	Non-Melanoma skin cancer	68	4.13%
C61 / D07.5	Prostate	67	4.07%
C82-C85, C96	Non-Hodgkin Lymphoma	66	4.01%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	63	3.82%
C22 / D01.5	Liver and intrahepatic bile ducts	57	3.46%

MOST COMMON CANCERS AMONGST NON-QATARI MALES

Leukemia accounted for 102 (10.53%) of the new cases and was the most common amongst non-Qatari males, followed by colorectal cancer with 99 (10.22%) new cases.

Table 15: Most common cancers among male non-Qataris

ICD 10 Codes	Primary Site	N	%
C91-C95	Leukemia	102	10.53%
C18-C21 / D01	Colorectal	99	10.22%
C61 / D07.5	Prostate	67	6.91%
C82-C85, C96	Non-Hodgkin Lymphoma	51	5.26%
C22 / D01.5	Liver and intrahepatic bile ducts	48	4.95%
C70-C72	Brain & CNS	48	4.95%
C73 / D09.3	Thyroid gland	47	4.85%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	47	4.85%
C44 / D04	Non-Melanoma skin cancer	46	4.75%
C67 / D09.0	Bladder	40	4.13%

MOST COMMON CANCERS AMONGST FEMALES NON-QATARIS

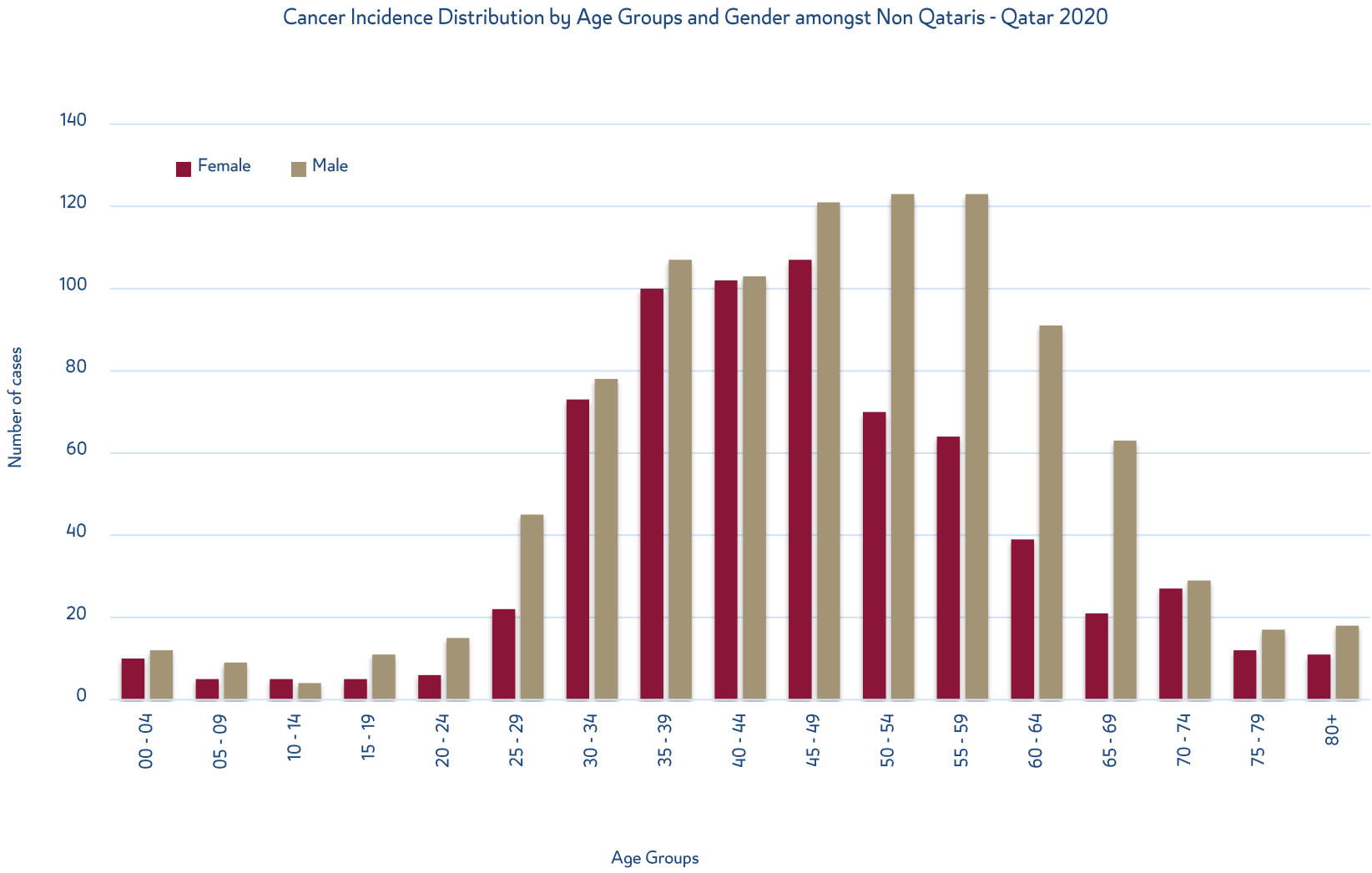
The most common cancer among non-Qatari females was breast cancer with 255 (37.61%) new cases. The second most common was thyroid gland cancer with 85 (12.54%) new cases.

Table 16: Most common cancers among female Non-Qataris

ICD 10 Codes	Primary Site	N	%
C50 / D05	Breast	255	37.56%
C73 / D09.3	Thyroid gland	85	12.52%
C18-C21 / D01	Colorectal	40	5.89%
C53 / D06	Cervix uteri	29	4.27%
C54-C55 / D07.0	Uterus	28	4.12%
C44 / D04	Non-Melanoma skin cancer	22	3.24%
C70-C72	Brain & CNS	20	2.95%
C56	Ovary	19	2.80%
C91-C95	Leukemia	19	2.80%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	16	2.36%

DISTRIBUTION BY AGE

Figure 10: Cancer distribution by age groups amongst non-Qataris



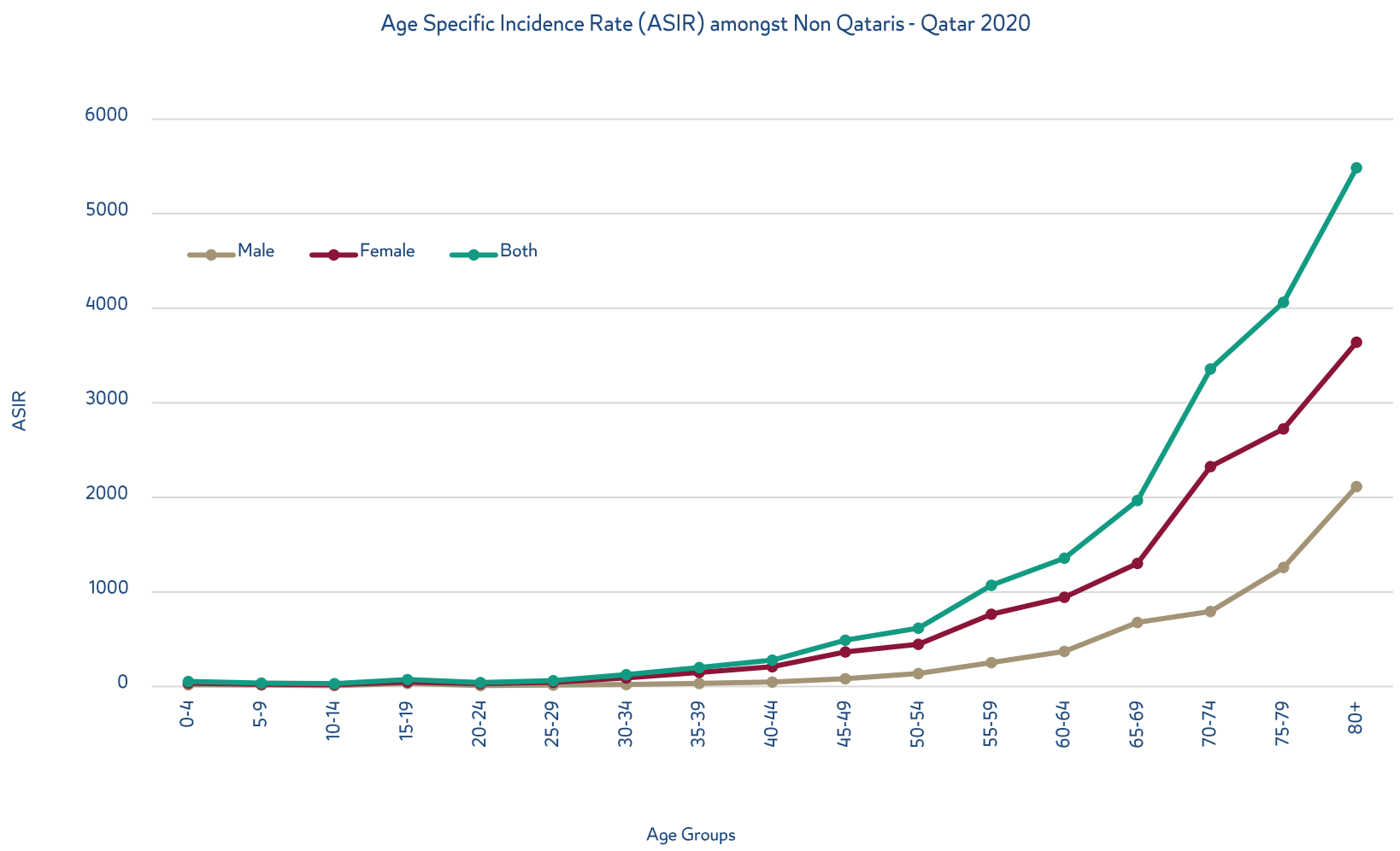
AGE SPECIFIC INCIDENCE RATE BY GENDER

Crude incidence rate was 65.65 *per 100,000* and Age Standardized Rate ASR was 156.65 *per 100,000* population at risk.

Table 17: Summary of cancer burden in Non-Qataris

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	12	19.23	10	16.80	22	18.04
5-9	9	14.95	5	8.63	14	11.85
10-14	4	8.59	5	11.34	9	9.93
15-19	11	32.07	5	16.37	16	24.67
20-24	15	10.51	6	18.41	21	11.98
25-29	45	15.30	22	28.25	67	18.01
30-34	78	21.71	73	69.99	151	32.57
35-39	107	33.44	100	115.21	207	50.89
40-44	103	46.07	102	162.12	205	71.56
45-49	121	83.11	107	281.58	228	124.19
50-54	123	136.40	70	310.59	193	171.23
55-59	123	253.43	64	511.18	187	306.28
60-64	91	370.30	39	572.27	130	414.14
65-69	63	677.78	21	625.93	84	664.03
70-74	29	792.57	27	1533.22	56	1033.21
75-79	17	1258.33	12	1466.99	29	1337.02
80+	18	2115.16	11	1525.66	29	1844.78
Total (N)	**1648**					
ASR *per 100,000 (WHO population)*	**156.12**					
Crude incidence rate *per 100,000*	**65.65**					
Cumulative Risk of Incidence [0-74]	**13.77**					

Figure 11: Age Specific Incidence Rate (ASIR) amongst Non-Qataris - 2020



04

TRENDS OF CANCER 2010-2020

2020

TRENDS OF CANCER 2010-2020

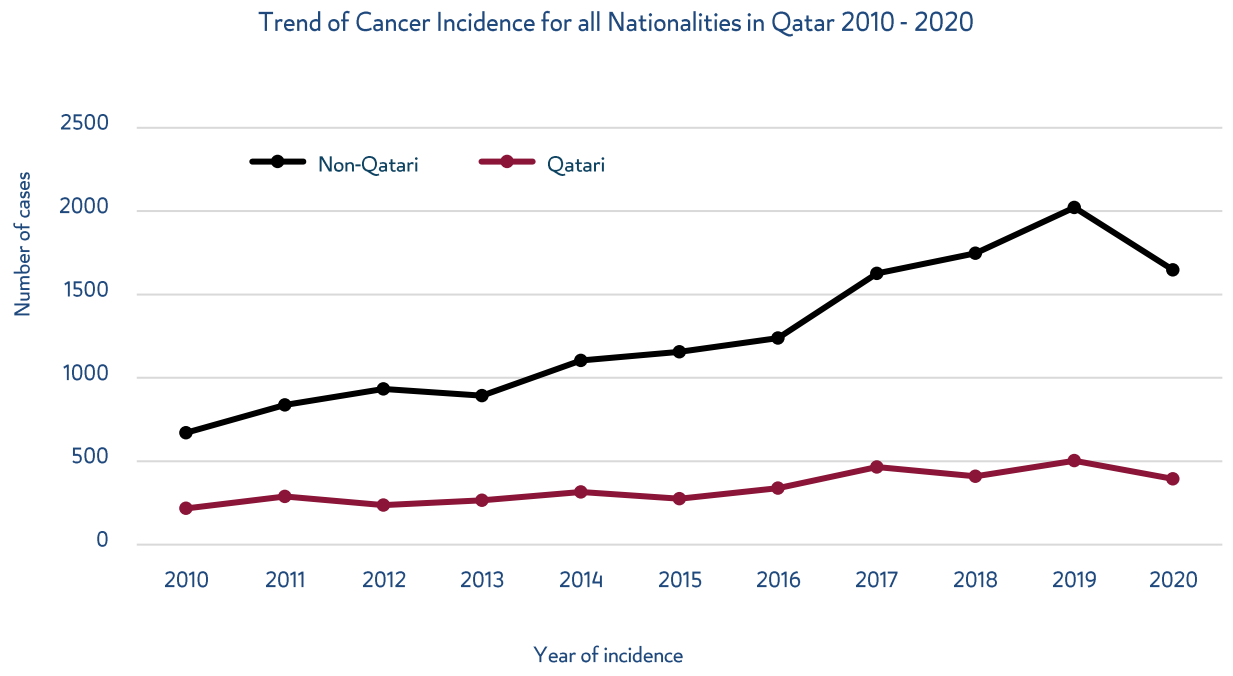
CRUDE RATE AND AGE STANDARDIZED RATE

Table 18: Summary of crude rate and ASR

Year	Cases	ASR *per 100,000 (WHO Population)*	Crude Rate *per 100,000*	Cumulative Risk [0-74]
2010	887	173.00	51.72	17.64
2011	1114	216.36	64.29	20.66
2012	1156	200.82	63.07	20.61
2013	1144	187.19	57.09	18.52
2014	1400	218.99	65.46	21.50
2015	1446	148.71	59.32	14.63
2016	1562	133.94	59.44	14.38
2017	2072	191.58	76.05	18.37
2018	2137	189.30	77.42	19.09
2019	2525	223.32	90.20	20.96
2020	2042	152.28	72.06	14.19

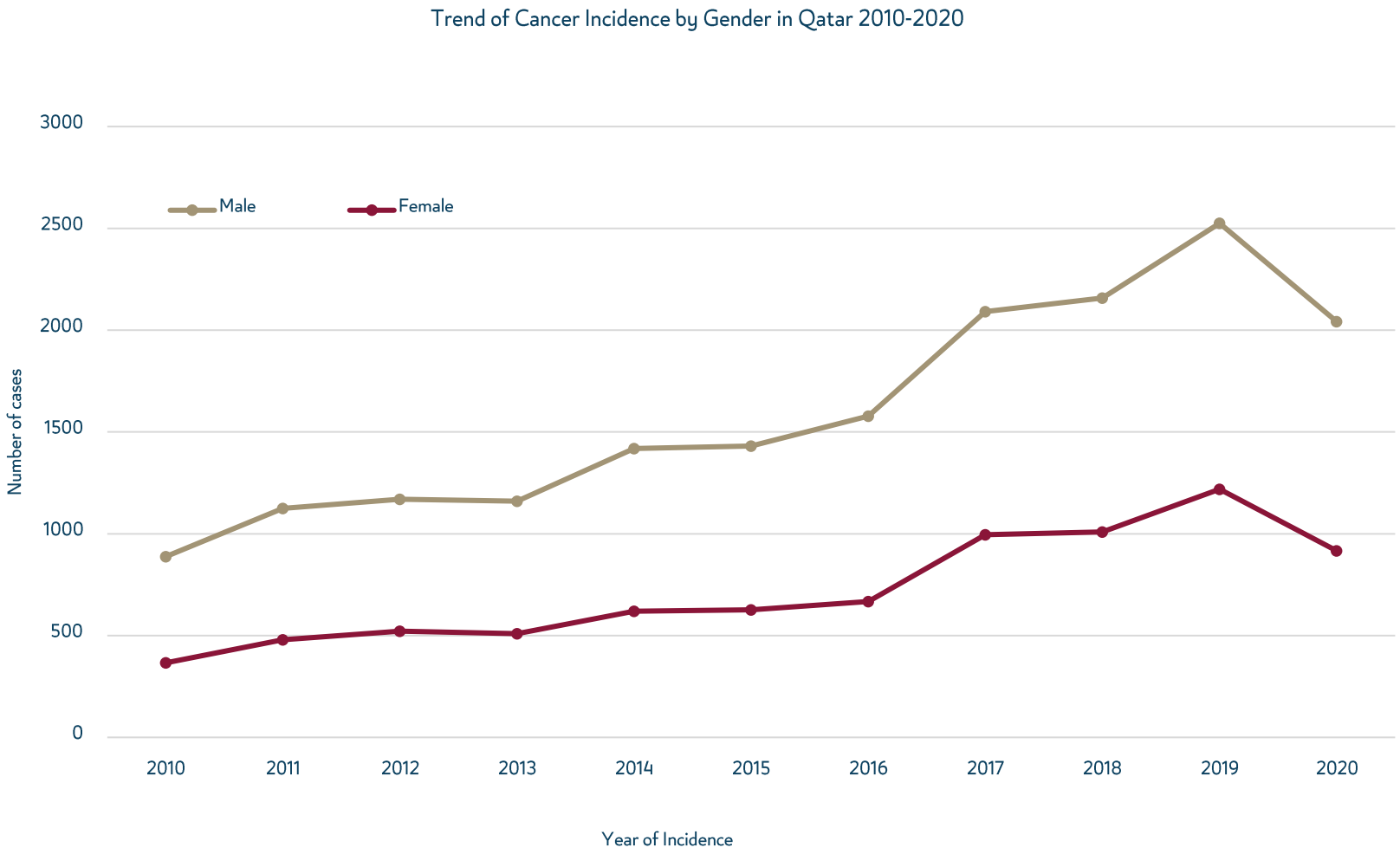
TREND OF INCIDENCE [NUMBER OF CASES] 2010-2020

Trend of cancer incidence, number of cases, of all nationalities



TREND OF INCIDENCE BY GENDER 2010-2020

Figure 12: Trend of number of cases, by gender of all nationalities



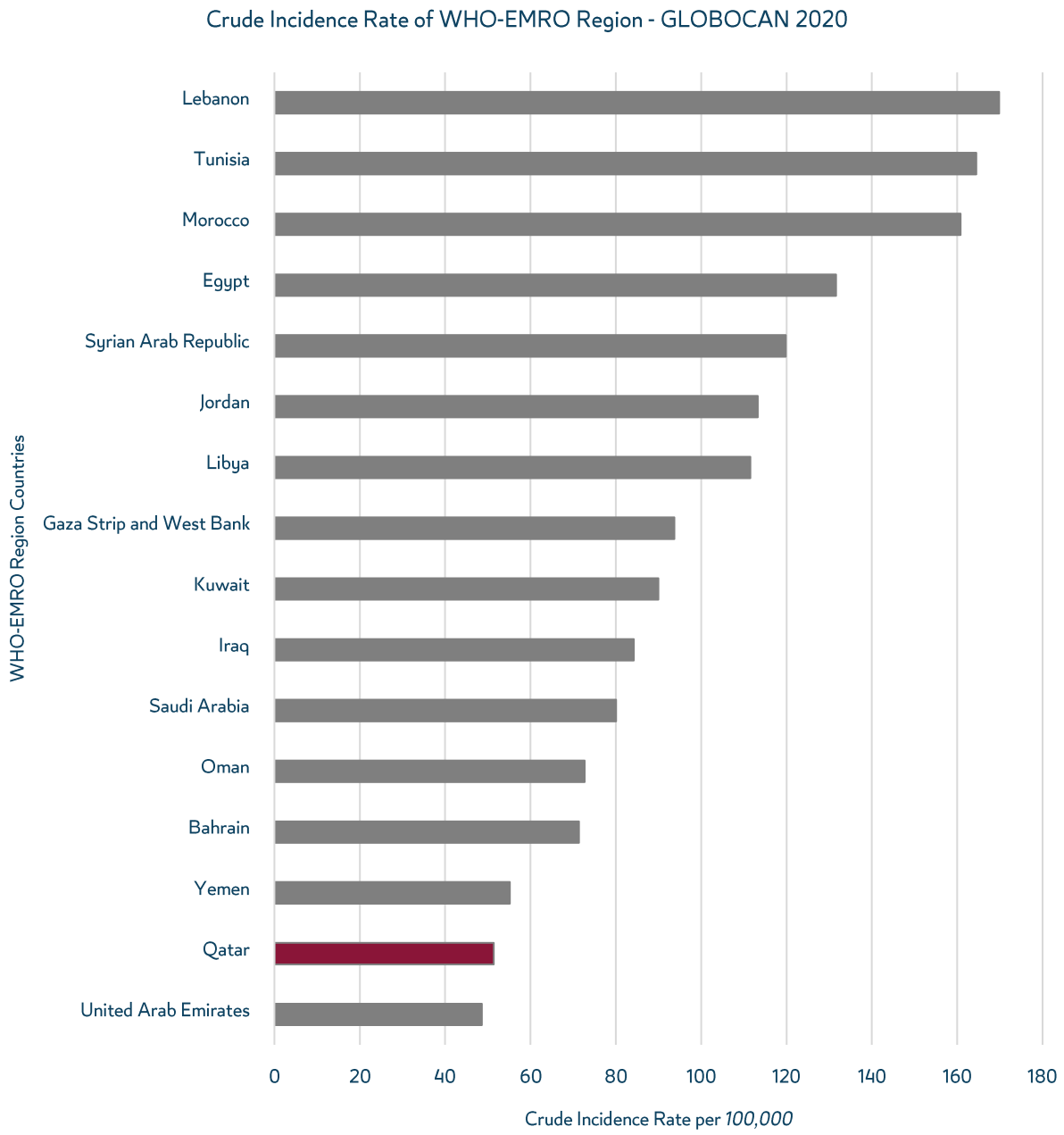
INTERNATIONAL PERSPECTIVE

Referencing the most recently available cancer data estimates in GLOBOCAN 2020, the following comparisons help position the cancer burden in the State of Qatar compared to international and regional countries.

CRUDE RATE

Within the Gulf region and the overall of EMRO countries and based on the estimates of GLOBOCAN 2020, Qatar data shows a low crude incidence rate.

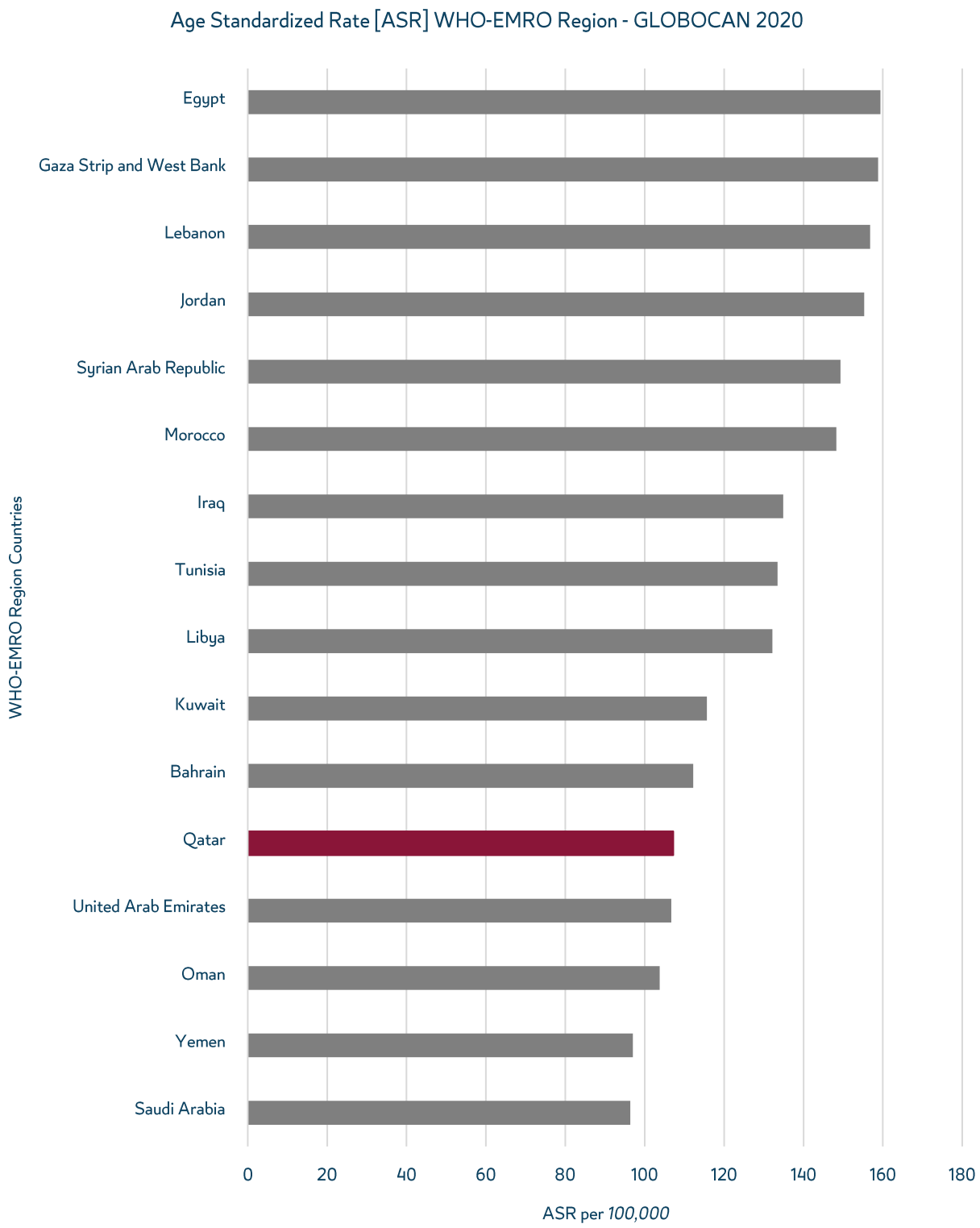
Figure 13: Crude rate of incidence based on GLOBOCAN 2020 – EMRO Region



AGE STANDARDIZED RATE ASR

Based on the estimates of GLOBOCAN -2020 Qatar also has very low ASR *per 100,000.*

Figure 14: ASR Based on GLOBOCAN 2020 – EMRO Region



05

PEDIATRICS CANCER INCIDENCE

2020

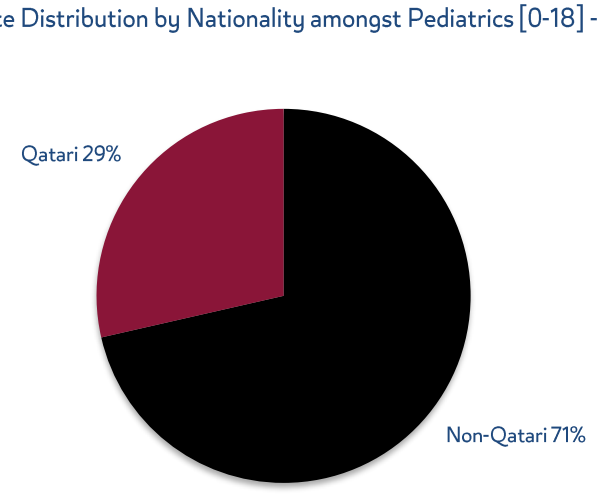
PEDIATRIC CANCER INCIDENCE

Within the age range of 0-18 years, there were 84 cases newly diagnosed with cancer during 2020.

DISTRIBUTION BY NATIONALITY

When distributed according to nationality, 24 (29%) new cases were Qataris, and 60 (71%) new cases were non-Qataris.

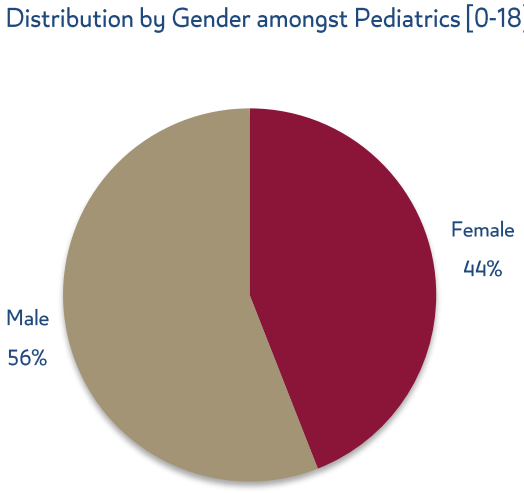
Figure 15: Pediatric [0-18] cancer incidence distribution by nationality



DISTRIBUTION BY GENDER

Across all nationalities, gender distribution shows 47 (56%) new cases were found in males and 37 (44%) new cases in females.

Figure 16: Pediatric [0-18] cancer incidence distribution by gender



MOST COMMON PEDIATRIC CANCERS

The most common cancer amongst pediatrics was Leukemia with 24 (28.57%) new cases. The second most common was Brain & CNS with 10 (11.90%) new cases.

Table 19: Most common cancers among pediatrics [0-18]

ICD 10 codes	Primary Site	N	%
C91-C95	Leukemia	24	28.57%
C70-C72	Brain & CNS	10	11.90%
C81	C81 Hodgkin lymphoma	8	9.52%
D43	Neoplasm of uncertain behavior of brain and central nervous system	6	7.14%
C40-C41	Bone and articular cartilage	6	7.14%
C74	Adrenal gland	4	4.76%
C38	Heart, mediastinum and pleura	3	3.57%
C22 / D01.5	Liver and intrahepatic bile ducts	3	3.57%
C64-C66	Kidney	3	3.57%
C62	Testis	2	2.38%

DEATHS AMONGST PEDIATRIC CANCERS

Table 20: Deaths among Pediatric [0-18] Cancer Population

ICD 10 codes	Primary Site	N	%
C91-C95	Leukemia	3	60.00%
C40-C41	Bone and articular cartilage	1	20.00%
C44 / D04	Non-Melanoma skin cancer	1	20.00%

06

MORTALITY IN CANCER

2020

MORTALITY IN CANCER - QATARIS

During the year 2020, there were 507 deaths amongst cancer patients, 350 (69%) Non-Qataris and 157 (31%) Qataris. Overall, all notifications of deaths in 2020 increased by 26.2%, as reported in the Planning and Statistics Authority, Births & Deaths (Review & Analysis) 2020.

Amongst the Qatari population, the Age Standardized Rate ASR for deaths was 77.55 *per 100,000* while the cumulative risk of deaths within the age range of 0-74 years old was 8.25.

Table 21: Death summary amongst Qatari cancer patients

Age-Groups (5 year)	Qataris	
	N	ASMR
0-4	1	2.53
5-9	0	0.00
10-14	0	0.00
15-19	4	12.62
20-24	1	3.62
25-29	1	3.80
30-34	5	21.11
35-39	7	34.30
40-44	6	35.19
45-49	7	48.44
50-54	16	121.95
55-59	22	199.85
60-64	22	251.11
65-69	29	540.94
70-74	13	446.28
75-79	7	336.22
80+	16	673.68
Total (N)	**157**	
ASR *per 100,000 (WHO population)*	**77.55**	
Crude Mortality Rate *per 100,000*	**48.56**	
Cumulative Risk of Mortality [0-74]	**8.25**	

COMMON CANCERS AMONGST QATARI DEATHS

In 2020, the prevalent primary site of cancer amongst deaths in the Qatari population were breast cancer, constituting 18.47% of deaths, and lung cancer, accounting for 15.29% of the cases.

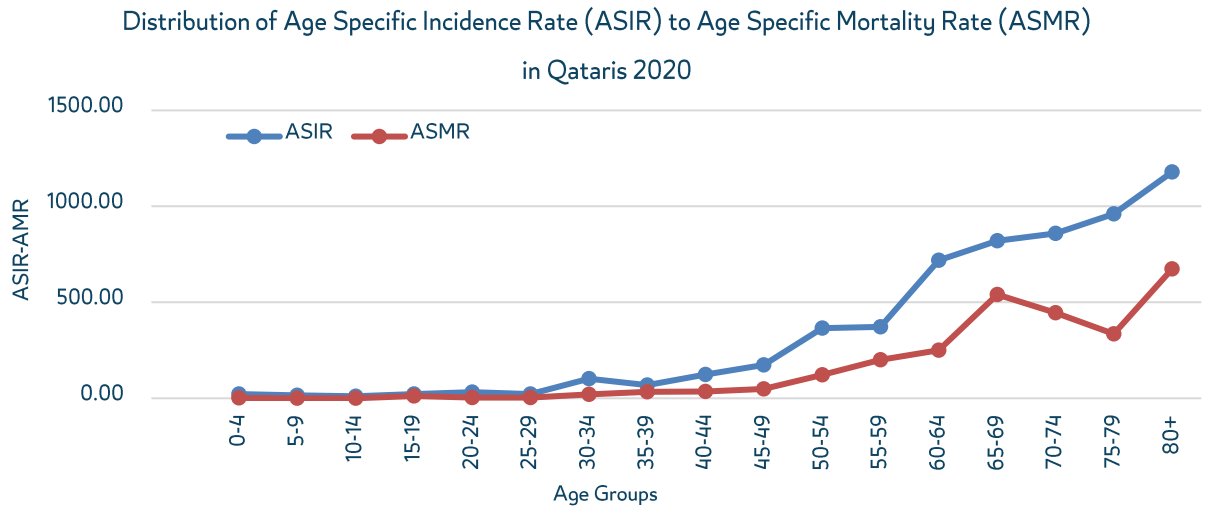
Table 22: Most common cancer among Qataris deaths

ICD 10	Primary Site	N	%
C50 / D05	Breast	29	18.47%
C33-C34 / D02.1-D02.2	Trachea, bronchus and lung	24	15.29%
C18-C21 / D01	Colorectal	23	14.65%
C22 / D01.5	Liver and intrahepatic bile ducts	10	6.37%
C82-C85, C96	Non-Hodgkin Lymphoma	9	5.73%
C61 / D07.5	Prostate	9	5.73%
C54-C55 / D07.0	Uterus	8	5.10%
C25 / D01.7	Pancreas	7	4.46%
C91-C95	Leukemia	7	4.46%
C70-C72	Brain & CNS	5	3.18%

MORTALITY / INCIDENCE RATIO

The healthcare system is actively working on improving the reporting of causes of death, so at present it is difficult to generate mortality to incidence ratio. However, it is possible to calculate the ratio of adjusted age in death among Qatari cancer patients to the adjusted age of incidence.

Figure 17: ASIR to ASMR in Qataris 2020



07

MOST COMMON CANCERS

2020

FEMALE BREAST CANCER

ICD 10 CODES

Table 23: ICD 10 codes for breast cancer in QNCR

ICD 10 Code	Description
C50	Malignant neoplasm of breast
D05	Carcinoma in situ of breast

KEY FACTS

In 2020, there were 326 newly diagnosed cases of breast cancer, of which 322 (99%) were among females and 4 (1%) among males.

Table 24: Female breast cancer distribution by behavior, and nationality

Behavior	Non-Qatari - Female	Qatari - Female	Grand Total
Malignant, primary site (invasive)	236	61	297
Carcinoma in situ	19	6	25
Grand Total	**255**	**67**	**322**

The Age Standardized Rate (ASR) was found to be 64.75 *per 100,000* of female population at risk. The crude incidence rate found to be 39.86 *per 100,000*.

Table 25: Summary of female breast cancer burden

Age-Groups (5 year)	Females	
	N	ASIR
0-4	0	0.00
5-9	0	0.00
10-14	0	0.00
15-19	0	0.00
20-24	1	2.16
25-29	7	7.70
30-34	30	25.72
35-39	44	44.99
40-44	56	77.68
45-49	63	137.78
50-54	33	111.60
55-59	22	118.54
60-64	25	213.71
65-69	14	224.14
70-74	16	474.78
75-79	2	102.99
80+	9	474.93
Total (N)	**322**	
ASR *per 100,000 (WHO population)*	**64.75**	
Incidence Rate *per 100,000*	**39.86**	
Cumulative Risk of Incidence [0-74]	**6.94**	

DEMOGRAPHICS

The peak of incidence was in the age group of 45-49, where the youngest age was 24 years old, and the average age was 49 years old.

Figure 18: Female breast cancer distribution by age groups

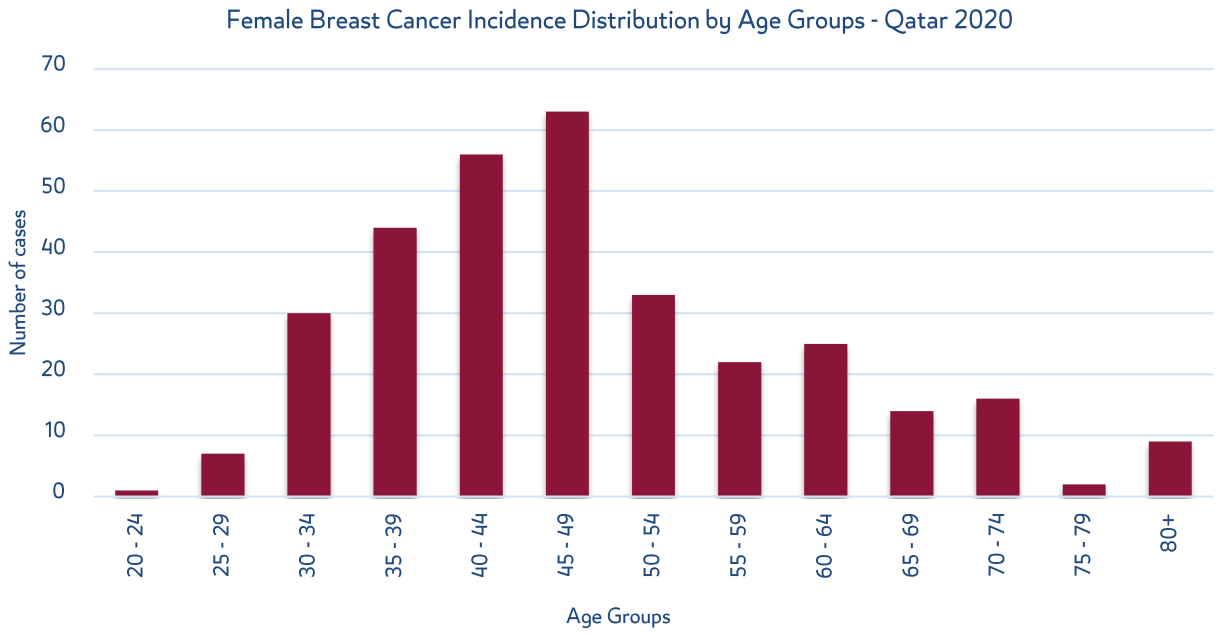


Table 26: Min, max and average age distribution for female breast cancer

Average of Age	Min (years)	Max (years)
49	24	87

PREVALENCE

Within the Qatari population recorded in the QNCR to date, 1103 instances of female breast cancer have been diagnosed. Among these cases, 217 individuals (19.67%) have passed away, while 883 individuals (80.05%) are still alive.

HISTOLOGY

Histological distribution of all female breast cancer cases showed that infiltration duct carcinoma, NOS accounted for the majority of cases, with 77.95% of cases.

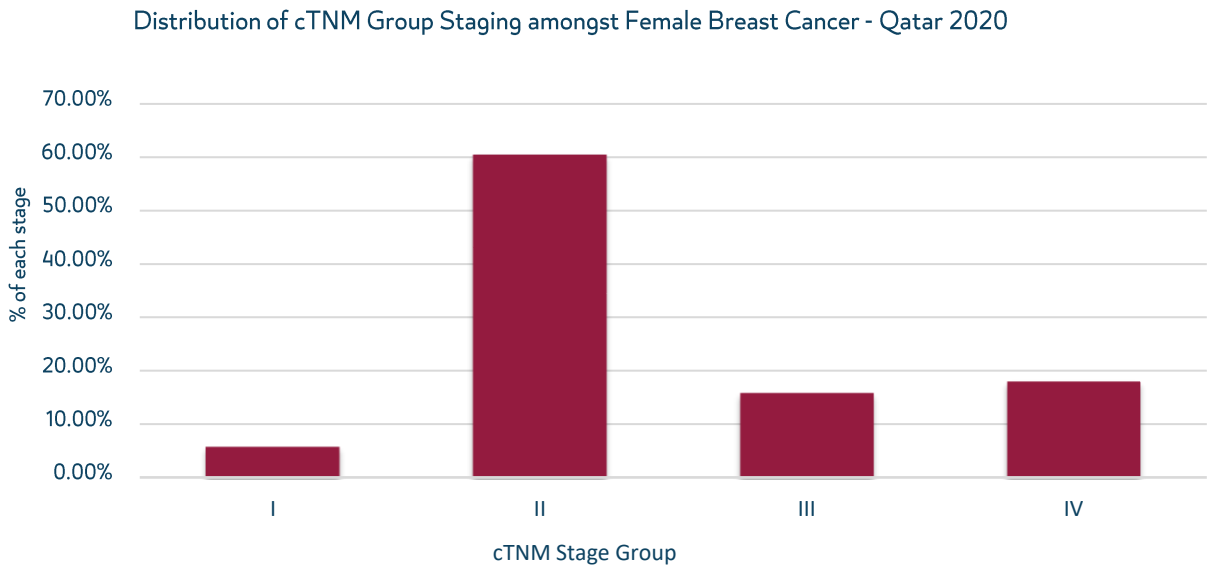
Table 27: ICD O-3 Histology distribution of female breast cancer

Histology	N	%
Infiltrating duct carcinoma, NOS	251	77.95%
Intraductal carcinoma, noninfiltrating, NOS	24	7.45%
Lobular carcinoma, NOS	23	7.14%
Infiltrating duct and lobular carcinoma	6	1.86%
Papillary carcinoma, NOS	4	1.24%
Phyllodes tumor, malignant	3	0.93%
Neoplasm, malignant	2	0.62%
Carcinoma, NOS	2	0.62%
Mucinous adenocarcinoma	2	0.62%
Noninfiltrating intraductal papillary adenocarcinoma	1	0.31%
Tubular adenocarcinoma	1	0.31%
Secretory carcinoma of breast	1	0.31%
Adenomyoepithelioma with carcinoma	1	0.31%
Metaplastic carcinoma, NOS	1	0.31%

STAGING

Almost 55% of the total female breast cancer cases reported in 2020 did not have a documented cTNM stage.

Figure 19: cTNM group staging for female breast cancer



TREATMENT

The following table shows the treatment modalities provided in no particular order. *[PLEASE SEE DISCLAIMER]*

Table 28: Treatment modalities for female breast cancer

Treatment Modality	%
Chemotherapy / Hormonotherapy / Radiation therapy / Surgery	36.79%
Hormonotherapy / Radiation therapy / Surgery	16.72%
Chemotherapy / Radiation therapy / Surgery	13.04%
Chemotherapy	5.02%
Chemotherapy / Surgery	4.01%
Hormonotherapy / Surgery	3.68%
Radiation therapy / Surgery	3.68%
Hormonotherapy	3.68%
Chemotherapy / Hormonotherapy / Surgery	3.01%
Chemotherapy / Hormonotherapy / Radiation therapy	2.68%
Surgery	1.67%
Hormonotherapy / Radiation therapy	1.67%
Chemotherapy / Hormonotherapy	1.34%
Chemotherapy / Radiation therapy	1.34%
Radiation therapy	0.67%
Chemotherapy / Immunotherapy / Radiation therapy	0.33%

263 female cases reported with surgery as one of the treatment modalities. The following table provides information on the types of surgical procedures undertaken.

Table 29: Surgery procedures (SEER) for female breast cancer

Surgery Procedure (SEER)	N	%
Lumpectomy or excisional biopsy	166	63.12%
Mastectomy, NOS	75	28.52%
Modified radical mastectomy, NOS	14	5.32%
Surgery, NOS	7	2.66%
Local tumor excision, NOS	1	0.38%
Grand Total	**263**	**100%**

COLORECTAL CANCER

ICD 10 CODES

Table 30: ICD 10 codes for colorectal cancer in QNCR

ICD 10 Code	Description
C18	Malignant neoplasm of colon
C19	Malignant neoplasm of rectosigmoid junction
C20	Malignant neoplasm of rectum
C21	Malignant neoplasm of anus and anal canal
D01	Carcinoma in situ of other and unspecified digestive organs
D010	Colon
D014	Other and unspecified parts of intestine

KEY FACTS

In 2020, there were 182 newly diagnosed cases of malignant colorectal cancer, and of these 120 (65.93%) cases were in males, and 62 (34.07%) cases were in females.

Table 31: Colorectal cancer distribution by behavior, gender and nationality

Behavior	Qatari			Non-Qatari			Grand Total
	Male	Female	Total	Male	Female	Total	
Malignant	21	22	43	99	40	138	181
Grand Total	21	22	43	99	40	138	181

The crude incidence was found to be 6.42 *per 100,000* and the Age Standardized Rate ASR to be 14.30 *per 100,000.*

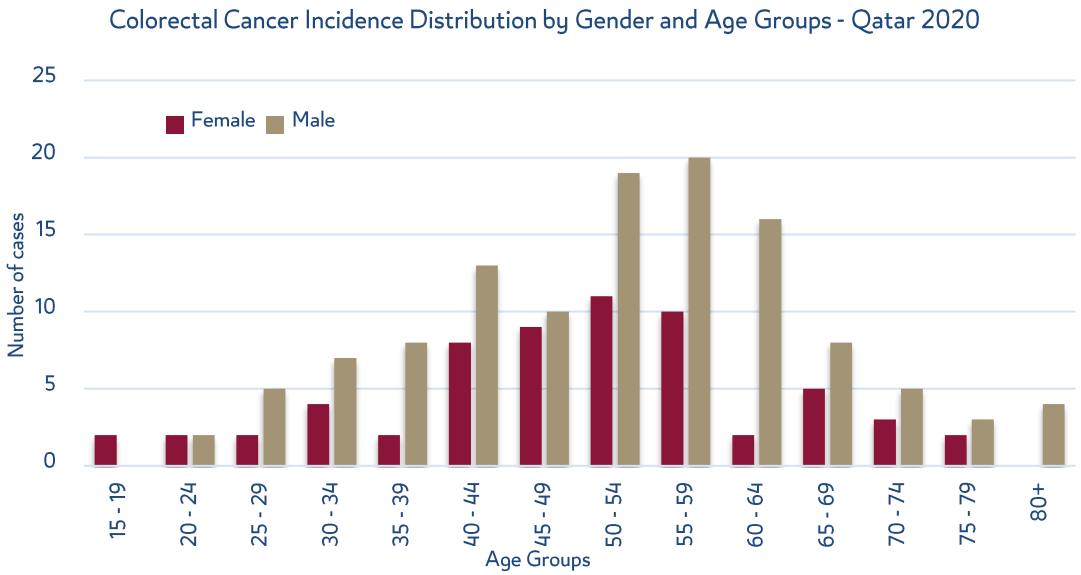
Table 32: Summary of colorectal cancer burden

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	0	0	0	0.00	0	0.00
5-9	0	0	0	0.00	0	0.00
10-14	0	0	0	0.00	0	0.00
15-19	0	0	2	4.33	2	2.07
20-24	2	1.28	2	4.32	4	1.97
25-29	5	1.63	2	2.20	7	1.76
30-34	7	1.89	4	3.43	11	2.26
35-39	8	2.43	2	2.05	10	2.34
40-44	13	5.62	8	11.10	21	6.92
45-49	10	6.57	9	19.68	19	9.59
50-54	19	19.74	11	37.20	30	23.84
55-59	20	37.38	10	53.88	30	41.63
60-64	16	52.72	2	17.10	18	44.83
65-69	8	68.00	5	80.05	13	72.18
70-74	5	100.75	3	89.02	8	96.00
75-79	3	129.93	2	102.99	5	117.62
80+	4	194.93	0	0.00	4	101.34
Total (N)	**182**					
ASR *per 100,000 (WHO population)*	**14.30**					
Crude incidence rate *per 100,000*	**6.42**					
Cumulative Risk of Incidence [0-74]	**1.52**					

DEMOGRAPHICS

Amongst males, the peak age group of colorectal cancer incidence was 55-59 while in females it was 50-54, and the average age was 52 years old.

Figure 20: Colorectal cancer distribution by age groups



PREVALENCE

Amongst all the Qataris registered in the QNCR to date, there were 635 cases diagnosed with colorectal cancer. Of these cases, 180 (28.35%) have died and 455 (71.65%) are still alive.

HISTOLOGY

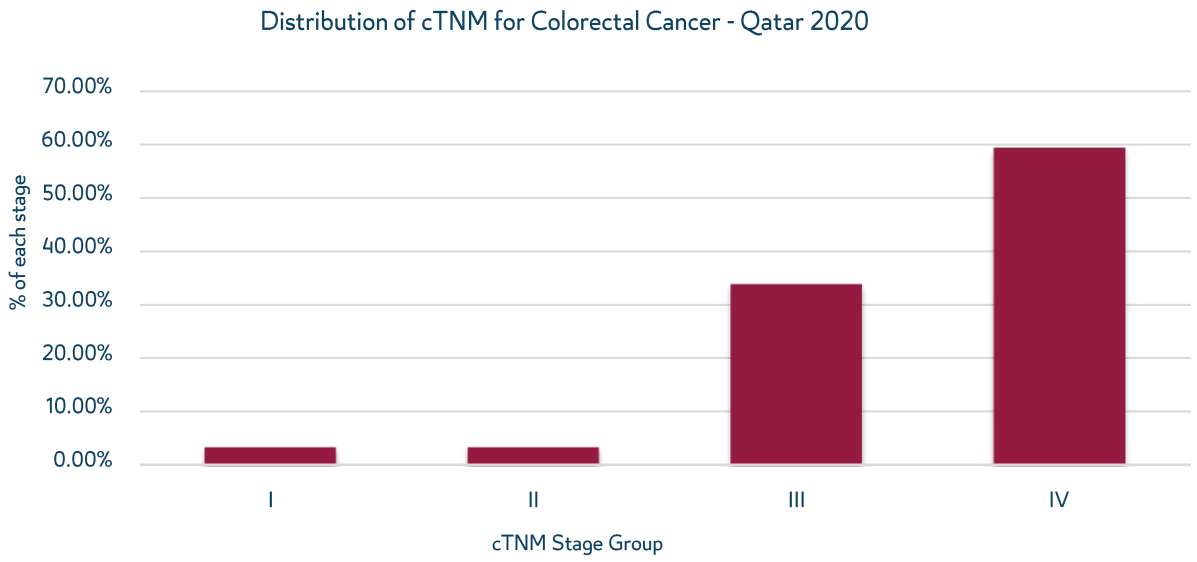
Table 33: Histology distribution for colorectal cancer

Histology	N	%
Adenocarcinoma, NOS	113	62.09%
Neuroendocrine tumor, NOS	20	10.99%
Mucinous adenocarcinoma	19	10.44%
Signet ring cell carcinoma	17	9.34%
Neoplasm, malignant	4	2.20%
Basaloid squamous cell carcinoma	3	1.65%
Neuroendocrine tumor, grade 2	2	1.10%
Squamous cell carcinoma, NOS	1	0.55%
Squamous intraepithelial neoplasia, high grade	1	0.55%
Adenocarcinoma, intestinal type (C16)	1	0.55%
Infiltrating duct carcinoma, NOS (C50)	1	0.55%

STAGING

Almost 33% of the total cases reported in 2020 did not have a cTNM stage reported value. Of those with a cTNM stage reported, 93% were at late stage (III and IV) and 7% were early stage (I and II).

Figure 21: cTNM distribution for colorectal cancer



TREATMENT

The following table shows the treatment types in no particular order. [PLEASE SEE DISCLAIMER]

Table 34: Treatment modalities for colorectal cancer

Treatment Modality	%
Surgery	28.57%
Chemotherapy / Surgery	25.27%
Chemotherapy	7.69%
Chemotherapy / Radiation therapy / Surgery	6.59%
Chemotherapy / Radiation therapy	3.30%
Chemotherapy / Immunotherapy / Surgery	1.10%
Radiation therapy / Surgery	0.55%
Chemotherapy / Immunotherapy / Radiation therapy / Surgery	0.55%
Radiation therapy	0.55%
No treatment recorded	25.82%

LEUKEMIA

ICD 10 CODES

Table 35: ICD 10 codes for Leukemia in QNCR

ICD 10 Code	Description
C91	Lymphoid leukemia
C92	Myeloid leukemia
C93	Monocytic leukemia
C94	Other leukemias of specified cell type
C95	Leukemia of unspecified cell type

KEY FACTS

In 2020, 144 cases were reported with Leukemia, 31 cases (21.53%) amongst females, and 113 (78.47%) amongst males. There was a total of 121 cases (84%) were in non-Qatari and 23 cases (16%) amongst Qataris.

Table 36: Distribution of leukemia by gender and nationality

Behavior	Qatari			Non-Qatari			Grand Total
	Male	Female	Total	Male	Female	Total	
Malignant	11	12	23	102	19	121	144
Grand Total	11	12	23	102	19	121	144

The crude incidence was found to be 5.08 *per 100,000* and the Age Standardized Rate ASR to be 7.68 *per 100,000.*

Table 37: Summary of leukemia burden

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	6	7.28	4	5.06	10	6.20
5-9	2	2.49	5	6.47	7	4.44
10-14	3	4.58	0	0.00	3	2.34
15-19	3	5.95	2	4.33	5	5.18
20-24	4	2.55	1	2.16	5	2.46
25-29	7	2.28	2	2.20	9	2.26
30-34	12	3.24	4	3.43	16	3.28
35-39	18	5.46	2	2.05	20	4.68
40-44	13	5.62	1	1.39	14	4.61
45-49	14	9.19	3	6.56	17	8.58
50-54	10	10.39	2	6.76	12	9.54
55-59	9	16.82	0	0.00	9	12.49
60-64	6	21.09	2	17.10	8	19.92
65-69	2	17.00	0	0.00	2	11.10
70-74	3	60.45	1	29.67	4	48.00
75-79	1	43.31	1	51.49	2	47.05
80+	0	0.00	1	52.77	1	25.34
Total (N)	**144**					
ASR *per 100,000 (WHO population)*	**7.68**					
Crude incidence rate *per 100,000*	**5.08**					
Cumulative Risk of Incidence [0-74]	**0.72**					

DEMOGRAPHICS

Amongst males, the peak age group of leukemia incidence was in 35-39, while it was 05-09 amongst females. The youngest age was less than 1 year old, and the average age was 38 years old.

Figure 22: Distribution of leukemia by age groups

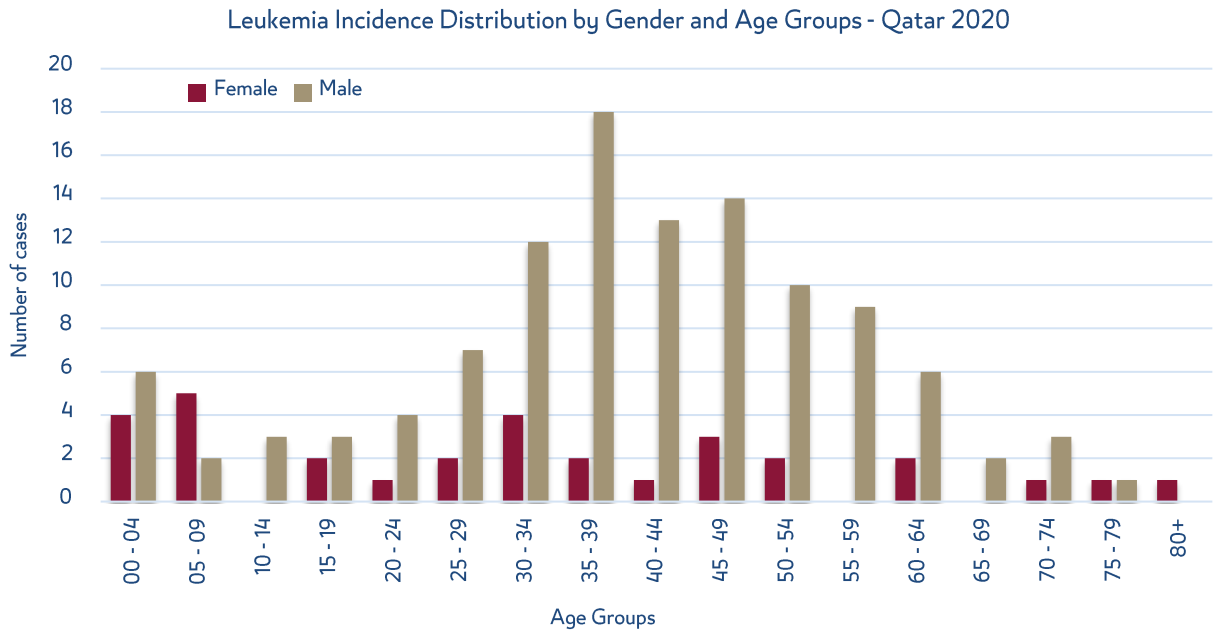


Table 38: Min, max and average age distribution for leukemia cancers

Average of Age	Min (years)	Max (years)
38	1	80

PREVALENCE

Amongst the Qatari population registered in the QNCR to date, there were 272 newly diagnosed cases with leukemia. Of these cases, 72 (26.47%) have died and 200 (73.53.%) are still alive.

HISTOLOGY

Table 39: Histology distribution for leukemia

Histology	N	%
Acute myeloid leukemia, NOS	38	26.39%
Chronic myeloid leukemia, NOS	25	17.36%
B-cell chronic lymphocytic leukemia/small lymphocytic lymphoma	21	14.58%
Precursor B-cell lymphoblastic leukemia	15	10.42%
Precursor cell lymphoblastic leukemia, NOS	10	6.94%
Acute promyelocytic leukemia, t(15;17) (q22;q11-12)	5	3.47%
Acute myeloid leukemia with abnormal marrow eosinophils (includes all variants)	5	3.47%
Hairy cell leukemia	5	3.47%
Acute panmyelosis with myelofibrosis	5	3.47%
Adult T-cell leukemia/lymphoma (HTLV-1 positive) (includes all variants)	3	2.08%
Precursor T-cell lymphoblastic leukemia	3	2.08%
Acute leukemia, NOS	2	1.39%
Precursor B-cell lymphoblastic lymphoma	1	0.69%
Therapy related myeloid neoplasm	1	0.69%
Mature T-cell lymphoma, NOS	1	0.69%
Chronic eosinophilic leukemia	1	0.69%
Therapy-related myelodysplastic syndrome, NOS	1	0.69%
Acute erythroid leukemia	1	0.69%
Chronic myelomonocytic leukemia, NOS	1	0.69%

TREATMENT

The following table shows the treatment types in no particular order. [PLEASE SEE DISCLAIMER]

Table 40: Treatment modalities for leukemia cancer

Treatment Modality	%
Chemotherapy	92.92%
Chemotherapy / Radiation therapy	3.54%
Targeted therapy	1.77%
Surgery	0.88%
Hormonotherapy	0.88%
No treatment recorded	21.53%

THYROID GLAND

ICD 10 CODES

Table 41: ICD 10 codes for thyroid cancer in QNCR

ICD 10 Code	Description
C73	Malignant neoplasm of thyroid gland
D093	Thyroid and other endocrine glands

KEY FACTS

In 2020, 165 cases were newly diagnosed with malignant thyroid cancer, 33 (20%) of which were Qataris and 132 (80%) cases non-Qataris. Of the total cases 112 (68%) were amongst female, while 53 (32%) were in males.

Table 42: Distribution of thyroid cancer by gender and nationality

Behavior	Qatari			Non-Qatari			Grand Total
	Male	Female	Total	Male	Female	Total	
Malignant	6	27	33	47	85	132	165
Grand Total	**6**	**27**	**33**	**47**	**85**	**132**	**165**

The crude incidence was found to be 5.82 *per 100,000* and the Age Standardized Rate ASR to be 5.01 *per 100,000.*

Table 43: Summary of thyroid cancer burden

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	0	0.00	0	0.00	0	0.00
5-9	0	0.00	0	0.00	0	0.00
10-14	0	0.00	0	0.00	0	0.00
15-19	0	0.00	0	0.00	0	0.00
20-24	0	0.00	4	8.64	4	1.97
25-29	7	2.28	8	8.80	15	3.77
30-34	10	2.70	20	17.15	30	6.16
35-39	7	2.13	24	24.54	31	7.26
40-44	9	3.89	18	24.97	27	8.90
45-49	9	5.91	13	28.43	22	11.11
50-54	5	5.19	11	37.20	16	12.72
55-59	5	9.35	10	53.88	15	20.82
60-64	1	3.51	1	8.55	2	4.98
65-69	0	0.00	3	48.03	3	16.66
70-74	0	0.00	0	0.00	0	0.00
75-79	0	0.00	0	0.00	0	0.00
80+	0	0.00	0	0.00	0	0.00
Total (N)	**165**					
ASR *per 100,000 (WHO population)*	**5.01**					
Crude incidence rate *per 100,000*	**5.82**					
Cumulative Risk of Incidence [0-74]	**0.47**					

DEMOGRAPHICS

Amongst females, the peak age group of thyroid cancer incidence was 35-39, while it was 30-35 amongst males.

The youngest age was 22 years old, and the average age was 41 years old.

Figure 23: Distribution of thyroid gland cancer by age groups

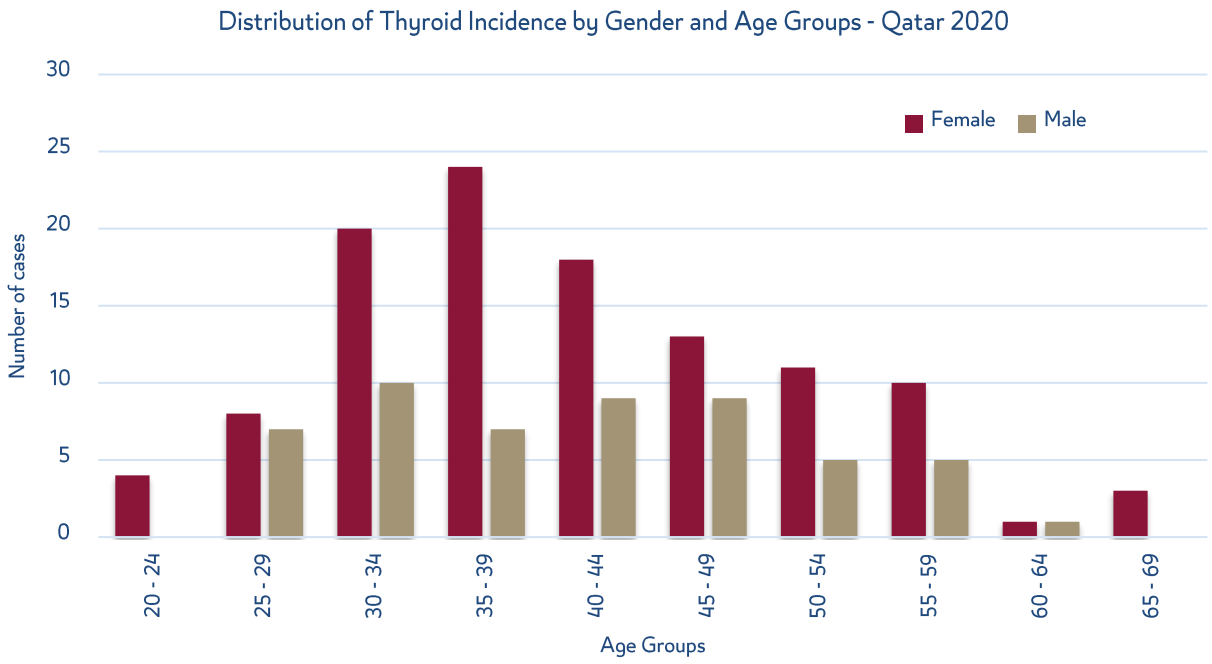


Table 44: Min, max and average age distribution for thyroid cancer

Average of Age	Min (years)	Max (years)
41	22	66

PREVALENCE

Amongst all of the Qataris registered in the QNCR to date, there were 339 cases diagnosed with thyroid cancer. Of these cases, 24 (7%) have died and 315 (93%) are still alive.

HISTOLOGY

All cases of histology were reported.

Table 45: Histology distribution for thyroid gland cancer

Histology	N	%
Papillary adenocarcinoma, NOS	130	78.79%
Papillary microcarcinoma (C73.9)	16	9.70%
Papillary carcinoma, NOS	7	4.24%
Follicular carcinoma, NOS (C73.9)	4	2.42%
Follicular carcinoma, minimally invasive (C73.9)	2	1.21%
Neoplasm, malignant	2	1.21%
Pseudosarcomatous carcinoma	1	0.61%
Papillary carcinoma, follicular variant (C73.9)	1	0.61%
Carcinoma, anaplastic, NOS	1	0.61%
Oxyphilic adenocarcinoma	1	0.61%

TREATMENT

The following table shows the treatment types in no particular order. [PLEASE SEE DISCLAIMER]

Table 46: Treatment modalities for thyroid cancer

Treatment Modality	%
Surgery	87.88%
Radiation therapy	1.82%
Radiation therapy / Surgery	1.82%
No treatment recorded	8.48%

PROSTATE CANCER

ICD 10 CODES

Table 47: ICD 10 codes for prostate in QNCR

ICD 10 Code	Description
C61	Malignant neoplasm of prostate
D075	Prostate

KEY FACTS

In 2020, there were 84 newly diagnosed cases of prostate cancer, 17 (20%) of which were Qataris and 67 (80%) were non-Qataris.

Table 48: Distribution of prostate cancer by nationality

Behavior	Qatari	Non-Qatari	Grand Total
Malignant	17	67	84
Grand Total	**17**	**67**	**84**

The cumulative risk, or the chance of a male getting prostate cancer between the ages of 0-74, is 2.02 *per 100,000.* Age Standardized Rate (ASR) was found to be 20.23 *per 100,000* of population at risk.

Table 49: Summary of prostate cancer burden

Age-Groups (5 year)	Males	
	N	ASMR
0-4	0	0.00
5-9	0	0.00
10-14	0	0.00
15-19	0	0.00
20-24	0	0.00
25-29	0	0.00
30-34	0	0.00
35-39	0	0.00
40-44	0	0.00
45-49	4	2.63
50-54	10	10.39
55-59	13	24.30
60-64	24	84.35
65-69	13	110.50
70-74	9	181.34
75-79	3	129.93
80+	8	389.86
Total (N)	**84**	
ASR *per 100,000 (WHO population)*	**20.23**	
Incidence Rate *per 100,000*	**4.15**	
Cumulative Risk of Incidence [0-74]	**2.02**	

DEMOGRAPHICS

The peak incidence of prostate cancer is in the age group 60-64. The youngest age was 47 years old, and the average age was 64 years old.

Figure 24: Distribution of prostate cancer by age groups

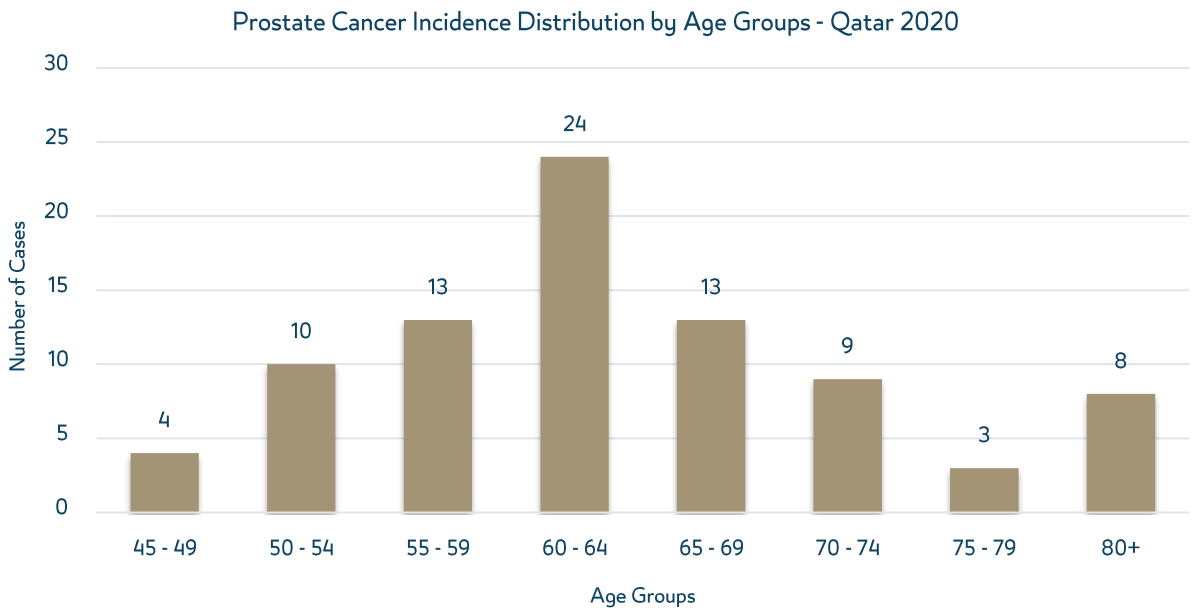


Table 50: Min, Max and Average Age Distribution for Prostate Cancer

Average of Age	Min (years)	Max (years)
64	47	90

PREVALENCE

Amongst all of the Qataris registered in the QNCR to date, there were 267 cases diagnosed with prostate cancer. Of these cases, 71 (26.59%) have died and 197 (73.41%) are still alive.

HISTOLOGY

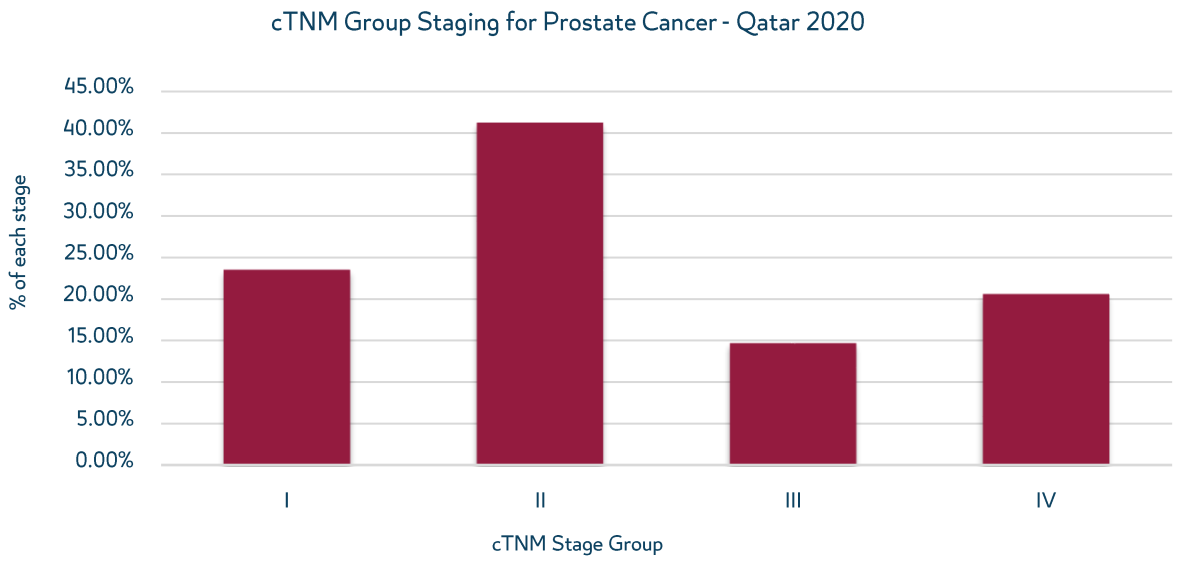
Table 51: Histology distribution for prostate cancer

Histology	N	%
Acinar cell carcinoma	72	85.71%
Neoplasm, malignant	8	9.52%
Adenocarcinoma, NOS	4	4.76%

STAGING

Over 40% of the total cases reported in 2020 did not have a known cTNM stage. Of those cases that did report a cTNM stage, more than 35% were late stages (III and IIV) and 65% were early stage (I and II). *[PLEASE SEE DISCLAIMER]*

Figure 25: cTNM Distribution for prostate cancer



TREATMENT

The following table shows the treatment types in no particular order. *[PLEASE SEE DISCLAIMER]*

Table 52: Treatment modalities for prostate cancer

Treatment Modality	%
Hormonotherapy / Radiation therapy	40.48%
Surgery	19.05%
Hormonotherapy	8.33%
Radiation therapy	4.76%
Chemotherapy / Hormonotherapy / Radiation therapy	4.76%
Hormonotherapy / Radiation therapy / Surgery	4.76%
Chemotherapy / Hormonotherapy	2.38%
Hormonotherapy / Surgery	2.38%
Chemotherapy / Hormonotherapy / Targeted therapy	1.19%
Radiation therapy / Surgery	1.19%
No treatment recorded	10.71%

NON-HODGKIN LYMPHOMA (NHL)

ICD 10 CODES

Table 53: ICD 10 codes for Non-Hodgkin Lymphoma cancer in QNCR

ICD 10 Code	Description
C82	Follicular lymphoma
C83	Non-follicular lymphoma
C84	Mature T/NK-cell lymphomas
C85	Other and unspecified types of non-Hodgkin lymphoma
C96	Other and unspecified malignant neoplasms of lymphoid

KEY FACTS

In 2020, there were 79 newly diagnosed cases of malignant Non-Hodgkin Lymphoma, 13 (16.46%) cases of which were Qataris and 66 (84.54%) cases non-Qataris.

Table 54: Non-Hodgkin Lymphoma distribution by gender and nationality

Behavior	Qatari			Non-Qatari			Grand Total
	Male	Female	Total	Male	Female	Total	
Malignant	7	6	13	51	15	66	79
Grand Total	**7**	**6**	**13**	**51**	**15**	**66**	**79**

The cumulative risk, or the chance of any person getting a Non-Hodgkin Lymphoma between the ages of 0-74, is 0.43 *per 100,000*. The Age Standardized Rate (ASR) was found to be 5.49 *per 100,000* people at risk.

Table 55: Summary of Non-Hodgkin Lymphoma burden

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	1	1.21	0	0.00	1	0.62
5-9	0	0.00	0	0.00	0	0.00
10-14	0	0.00	0	0.00	0	0.00
15-19	1	1.98	0	0.00	1	1.04
20-24	2	1.28	0	0.00	2	0.99
25-29	2	0.65	0	0.00	2	0.50
30-34	7	1.89	0	0.00	7	1.44
35-39	6	1.82	2	2.05	8	1.87
40-44	7	3.02	3	4.16	10	3.29
45-49	10	6.57	2	4.37	12	6.06
50-54	6	6.23	3	10.15	9	7.15
55-59	7	13.08	2	10.78	9	12.49
60-64	4	14.06	5	42.74	9	22.42
65-69	3	25.50	0	0.00	3	16.66
70-74	0	0.00	1	29.67	1	12.00
75-79	1	43.31	2	102.99	3	70.57
80+	1	48.73	1	52.77	2	50.67
Total (N)	**79**					
ASR *per 100,000 (WHO population)*	**5.49**					
Incidence rate *per 100,000*	**2.79**					
Cumulative Risk of Incidence [0-74]	**0.43**					

DEMOGRAPHICS

Amongst males, peak of incidence of Non-Hodgkin Lymphoma was in the age group 45-49, and 60-64 in females. The youngest age was 3 years old, and the average age was 48 years old.

Figure 26: Distribution of Non-Hodgkin Lymphoma by age groups

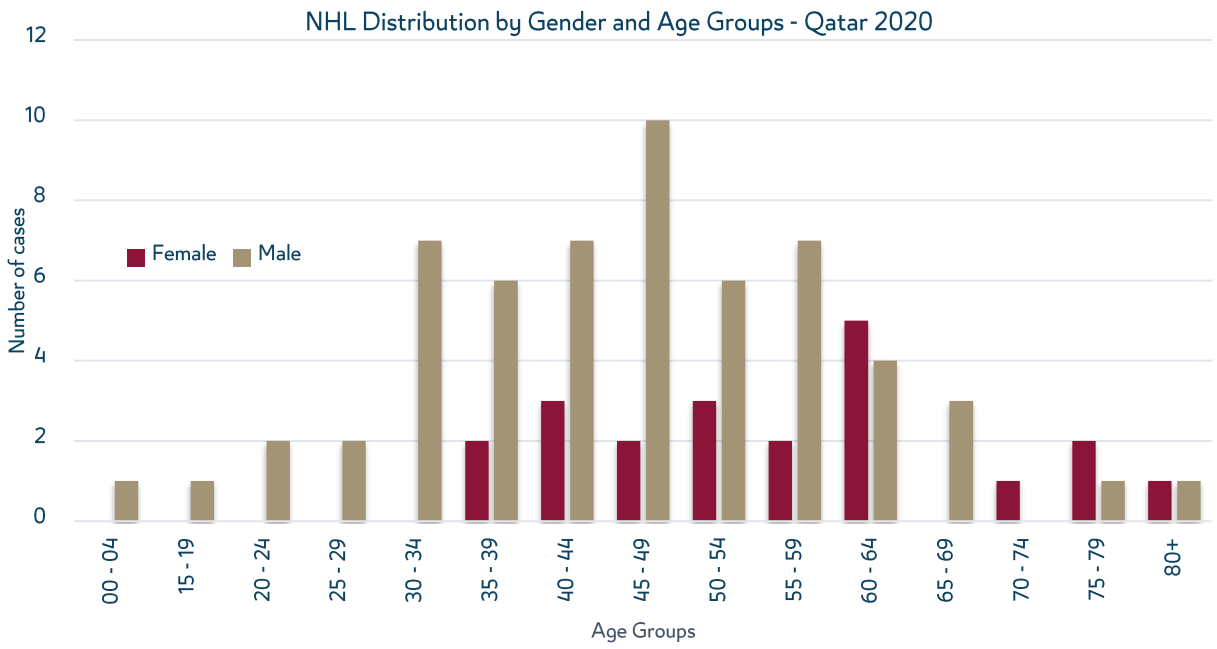


Table 56: Min, max and average age distribution for NHL cancer

Average of Age	Min (years)	Max (years)
48	3	82

PREVALENCE

Amongst all of Qataris registered in the QNCR to date, there were 257 cases diagnosed with Non-Hodgkin Lymphoma. Of these cases, 66 (26%) have died and 191 (74%) are still alive.

HISTOLOGY

Table 57: Histology distribution for Non-Hodgkin Lymphoma

Histology	N	%
Diffuse large B-cell lymphoma, NOS	38	48.10%
Follicular lymphoma, NOS	8	10.13%
Follicular lymphoma, grade 3	7	8.86%
Burkitt lymphoma, NOS (Includes all variants)	6	7.59%
Mantle cell lymphoma (Includes all variants: blastic, pleomorphic, small cell)	4	5.06%
Mature T-cell lymphoma, NOS	4	5.06%
Malignant lymphoma, non-Hodgkin, NOS	3	3.80%
Precursor T-cell lymphoblastic lymphoma	2	2.53%
Lymphoplasmacytic lymphoma	2	2.53%
NK/T-cell lymphoma, nasal and nasal-type	1	1.27%
Follicular lymphoma, grade 2	1	1.27%
Follicular lymphoma, grade 1	1	1.27%
Mediastinal large B-cell lymphoma	1	1.27%
Mycosis fungoides	1	1.27%

TREATMENT

The following table shows the treatment types in no particular order. *[PLEASE SEE DISCLAIMER]*

Table 58: Treatment modalities for Non-Hodgkin Lymphoma

Treatment Modality	%
Chemotherapy	51.90%
Chemotherapy / Radiation therapy	12.66%
Chemotherapy / Surgery	12.66%
Surgery	5.06%
Radiation therapy	2.53%
No treatment recorded	1.27%

LIVER AND INTRAHEPATIC BILE DUCTS

ICD 10 CODES

Table 59: ICD 10 codes for liver cancer in QNCR

ICD 10 Code	Description
C22	Malignant neoplasm of liver and intrahepatic bile ducts
C24	Malignant neoplasm of other and unspecified parts of biliary tract
D015	Carcinoma in situ of liver, gallbladder and bile ducts

KEY FACTS

Table 60: Distribution of liver cancer by gender and nationality

Behavior	Qatari			Non-Qatari			Grand Total
	Male	Female	Total	Male	Female	Total	
Malignant	11	3	14	48	9	57	71
Grand Total	**11**	**3**	**14**	**48**	**9**	**57**	**71**

In 2020, 71 cases were newly diagnosed with liver cancer, 14 (20%) of which were Qataris and 57 (80%) non-Qataris.

The cumulative risk is 0.77 *per 100,000*, that relates to the chance of a person to get liver cancer during the age of 0-74. The Age Standardized Rate ASR was found to be 7.71 *per 100,000* of population at risk.

Table 61: Summary of liver cancer burden

Age-Group (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	1	1.21	2	2.53	3	1.86
5-9	0	0.00	0	0.00	0	0.00
10-14	0	0.00	0	0.00	0	0.00
15-19	0	0.00	0	0.00	0	0.00
20-24	0	0.00	0	0.00	0	0.00
25-29	2	0.65	0	0.00	2	0.50
30-34	3	0.81	0	0.00	3	0.62
35-39	6	1.82	0	0.00	6	1.40
40-44	5	2.16	1	1.39	6	1.98
45-49	2	1.31	1	2.19	3	1.51
50-54	6	6.23	2	6.76	8	6.36
55-59	10	18.69	0	0.00	10	13.88
60-64	10	35.15	1	8.55	11	27.40
65-69	4	34.00	3	48.03	7	38.87
70-74	5	100.75	0	0.00	5	60.00
75-79	1	43.31	1	51.49	2	47.05
80+	4	194.93	1	52.77	5	126.68
Total (N)	**71**					
ASR *per 100,000 (WHO population)*	**7.71**					
Crude incidence rate *per 100,000*	**2.51**					
Cumulative Risk of Incidence [0-74]	**0.77**					

DEMOGRAPHICS

In male patients, the peak age group was 55-64, while it was 65-69 for female patients, with average age of incidence is 54.

Figure 27: Distribution of liver cancer by age groups

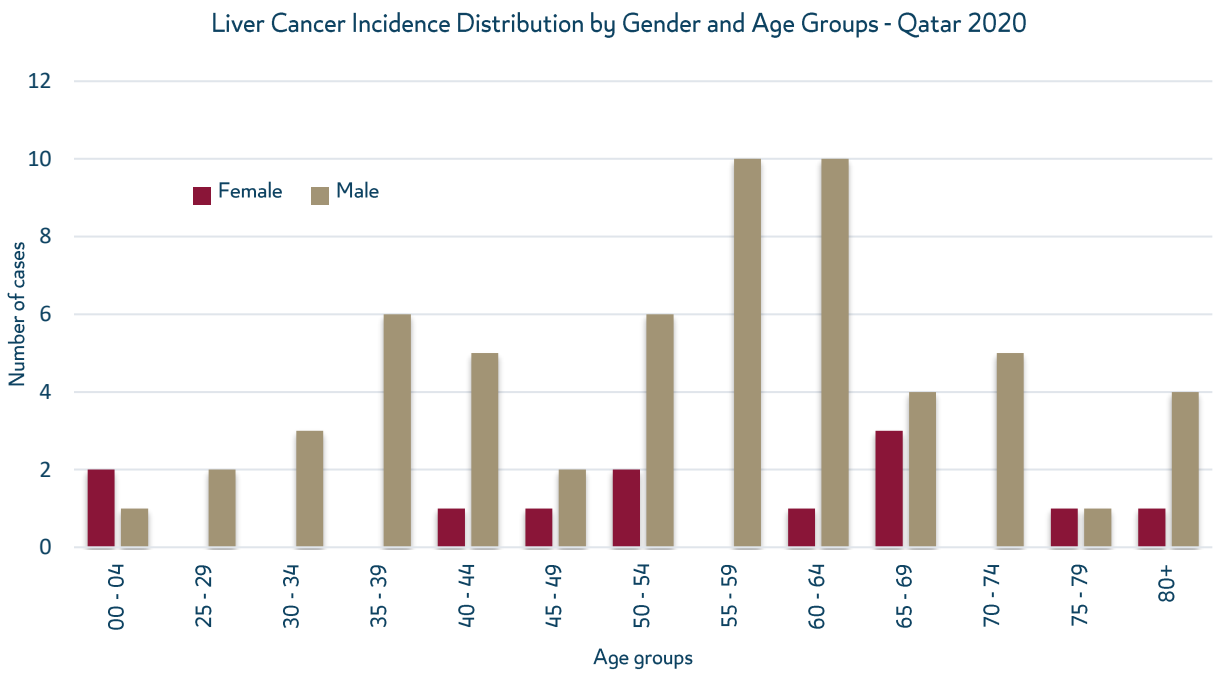


Table 62: Min, Max and Average Age Distribution for Liver Cancer

Average of Age	Min (years)	Max (years)
54	0	90

PREVALENCE

Amongst all the Qatari population registered in the QNCR, to date there were 246 cases diagnosed with liver cancer. Of these cases, 161 (65%) have died and 85 (35%) are still alive.

HISTOLOGY

Table 63: Histology distribution for liver cancer

Histology	N	%
Hepatocellular carcinoma, NOS	56	78.87%
Cholangiocarcinoma	4	5.63%
Neoplasm, malignant	3	4.23%
Hepatoblastoma	3	4.23%
Neuroendocrine tumor, grade 2	2	2.82%
Neuroendocrine carcinoma, NOS	1	1.41%
Carcinoma, undifferentiated, NOS	1	1.41%
Adenocarcinoma, NOS	1	1.41%

TREATMENT

The following table shows the treatment types in no particular order. *[PLEASE SEE DISCLAIMER]*

Table 64: Treatment modalities for liver cancer

Treatment Modality	%
Radiation therapy	14.08%
Chemotherapy	11.27%
Chemotherapy / Radiation therapy	8.45%
Chemotherapy / Immunotherapy	2.82%
Chemotherapy / Immunotherapy / Radiation therapy	1.41%
Immunotherapy / Radiation therapy	1.41%
Surgery	1.41%
Radiation therapy / Surgery	1.41%
Chemotherapy / Surgery	1.41%
Immunotherapy	1.41%
No treatment reported	54.93%

TRACHEA, BRONCHUS AND LUNG

ICD 10 CODES

Table 65: ICD 10 codes for lung cancer in QNCR

ICD 10 Code	Description
C33	Malignant neoplasm of trachea
C34	Malignant neoplasm of bronchus and lung
D021	Trachea

KEY FACTS

In 2020, 81 cases were newly diagnosed with lung cancer, 18 (22%) of which were Qataris and 63 (78%) were non-Qataris.

Table 66: Distribution of lung cancer by gender and nationality

Behavior	Qatari			Non-Qatari			Grand Total
	Male	Female	Total	Male	Female	Total	
Malignant	14	4	18	47	16	63	81
Grand Total	**14**	**4**	**18**	**47**	**16**	**63**	**81**

The cumulative risk is 0.91 *per 100,000*, that relates to the chance of a person getting malignant lung cancer during the age of 0-74. The Age Standardized Rate ASR was found to be 9.88 *per 100,000* of population at risk.

Table 67: Summary of lung cancer burden

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	0	0.00	0	0.00	0	0.00
5-9	0	0.00	0	0.00	0	0.00
10-14	0	0.00	0	0.00	0	0.00
15-19	0	0.00	0	0.00	0	0.00
20-24	0	0.00	0	0.00	0	0.00
25-29	0	0.00	0	0.00	0	0.00
30-34	1	0.27	1	0.86	2	0.41
35-39	6	1.82	2	2.05	8	1.87
40-44	5	2.16	1	1.39	6	1.98
45-49	8	5.25	1	2.19	9	4.54
50-54	9	9.35	1	3.38	10	7.95
55-59	7	13.08	6	32.33	13	18.04
60-64	6	21.09	0	0.00	6	14.94
65-69	8	68.00	1	16.01	9	49.97
70-74	3	60.45	4	118.69	7	84.00
75-79	3	129.93	1	51.49	4	94.10
80+	5	243.66	2	105.54	7	177.35
Total (N)	**81**					
ASR *per 100,000 (WHO population)*	**9.88**					
Incidence rate *per 100,000*	**2.86**					
Cumulative Risk of Incidence [0-74]	**0.91**					

DEMOGRAPHICS

In comparison to females, male have a higher incidence of lung cancer at 50-54. The youngest age was 33 years, and the average age was 58 years old.

Figure 28: Distribution of lung cancer by age groups

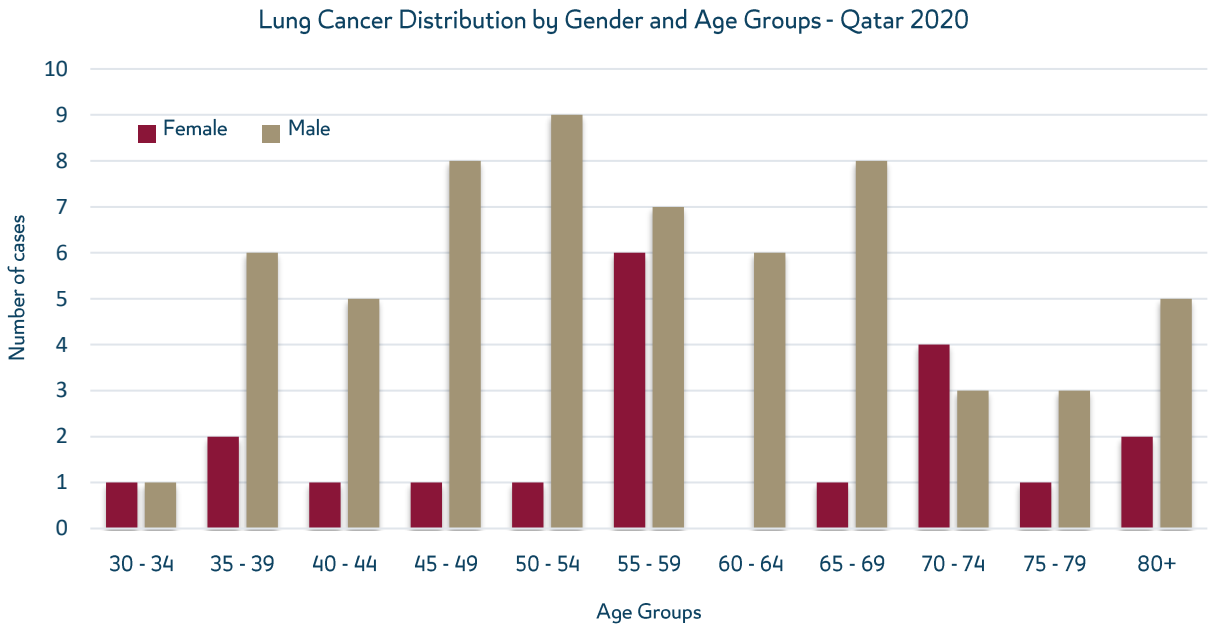


Table 68: Min, max and average age distribution for lung cancer

Average of Age	Min (years)	Max (years)
58	33	95

PREVALENCE

Amongst all of the Qatari population registered in the QNCR to date, there were 303 cases diagnosed with lung cancer. Of these cases, 206 (68%) have died and 97 (32%) are still alive.

HISTOLOGY

Table 69: Histology distribution for lung cancer

Histology	N	%
Adenocarcinoma, NOS	48	59.26%
Small cell carcinoma, NOS	9	11.11%
Squamous cell carcinoma, NOS	5	6.17%
Neuroendocrine tumor, NOS	4	4.94%
Neoplasm, malignant	4	4.94%
Mucinous adenocarcinoma	3	3.70%
Carcinoma, NOS	2	2.47%
Large cell neuroendocrine carcinoma	1	1.23%
Basaloid squamous cell carcinoma	1	1.23%
Neuroendocrine carcinoma, NOS	1	1.23%
Adenoid cystic carcinoma	1	1.23%
Thymoma, type B2	1	1.23%
Neuroendocrine tumor, grade 2	1	1.23%

TREATMENT

The following table shows the treatment types in no particular order. *[PLEASE SEE DISCLAIMER]*

Table 70: Treatment modalities for lung cancer

Treatment Modality	%
Chemotherapy	24.69%
Chemotherapy / Immunotherapy / Radiation therapy	11.11%
Chemotherapy / Immunotherapy	7.41%
Chemotherapy / Radiation therapy	7.41%
Surgery	4.94%
Chemotherapy / Surgery	3.70%
Chemotherapy / Radiation therapy / Surgery	1.23%
Immunotherapy / Radiation therapy	1.23%
Targeted therapy	1.23%
Radiation therapy	1.23%
Radiation therapy / Surgery	1.23%
Not treatment recorded	34.57%

URINARY TRACT

ICD 10 CODES

Table 71: ICD 10 codes for urinary tract in QNCR

ICD 10 Code	Description
C64	Malignant neoplasm of kidney
C65	Malignant neoplasm of renal pelvis
C66	Malignant neoplasm of ureter
C68	Malignant neoplasm of other and unspecified urinary organs
D091	Other and unspecified urinary organs

KEY FACTS

In 2020, 58 cases were newly diagnosed with kidney cancer, 14(24.14%) of which were Qataris and 44 (75.86%) non-Qataris.

Table 72: Distribution of urinary tract cancer by gender and nationality

Behavior	Qatari			Non-Qatari			Grand Total
	Male	Female	Total	Male	Female	Total	
Malignant	7	7	14	36	8	44	58
Grand Total	**7**	**7**	**14**	**36**	**8**	**44**	**58**

The cumulative risk is 0.47 *per 100,000*, that relates to the chance of a person to get kidney cancer during the age of 0-74. The Age Standardized Rate ASR was found to be 3.87 *per 100,000* of population at risk.

Table 73: Summary of urinary tract cancer burden

Age-Groups (5 year)	Male		Female		Both Genders	
	N	ASIR	N	ASIR	N	ASIR
0-4	1	1.21	1	1.27	2	1.24
5-9	0	0.00	1	1.29	1	0.63
10-14	0	0.00	0	0.00	0	0.00
15-19	0	0.00	0	0.00	0	0.00
20-24	0	0.00	0	0.00	1	0.00
25-29	1	0.33	0	0.00	3	0.25
30-34	4	1.35	0	0.00	4	1.03
35-39	2	0.61	0	0.00	8	0.47
40-44	5	2.16	0	0.00	13	1.65
45-49	4	3.28	1	2.19	17	3.03
50-54	7	7.27	4	13.53	12	8.74
55-59	4	7.48	6	32.33	16	13.88
60-64	6	24.60	1	8.55	16	19.92
65-69	4	34.00	0	0.00	12	22.21
70-74	1	20.15	1	29.67	3	24.00
75-79	0	0.00	0	0.00	2	0.00
80+	1	48.73	0	0.00	2	25.34
Total (N)	**55**					
ASR *per 100,000 (WHO population)*	**3.87**					
Incidence rate *per 100,000*	**1.94**					
Cumulative Risk of Incidence [0-74]	**0.47**					

DEMOGRAPHICS

Figure 29: Distribution of urinary tract cancer by age groups

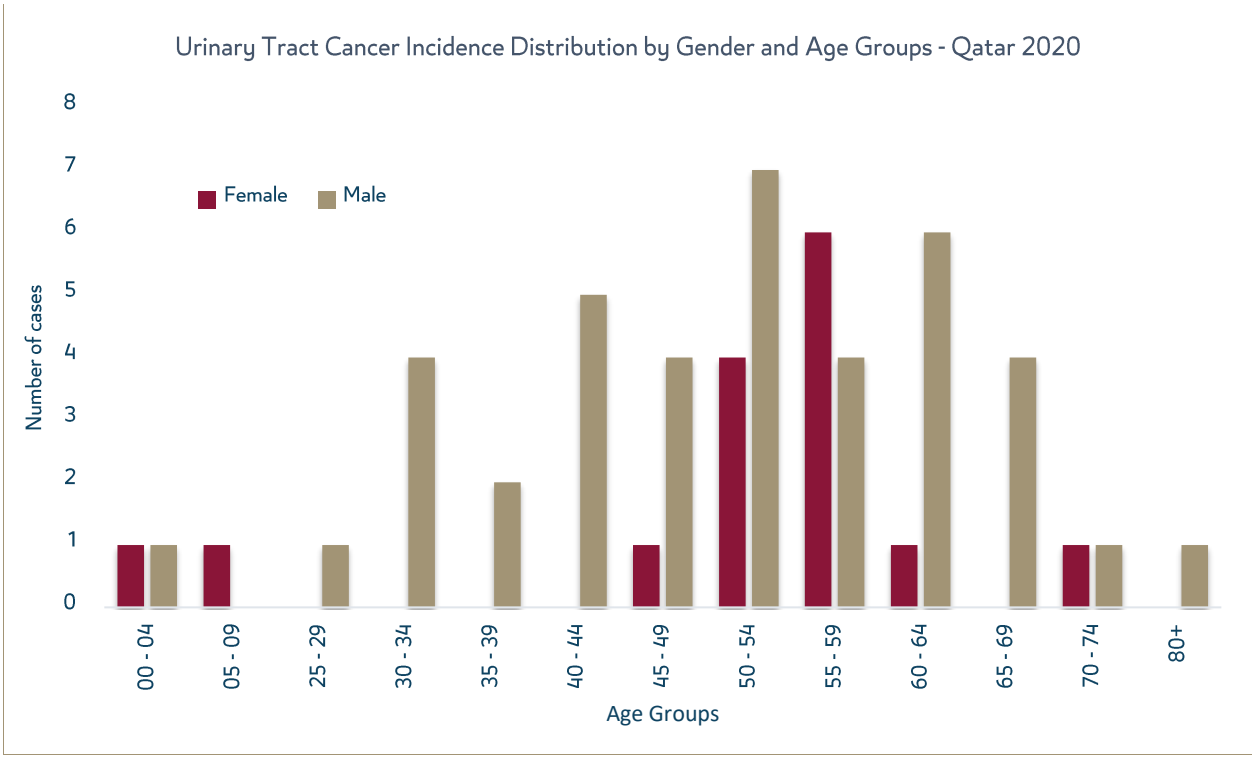


Table 74: Min, max and average age distribution for urinary tract cancer

Average of Age	Min (years)	Max (years)
50	1	81

PREVALENCE

Amongst the Qatari population registered in the QNCR, there were 165 cases diagnosed with kidney cancer. Of these cases, 38 (23%) have died and 127 (63%) are still alive.

HISTOLOGY

Table 75: Histology distribution for urinary tract cancer

Histology	N	%
Renal cell carcinoma, NOS	37	63.79%
Renal cell carcinoma, Chromophobe type	5	8.62%
Papillary transitional cell carcinoma	3	5.17%
Neoplasm, malignant	3	5.17%
Nephroblastoma, NOS	3	5.17%
Papillary adenocarcinoma, NOS	2	3.45%
Carcinoma, NOS	1	1.72%
Clear cell adenocarcinoma, NOS	1	1.72%
Urothelial carcinoma in situ	1	1.72%
Papillary urothelial carcinoma, non-invasive	1	1.72%
Neuroendocrine tumor, NOS	1	1.72%

TREATMENT

The following table shows the treatment types in no particular order. *[PLEASE SEE DISCLAIMER]*

Table 76: Treatment modalities for urinary tract cancer

Treatment Modality	%
Surgery	68.97%
Chemotherapy / Surgery	8.62%
Immunotherapy	3.45%
Chemotherapy / Immunotherapy	1.72%
Chemotherapy / Immunotherapy / Radiation therapy / Surgery	1.72%
Chemotherapy / Immunotherapy / Surgery	1.72%
Chemotherapy	1.72%
Hormonotherapy / Surgery	1.72%

APPENDIX

DATA MANAGEMENT

DENOMINATOR

Cancer incidence nominator covers all cases diagnosed with cancer in the State of Qatar excluding cases classified as "Visitors", in addition to Qatari cases diagnosed abroad.

Whilst for the calculation of prevalence and survival, we considered the Qatari population only, for being a stable population, which allows a reasonable control on the information compared to non-Qatari population.

Only In situ and malignant cases are included, except for brain and central nervous system where all behaviors are included.

MATERIAL AND METHODS

DEFINITIONS

INCIDENCE

Incidence is the number of new cases arising in a given period in a specified mid-year population. This information is collected routinely by cancer registries. It can be expressed as an absolute number of cases per year or as a rate per 100,000 persons per year (see Crude rate and ASR below).

MORTALITY 0

Mortality is the number of deaths occurring in a given period in a specified population. It can be expressed as an absolute number of deaths per year or as a rate per 100,000 persons per year.

PREVALENCE 0

The prevalence of a particular cancer can be defined as the number of persons in a defined population who have been diagnosed with that type of cancer, and who are still alive at the end of a given year. Complete prevalence represents the number of persons alive at certain point in time who previously had a diagnosis of the disease, regardless of how long ago the diagnosis was, or if the patient is still under treatment or is considered cured. Partial prevalence, which limits the number of patients to those diagnosed during a fixed time in the past, is a particularly useful measure of cancer burden.

Prevalence is presented for the adult population only (ages 15 and over) and is available both as numbers and as proportions per 100,000 persons.

CRUDE RATE

Data on incidence or mortality are often presented as rates. For a specific tumor and population, a crude rate is calculated simply by dividing the number of new cancers or cancer deaths observed during a given time period by the corresponding number of person years in the population at risk. For cancer, the result is usually expressed as an annual rate per 100,000 persons at risk.

AGE STANDARDIZED RATE ASR0

An age-standardized rate (ASR) is a summary measure of the rate that a population would have if it had a standard age structure. Standardization is necessary when comparing several populations that differ with respect to age because age has a powerful influence on the risk of cancer. The ASR is a weighted mean of the age-specific rates; the weights are taken from population distribution of the standard population. The most frequently used standard population is the World Standard Population. The calculated incidence or mortality rate is then called age-standardized incidence or mortality rate (world). It is also expressed per 100,000.

CUMULATIVE RISK0

Cumulative incidence/mortality is the probability or risk of individuals getting/dying from the disease during a specified period. For cancer, it is expressed as the number of newborn children (out of 100) who would be expected to develop/die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

CRUDE INCIDENCE RATE

It is calculated according to the following equation:

$$Crude\ Incidence\ Rate\ = \frac{Total\ Number\ of\ cancer\ cases\ diagnosed\ in\ the\ given\ year}{Total\ Population\ in\ the\ same\ year} \times 100000$$

AGE-SPECIFIC INCIDENCE RATE ASIR

The Age-Specific Incidence Rate (ASIR) is calculated simply by dividing the number of cancer incidences observed in a given age category during a given time period by the corresponding number of person years in the population at risk in the same age category and time period. For cancer, the result is usually expressed as an annual rate per 100,000 person-years.

EQUATIONS

$$ASIR = \frac{Number\ of\ cancer\ cases\ diagnosed\ in\ the\ given\ age\ group}{Population\ at\ risk\ in\ the\ same\ age\ group} \times 100000$$

Age Standardized Rate ASR[0]

It is calculated as

$$ASR = \sum ASIR \times Weight\ of\ Standard\ Population$$

The weight of standard population is calculated as follows

$$Weight = \frac{Standard\ population\ of\ a\ given\ age\ group}{Total\ standard\ population}$$

Table 77: WHO Standard Population

Age Group	Population	Weight
0-4	88,569	0.088569
5 - 9	86,870	0.0868696
10 - 14	85,970	0.0859699
15 - 19	84,670	0.0846704
20 - 24	82,171	0.0821712
25 - 29	79,272	0.0792723
30 - 34	76,073	0.0760734
35 - 39	71,475	0.071475
40 - 44	65,877	0.0658769
45 - 49	60,379	0.0603789
50 - 54	53,681	0.0536812
55 - 59	45,484	0.0454841
60 - 64	37,187	0.037187
65 - 69	29,590	0.0295896
70 - 74	22,092	0.0220923
75 - 79	15,195	0.0151947
80 +	15,445	0.0154446
Total	100 000	1

THE CUMULATIVE RISK

The cumulative rate is expressed as

$$\text{The cumulative rate } = \sum_{i=1}^{A} ai\ ti$$

$$The\ Cumulative\ risk\ = 100\ \times [1 - \exp(cumulative\ rate/100)]$$

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Cancer National Program

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