QATAR HEALTH REPORT 2014-2016

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FOREWORD

Improving the health of the population requires knowledge of the distribution of the main causes of disease, of the risk factors and of the resources available in the health system to address them. Only on the basis of a comprehensive set of valid and reliable data, we can implement a well-informed policy, based on evidence and facts. This is particularly relevant at a time when the circulation of information on health, treatments and exposures often relies on informal and unverified sources through vehicles such as the internet and social media.

The Qatar National Health Report 2014-2016 is a serious attempt to provide the necessary data to guide Qatar's health policy on the basis of the effective situation of the country. This volume contains critical indicators on health in the state of Qatar and allows health and government authorities to identify the areas of concern that require policy decisions and effective actions. These data, if referred to in the future, also allow to assess the impact of measures that are and will be put in place to address ill-health and promote well-being. They were essential to define the main policy directions of the National Health Strategy 2018-2022.

The figures included in this report also constitute a solid and official set of data to report at the international level the health status of the Qatari population, allowing for international comparisons and facilitating the monitoring of the implementation of the international commitments that Qatar has taken to support and promote health.

I would like to thank all people that have worked at the collection, collation and review of the data presented in this report. There is a lot to be done to further improve quality and coverage of the information on health in the country, but I am confident that our motivated and professional team will be able to address these challenges and extend the quality of our data bases in the years to come. This will be essential for the promotion of the health of the population of Qatar.

HE Dr. Hanan Al Kuwari
Minister of Public Health

ACKNOWLEDGEMENTS

Report leadership was provided by the members of the Qatar Health Observatory committee, chaired by Dr. Al Anoud Mohammad Al Thani, Head of Health Promotion and Non-Communicable Diseases, Ministry of Public Health, and Dr. Roberto Bertollini, Advisor to Her Excellency Dr. Hanan Mohammad Al Kuwari, the Minister of Public Health, Ministry of Public Health.

Report preparation, drafting and review was provided by Dr. Ralph Hachem, Consultant, Ministry of Public Health and Mr. Tim Olsen, Program Support Manager, Directorate of Policy, Ministry of Public Health, with statistical support and validation provided by Mr. Shamseldin Khalifa and Mr. Amine el Toumi, Health Intelligence and Information Section, Ministry of Public Health.

Qatar's healthcare providers, other departments at the Ministry of Public Health, and government agencies greatly contributed to this report by providing comprehensive data and information, often within short timeframes.

ACRONYMS AND ABBREVIATIONS

UN: United Nations
SDGs: Sustainable Development Goals

MDPS: Ministry of Development, Planning and Statistics

ASMR: Age Specific Mortality Rate

ASFR: Age Specific Fertility Rate

TFR: Total Fertility Rate

ICD-10: International Classification of Diseases, Tenth Revision

GCC: Gulf Cooperation Council

OECD: Organization of Economic Co-operation and Development

WHO: World Health Organization

NCD: Non-Communicable Diseases

WHO EMRO: World Health Organization Eastern Mediterranean Regional Office

SBP: Systolic Blood Pressure

DBP: Diastolic Blood Pressure

BMI: Body Mass Index

AMR: Adult Mortality Rate

g/dL: Grams per Deciliter

sq.km: Square Kilometer

GYTS: Global Youth Tobacco Survey

GATS: Global Adult Tobacco Survey

1 CONTEXT

1.1 SOCIO-ECONOMIC

Socioeconomic status, is a combination of economic and sociological measures used to compare individuals in a population on the basis of income, education and occupation. It is a widely recognized determinant of health status (Flaskerud & Carol, 2012). Universal education and eradication of poverty are both global priorities under the UN SDGs (United Nations [UN], 2015) (GOAL 1 "No Poverty" and GOAL 4 "Quality Education")

Literacy rate, net primary school enrolment and percentage of the population below the international poverty line are three indicators measuring socioeconomic determinants of a country or population. Literacy rate refers to the number of literate persons in a given age group as a percentage of the total population of its respective age group. Net primary school enrolment corresponds to the number of children enrolled in primary school of a specific age group that officially corresponds to primary schooling, divided by the total population of the same age group. Both these indicators refer to the education level of a particular country as well as access to education (UN, 2009).

In Qatar, in 2015, youth literacy rate (among adolescents and young adults aged 15 to 24 years) was 98% and 99% for males and females respectively (Table 1.1.1). In 2016, 99% of males and females were literate. Table 1.1.1 also shows that net primary school enrolment is the same among males and females in Qatar in the years 2015 and 2016: in 2015, the overall net primary school enrolment was 91 per 100 school-age children (same for males and females) and in 2016 was 94 per 100 school-age children (same for males and females). (Table 1.1.1).

The population below the international poverty line represents the part of the population living in poverty, defined as having an income of less than 1.90$ a day (World Bank, 2019).

In Qatar, 0.1% of the population was living below the international poverty line in 2015 (Table 1.1.1).

Socioeconomic factors result in different exposure to determinants of diseases and therefore play a role in influencing the health status of a population and of a country. Review of the literature showed that high income and education level have both been linked with increased life expectancy and better health outcomes overall (Flaskerud & Carol, 2012).

Table 1.1.1: Literacy rate ages 15 to 24 years, Net primary school enrolment ratio and Population below the international poverty line, by gender and year, 2015 & 2016

LITERACY RATE (15-24 YEARS)			NET PRIMARY SCHOOL ENROLMENT (RATIO PER 100 SCHOOL-AGE CHILDREN)			POPULATION BELOW THE INTERNATIONAL POVERTY LINE
YEAR	MALE	FEMALE	MALE	FEMALE	BOTH SEXES	
2015	98%	99%	91	91	91	0.1%
2016	99%	99%	94	94	94	0.1%*

Sources: Planning and Statistics Authority, Social Statistics 2014-2016

**: Estimates from MoPH*

1.2 DEMOGRAPHY

Demographic characteristics of a population impact its health needs and drive the allocation of healthcare resources. Studying the size, age structure, gender ratio, spatial distribution and temporal changes of the population as related to birth, migration, growth and death are all important determinants for system planning as individuals have varying health needs in the different stages of life (Jahan et al., 2014).

Qatar has had the world's fastest growing population over the 2010-2015 period, according to estimates from the World Population Prospects: the 2017 Revision (UN, 2017). In 2014, Qatar's population was 2,216,180 and reached 2,617,634 in 2016 (Table 1.2.1), corresponding to a growth of 18%. The growth rate was 10% from 2014 to 2015 and 7.4% from 2015 to 2016 (Figure 1.2.8).

Qatar's estimated growth rate is high compared to the estimated growth rates of other GCC countries, ranging from 2.01% in Bahrain to 6.45% in Oman (UN, 2017).

The pyramid of the population of the State of Qatar has a unique shape (Figure 1.2.1, Figure 1.2.2, and Figure 1.2.3). It is largely driven by disproportionate share of working age males in the population with expatriates making up a large proportion of the total population.

The Qatari population pyramid (Figure 1.2.4) shows a growing population pyramid with a large percentage of people in younger age groups. The expatriate population pyramid (Figure 1.2.5) reflects a high proportion of non-Qatari males, mainly aged 20 to 50.

A similar population pyramid shape is found in other countries in the GCC such as UAE and Oman (UN, 2017).

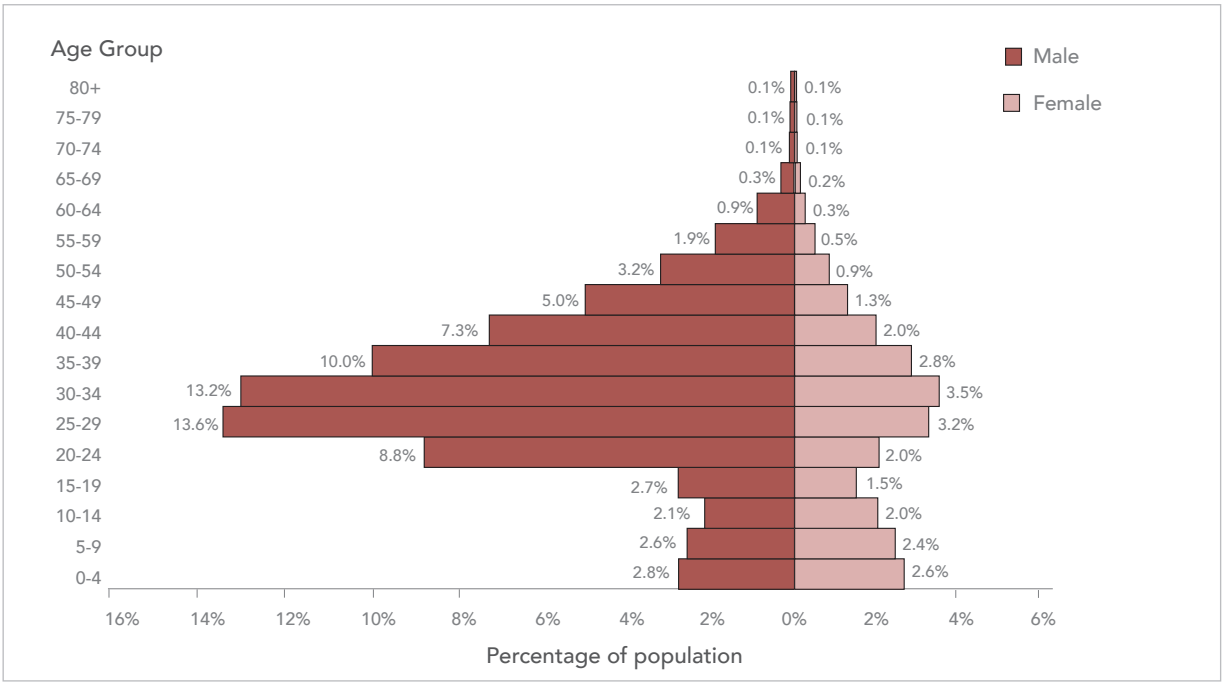
Qatar's population pyramid is the result of a large influx of working-age expatriates combined with a high fertility rate among Qatari female population (3 births per Qatari woman in 2016, Table 2.3.1). In 2015, Qatar's demographics profile showed that 13.8% of the population is aged 15 or less, 85.2% of the population is aged 15-64 and 1% of the population aged 65 and above (Figure 1.2.6, Figure 1.2.7).

Table 1.2.1: Total population by age group, gender and year, 2014 to 2016

AGE	2014			2015			2016		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
0	12,445	11,975	24,420	13,188	12,683	25,871	13,648	13,041	26,689
1-4	48,809	46,511	95,320	50,708	48,461	99,169	57,073	54,506	111,579
5-9	57,049	54,228	111,277	59,233	56,611	115,844	62,962	60,704	123,666
10-14	46,694	44,428	91,122	49,625	46,886	96,511	48,979	46,994	95,973
15-19	60,862	32,957	93,819	64,384	35,467	99,851	54,764	34,346	89,110
20-24	194,766	44,933	239,699	212,289	48,190	260,479	229,491	44,593	274,084
25-29	301,046	71,391	372,437	344,955	80,030	424,985	375,542	87,832	463,374
30-34	292,097	77,392	369,489	321,012	81,137	402,149	348,857	90,039	438,896
35-39	222,194	62,245	284,439	242,593	64,696	307,289	261,734	71,937	333,671
40-44	160,681	43,287	203,968	183,522	44,988	228,510	197,691	49,614	247,305
45-49	109,836	28,815	138,651	129,090	30,330	159,420	139,521	33,097	172,618
50-54	69,893	19,024	88,917	79,920	19,612	99,532	86,582	22,155	108,737
55-59	41,582	11,752	53,334	51,461	12,513	63,974	56,087	14,477	70,564
60-64	19,626	6,433	26,059	22,100	6,962	29,062	24,310	8,414	32,724
65-69	7,155	3,463	10,618	9,244	3,555	12,799	10,279	4,328	14,607
70-74	2,915	2,041	4,956	3,737	2,140	5,877	4,086	2,655	6,741
75-79	2,278	1,479	3,757	1,999	1,397	3,396	2,236	1,744	3,980
80+	2,109	1,789	3,898	1,583	1,489	3,072	1,694	1,622	3,316
Total	1,652,037	564,143	2,216,180	1,840,643	597,147	2,437,790	1,975,536	642,098	2,617,634

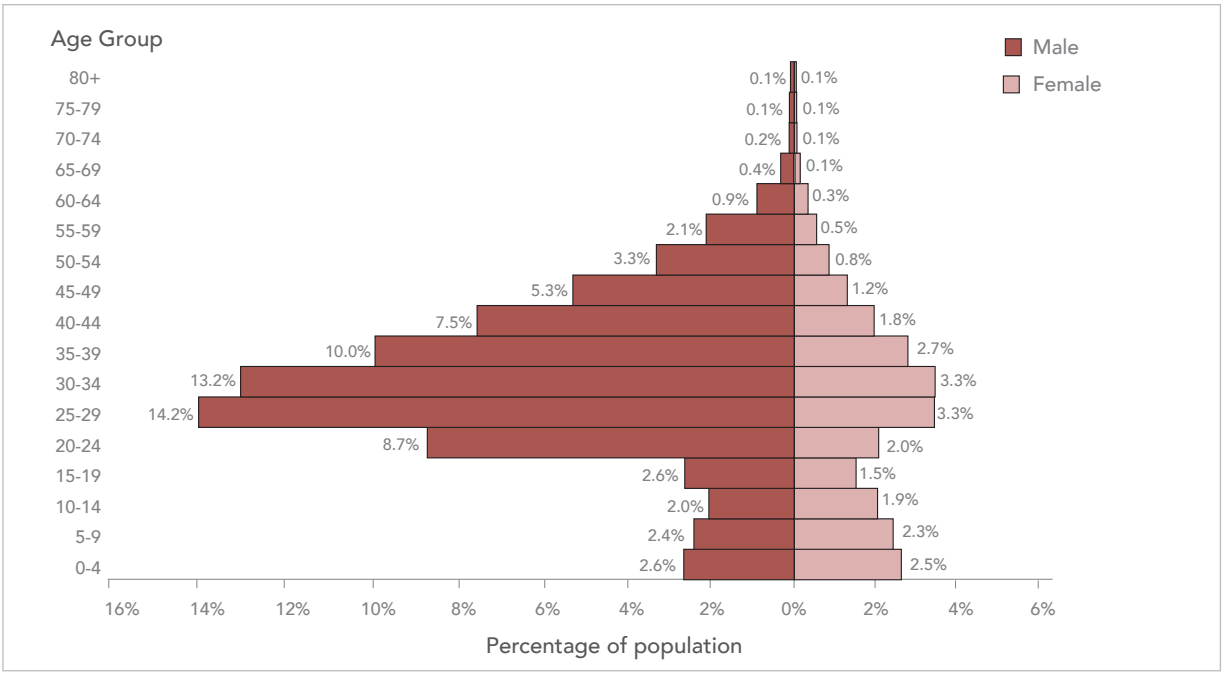
Source: Planning and Statistics Authority

Figure 1.2.1: Population pyramid, by age group and gender, 2014



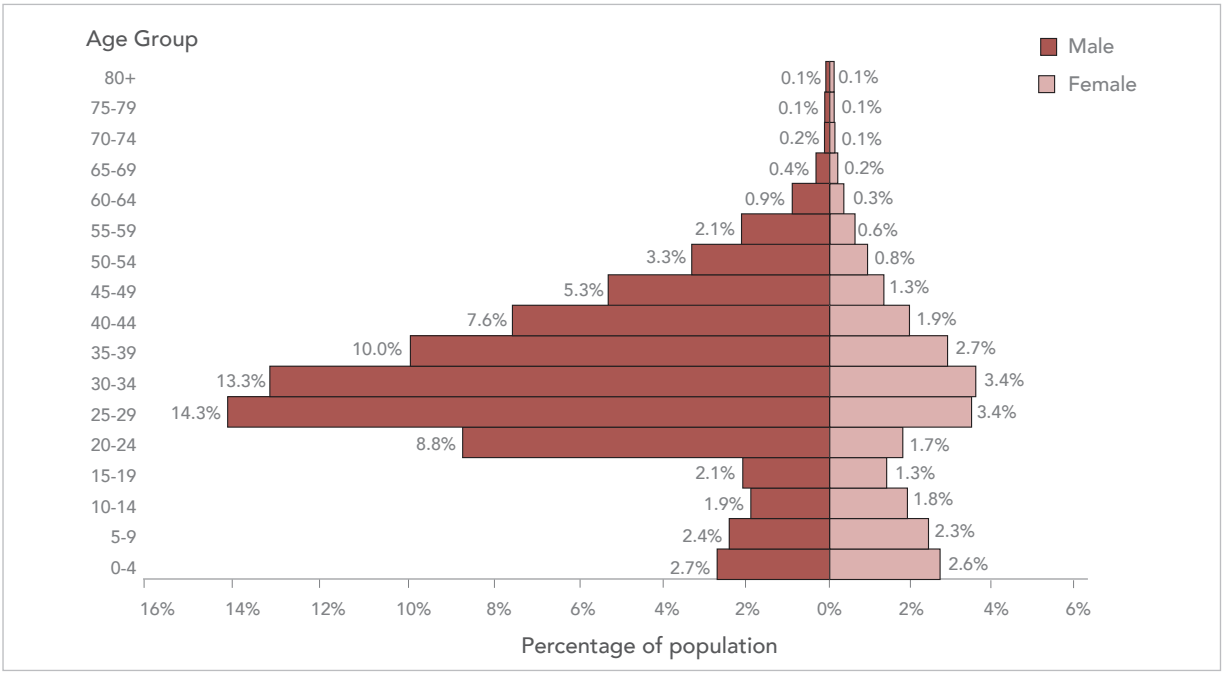
Source: Planning and Statistics Authority

Figure 1.2.2: Population pyramid, by age group and gender, 2015



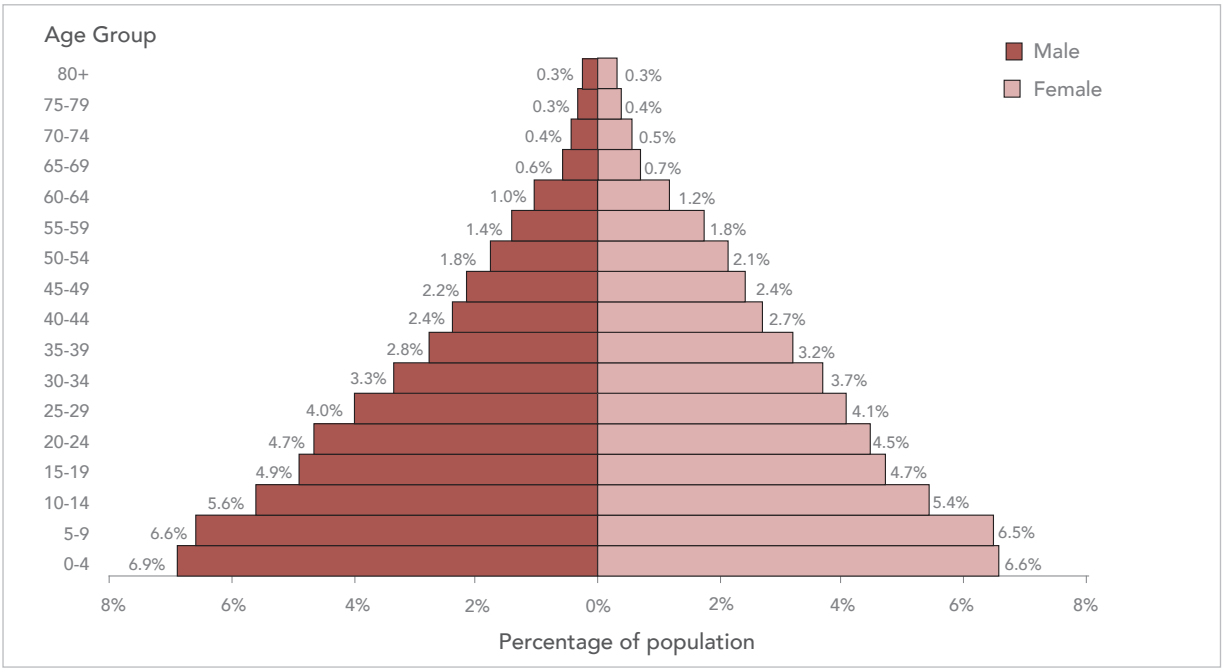
Source: Planning and Statistics Authority

Figure 1.2.3: Population pyramid, by age group and gender, 2016



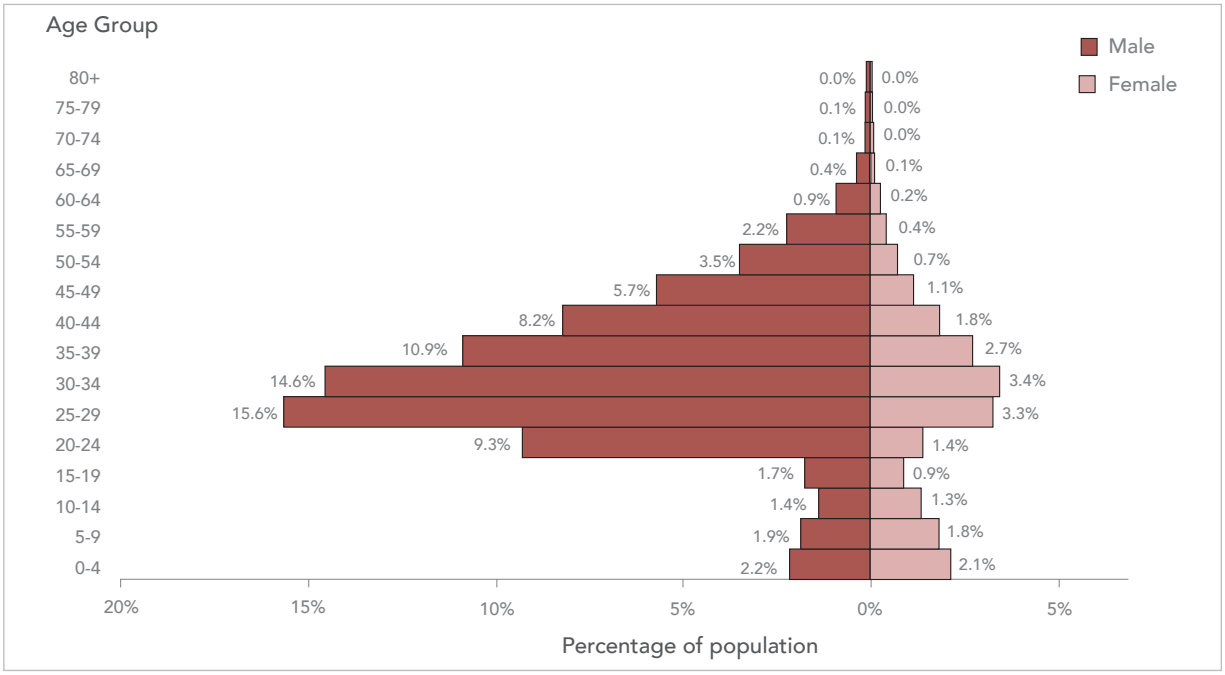
Source: Planning and Statistics Authority

Figure 1.2.4: Population pyramid of Qatari nationals, by age group and gender, 2016



Source: Planning and Statistics Authority

Figure 1.2.5: Population pyramid of non-Qatari citizens, by age group and gender, 2016

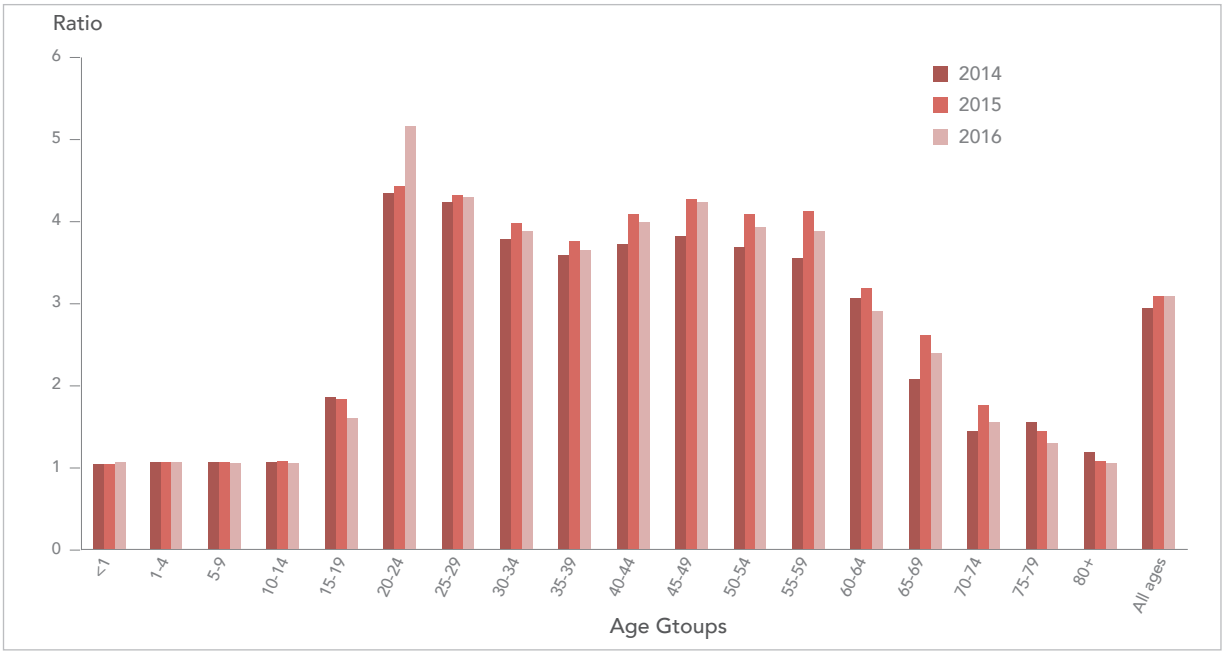


Source: Planning and Statistics Authority

The population gender ratio (number of males per 100 females) is a useful indicator for assessing health needs, the prevalence of gender related behaviors and other determinants (Phillips, 2011). Certain behaviors are more prominent in one gender compared to the other such, for instance dangerous driving of young males leading to road traffic injuries (Croisant, Haque Laz, Rahman & Berenson, 2013).

In 2016, Qatar's gender ratio (M/F) is high in the 15-65 age group with values ranging between 2 and 5 over the 3 year period (Figure 1.2.5). Qatar is estimated to have the highest gender ratio in the world and this is mainly due to the high proportion of non-Qatari working-age males (UN, 2017). In fact, all the countries of the GCC are estimated to have the 6 highest gender ratio worldwide (UN, 2017)

Figure 1.2.6: Gender ratio by age group and year, 2014 to 2016



Source: Planning and Statistics Authority

Note: Ratio is males to females. For example, X males to 1 female.

Dependency ratio is a measure of the pressure on the working population (defined as people aged 15 to 64 years), to support the dependent population (defined as people aged less than 15 years and aged 65 and above). Higher dependency ratio refers to more financial stress on the "productive" group of people whereas low dependency ratio is interpreted as having sufficient working people providing economic support to the dependent population (OECD, 2007).

Table 1.2.2 shows the total dependency ratio, calculated by dividing the number of dependents over the number of the working population group. It shows a steady decrease in dependency ratio from 18.5% in 2014 to 17.5% in 2015 to 17.3% of the workforce in Qatar in 2016. These values are explained by the disproportional increase of the working group population aged 15-64 over 3 years compared to the dependent groups (group of people aged less than 15 years and the group of people aged above 65 years) (Table 1.2.3). In fact, from 2014 to 2016, the number of child/young dependents increased by 35,768 (from 322,139 to 357,907) and the number of elderly dependents by 5,415 (from 23,229 to 28,644). When looking at the 15-64 age group of working people, there was an increase of 360,271 (from 1,870,812 to 2,231,083) in the respective population group over the 3 year period.

Table 1.2.2: Dependency ratio by year, 2014 to 2016

YEARS	2014	2015	2016
Total Dependency ratio	18.5%	17.5%	17.3%

Source: Planning and Statistics Authority

Table 1.2.3: Dependent (<15 years and ≥ 65 Years) and non-dependent (15 to 64 years) age groups of the State of Qatar population by year, 2014 to 2016

YEARS	2014	2015	2016
Less than 15	322,139	337,395	357,907
15-64 years	1,870,812	2,075,251	2,231,083
65 years and above	23,229	25,144	28,644

Source: Planning and Statistics Authority

The total dependency ratio can be separated further into child dependency ratio and elderly dependency ratio.

In 2016, Qatari children (making 37.7% of the Qatari population) dependency ratio was 64% of the workforce, whereas the non-Qatari children (making 10.7% of the non-Qatari population) dependency ratio was 12% of the workforce (Table 1.2.4, Figure 1.2.6 and 1.2.7). The total child dependency ratio was 16% with the age group of children aged less than 15 years of age making 13.7% of the total population of the State of Qatar (Table 1.2.4, Figure 1.2.6 and 1.2.7).

In Qatari elderly (making 3.5% of the Qatari population) dependency ratio was 6.0% of the workforce as opposed to the non-Qatari elderly (making 0.8% of the non-Qatari population) dependency ratio which was 0.9% of the workforce (Table 1.2.4, Figure 1.2.6 and 1.2.7). The total aged dependency ratio was 1.3% with the age group of elderly above 65 years of age making 1.1% of the total population of the State of Qatar (Table 1.2.4, Figure 1.2.6 and 1.2.7).

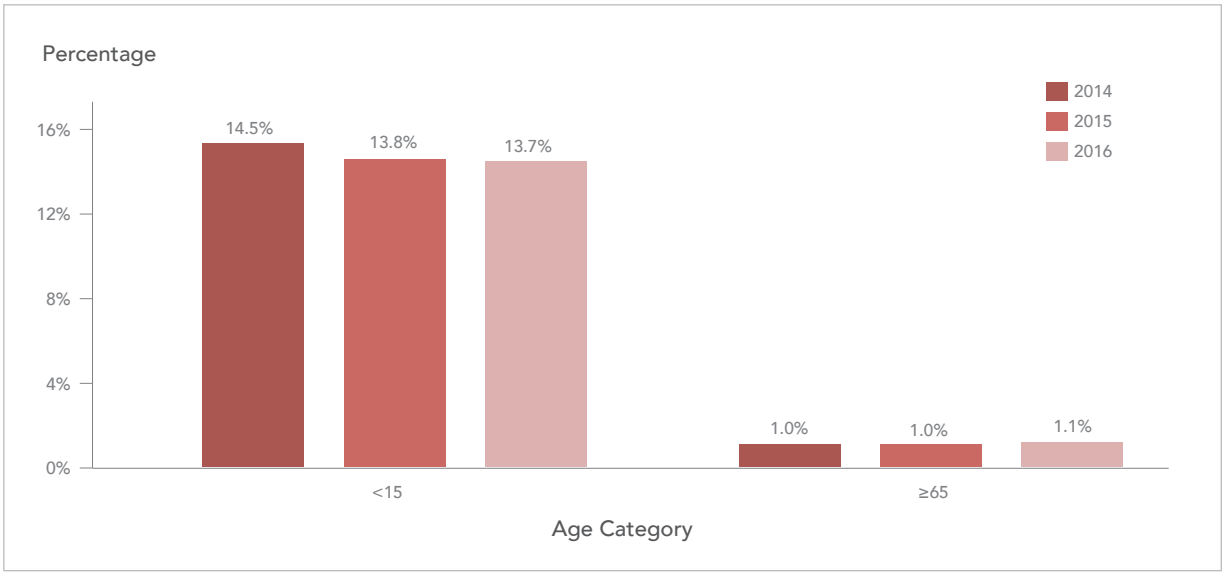
The World Bank estimates a global dependency ratio of 54.2% of the workforce population in 2016 (World Bank, 2019). The relatively low dependency ratio of Qatar (17.3% in 2016) is explained by the influx of young working-age expatriates making the large proportion of young adults, as previously shown in the population pyramid of non-Qatari citizens in Figure 1.2.5. However, among Qatari, in the age group less than 15 years, the child dependency ratio was 64.0% of the workforce population. It is significantly higher than the Qatar total dependency ratio and high compared to the elderly dependency ratio and the non-Qatari child dependency ratio.

Table 1.2.4: Population proportion and dependency ratio for age groups <15 and ≥ 65 years, by nationality, 2016

	QATARI		NON-QATARI		TOTAL	
	POPULATION PROPORTION	DEPENDENCY RATIO	POPULATION PROPORTION	DEPENDENCY RATIO	POPULATION PROPORTION	DEPENDENCY RATIO
Less than 15 years	37.7%	64.0%	10.7%	12.0%	13.7%	16.0%
65 years and above	3.5%	6.0%	0.8%	0.9%	1.1%	1.3%

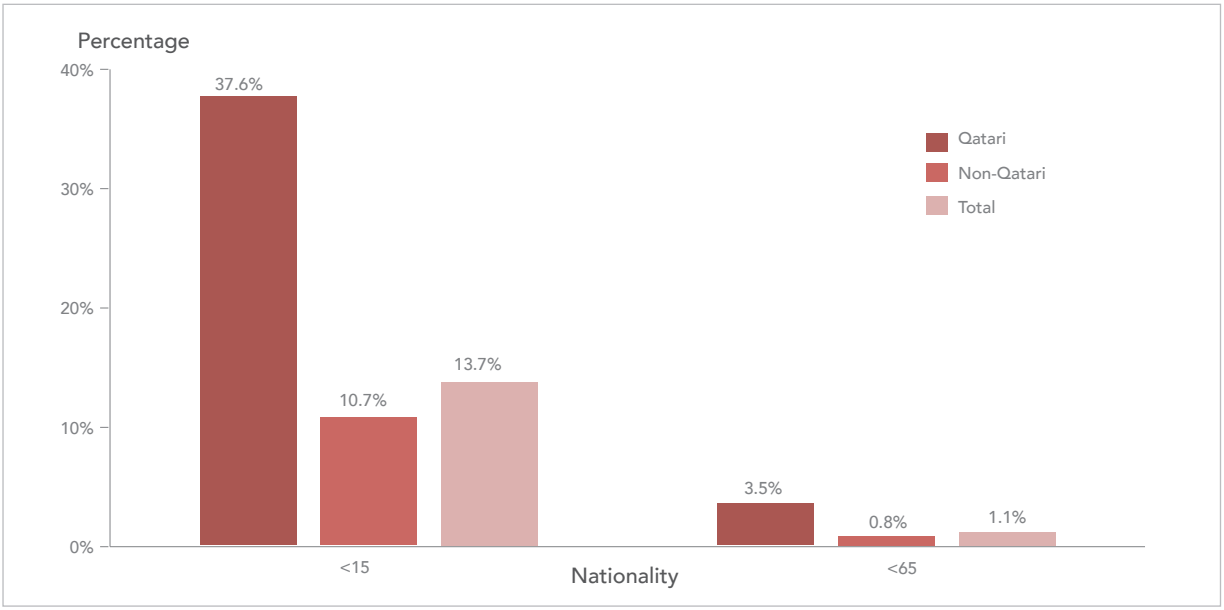
Source: Planning and Statistics Authority

Figure 1.2.7: Percent of population in the age groups <15 years and ≥ 65 years in the State of Qatar, by year, 2014 to 2016



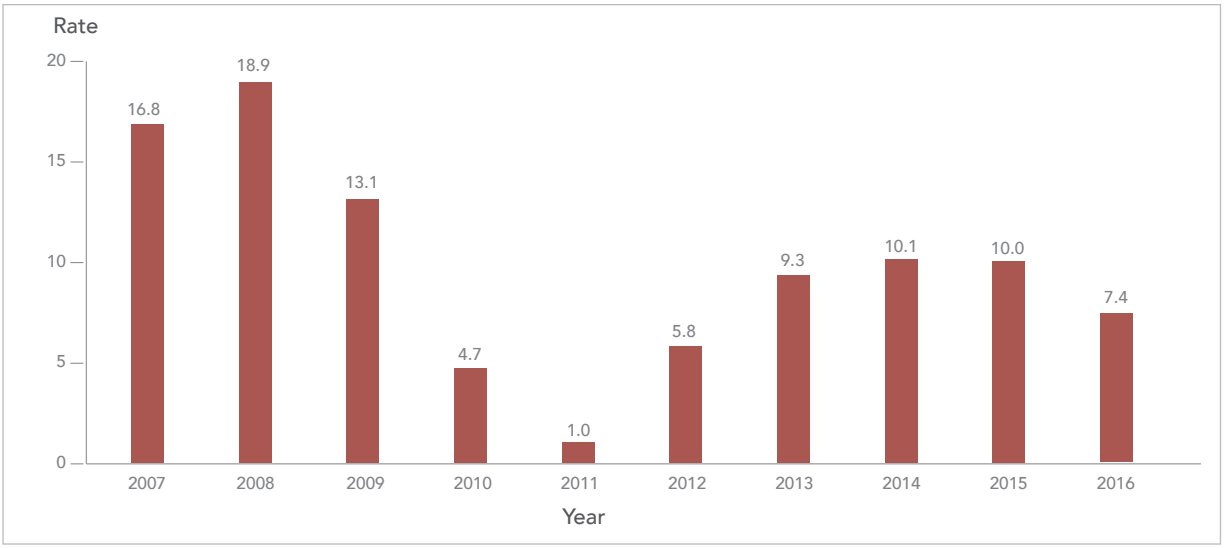
Source: Planning and Statistics Authority

Figure 1.2.8: Percentage of population less than 15 years and under and 65 years and over age groups, by nationality, 2016



Source: Planning and Statistics Authority

Figure 1.2.9: Annual population growth rate by year, 2007 to 2016



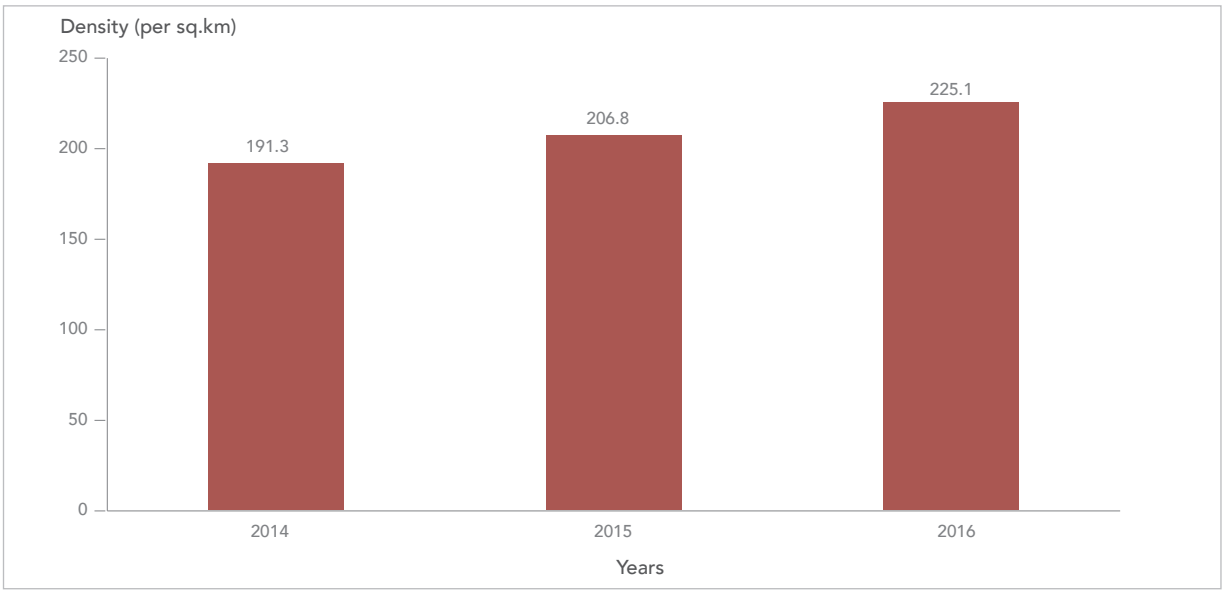
Source: Qatar Social Statistics, Planning and Statistics Authority

1.3 POPULATION DENSITY

Population density refers to the number of people living in a unit of area such as square kilometer.

Population density in Qatar has been on the rise with Figure 1.3.1 showing a increase of 191.3 individuals per sq.km in 2014 to finally reach 225.1 individuals per sq.km in 2016.

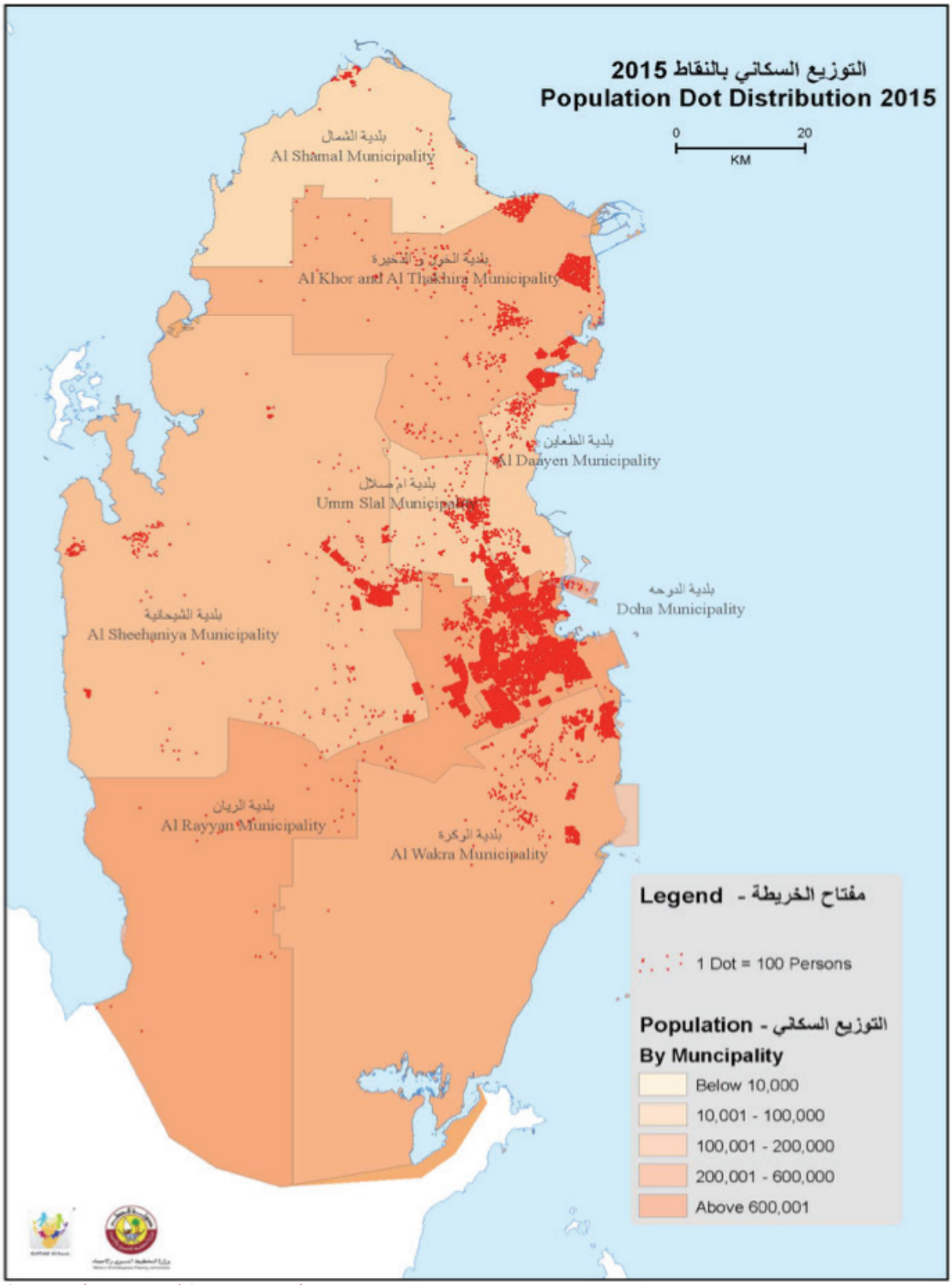
Figure 1.3.1: Population Density per square kilometer by year, 2014 to 2016



Source: Planning and Statistics Authority

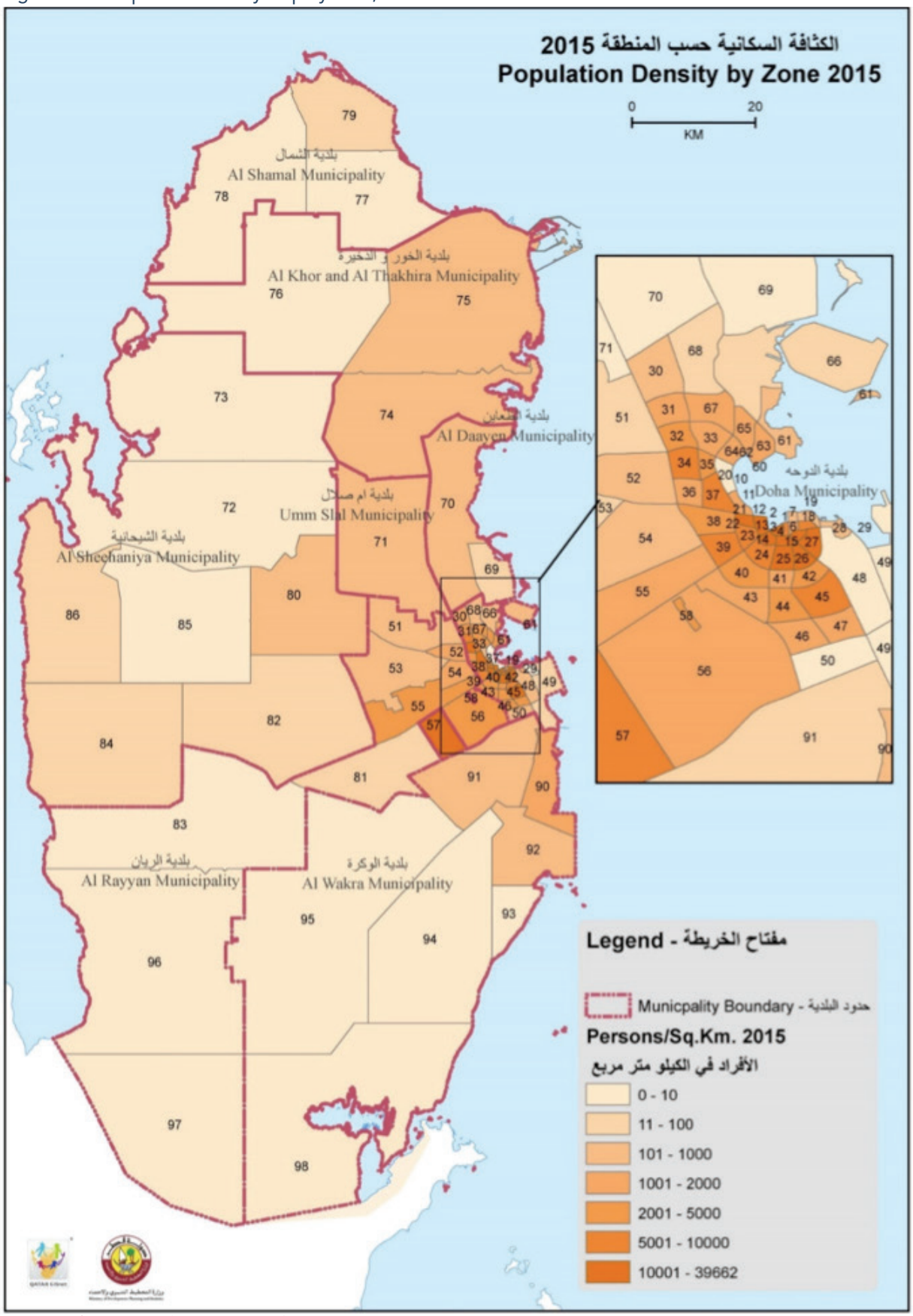
It is clearly shown that the Doha municipality and surrounding zones is the densest area with zones reaching densities from 10,001 to 39,662 persons per sq.km (Figure 1.3.2 and 1.3.3).

Figure 1.3.2: Population density map by municipality and population dot distribution, 2015



Source: Planning and Statistics Authority

Figure 1.3.3: Population density map by zone, 2015



Source: Planning and Statistics Authority

2 BIRTHS AND FERTILITY

2.1 BIRTHS

The number of live births and the corresponding crude birth rate are commonly used parameters in describing a country's fertility as well as the rate of natural increase and reflect the needs for maternal and child health services.

The State of Qatar has seen a slow increase in number of live births over the 3 year period, from 2014 to 2016 (Table 2.1.1). It has increased from 25,607 in 2014 to 26,622 in 2015 and reached 26.816 births in 2016. The number of non-Qatari live births increased from 17,575 to 18,878 births over the 3 years period, whereas Qatari live births remained relatively stable with 8,032 live births in 2014 and 7,938 in 2016. Among Qataris, there were 4,135 male and 3,897 female live births in 2014, 4,216 male and 4,028 female live births in 2015, 4,016 male and 3,922 female live births in 2016. Among non-Qataris, there were 8,922 male and 8,653 female live births in 2014, 9,394 male and 8,984 female live births in 2015, 9,575 male and 9,303 female live births in 2016 (Table 2.1.1). The numbers of live births have doubled in Qatar since 2004, increasing from 13,190 live births in 2004 to 26.816 live births in 2016. (Figure 2.1.1)

While the absolute number of live births increased slightly during the three year period studied, there has been a decrease in overall crude birth rate from 11.5 births per 1000 in 2014 to 10.2 birth per 1000 in 2016 (Table 2.1.2, Figure 2.1.2). Qataris have a significant higher crude birth rate compared to non-Qataris. In 2015, crude birth rate was 29.2 births per 1000. It decreased to 27.1 births per 1000 Qatari in 2016. Non-Qataris crude birth rate was 8.5 per 1000 in 2015 and 8.1 per 1000 in 2016 (Table 2.1.2, Figure 2.1.2)

Table 2.1.1: Number of live births, by gender, nationality and year, 2014 to 2016

	MALE			FEMALE			BOTH SEXES		
YEAR	QATARI	NON-QATARI	TOTAL	QATARI	NON-QATARI	TOTAL	QATARI	NON-QATARI	TOTAL
2014	4,135	8,922	13,057	3,897	8,653	12,550	8,032	17,575	25,607
2015	4,216	9,394	13,610	4,028	8,984	13,012	8,244	18,378	26,622
2016	4,016	9,575	13,591	3,922	9,303	13,225	7,938	18,878	26,816

Source: Planning and Statistics Authority, MoPH

In Qatar, the overall sex ratio among live births has also been relatively constant with 104 boys to 100 girls in 2014, 104.6 boys to 100 girls in 2015 and ultimately 102.8 boys to 100 girls in 2016. (Table 2.1.2) Among Qataris, there was a decrease in sex ratio from 106.1 boys per 100 girls in 2014, to 104.7 per 100 girls in 2015, reaching 102.4 per 100 girls in 2016. Among Non-Qataris, sex ratio has grossly remained constant with values of 103.1 in 2014, 104.6 in 2015 and 102.9 in 2016

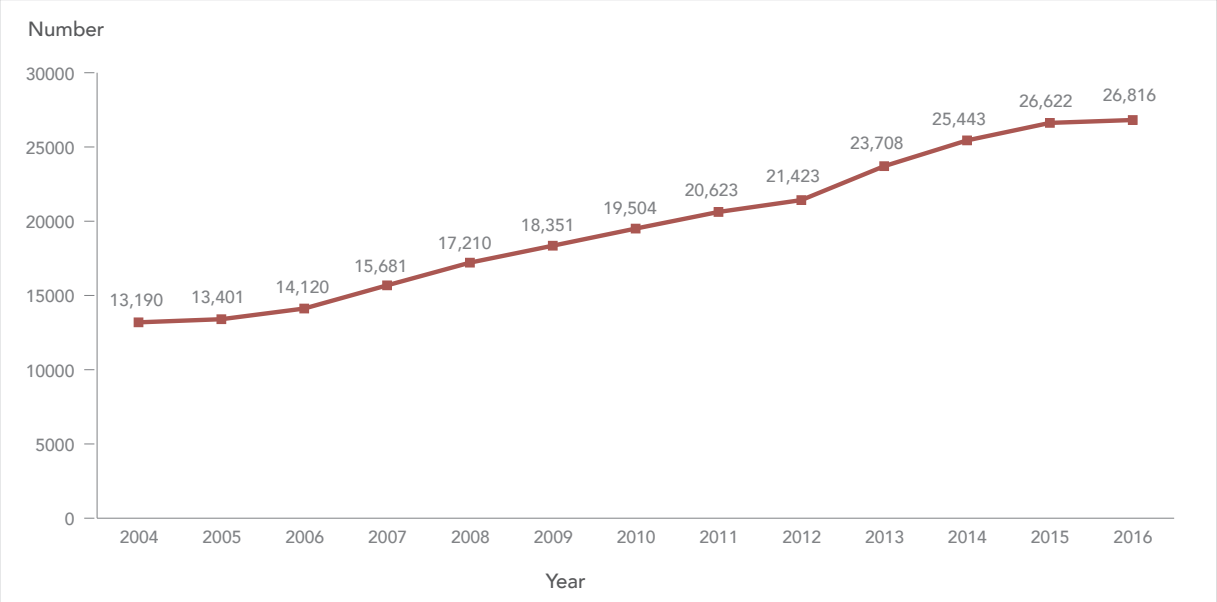
Table 2.1.2: Sex ratio of live births and crude birth rate per 1,000, by nationality and year, 2014 to 2016

	SEX RATIO			CRUDE BIRTH RATE		
YEAR	QATARI	NON-QATARI	TOTAL	QATARI	NON-QATARI	TOTAL
2014	106.1	103.1	104.0	. .	. .	11.5
2015	104.7	104.6	104.6	29.2	8.5	10.9
2016	102.4	102.9	102.8	27.1	8.1	10.2

Source: Planning and Statistics Authority, MoPH

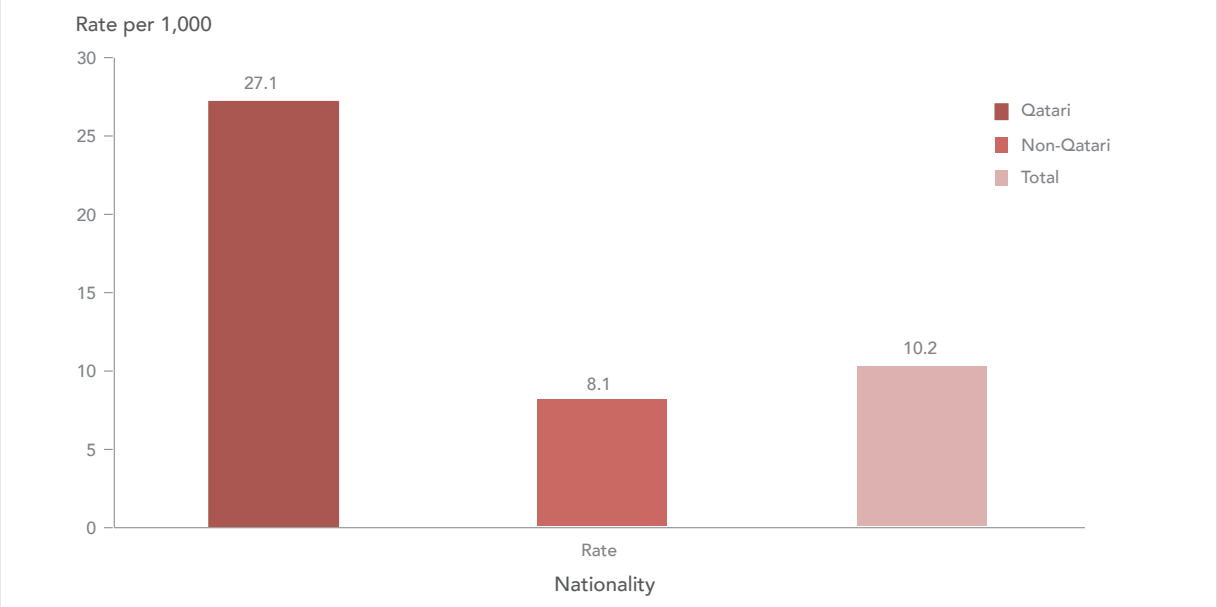
*Note: Sex ratio is males to females per 100 population (M/F * 100); Crude birth rate is per 1,000 population (Number of births/total population * 1,000); 2014 data not available (. .)*

Figure 2.1.1: Number of live births by year, 2004 to 2016



Source: Planning and Statistics Authority, MoPH

Figure 2.1.2: Crude birth rate per 1,000 population, by nationality, 2016



Source: Planning and Statistics Authority, MoPH

2.2 MATERNAL AGE

Maternal age distribution provides an important information for health services planning. For instance, the prevalence of advanced maternal age, defined as a woman who is 35 years of age or older at time of delivery, is important when considering planning of prenatal screening and at-risk pregnancies services. Teenage pregnancies are also a significant issue requiring specific health policy responses (Saloojee &Coovadia, 2015).

From 2014 to 2016, the majority of women giving birth were in the age groups 25-29 and 30-34 (Table 2.2.1).

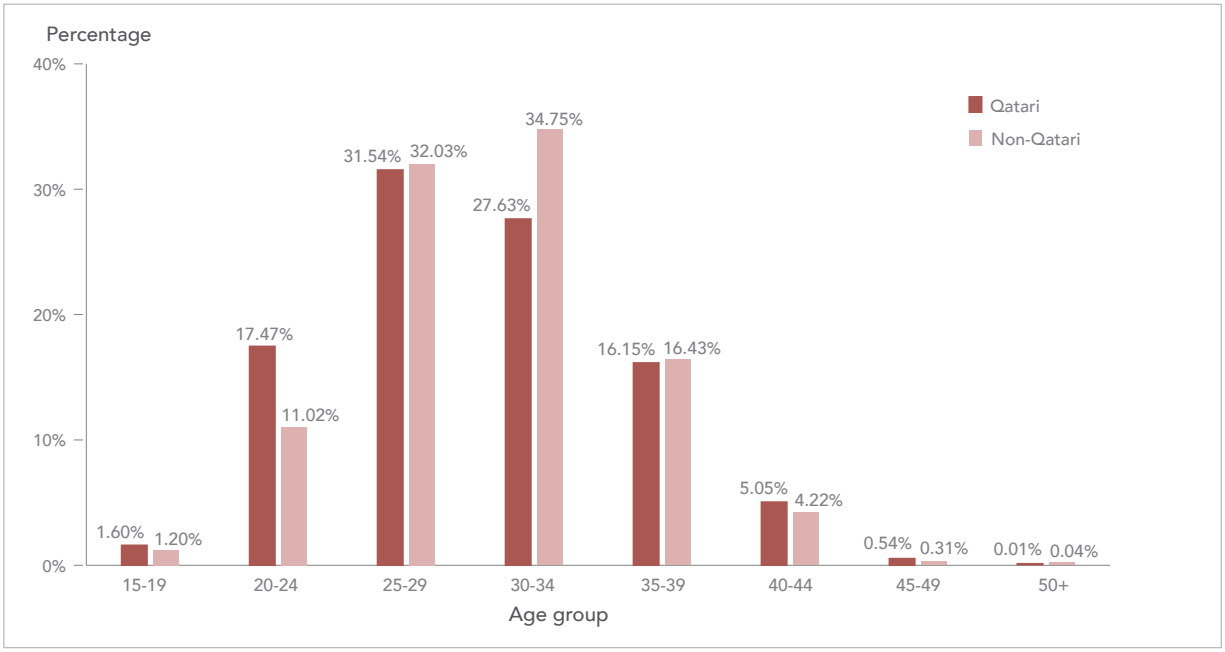
Figure 2.2.1 shows that in 2016 almost 77% of Qatari births occur in 20-34 year old women and 78% of non-Qatari births occurred in women within the same age group. Among Qatari, there is a higher proportion of births in the 20-24 age group compared to non-Qatari: 17.5% of births in contrast to 11.0% of births in the same age group among non-Qatari women (Figure 2.2.1). This difference is reversed at relatively older age group (30-34 years) where 34.8% of births occur in pregnant non-Qatari women compared to 27.6% of births occurring in Qatari women. This may indicate an earlier start of the reproduction among Qatari women. At the extremes of age (0-1 and 65+), the percentages of births are quite low. Teenage pregnancies account for 1.6% of Qatari and 1.2% of non-Qatari births in 2016. At the other end of the spectrum of reproductive age (age 35+) the proportion of births is very similar with 21.75% of births occurring in this age group among Qatari women as compared to 21% among non-Qatari.

Table 2.2.1: Number of births by maternal age group at birth and year, 2014 to 2016

	2014		2015		2016	
AGE OF MOTHER	BIRTHS	POPULATION IN AGE GROUP	BIRTHS	POPULATION IN AGE GROUP	BIRTHS	POPULATION IN AGE GROUP
15-19	347	32,957	374	35,467	353	34,346
20-24	3,855	44,933	3,722	48,190	3,468	44,593
25-29	8,145	71,391	8,407	80,030	8,551	87,832
30-34	7,805	77,392	8,432	81,137	8,754	90,039
34-39	4,153	62,245	4,384	64,696	4,383	71,937
40-44	1,022	43,287	1,170	44,988	1,198	49,614
45-49	96	28,815	113	30,330	101	33,097
50-54	20	19,024	20	19,612	8	22,155

Source: Planning and Statistics Authority, MoPH

Figure 2.2.1: Percentage of births by maternal age group and nationality, 2016



Source: Planning and Statistics Authority, MoPH

2.3 FERTILITY RATES

Age specific fertility rates (ASFR) and total fertility rates (TFR) are important maternal health indicators of a country. By taking into account the age structure of the population, these parameters offer a standardized way to analyze and compare fertility levels across countries and population groups over time (Payne, 2004).

In 2014, TFR among Qatari was 3.2 births per 1000 women aged 15 to 49, higher than the non-Qatari TFR of 1.8 live births per 1000 women in the same age group (Table 2.3.1). Similarly, in the following 2 years, Qatari TFR was substantially higher than non-Qatari TFR, with 3.2 and 3.0 births per Qatari woman compared to 1.8 and 1.7 births per non-Qatari woman in 2015 and 2016 respectively. Overall, total fertility rate was relatively constant in Qatar from 2014 (2.0 births per 1000 women) to 2016 (1.9 births per 1000 women) (Table 2.3.1).

The comparison of age specific fertility rates over the years of observation, shows similar patterns in the 20-39 age groups among Qatari and non-Qatari women with an overall decrease of fertility between 2014 and 2016. For instance, ASFR for Qatari women in the age group 20-24 decreased from 94.9 in 2014 to 78.9 births per 1000 women in 2016 (Table 2.3.1). For teenage pregnancies (age group 15-19), the proportion of births among Qatari women is also decreasing over time while there is a slight increase among non-Qatari women in the same age group (Table 2.3.1).

According to the World Bank, the total fertility rate globally was estimated to be 2.4 births per woman in 2016 (World Bank, 2019). This value is higher than the Qatar's total fertility rate of 1.9 births per woman but lower than the total fertility rate of 3.0 births per woman among Qatari.

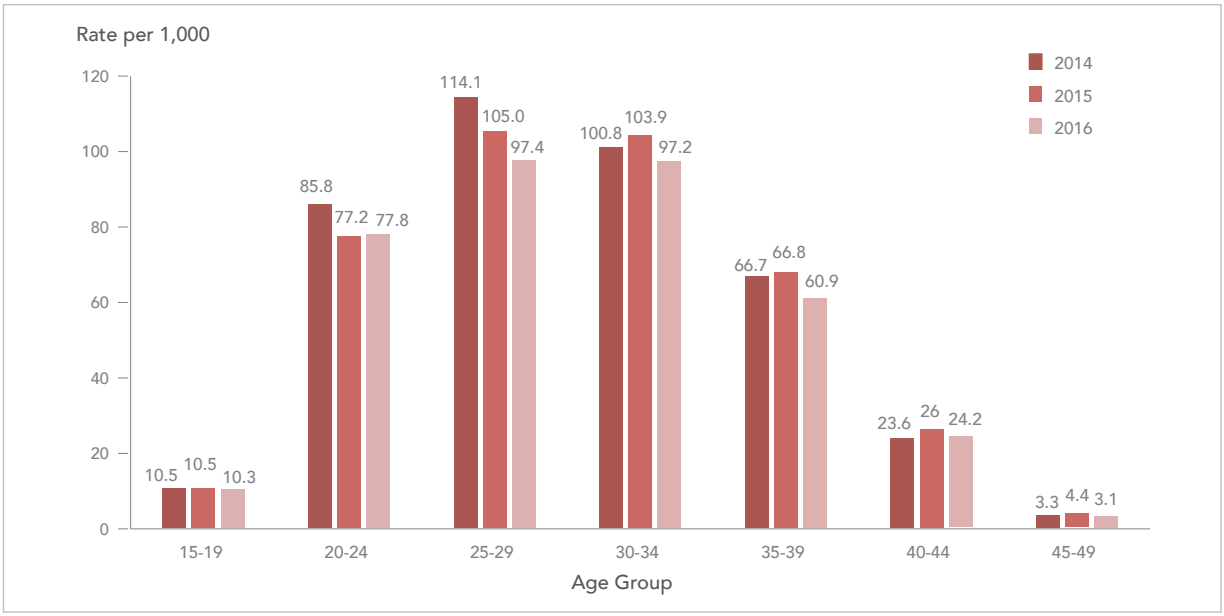
Table 2.3.1: Age specific fertility rates by maternal age groups, nationality and year, 2014 to 2016

		QATARI			NON-QATARI			TOTAL		
UNIT	AGE	2014	2015	2016	2014	2015	2016	2014	2015	2016
Number of births per 1,000 women	15-19	7.4	6.5	5.7	12.7	13.2	13.4	10.5	10.5	10.3
	20-24	94.9	84.8	78.9	82.3	74.5	77.3	85.8	77.2	77.8
	25-29	177.5	179.2	166.1	102.2	92.2	86.5	114.1	105.0	97.4
	30-34	181.1	177.6	171.3	88.9	92.9	87.1	100.8	103.9	97.2
	34-39	133.3	133.0	122.3	56.0	57.1	51.8	66.7	67.8	60.9
	40-44	49.2	56.2	48.4	18.2	19.6	19.6	23.6	26.0	24.2
	45-49	4.1	6.5	6.2	3.1	3.7	2.2	3.3	4.4	3.1
	Total Fertility Rate (15 to 49 years)	3.2	3.2	3.0	1.8	1.8	1.7	2.0	2.0	1.9

Source: Planning and Statistics Authority, MoPH

There are many factors which could influence the fertility rate of a population. Social determinants generally associated with increased fertility include maternal support, socioeconomic status as well as social norms among others (Schaffnit & Sear, 2014) (Payne, 2004).

Figure 2.3.1: Age specific fertility rates by maternal age groups and year, 2014 to 2016



Source: Planning and Statistics Authority, MoPH

3 LIFE EXPECTANCY AND MORTALITY

3.1 LIFE EXPECTANCY

Life expectancy is a widely accepted indicator used to estimate the average number of years a person is expected to live and reflects the overall health status of a population over time (OECD, 2017).

Total life expectancy at birth among Qatari nationals was highest in 2016 with a value of 80.5 years. Life expectancy was 77.5, 77.5 and 78.9 years in 2014, 2015 and 2016 respectively for Qatari males. Life expectancy was higher among Qatari females with values of 82.2, 82.0 and 82.3 in 2014, 2015 and 2016 respectively (Table 3.1.1). Life expectancy at 65 was found to be 13.5 for males and 14.3 for females (Table 3.1.2)

According to the World Bank, GCC countries have achieved remarkable improvement in life expectancy at birth of the past decades (World Bank, 2019). Qatar has the highest life expectancy among the GCC countries and way above the world average life expectancy at birth of 72.0 years (World bank, 2019). Life expectancy at birth in 28 European Union countries was 81 in 2016 which is comparable to the life expectancy of the State of Qatar in the same year (OECD/EU, 2018).

Many factors play a role in determining a country's life expectancy. Life expectancy at birth is believed to be the result of complex interactions between the social determinants of health and socioeconomic conditions, including socioeconomic status, education level, access to clean water and improvement in sanitation (OECD/EU, 2018). It is also related to access to health services and effectiveness of public health action as well as the progress of medical science in different domain, including the availability and coverage of vaccination programs (Centers for Disease Control and Prevention [CDC], 1999).

Table 3.1.1: Life Expectancy at Birth for Qatari nationals, by gender and year, 2014 to 2016

	MALES	FEMALES	BOTH SEXES
2014	77.5	82.2	79.6
2015	77.5	82.1	80.4
2016	78.9	82.3	80.5

Source: Planning and Statistics Authority

Table 3.1.2: Life Expectancy at 65, by gender, 2016

	MALES	FEMALES
Life expectancy	13.5	14.3

Source: Global Burden of Disease Study, Lancet, 2017

Note: Life expectancy is based on 2016 data

3.2 MORTALITY

Mortality data and causes of deaths specific to the population of Qatar can provide insight on Qatar's disease profile and drive evidence-based policy making and public health interventions. Many indicators of mortality are widely used and recognized in public health policy development (OECD, 2017).

In Qatar, the number of deaths for all causes has been stable over the past 3 years, with 2,197 deaths in 2014 and 2,207 death in 2016. (Table 3.2.1). The number of deaths has also been stable when looking at gender and nationality. Table 3.2.2 shows the number of deaths by gender in every age group occurred in Qatar.

It is worthwhile to note that the mortality data published in this document is taken from the database of the Qatar Ministry of Public Health (Table 3.2.1). MoPH collects and reports deaths of people who died within the State of Qatar. The number of deaths reported by the Qatar Planning and Statistics Authority also include deaths of Qatari nationals occurring outside the State of Qatar. For instance in 2016, MDPS recorded a total of 695 Qatari deaths, (432 Qatari male and 263 Qatari female) as compared to 559 reported to the Ministry of Public Health.

The crude death rate has been steadily declining over the past 3 years from 99.1 deaths per 100,000 in 2014 to 84.3 deaths per 100,000 in 2016 in Qatar. (Figure 3.2.2). During the past decade, there has been a consistent decrease in the crude mortality rate from 198.3 deaths per 100,000 in 2006 to the current value of 84.3 deaths per 100,000 in 2016.

The crude mortality rate is a very broad indicator of a country's health status. Its interpretation needs to consider the age distribution of the population that, as in the case of Qatar, is dynamic and quite young. For instance, for comparative purposes, the crude death rate in the EU in 2016 with a very different population age distribution, has been estimated to be 1004 per 100,000 (World Bank, 2019).

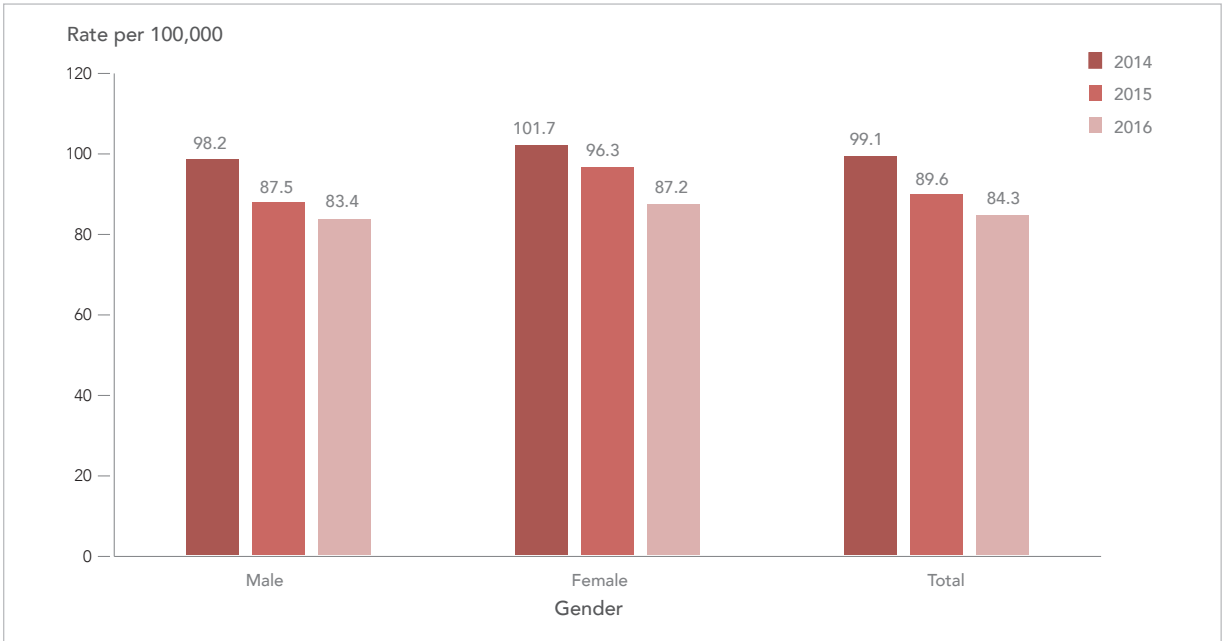
Table 3.2.1: Number of deaths for all causes, by gender, nationality and year, 2014 to 2016

	MALE			FEMALE			BOTH SEXES		
YEAR	QATARI	NON-QATARI	TOTAL	QATARI	NON-QATARI	TOTAL	QATARI	NON-QATARI	TOTAL
2014	350	1,273	1,623	244	330	574	594	1,603	2,197
2015	304	1,306	1,610	249	326	575	553	1,632	2,185
2016	336	1,311	1,647	223	337	560	559	1,648	2,207

Source: Ministry of Public Health

Note: Deaths of Qatari citizens outside of the State of Qatar are not included.

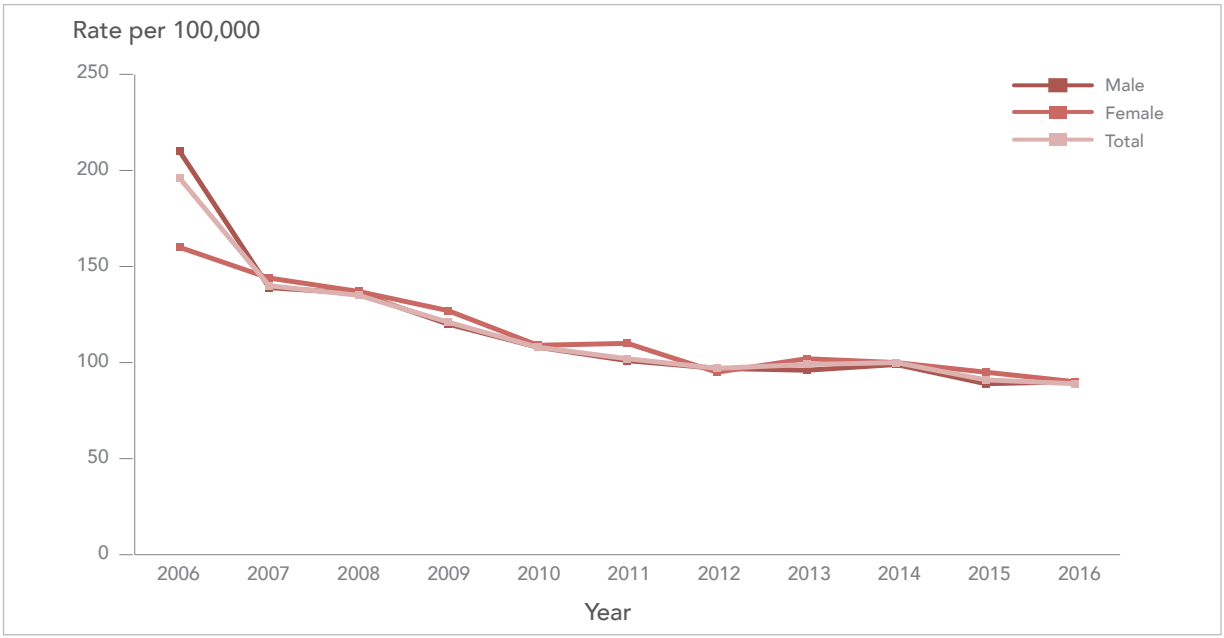
Figure 3.2.1: Crude death rates per 100,000, by year and gender, 2014 to 2016



Source: Ministry of Public Health

Note: Deaths of Qatari citizens outside of the State of Qatar are not included.

Figure 3.2.2: Crude death rates per 100,000, by gender and year, 2006 to 2016



Source: Ministry of Public Health

Note: Deaths of Qatari citizens outside of the State of Qatar are not included.

Table 3.2.2: Deaths from all causes, by gender, age group, and year, 2014 to 2016

	2014			2015			2016		
	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES
0	81	77	158	102	94	196	82	78	160
1-4	24	13	37	21	18	39	15	13	28
5-9	12	11	23	11	6	17	26	15	41
10-14	8	5	13	5	8	13	10	4	14
15-19	35	7	42	36	8	44	25	7	32
20-24	87	8	95	90	9	99	96	8	104
25-29	151	15	166	126	15	141	132	12	144
30-34	129	15	144	126	11	137	133	27	160
35-39	115	22	137	130	31	161	143	22	165
40-44	141	20	161	142	16	158	109	21	130
45-49	130	21	151	138	28	166	149	23	172
50-54	134	25	159	118	26	144	125	22	147
55-59	130	29	159	137	37	174	138	34	172
60-64	112	48	160	114	33	147	103	52	155
65-69	80	54	134	83	41	124	87	44	131
70-74	67	54	121	65	54	119	80	50	130
75-79	68	61	129	67	41	108	69	37	106
80+	119	89	208	99	99	198	125	91	216
Total	1,623	574	2,197	1,610	575	2,185	1,647	560	2,207

Source: Ministry of Public Health

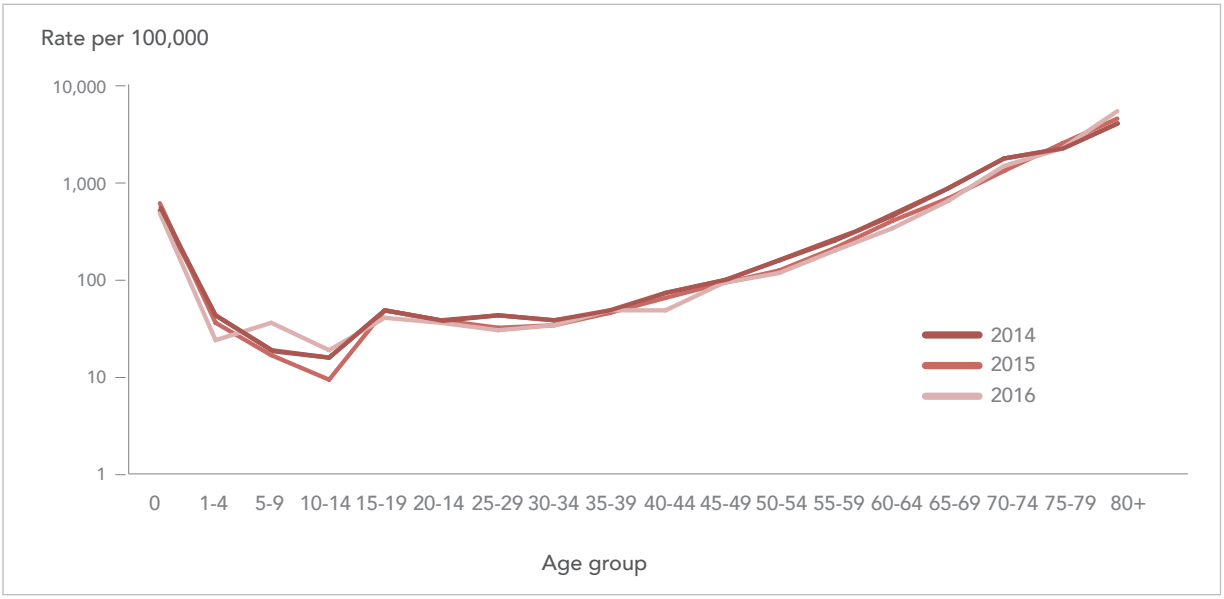
Age specific mortality rate (ASMR) allows for a more meaningful interpretation of mortality patterns within and across populations. Some types of age-specific mortality rates, such as infant mortality rate (Figure 3.4.3) are indicators used internationally to compare the effectiveness of the healthcare and public health system across nations (OECD, 2017).

ASMR per 100,000 among males and females follow the same trend over the 3 years period 2014-2016, with increased age specific mortality rate at the extreme of ages, illustrated by the J-shaped curve of age specific mortality rates (Figure 3.2.3, Figure 3.2.4). Even when stratifying by nationality, there is the same tendency of increased age specific mortality rate at the extremes of age and a similar J-shaped curve (Figure 3.2.5, Figure 3.2.6).

Figure 3.2.5 shows that Qatari males have higher ASMR compared to non-Qatari males across all 5-years age groups from 10 years of age onwards in 2016. This finding could potentially be explained by the "healthy worker" effect where workers would have lower overall death rates compared to the general population, especially in the young and middle age classes. On the other hand, ASMR for non-Qatari males are higher than they Qatari counterpart in the age groups 1-4 and 5-9. (Figure 3.2.5). This finding is also seen in non-Qatari females exhibiting a higher ASMR in the age group 1-4 compared to Qatari females in the same age group in 2016. The latter findings are worth additional analysis.

Age specific mortality rate in the male working age groups is generally higher when compared to their female counterpart (Figure 3.2.3, Figure 3.2.4, Figure 3.2.5, Figure 3.2.6). For example, in 2016, in the age group 35-39, Qatari male age specific mortality rate was 98.7 deaths per 100,000 compared to 64.3 deaths per 100,000 Qatari female.

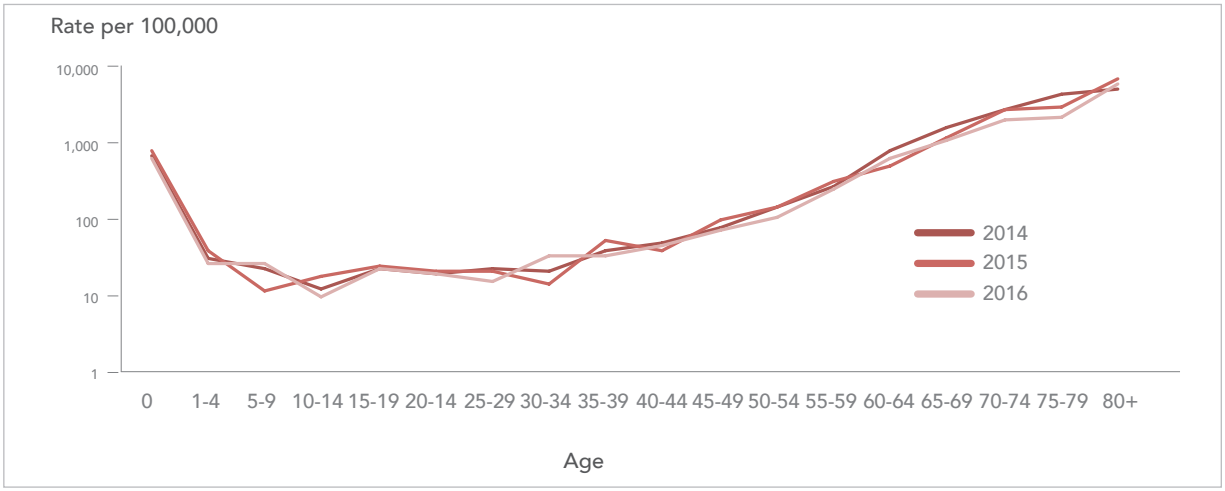
Figure 3.2.3: Age specific mortality rates per 100,000 among males, by age group and year, 2014 to 2016



Source: Ministry of Public Health

Note: Figure in logarithmic scale - The logarithmic scale on the x-axis was used to better illustrate the significant variations in mortality rates between age groups.

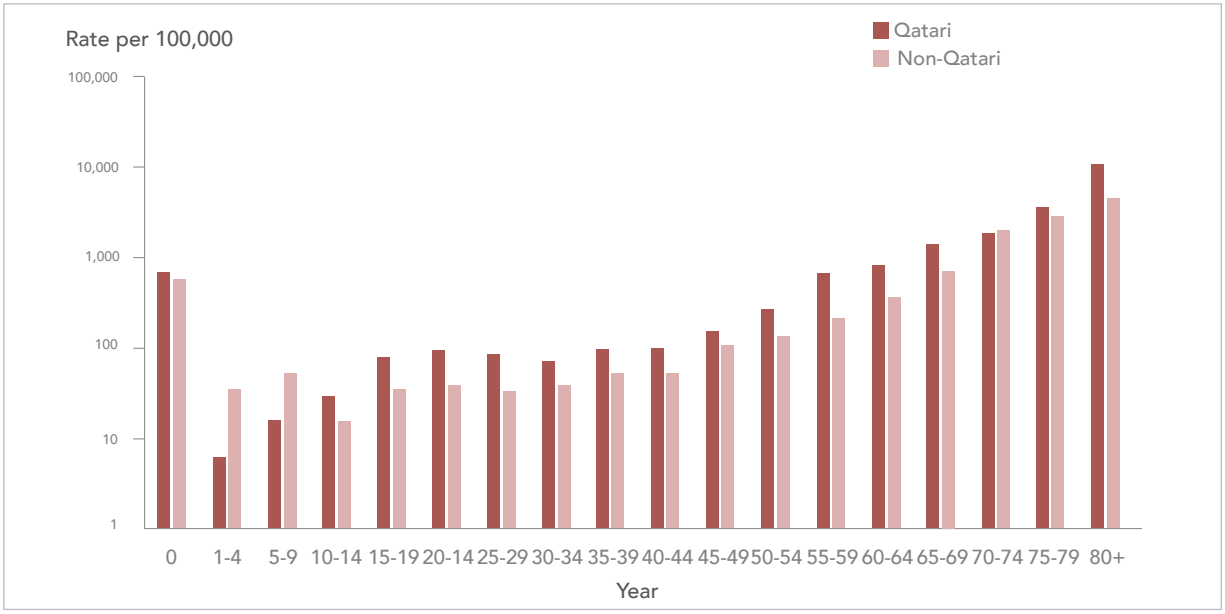
Figure 3.2.4: Age specific mortality rates per 100,000 among females, by age group and year, 2014 to 2016



Source: Ministry of Public Health

Note: Figure in logarithmic scale - The logarithmic scale on the x-axis was used to better illustrate the significant variations in mortality rates between age groups.

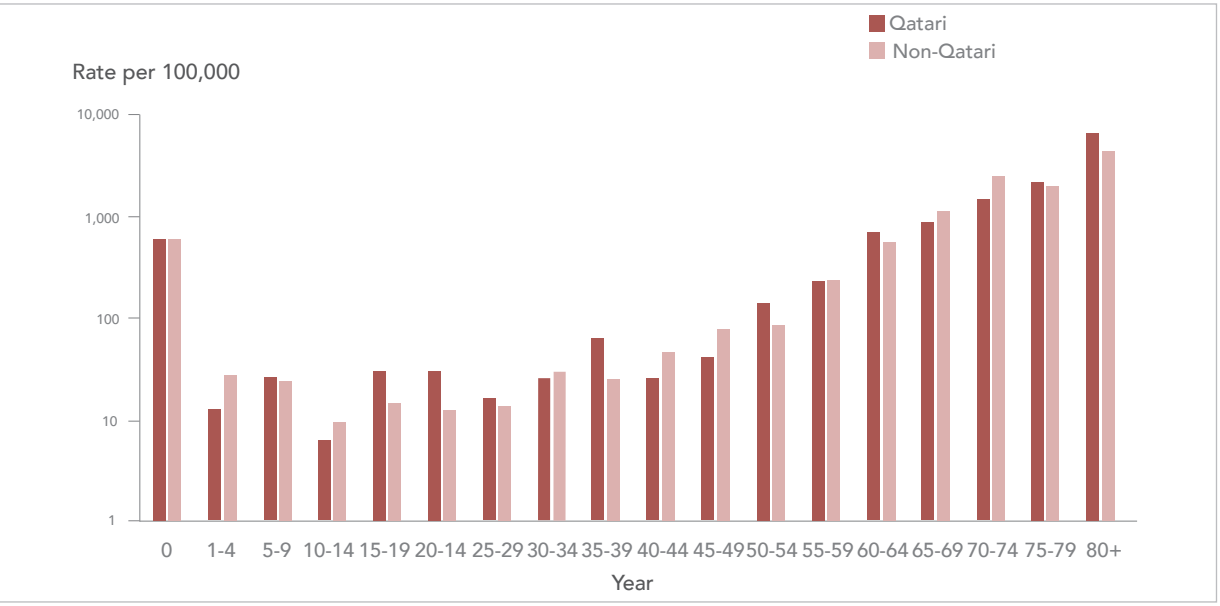
Figure 3.2.5: Age specific mortality rates per 100,000 among males, by age group and nationality, 2016



Source: Ministry of Public Health

Note: Figure in logarithmic scale - The logarithmic scale on the x-axis was used to better illustrate the significant variations in mortality rates between age groups.

Figure 3.2.6: Age specific mortality rates per 100,000 among females, by age group and nationality, 2016



Source: Ministry of Public Health

Note: Figure in logarithmic scale - The logarithmic scale on the x-axis was used to better illustrate the significant variations in mortality rates between age groups.

3.3 MORTALITY BY CAUSES

Table 3.3.1 enumerates the number of deaths classified according to the ICD-10 chapters of diseases. In Qatar, diseases of the circulatory system (such as ischemic heart diseases, strokes and other circulatory diseases) were the main cause of mortality from 2014-2016 among males and females (Table 3.3.1). They are followed by external causes of morbidity and mortality and diseases of the respiratory system as second and third contributors to the number of deaths in males across the 3 year period respectively. Deaths from neoplasms followed by diseases of the respiratory system are the second and third most common cause of deaths in women across the 3 year period. (Table 3.3.1). In the OECD countries and overall at the global level, diseases of the circulatory system remain the main cause of death followed by cancer (OECD, 2017).

There was an increase in the number of deaths due to circulatory system diseases mostly in males over a three-year period from 248 deaths in 2014, 268 deaths in 2015 to a sharp increase to 578 deaths in 2016. In parallel deaths from unknown causes ("Signs and abnormal clinical and laboratory findings, not elsewhere classified") decreased remarkably in 2016 with respect to previous years from 517 deaths in 2014, 428 deaths in 2015 to 97 deaths in 2016 among males. This marked change is attributable to the improvement of death registration and cause of death classification carried out since 2016 by the Ministry of Public Health. Additional work is being implemented to further improve cause of death classification for the following years

Table 3.3.1: Number of deaths, by underlying cause of death chapter (ICD-10), gender and year, 2014 to 2016

		MALES			FEMALES		
CHAPTER	CAUSE OF DEATH CHAPTER	2014	2015	2016	2014	2015	2016
I	Certain infectious and parasitic diseases	27	25	18	11	19	14
II	Neoplasms	125	159	170	104	114	120
III	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	9	1	2	4	3	4
IV	Endocrine, nutritional and metabolic diseases	83	82	73	58	55	36
V	Mental and behavioral disorders	*	*	*	*	*	*
VI	Diseases of the nervous system	17	18	21	12	9	11
VII	Diseases of the eye and adnexa	0	0	0	0	0	0
VIII	Diseases of the ear and mastoid process	0	0	0	0	0	0
IX	Diseases of the circulatory system	248	268	578	107	91	143
X	Diseases of the respiratory system	76	108	171	34	54	50
XI	Diseases of the digestive system	29	34	39	24	16	16
XII	Diseases of the skin and subcutaneous tissue	1	5	3	1	2	0
XIII	Diseases of the musculoskeletal system and connective tissue	0	0	1	0	1	0
XIV	Diseases of the genitourinary system	30	33	41	31	26	37
XV	Pregnancy, childbirth and the puerperium	n/a	n/a	n/a	1	3	0
XVI	Certain conditions originating in the perinatal period	24	38	23	28	39	27
XVII	Congenital malformations, deformations and chromosomal abnormalities	33	41	33	31	38	34
XVIII	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	517	428	97	94	55	31
XX	External causes of morbidity and mortality	404	370	377	34	50	37
	Total deaths	**1,623**	**1,610**	**1,647**	**574**	**575**	**560**

Source: Ministry of Public Health

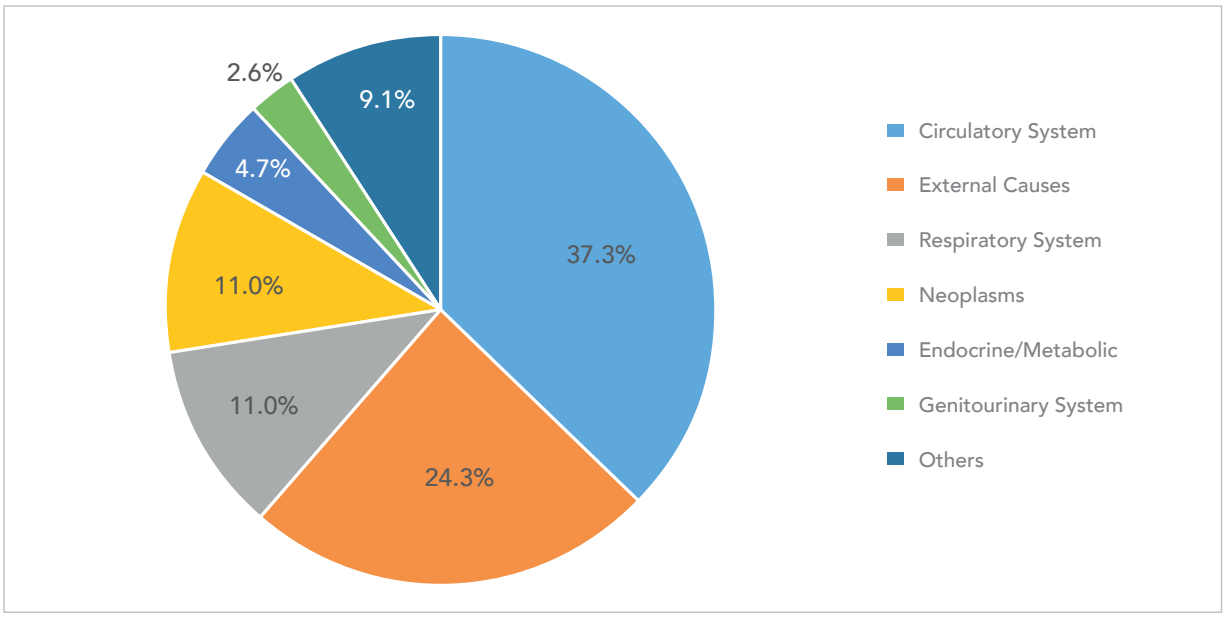
Chapters 'XIX Injury, poisoning and certain other consequences of external causes', 'XXI Factors influencing health status and contact with health services' and 'XXII Codes for special purposes' have not been included, as they either relate to causes of morbidity or non-mortality based events.

** There are no deaths recorded in Chapter 'V Mental and behavioral disorders', as all deaths due to suicide are recorded in 'XX External causes or morbidity and mortality'. Please refer to Figure 3.7.9: Number of deaths from intentional self-harm, by nationality and gender, 2016 for data presenting deaths due to suicide.*

n/a - not applicable

Figure 3.3.1 summarizes the most common causes of death in 2016 among males in decreasing order. As mentioned earlier, diseases of the circulatory system represent 37.3% of all deaths, external causes of morbidity and mortality 24.3% and diseases of the respiratory system and cancer 11.0%.

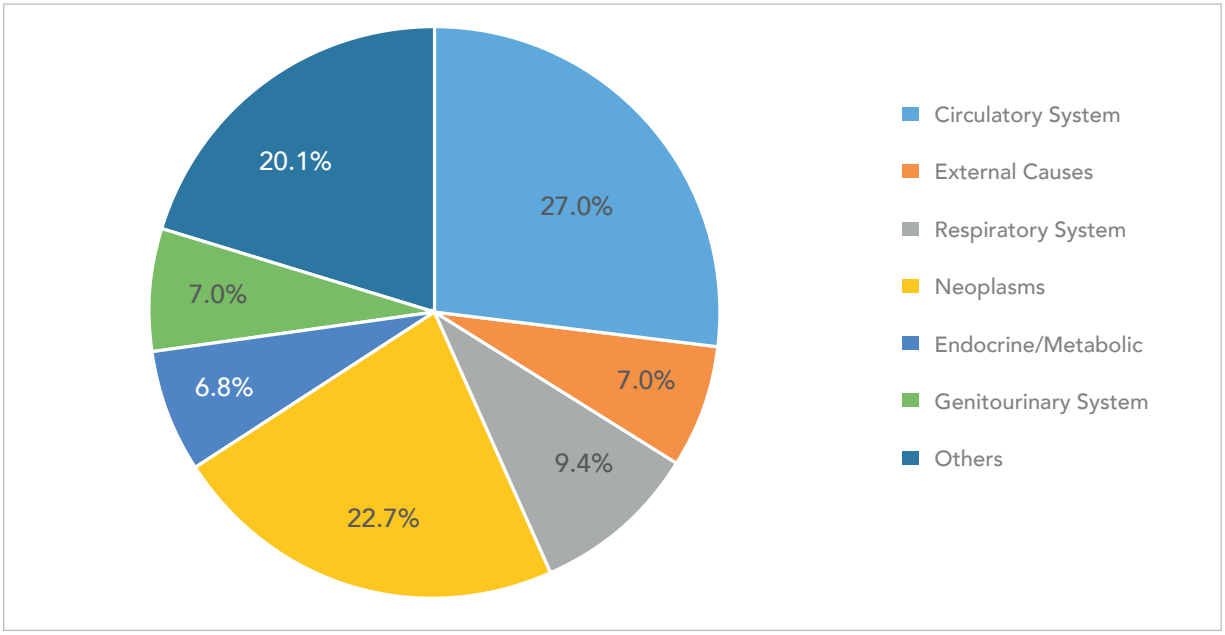
Figure 3.3.1. Percentage of deaths in males, by the top six chapters of cause of death, 2016



Source: Ministry of Public Health
Notes: N=1,550; Excludes unknown causes

In 2016, the most common causes of death among females, in descending order, were: diseases of the circulatory system (27.0%), neoplasms (22.7%) and diseases of the respiratory system (9.4%) (Figure 3.3.2)

Figure 3.3.2: Percentage of deaths in females, by the top six chapters of cause of death, 2016

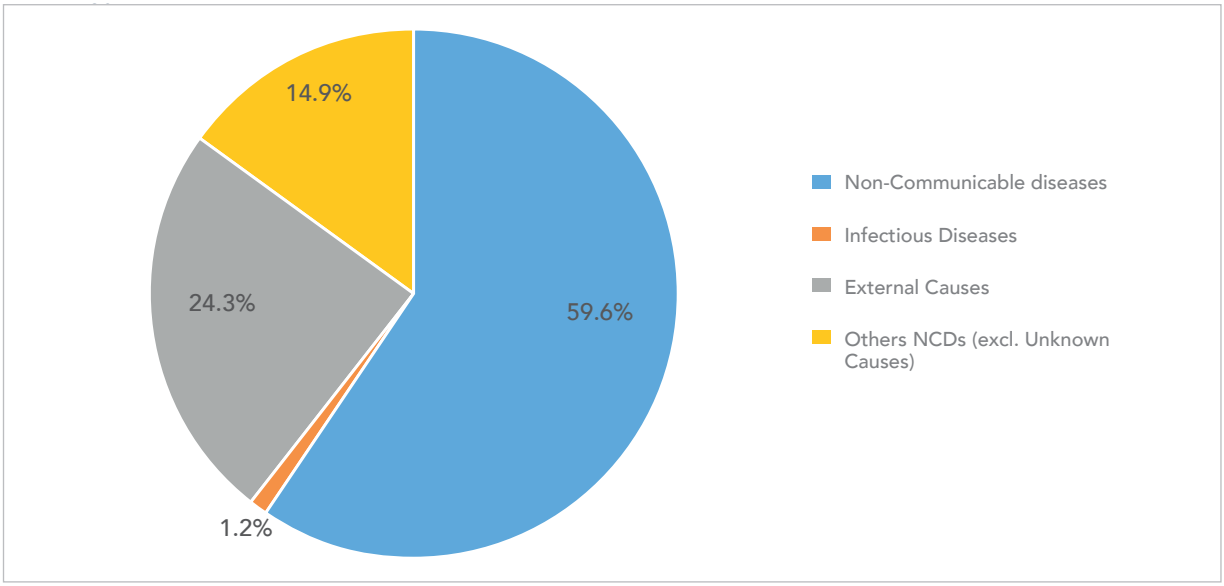


Source: Ministry of Public Health
Notes: N=529; Excludes unknown causes

The main four NCDs (cardiovascular diseases, neoplasms, diabetes, respiratory diseases) remain the main contributors of death among males (59.6%) and females (60.7%) (Figure 3.3.3 and 3.3.4), while infectious diseases make up a small proportion of deaths among males (1.2%) and females (2.6%).

In 2016, external causes were the second contributor to deaths among males (24.3%), followed by other NCDs (14.9%) in this classification. In females, the trend is reversed as other NCDs were the second contributors to deaths (29.7%, followed by external causes (7.0%). The highest mortality rate from road traffic accidents among males is a major explanatory factor of these differences. (Table 3.7.5 and Figure 3.7.6)

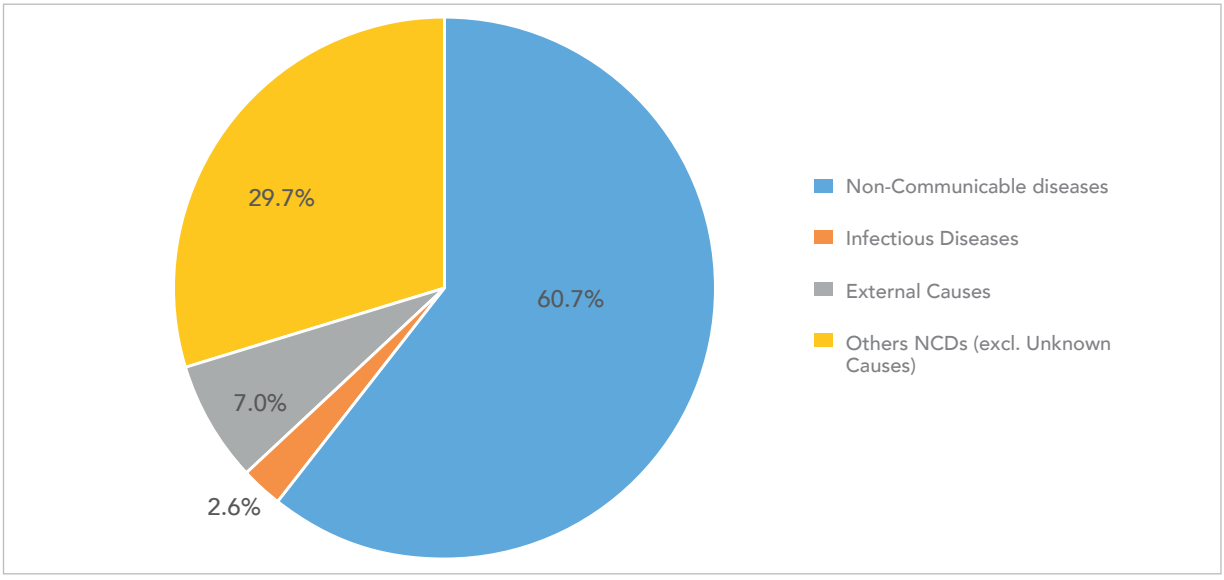
Figure 3.3.3: Percentage of deaths in males by main non-communicable diseases, infectious diseases and external



Source: Ministry of Public Health

Notes: Non-communicable chronic diseases based on cardiovascular disease (I00-I99), cancers (C00-C97), diabetes (E10-E14), chronic respiratory disease (J30-J98); Excludes unknown causes

Figure 3.3.4: Percentage of deaths in females by main non-communicable diseases, infectious diseases and external causes, 2016



Source: Ministry of Public Health

Notes: Non-communicable chronic diseases based on cardiovascular disease (I00-I99), cancers (C00-C97), diabetes (E10-E14), chronic respiratory disease (J30-J98); Excludes unknown causes

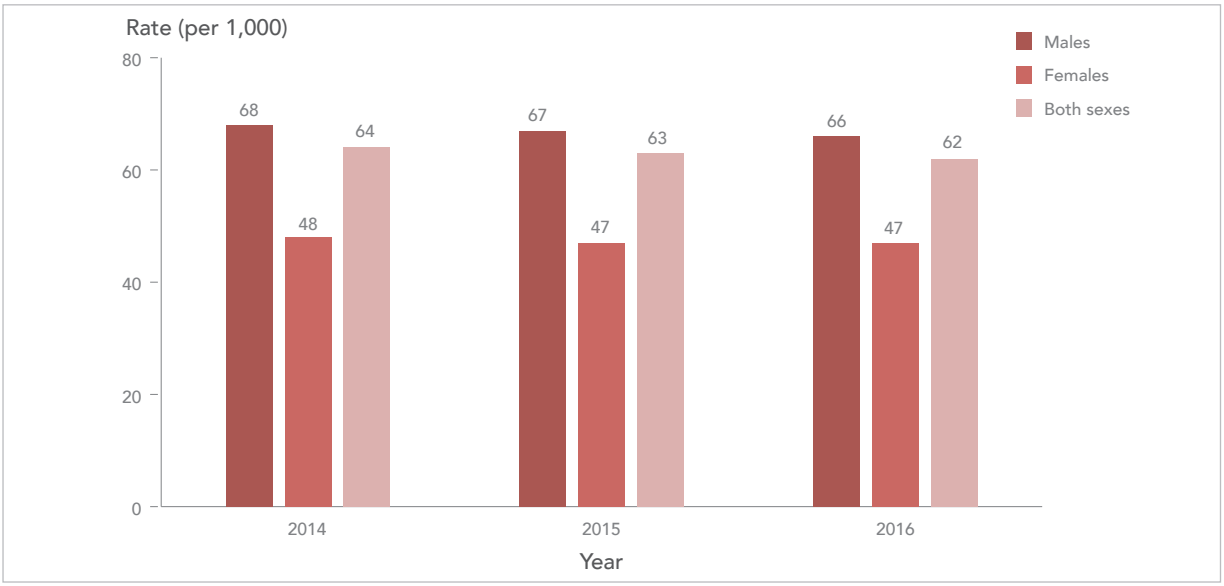
3.4 MORTALITY BY AGE GROUPS

Adult mortality between 15 and 60 years of age is a widely used indicator to assess the burden of disease (mainly NCD) in the most economically productive age group (Wang et al., 2017).

In Qatar, across the 3-year periods, there was a small but steady decrease in adult mortality rate (AMR). In males, AMR decreased from 68 deaths in 2014 to 67 deaths in 2015 and finally 66 deaths per 1,000 in 2014. Similarly, among females, AMR declined from 48 to 47 deaths per 1,000 across the 3-year period. Overall, total AMR declined from 64 deaths in 2014 to 63 deaths in 2015 before reaching 62 deaths per 1000 in 2016.

According to the World Bank, globally, male adult mortality rate was 179 per 1000 and female adult mortality rate was 123 per 1000 in 2016 (World Bank, 2019)

Figure 3.4.1: Adult mortality rate per 1,000 between 15 and 60 years old, by gender and year, 2014 to 2016



Source: WHO Global Health Observatory, 2018

The mortality rates of children under-5 and infants reflect the effect of socioeconomic conditions on the health of mothers and newborns, as well as the effectiveness of health systems, particularly in addressing any life-threatening problems during the neonatal period (i.e. during the first four weeks). This indicator is internationally recognized as an overall measure of the health status of a population and of the effectiveness of health services (OECD/EU, 2018).

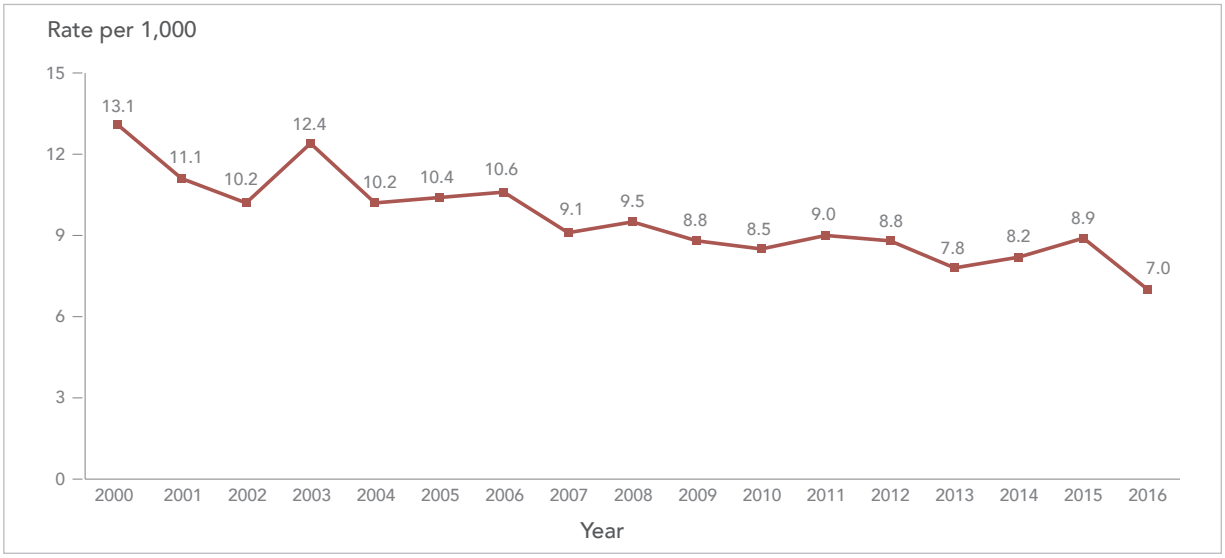
Table 3.4.1: Number of deaths for children under 5 years of age, by age at death, gender and year, 2014 to 2016

AGE	2014			2015			2016		
	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES
Early Neonatal (0-6 days)	24	31	55	43	45	88	30	34	64
Late Neonatal (7-27 days)	23	14	37	20	14	34	11	9	20
Post Neonatal (28 days-1 year)	34	32	66	39	35	74	41	35	76
Total Infant Mortality	81	77	158	102	94	196	82	78	160
1-4 years	24	13	37	21	18	39	15	13	28
Total Under 5 Mortality	105	90	195	123	112	235	97	91	188

Source: Ministry of Public Health

Under 5 mortality rate is low in Qatar with a value of 7 deaths per 1000 live births in 2016 (Figure 3.4.2). Qatar's data from the year 2000 shows a consistent and significant decrease from an under 5 mortality rate of 13.1 deaths per 1000 down to the current value of 7.0 deaths per 1000, an overall decrease of about 53%.

Figure 3.4.2: Under 5 mortality rate per 1,000 live births, by year, 2000 to 2016



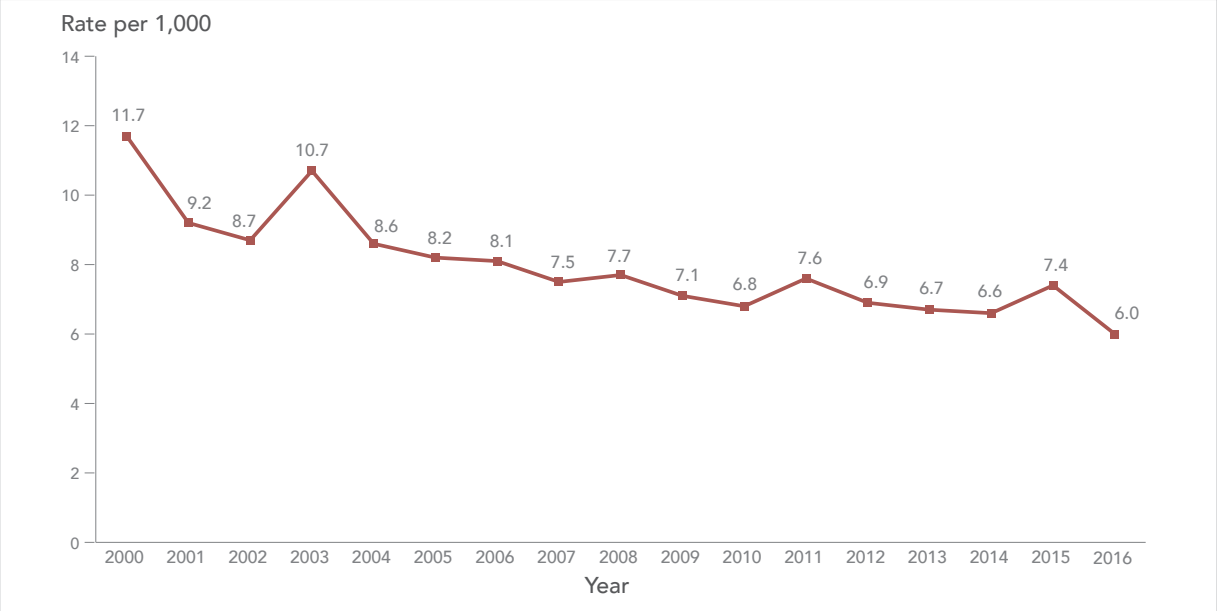
Source: Ministry of Public Health

Infant mortality rate is also low in Qatar with a value of 6 infant deaths for 1,000 live births in 2016 (Figure 3.4.3). Qatar's data from the year 2000 shows a consistent and significant decrease from 11.7 per 1000 infant mortality down to the current value of 6 per 1,000, an overall decrease of about 50%.

A number of countries, including GCC and European countries have achieved notable progress in reducing infant mortality rates over the past few decades (World Bank, 2019). For instance, the EU average went down from over 10 deaths per 1,000 live births in 1990 to 3.6 deaths in 2016. However, the downward trend in infant mortality has halted in recent years, at least partly because of increasing numbers of low birth weight infants (OECD/EU, 2018).

Qatar's infant mortality rate is one of the lowest values in the WHO EMRO region and comparable to those observed in the GCC countries ranging from 5 in Bahrain to 13 in Saudi Arabia (WHO EMRO, 2017.

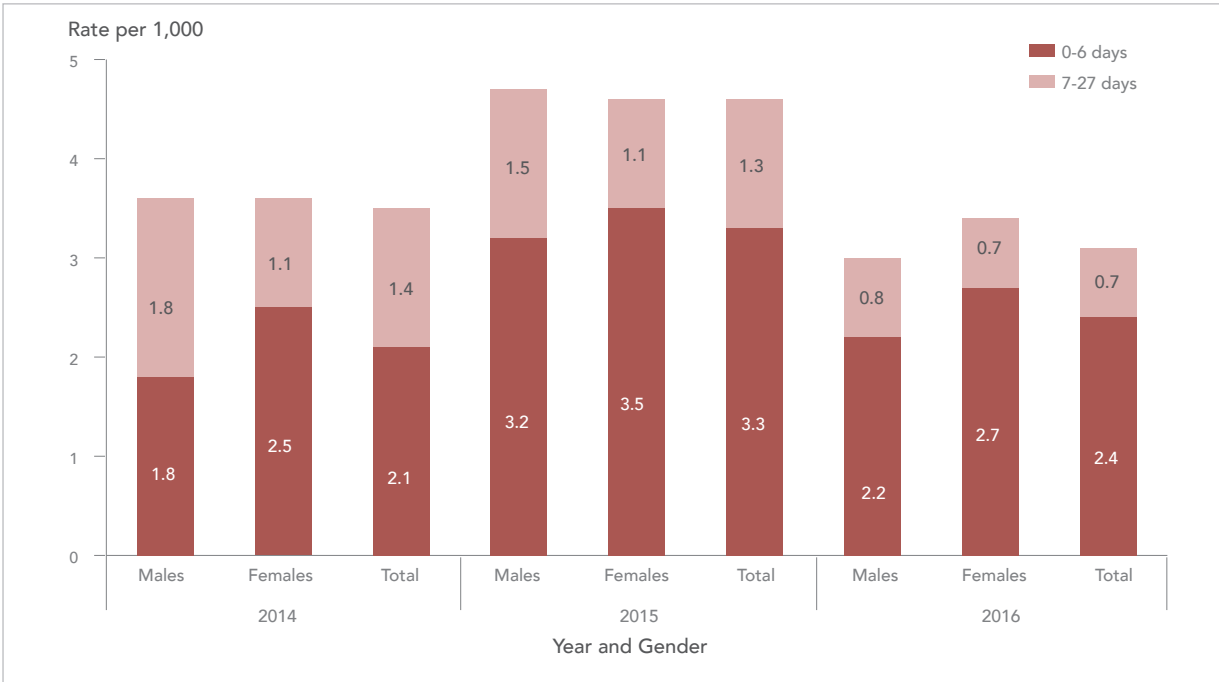
Figure 3.4.3: Infant mortality rate per 1,000 live births, by year, 2000 to 2016



Source: Ministry of Public Health

Around half of the deaths during the first year of life occur during the first month (i.e. neonatal mortality) (Table 3.4.1 and Figure 3.4.4). This compares to a ratio of two thirds in most EU countries. The main causes of death during the first month of life are congenital anomalies, prematurity and other conditions arising during pregnancy. For deaths beyond one month (post neonatal mortality), there tends to be a greater range of causes – the most common being Sudden Infant Death Syndrome (SIDS), birth defects, infections and accidents (OECD/EU, 2018).

Figure 3.4.4: Early neonatal (0 to 6 days) and late neonatal (7 to 27 days) mortality rates per 1,000 live births, by gender and year, 2014 to 2016



Source: Ministry of Public Health

3.5 STILLBIRTHS

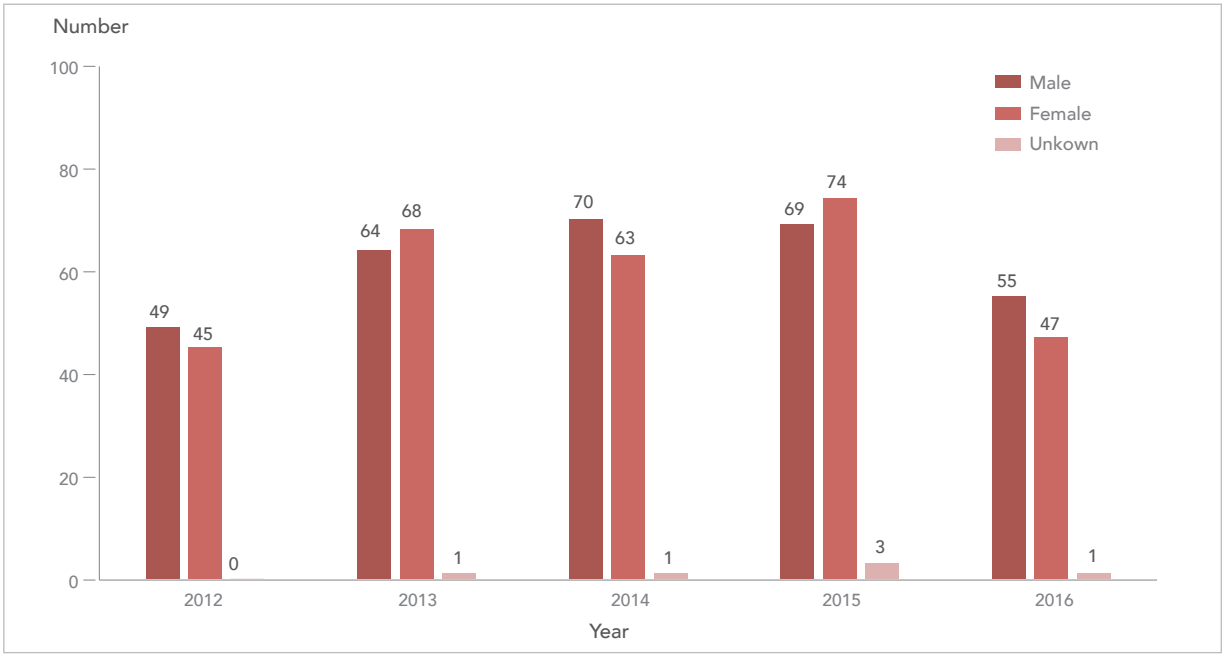
The term stillbirths refers to the loss of a baby before or during delivery. Based on the WHO definition used for international comparison, a stillbirth represents a newborn with no signs of life after the 28th week of gestation (WHO, 2006). Improved health systems and advanced prenatal care are effective ways to prevent stillbirths from occurring. The stillbirth rate is influenced by both prenatal conditions (such as congenital anomalies) and the quality of care before and during pregnancy (WHO, 2006).

The number of stillbirths by gender is presented in Figure 3.5.1.

In Qatar, there was an increase in still birth rate from 2004 (4.9 stillbirths per 1000) to 2011 (10.7 stillbirths per 1000), followed by a steady decrease reaching 3.8 stillbirths per 1000 in 2016. This value is the lowest Qatar has seen over the past 14 years (Figure 3.5.2). Qatar has already met the World Health Assembly target of 12 or fewer stillbirths per 1000 births in 2030. Worldwide, stillbirth rate was estimated to be 18.4 per 1000 total births in 2015 (Lawn et al., 2016).

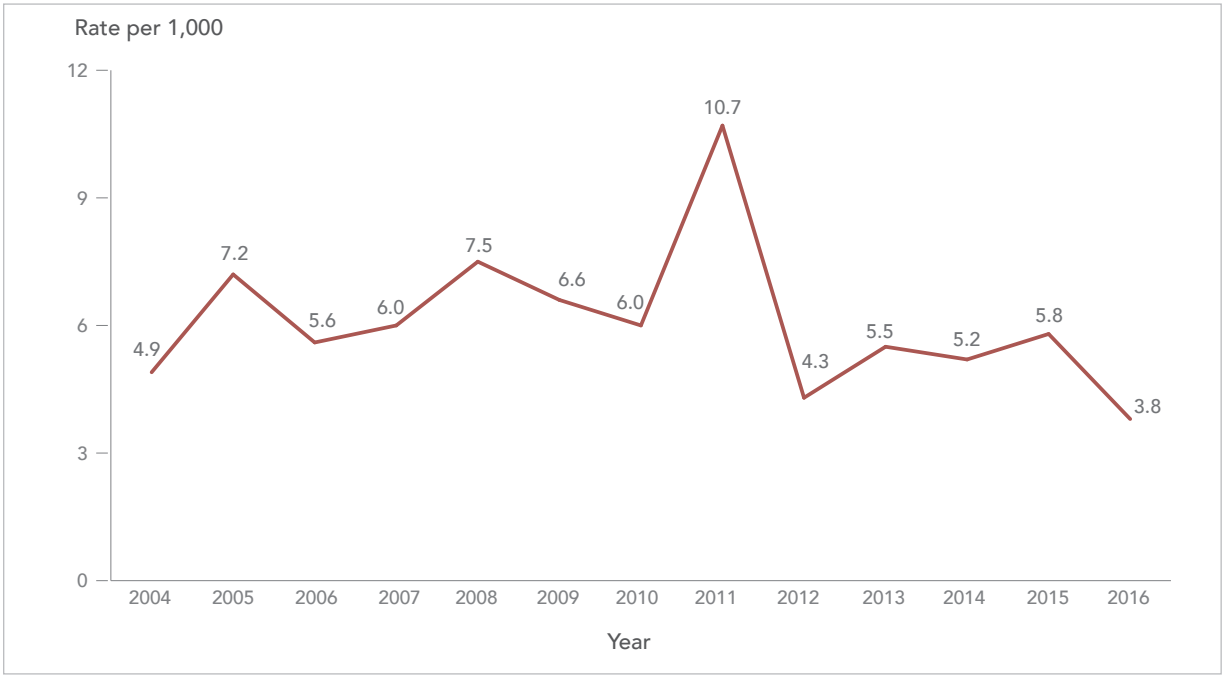
Stillbirth rates have been on the decrease worldwide. Improved antenatal care and public health interventions targeted to promote healthy behaviors contributed to this decrease (Frøen et al., 2016) (Lawn et al., 2016). Known risk factors for stillbirths include: placental problems, hypertension during pregnancy (preeclampsia or pregnancy induced hypertension) and smoking (Lawn et al., 2016).

Figure 3.5.1: Number of still births, by gender and year, 2012 to 2016



Source: Ministry of Public Health

Figure 3.5.3: Still birth rate per 1,000 live births, by year, 2004 to 2016



Source: Ministry of Public Health

3.6 MATERNAL MORTALITY

Maternal mortality is defined by the WHO as a female death occurring during pregnancy or by 6 weeks (42 days) after end of pregnancy and due to any cause related to the pregnancy or its management (excluding accidental causes) (Khan, Wojdyla, Say, Gulmezoglu &Van Look, 2006) . Like many indicators of mortality, maternal mortality is an important indicator of health system performance.

Number of maternal deaths are very low in Qatar with 1 death in 2014, 3 deaths in 2015 and 0 in 2016 (Table 3.6.1)

Table 3.6.1: Number of maternal deaths, by nationality and year, 2014 to 2016

YEAR	NUMBER OF MATERNAL DEATHS - QATARI	NUMBER OF MATERNAL DEATHS - NON QATARI	TOTAL NUMBER OF MATERNAL DEATHS	NUMBER OF LIVE BIRTHS - QATARI	NUMBER OF LIVE BIRTHS NON QATARI	TOTAL NUMBER OF LIVE BIRTHS
2014	0	1	1	7,954	17,489	25,443
2015	1	2	3	8,244	18,378	26,622
2016	0	0	0	7,938	18,878	26,816

Source: Ministry of Public Health, Planning and Statistics Authority

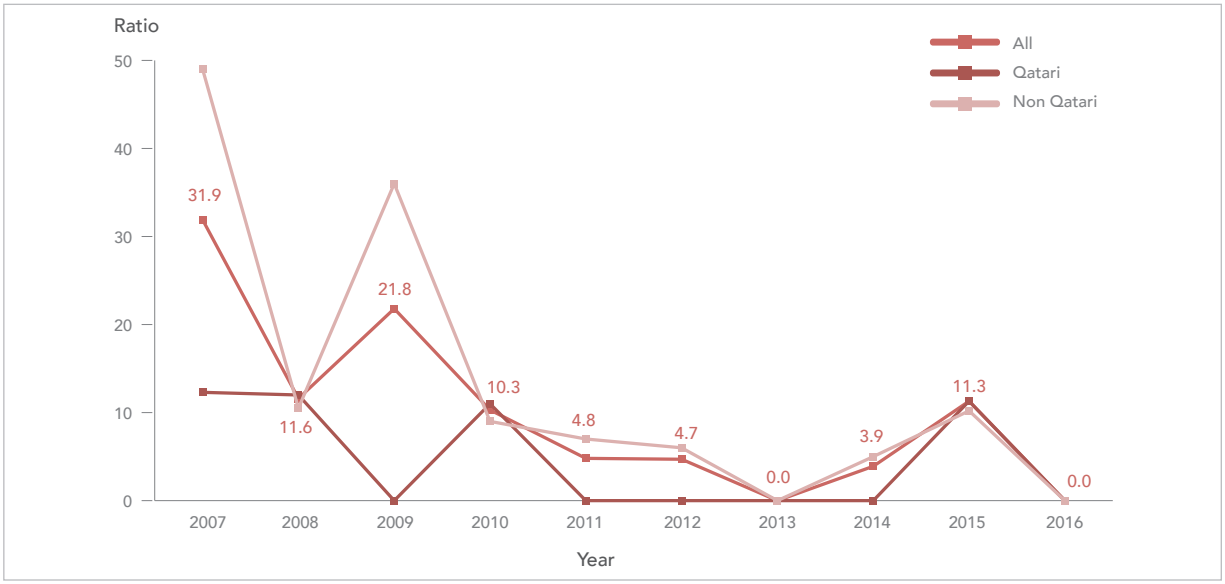
Qatar has a very low maternal mortality ratio and has already met the global SDG 3 goal 3.1 of reducing the maternal mortality ratio to less than 70 per 100,000 live births by 2030. The global maternal mortality ratio in 2015 has been estimated to be 216 deaths per 100,000 (World Bank, 2019).

Overall, in Qatar there has been a decreasing trend of maternal mortality ratio from 2007 (31.9 maternal deaths per 100,000 live births in 2007) to 0 deaths per 100,000 live births in 2016 (Figure 3.6.1). Because of the rarity of the event, the ratio can fluctuate over time even for small changes in the number of deaths as it happened between 2013 and 2016 (Figure 3.6.1).

In order to compensate for yearly fluctuation and stabilize the yearly rate a three year moving average of maternal mortality ratio was used to improve data analysis and interpretation. Over the past decade, there has been a significant decrease in the 3 year moving average of maternal mortality ratio, from 21.8 deaths per 100,000 in 2007 to 3.8 deaths per 100,000 in 2016. This pattern followed an increasing trend from 1993 to 2008, where the moving average went from 3.2 deaths per 100,000 (1993) to 21.8 deaths per 100,000 (2008). (Figure 3.6.2)

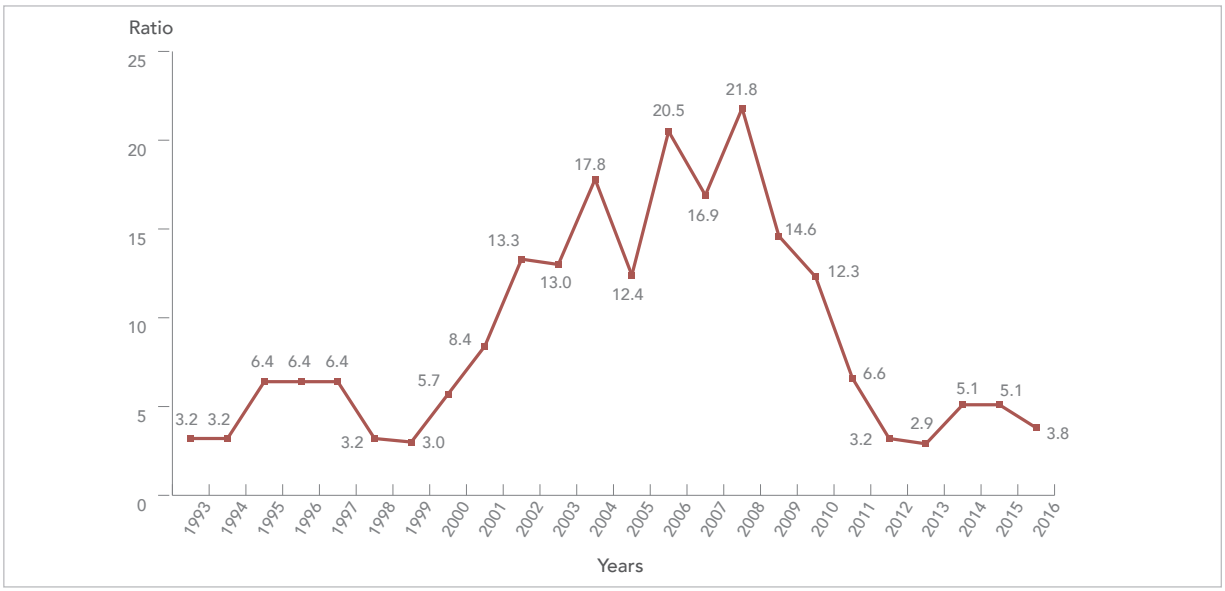
The low mortality ratio seen in Qatar is largely attributed to the advances in its healthcare system and improvement in maternal health, antenatal care, neonatal and postnatal care services and to the public health interventions targeted at promoting healthy behaviors and healthy habits before and during pregnancy.

Figure 3.6.1: Maternal mortality ratio, by nationality and year, 2007 to 2016



Source: Ministry of Public Health

Figure 3.6.2: Three year moving average of maternal mortality ratio, by year, 1993 to 2016



Source: Ministry of Public Health

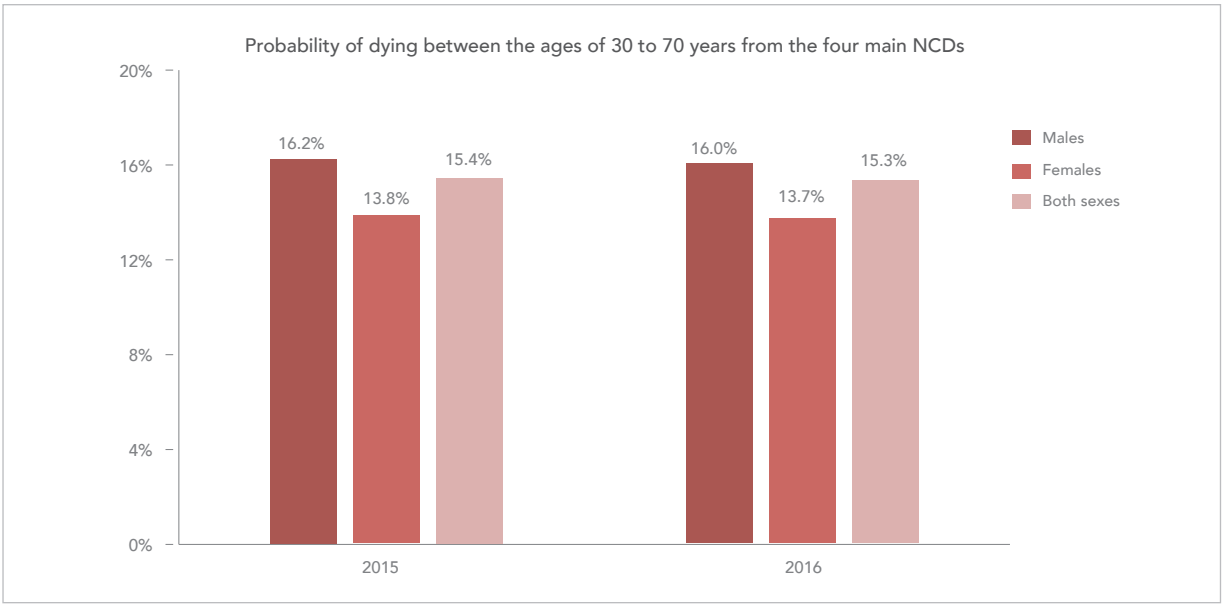
Note: Three year moving average calculation – Year B = (Year A + Year B + Year C)/3

3.7 MORTALITY BY MAIN CAUSE AND AGE

Probability of dying between 30 and 70 years of age from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases refers to the probability that a 30-year-old individual will die before reaching the age of 70 from the 4 main NCDs. It relates to the contribution of the 4 NCDs on the burden of mortality in an economically productive and working population (WHO, 2018)

In Qatar, from 2015 to 2016, the probability of dying between the ages of 30 to 70 from the four major NCDs has remained relatively stable. Males were at higher risk of dying from the top four NCDs in the 30-70 age group as compared to females (Figure 3.7.1). Overall, the probability of dying from the four NCDs was 15.4% in 2015 and 15.3% in 2016.

Figure 3.7.1: Probability of dying between 30 and 70 years of age from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases, by year, 2015 & 2016



Source: WHO Global Health Observatory
Note: WHO estimates

Table 3.7.1 shows the number of cardiovascular disease deaths among males and females. As previously mentioned, there is a substantially higher number of deaths from cardiovascular diseases among males compared to females in all adult age groups. This is attributable both to the high risk of these diseases in men as well as the disproportionate number of men in the middle age groups. (Table 3.7.1)

Table 3.7.1: Number of cardiovascular disease related deaths (Chapter IX), by gender and age group, 2016

AGE GROUPS	MALE	FEMALE	BOTH SEXES
0 - 4	4	2	6
5 - 9	0	3	3
10 - 14	0	0	0
15 - 19	4	0	4
20 - 24	10	2	12
25 - 29	21	1	22
30 - 34	23	7	30
35 - 39	48	5	53
40 - 44	50	7	57
45 - 49	83	7	90
50 - 54	59	3	62
55 - 59	66	6	72
60 - 64	59	17	76
65 - 69	39	15	54
70 - 74	31	17	48
75 - 79	30	11	41
80 +	51	40	91
Total	578	143	721

Source: Ministry of Public Health

Cancer related mortality reveals a more uniform pattern among males and females, with the risk of developing and dying from the majority of cancers increase with age (Table 3.7.2).

Table 3.7.2: Cancer related mortality, by gender and age group, 2016

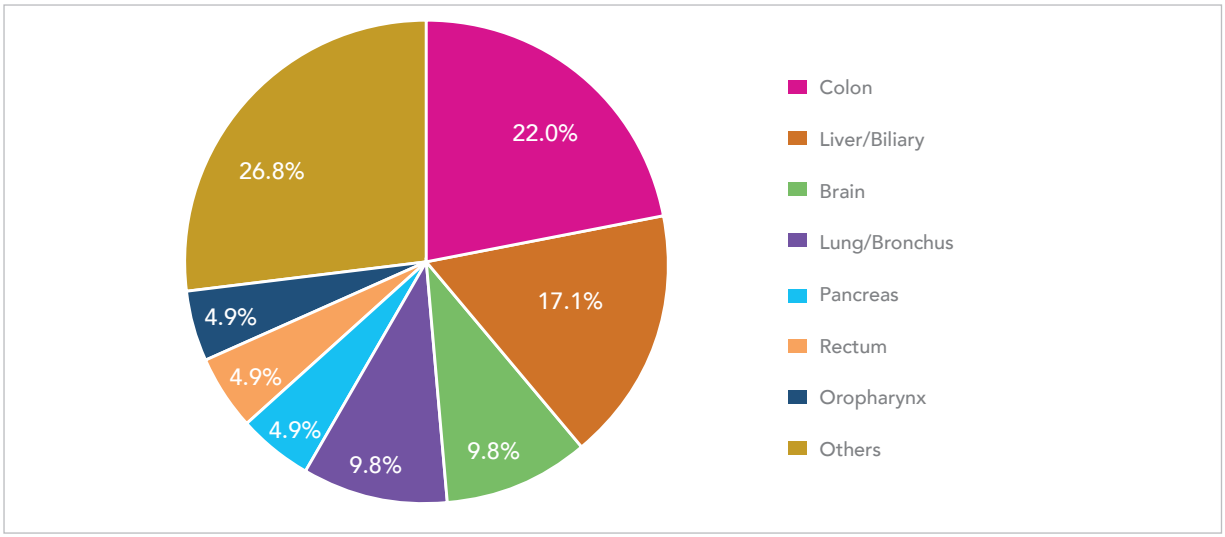
AGE GROUPS	MALES	FEMALES	BOTH SEXES
0-4	0	2	2
5-9	2	0	2
10-14	1	0	1
15-19	0	1	1
20-24	6	0	6
25-29	10	3	13
30-34	7	8	15
35-39	3	6	9
40-44	6	6	12
45-49	16	10	26
50-54	14	12	26
55-59	21	13	34
60-64	16	16	32
65-69	17	17	34
70-74	18	9	27
75-79	15	9	24
80+	18	8	26
Total	170	120	290

Source: Ministry of Public Health

The main contributors of cancer-related deaths among Qatari males in 2016 are colon cancer (22.0%), followed by liver/biliary cancer (17.1%) and brain and lung cancer (9.8% each) (Figure 3.7.2). The main causes of cancer mortality among non-Qatari males in 2016 are liver/biliary cancer (12.4%) colon (10.1%) and lung cancer (7.8%) (Figure 3.7.3).

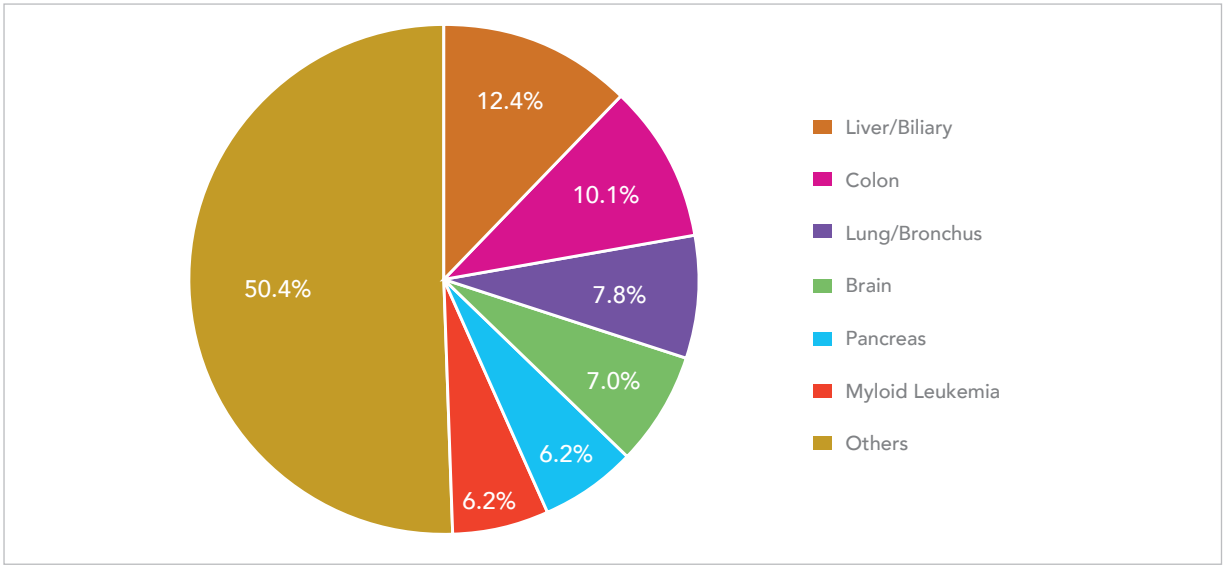
The main causes of cancer mortality among males (Qatari and non-Qatari) in Qatar is different than the ones seen among industrialized countries, such as the EU. In 2016, among EU countries, lung cancer is the most common cause of cancer-related deaths associated to 25% of cancer mortality among males, followed by colorectal cancer (11%) and prostate cancer (10%) (OECD, 2016)

Figure 3.7.2: Percentage of deaths by type of cancer in Qatari males, by top 7 causes, 2016



Source: Ministry of Public Health

Figure 3.7.3: Percentage of deaths by type of cancer in non-Qatari males, by top 6 causes, 2016



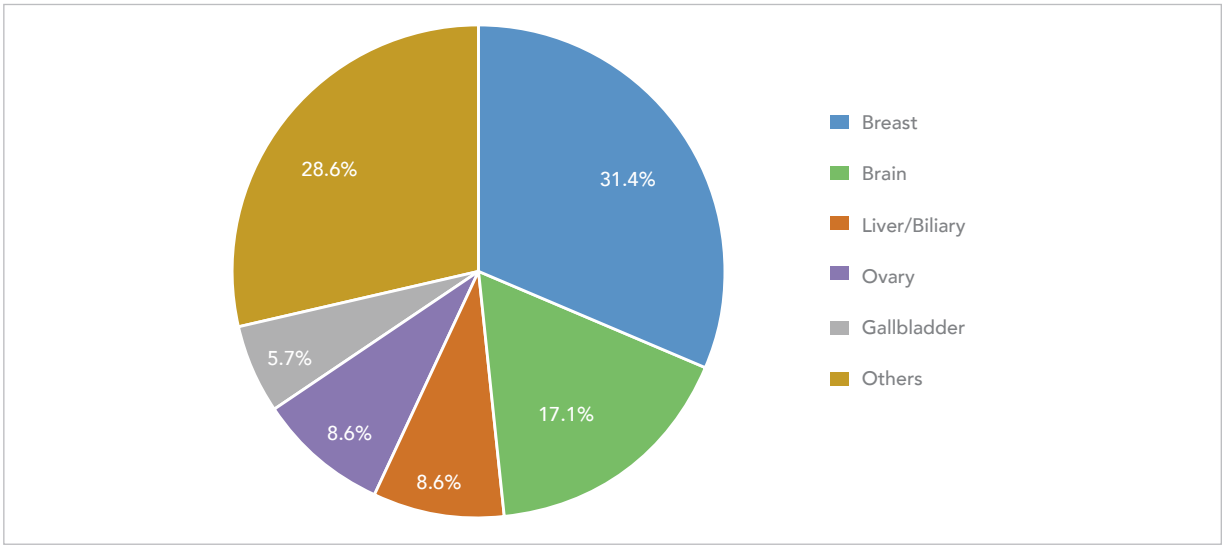
Source: Ministry of Public Health

The main contributors of cancer-related deaths among Qatari females in 2016 are breast cancer (31.4%), followed by brain cancer (17.1%) and liver/biliary cancer and ovarian cancer (8.6% each) (Figure 3.7.4). The main causes of cancer mortality among non-Qatari females in 2016 are breast (32.9%) followed by liver/biliary cancer (8.2%) and colon and pancreatic cancer (7.1% each) (Figure 3.7.5).

The main causes of cancer mortality among females (Qatari and non-Qatari) in Qatar are also different than observed in EU countries. In 2016, among EU countries, breast cancer was the most common cause of cancer-related deaths (16% of deaths) followed by lung cancer (15%) and colorectal cancer (12%) (OECD, 2016).

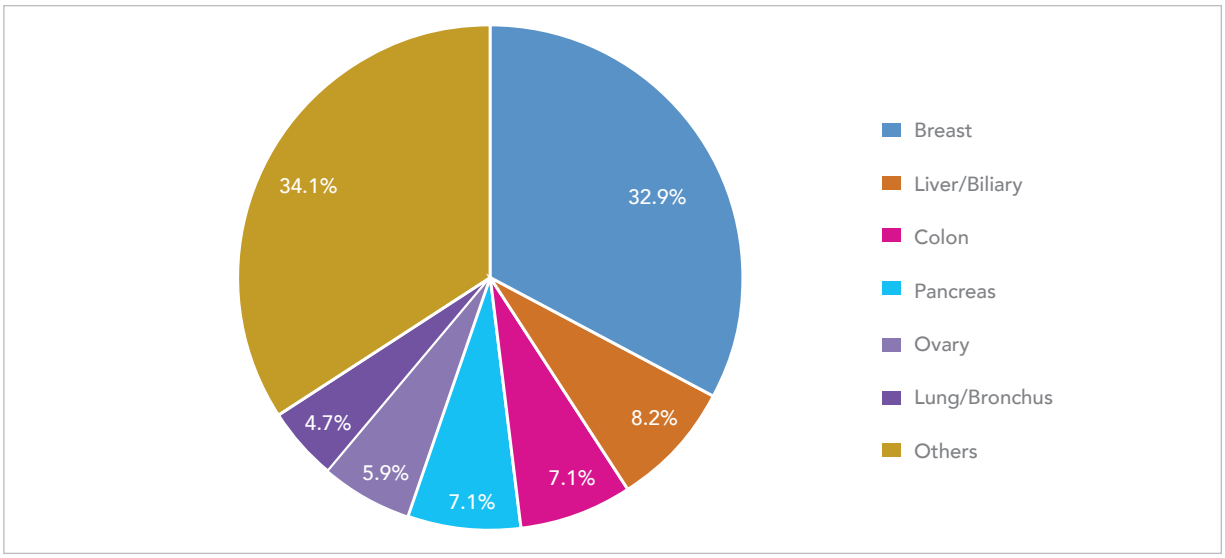
The difference in cancer related mortality between Qatar and European Union countries could be the result of different age distribution, lifestyles, environmental factors, infectious diseases prevalence and genetics in the populations. In particular, the low frequency of cancer related deaths in females in Qatar may be explained by the low prevalence of smoking in women (Table 5.5)

Figure 3.7.4: Percentage of deaths by type of cancer in Qatari females, by top 5 causes, 2016



Source: Ministry of Public Health

Figure 3.7.5: Percentage of deaths by type of cancer in non-Qatari females, by top 6 causes, 2016



Source: Ministry of Public Health

Diabetes related mortality shows a decreasing trend. There were 119 diabetes-related deaths in 2014, 120 diabetes-related deaths in 2015 and decreased to 90 diabetes-related deaths in 2016 in males and females (Table 3.7.3).

Table 3.7.3: Number of diabetes-related deaths, by gender, age group and year, 2014 to 2016

	2014			2015			2016		
AGE GROUPS	MALES	FEMALES	BOTH SEXES	MALES	FEMALES	BOTH SEXES	MALES	FEMALES	BOTH SEXES
0-24	0	0	0	0	0	0	0	0	0
25-29	0	0	0	2	0	2	2	0	2
30-34	0	0	0	0	0	0	2	0	2
35-39	0	0	0	5	0	5	1	0	1
40-44	1	1	2	1	3	4	1	0	1
45-49	3	0	3	3	0	3	2	2	4
50-54	8	1	9	7	1	8	6	1	7
55-59	9	3	12	8	6	14	11	2	13
60-64	8	4	12	2	3	5	10	5	15
65-69	12	3	15	9	1	10	6	7	13
70-74	8	4	12	9	8	17	11	7	18
75-79	2	3	5	12	11	23	8	12	20
80+	11	9	20	12	17	29	13	15	28
Total	62	28	90	70	50	120	73	51	124

Source: Ministry of Public Health

Deaths related to respiratory diseases contribute to an important proportion of the NCD burden of disease. (Table 3.7.4).

It is worthwhile to note that a substantially higher number of deaths from respiratory diseases are found in the age groups 0-4 in males (16 deaths) and females (6 deaths) as well as in the age group 25-29 (57 deaths) in males (Table 3.7.4)

Table 3.7.4: Number of respiratory disease-related deaths, by gender and age group, 2016

AGE GROUPS	MALES	FEMALES	BOTH SEXES
0-4	16	6	22
5-9	3	4	7
10-14	5	1	6
15-19	4	1	5
20-24	7	4	11
25-29	22	0	22
30-34	15	2	17
35-39	20	2	22
40-44	17	3	20
45-49	4	3	7
50-54	7	4	11
55-59	10	1	11
60-64	2	4	6
65-69	5	2	7
70-74	6	0	6
75-79	8	4	12
80+	20	9	29
Total	171	50	221

Source: Ministry of Public Health

Road traffic injuries are responsible for a significant number of mortalities and morbidities, particularly among young people (OECD/EU, 2018).

In 2016, there was a total of 196 deaths from road traffic accidents in Qatar. This is close to the number of deaths due to cancer and higher than deaths attributable to diabetes.

Males account for the majority of deaths due to road traffic accidents (186 deaths). Only 10 deaths occurred among females. Most of these deaths occurred in young age groups 15 to 39 of both genders, with a total of 144 deaths in males and 7 deaths in females (Table 3.7.5).

Although the absolute number of deaths is larger among non-Qataris (Figure 3.7.8), the highest mortality rate is observed among Qatari males aged 15 to 29 (figure 3.7.7). The risk of dying for a road traffic accident was 4 times higher in Qatari males than in non-Qataris in the age group 20-24 (Figure 3.7.7).

Table 3.7.5: Number of deaths from road traffic accidents, by gender and age group, 2016

AGE GROUPS	MALES	FEMALES	BOTH SEXES
0-4	3	1	4
5-9	3	0	3
10-14	3	0	3
15-19	12	0	12
20-24	35	1	36
25-29	38	1	39
30-34	34	4	38
35-39	22	1	23
40-44	8	0	8
45-49	11	0	11
50-54	7	0	7
55-59	3	2	5
60-64	2	0	2
65-69	2	0	2
70-74	2	0	2
75-79	0	0	0
≥80	1	0	1
Total	186	10	196

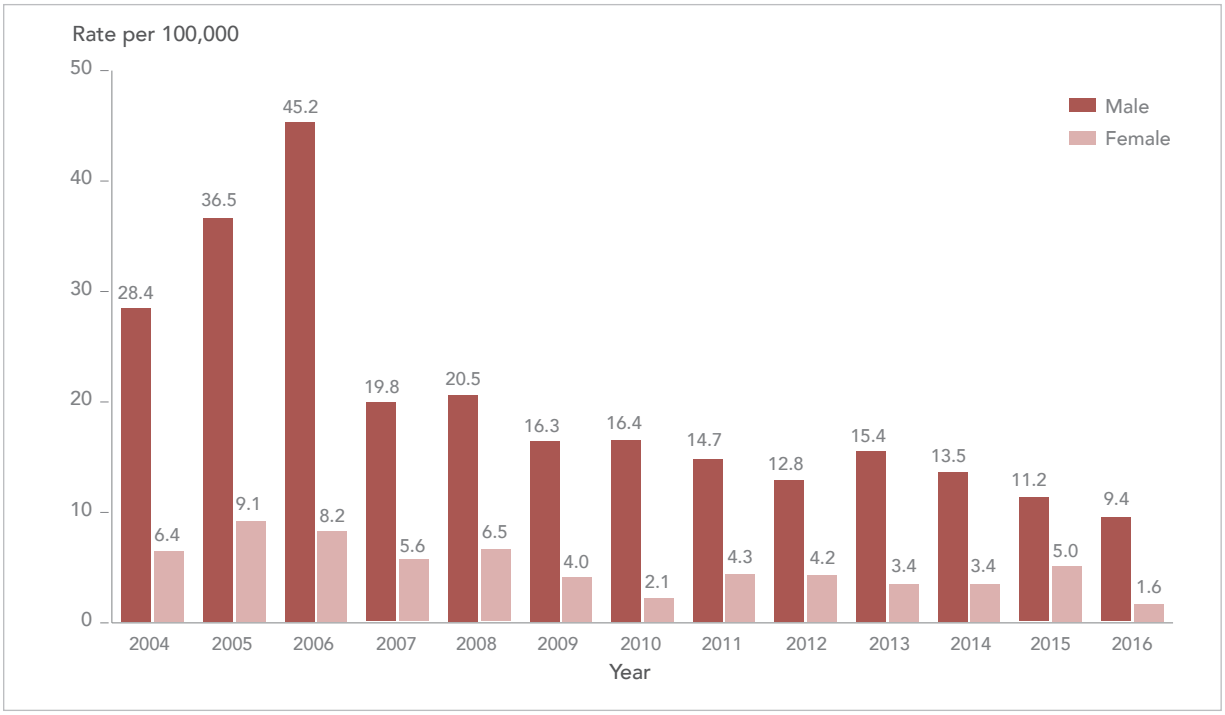
Source: Ministry of Public Health

The mortality rate due to road traffic accidents was initially increasing from 2004 to 2006 up to 45.2 deaths per 100,000 among males (Figure 3.7.6). After 2006, the mortality decreases year by year down to the 2016 value of 9.4 deaths per 100,000 among males (a decrease of 5 times in 10 years) and 1.6 among females.

Mortality from road traffic injuries in Qatar is currently comparable to the average mortality rate from road traffic injuries across the OECD countries. In 2015, mortality rate from road traffic accidents was 7.7 deaths per 100,000 (World Bank, 2019) compared to 7.5 deaths per 100,000 in Qatar in 2016.

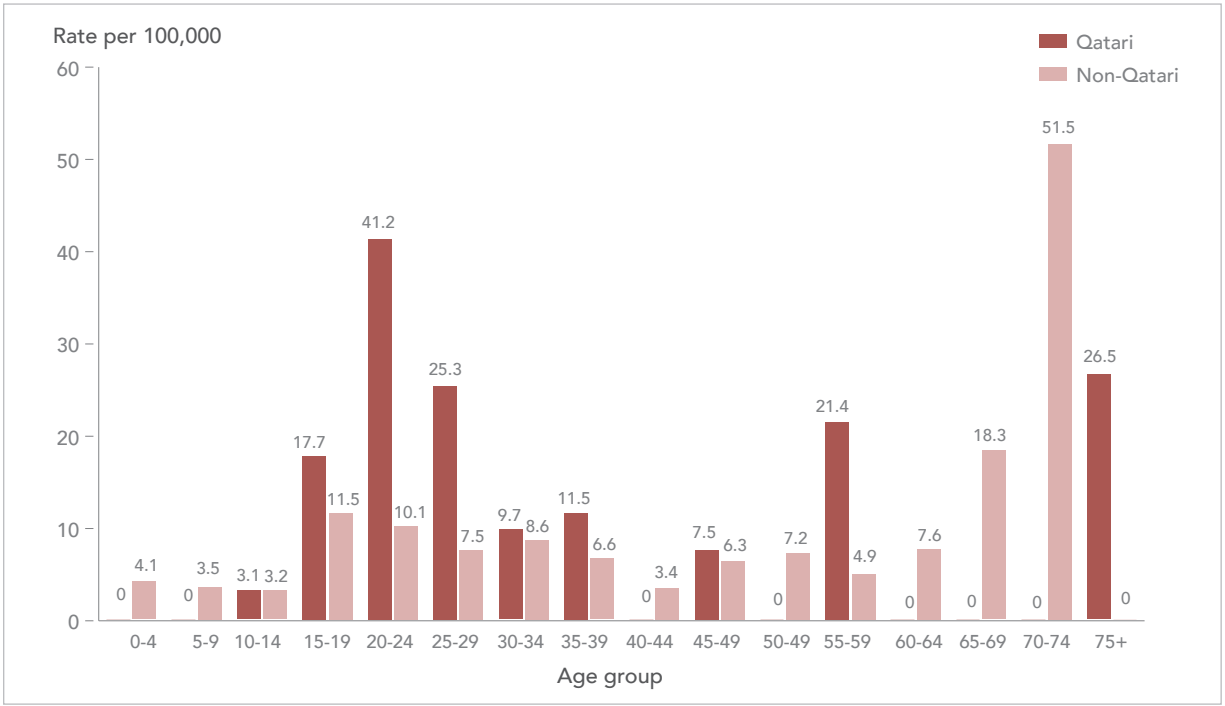
The significant decrease in mortality rate from road traffic accidents in Qatar is attributable to the reinforced public policies aimed at reducing speed driving, reckless driving, drunk-driving as well as increasing seat-belt use, helmet use for motorcycle and children restraints (Peter et al., 2004).

Figure 3.7.6: Mortality rate per 100,000 from road traffic injuries, by gender and year, 2004 to 2016



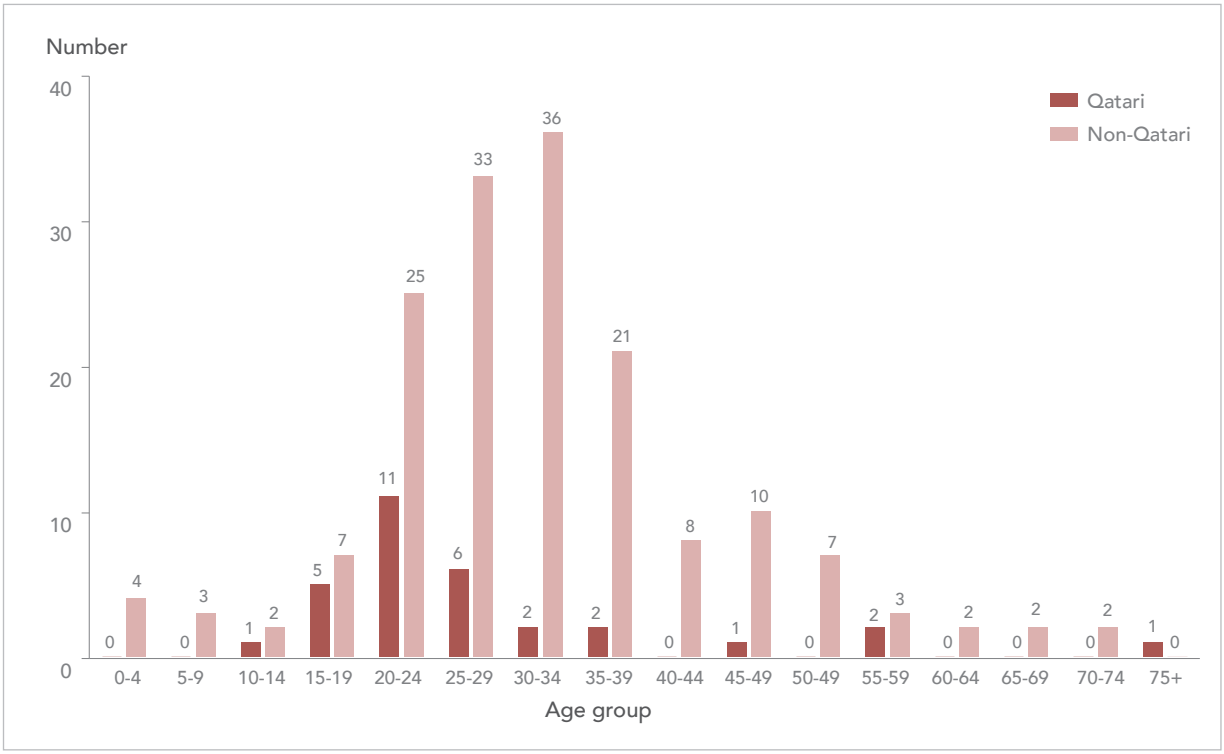
Source: Ministry of Public Health

Figure 3.7.7: Age-specific mortality rate per 100,000 from road traffic injuries, by age group and nationality, 2016



Source: Ministry of Public Health

Figure 3.7.8: Number of deaths from road traffic injuries, by age group and nationality, 2016



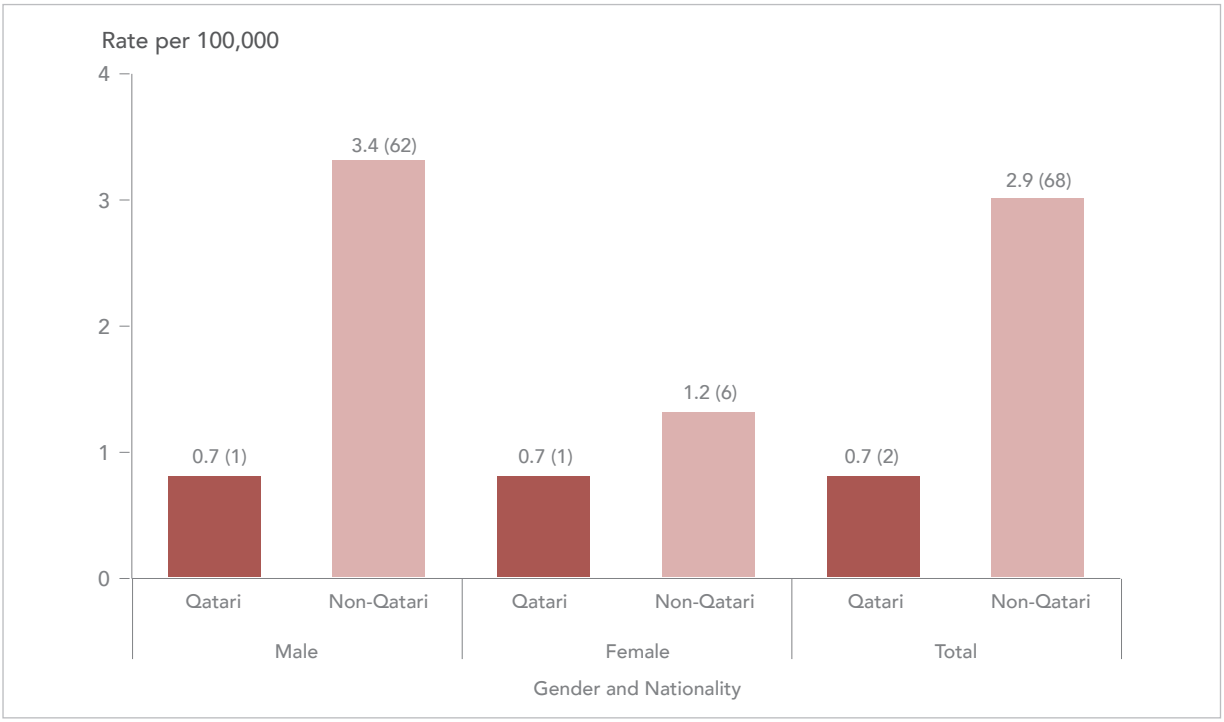
Source: Ministry of Public Health

Suicide and fatal self-harm remain significant causes of death worldwide (OECD, 2017). In 2016, Qatar's total death rate from suicide is 2.7 deaths per 100,000 (Figure 3.7.9). Death rate from intentional self-harm is lower among Qataris (0.7 deaths per 100,000) than in non-Qataris (2.9 deaths per 100,000). Non-Qatari suicide death rate is higher among males (3.4 deaths per 100,000) in comparison to females (1.2 deaths per 100,000).

The death rate from suicide is lower in Qatar compared to the global rate. According to data from the World Bank (World Bank ,2019), the worldwide average death rate from suicide was found to be 10.6 deaths per 100,000 in 2016. The total death rate from suicide among OECD countries is 12.1 deaths per 100,000, with 19.5 and 5.6 deaths from suicide among males and females respectively.

Mental health disorders represent a growing proportion of the global burden of disease. Many of these diseases might lead to intentional self-harm, potentially leading to death from suicide. Social determinants of health, such as income, socioeconomic status, education, combined with mental illnesses determine a person's tendency to harm himself (OECD, 2017).

Figure 3.7.9: Rate of deaths from intentional self-harm per 100,000 population, by nationality and gender, 2016. Absolute values in parentheses



Source: Ministry of Public Health

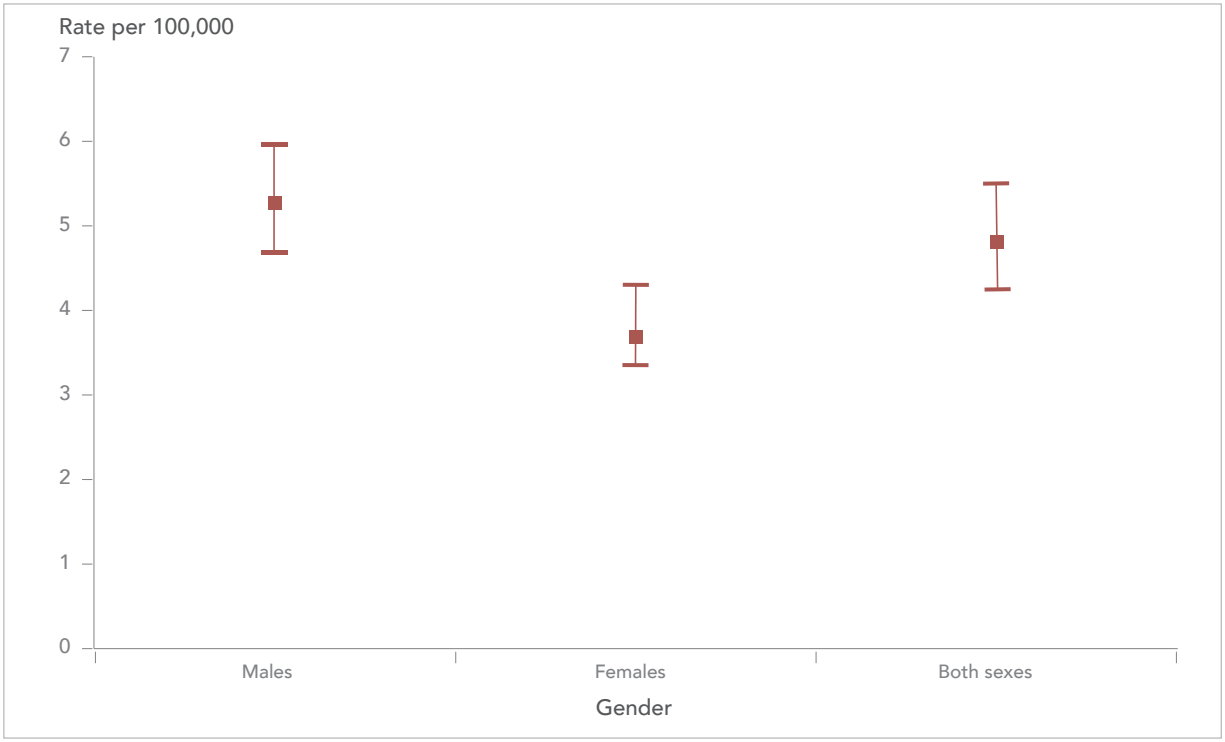
Note: The number in brackets is the number of deaths from intentional self-harm

Exposure to air pollutants such as particulate matter with diameter less or equal to 2.5 µm (PM 2.5), less or equal to 10 µm (PM 10) and ozone (O_3) has been shown to increase the risk of many diseases and to increase the risk of death (Brunekreef & Holgate, 2002).

In 2016, the estimated mortality rate in Qatar was 5.2 deaths per 10,000 for males, 3.7 deaths per 10,000 for females, combined for a total 4.7 deaths per 10,000 attributable to ambient air pollution in Qatar.

High air pollution has been associated to several diseases, including lung cancer, respiratory disease, cardiovascular disease and neurological problems. Recently, air pollution has been recognized as a major risk factors for NCD (Prüss-Ustün et al., 2019). This public health concern should be closely monitored in all countries with public health interventions targeted to reduce the anthropogenic emission of PM2.5 and other air pollutants in order to reduce their health impact (Prüss-Ustün et al., 2019).

Figure 3.7.10: Estimated mortality rate per 10,000 attributable to ambient air pollution, by gender, 2016



Source: WHO Global Health Observatory, 2018

4 MORBIDITY

4.1 NON-COMMUNICABLE DISEASES

Cancer is one of the leading causes of morbidity worldwide (Kanavos, 2006).

In Qatar, the crude cancer incidence rate among males was 47.7 per 100,000 and 43.6 per 100,000 in 2014 and 2015 respectively (Table 4.1.1). Among females, the crude cancer incidence rate was 110.6 and 102.8 per 100,000 in 2014 and 2015 respectively. Overall, cancer incidence was estimated to be 63.7 per 100,000 in 2014 and 58.1 per 100,000 in 2015. (Table 4.1.1) The difference of the crude rate between males and females may be associated to the age distribution in the two genders with a higher number of people in the younger groups among males.

For comparative purposes, age-specific cancer incidence rate is a commonly utilized indicator to describe the burden of cancer among different population age groups and among different countries. Calculating the age-standardized rates removes the differences from variations in age structure across a country and over time (Ahmad, et al., 2001).

In Qatar, age specific cancer incidence rates increase with advanced age and increases even more dramatically among the 50+ age groups this trend is seen in the years 2014 and 2015. (Table 4.1.2). For instance, the cancer incidence rate was 22.3 and 21.6 cases per 100,000 in the age group 0-4 in 2014 and 2015, respectively. The rate then increases gradually to 168.8 and 182.8 cases per 100,000 in the age group 50-54, up to 2,111.4 and 1,041.6 cases per 100,000 in the 80+ age group in the years 2014 and 2015, respectively (Table 4.1.1).

Table 4.1.1: Crude cancer incidence per 100,000, by Gender, 2014 to 2015

YEAR	MALE	FEMALES	TOTAL
2014	47.7	110.6	63.7
2015	43.6	102.8	58.1

Source: Qatar National Cancer Register, Ministry of Public Health

Note: 2016 data not available at the time of publication

Table 4.1.2: Age-specific cancer incidence rate per 100,000, by age group and year, 2014 to 2015

	2014	2015
0-4	22.3	21.6
5 - 9	11.6	14.7
10 - 14	21.9	10.4
15 - 19	19.5	23.0
20 - 24	9.9	5.4
25 - 29	16.0	15.5
30 - 34	27.5	22.1
35 - 39	34.7	34.5
40 - 44	62.4	67.4
45 - 49	96.3	100.4
50 - 54	168.8	182.9
55 - 59	355.3	268.9
60 - 64	857.2	529.9
65 - 69	1,483.9	796.9
70 - 74	1,627.0	1,003.9
75 - 79	1,778.9	1,384.0
80 +	2,114.4	1,041.7

Source: Qatar National Cancer Register, Ministry of Public Health

Note: 2016 data not available at the time of publication

In Qatar, in 2014, the majority (31.9%) of newly diagnosed cases of cancer among males constituted of colorectal cancer (99 cases), prostate gland (92 cases) and lymphoma (60 cases) (Table 4.1.3). Among females, the majority (54%) of newly diagnosed cancer cases were breast cancer (242), colorectal cancer (50) and thyroid gland cancer (45) (Table 4.1.4).

In 2015, prostate cancer (96 cases) followed by colorectal (94 cases) and leukemia (65 cases) cancers accounted for the majority (31.8%) of newly diagnosed cases of cancer among males (Table 4.1.5). Among females, breast (242 cases), thyroid gland (53 cases) and colorectal (51 cases) cancers contributed to the majority (56.4%) of newly diagnosed cases of cancer (Table 4.1.4).

Table 4.1.3: Number and percentage of cancer among males, by category of cancer, 2014

ICD 10 PRIMARY SITE	NUMBER OF CASES	% OF TOTAL
C18-C21 Colorectal	99	12.6%
C61 Prostate gland	92	11.7%
C81-C85, C96 Lymphoma	60	7.6%
C22 Liver and intrahepatic bile ducts	56	7.1%
C33-34 Bronchus and Lung	55	7.0%
C91-C95 Leukemia	55	7.0%
C44 Non-melanoma skin	46	5.8%
C16 Stomach	34	4.3%
C70-C72 Brain & CNs	33	4.2%
C67 Bladder	24	3.1%

Source: Qatar National Cancer Register, Ministry of Public Health

Table 4.1.4: Number and percentage of cancer among females, by category of cancer, 2014

ICD 10 PRIMARY SITE	NUMBER OF CASES	% OF TOTAL
C50 Breast	242	38.8%
C18-C21 Colorectal	50	8.0%
C73 Thyroid gland	45	7.2%
C54-C55 Uterus	32	5.1%
C81-C85, C96 Lymphoma	32	5.1%
C91-C95 Leukemia	26	4.2%
C56 Ovary	21	3.4%
C22 Liver and intrahepatic bile ducts	18	2.9%
C53 Cervix uteri	18	2.9%
C44 Non-melanoma skin	17	2.7%

Source: Qatar National Cancer Register, Ministry of Public Health

Table 4.1.5: Number and percentage of cancer among males, by category of cancer, 2015

ICD 10 PRIMARY SITE	NUMBER OF CASES	% OF TOTAL
C61 Prostate gland	96	12.0%
C18-C21 Colorectal	94	11.7%
C91-C95 Leukemia	65	8.1%
C82-C85, C96 Non-Hodgkin Lymphoma	62	7.7%
C33-C34 Trachea, bronchus and lung	53	6.6%
C44 Non-Melanoma skin cancer	52	6.1%
C22 Liver and intrahepatic bile ducts	47	5.9%
C70-C72 Brain & CNS	36	4.5%
C64-C66, C68 Kidney	30	3.7%
C16 Stomach	29	3.6%

Source: Qatar National Cancer Register, Ministry of Public Health

Table 4.1.6: Number and percentage of cancer cases among females, by category of cancer, 2015

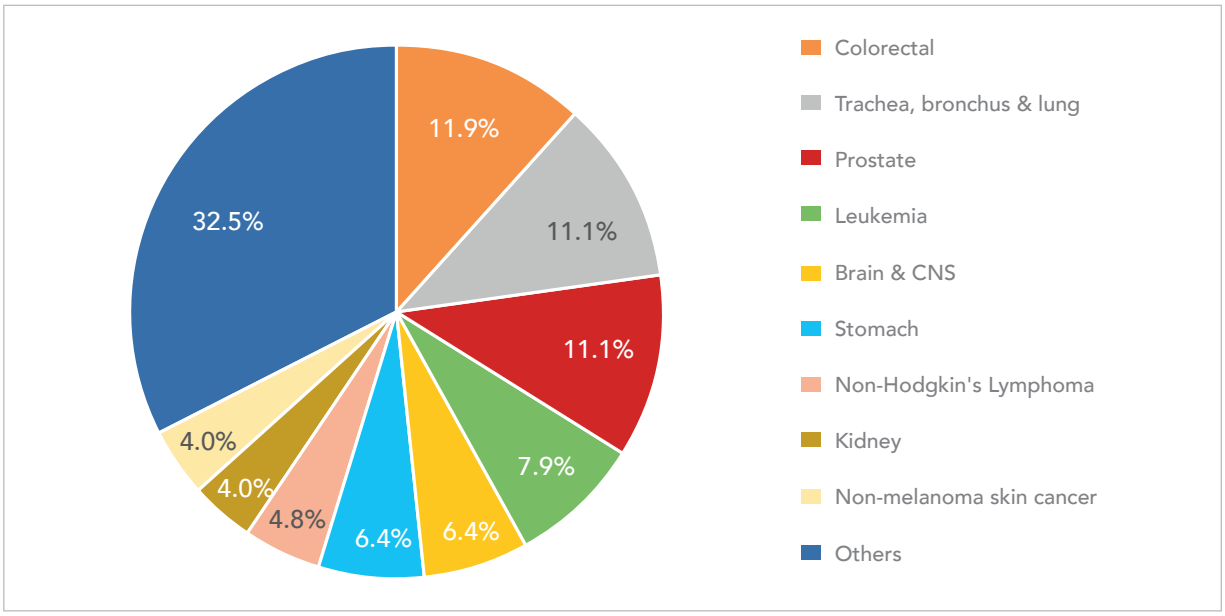
ICD 10 PRIMARY SITE	NUMBER OF CASES	% OF TOTAL
C50 Breast	242	39.4%
C73 Thyroid gland	53	8.6%
C18-C21 Colorectal	51	8.3%
C54-C55 Uterus	40	6.5%
C56 Ovary	25	4.1%
C53 Cervix uteri	25	4.1%
C82-C85, C96 Non-Hodgkin Lymphoma	21	3.4%
C33-C34 Trachea, bronchus and lung	19	3.1%
C91-C95 Leukemia	17	2.8%
C44 Non-Melanoma skin cancer	16	2.6%

Source: Qatar National Cancer Register, Ministry of Public Health

In 2015, variations in cancer incidence exist between Qatari and non-Qatari males.For Qatari males, colorectal cancers (11.9%), are the most common cancers, followed by trachea, bronchus and lung (11.1%) and prostate (11.1%) cancers. There is a different cancer distribution among non-Qatari males with prostate cancers making up to majority of cancers (12.1%), followed by colorectal cancers (11.7%) and non-Hodgkin's lymphoma (8.3%).

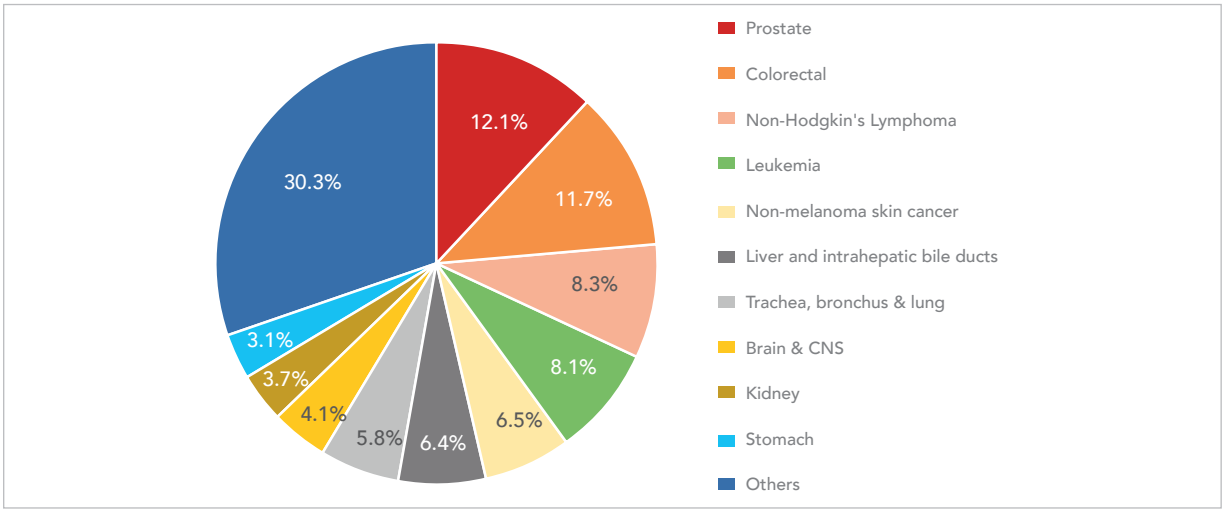
In 2015, breast cancer is the most common cancer found among females, both Qatari (36.8%) and non-Qatari (40.2%). This is followed by uterine (12.5%) and colorectal (11.8%) cancers among Qatari females and by thyroid (9.0%) and colorectal (7.3%) cancers as the most common cancers among non-Qatari females.

Figure 4.1.1: Percentage of cancers in the Qatari male population, by cancer type, 2015



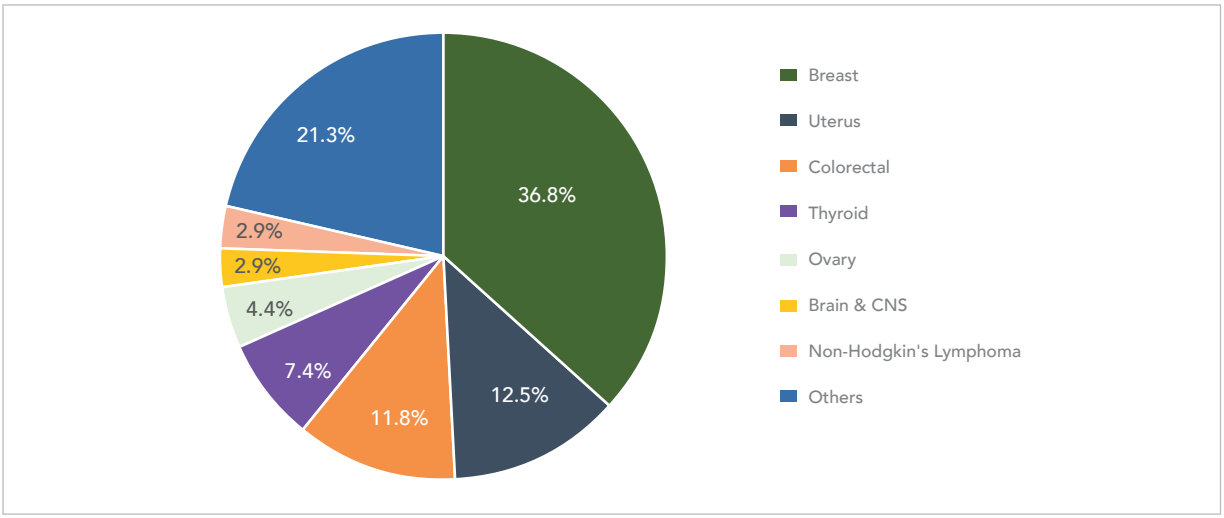
Source: Qatar National Cancer Register, Ministry of Public Health

Figure 4.1.2: Percentage of cancers in the non-Qatari male population, by cancer type, 2015



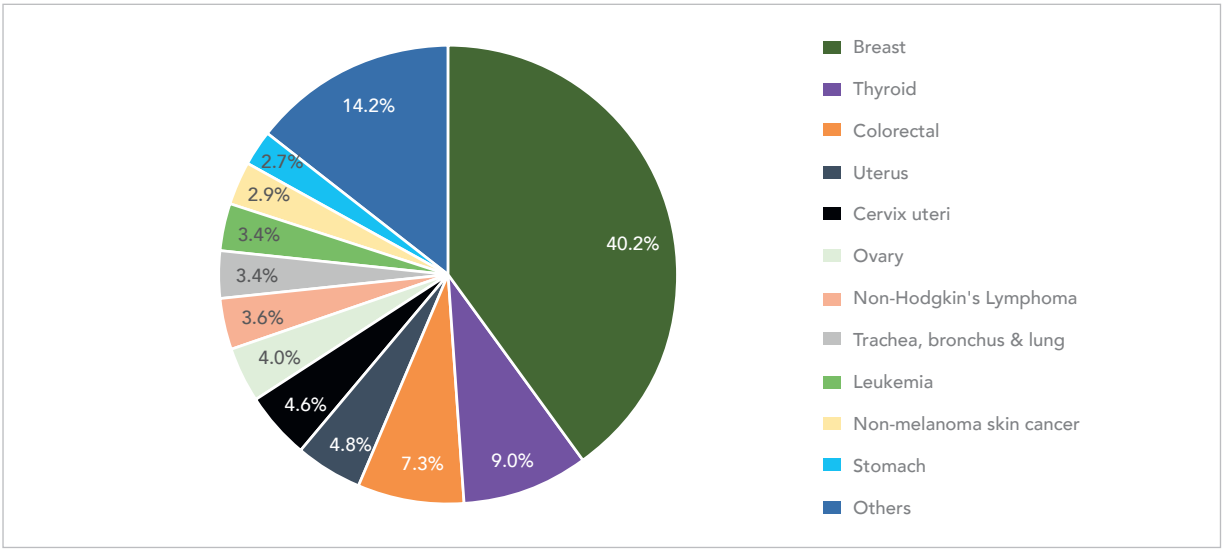
Source: Qatar National Cancer Register, Ministry of Public Health

Figure 4.1.3: Percentage of cancers in the Qatari female population, by cancer type, 2015



Source: Qatar National Cancer Register, Ministry of Public Health

Figure 4.1.4: Number and percentage of cancers in the non-Qatari female population, by cancer type, 2015



Source: Qatar National Cancer Register, Ministry of Public Health

On average, in the OECD countries, prostate cancer contributed to 24% of all new incident cancers in men in 2012, followed by lung (14%) and colorectal (12%) cancers (Ferlay, et al., 2015). On the other hand, breast cancer was the most common primary site in women (28%), followed by colorectal (12%) and lung (10%) cancers (Ferlay, et al., 2015).

4.2 COMMUNICABLE DISEASES

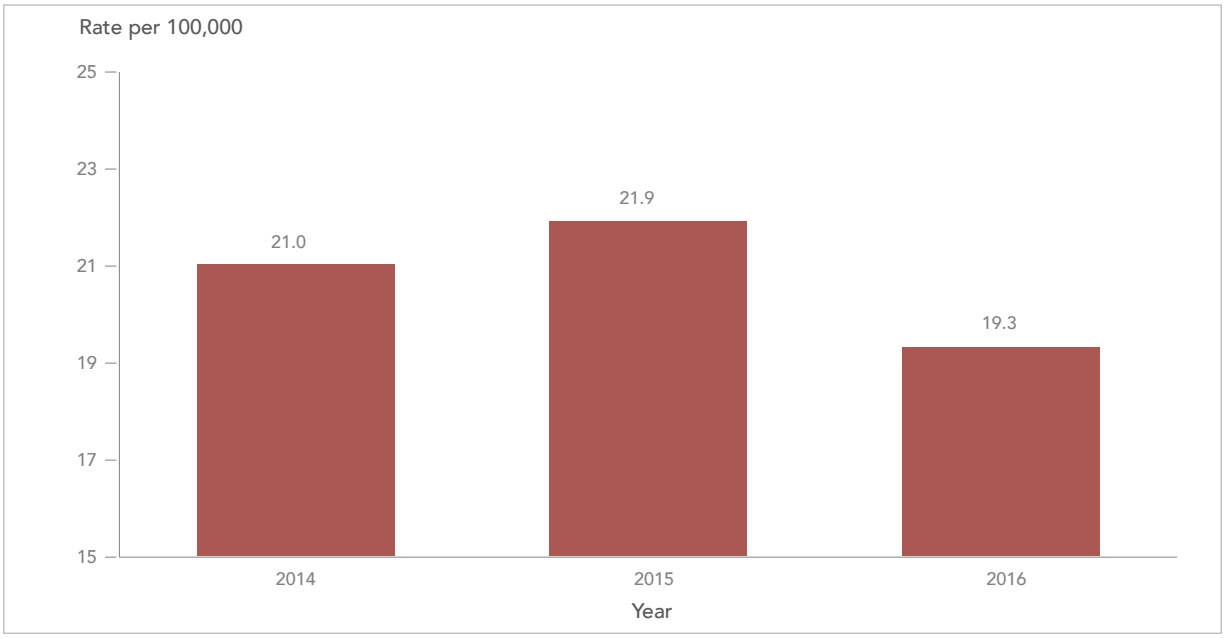
Tuberculosis is an infectious disease caused by the bacteria mycobacterium tuberculosis. Given its contagious nature, tuberculosis poses a serious public health threat, which led many countries to adopt strict regulatory procedures and protocols to adequately identify and treat tuberculosis in order to limit its spread (WHO, 2013).

In Qatar, incidence rate of notified tuberculosis cases has been on the decline over the past years (Figure 4.2.1 and Table 4.2.1). Tuberculosis incidence rate was 28.0 cases per 100,000 in 2012, gradually decreasing to 21.0, 21.9 and 19.3 cases per 100,000 in 2014, 2015 and 2016 respectively (Figure 4.2.1 and Table 4.2.1). The extra-pulmonary, pulmonary and overall tuberculosis cases have been grossly constant over the past 5 years, with minor fluctuations between the years (Table 4.2.1).

Qatar's tuberculosis incidence rate of 19.3 cases per 100,000 is much lower than the worldwide average of 136 cases per 100,000 in 2016. The observed decrease of tuberculosis incidence rate in Qatar follows the global trend. According to the World Bank, the incidence rate of tuberculosis has decreased from 148 cases per 100,000 in 2012 to 136 cases per 100,000 in 2016 (World Bank, 2019). It was estimated to be 140 cases per 100,000 in 2016 according to the Global Tuberculosis Report 2017 (WHO, 2017).

A number of public health interventions and clinical guidelines have been put in place and enforced over the past years and could account for the gradual decrease in tuberculosis incidence rate (screening X-Rays, raising awareness, treatment of latent TB, precautionary measures when travelling to countries endemic with tuberculosis) (David, et al., 2017) (WHO, 2013). However, this is counteracted by another public health crisis: the emergence of multidrug-resistant tuberculosis (MDR-TB) where an increasing number of newly diagnosed cases are found to be resistant to rifampicin, the first-line drug therapy for treatment of tuberculosis (WHO, 2013).

Figure 4.2.1: Rate of tuberculosis case notification per 100,000, by year, 2014 to 2016



Source: Ministry of Public Health

Table 4.2.1: Notification of tuberculosis cases and rate per 100,000 population, by tuberculosis type and year, 2012 to 2016

YEAR	T.B (EXT-PULMONARY)	T.B (PULMONARY)	ALL	RATES
2012	259	252	511	28.0
2013	215	256	471	23.5
2014	322	143	465	21.0
2015	305	229	534	21.9
2016	262	244	506	19.3

Source: Ministry of Public Health

HIV, the human immunodeficiency virus, is the agent causative of the HIV infection. HIV is notably known to be a sexually transmitted infection but can also be transmitted by transfer of infected blood and from an infected mother to her infant during pregnancy or through breast milk (Rom & Markowitz, 2007). HIV targets the cells responsible for the immune system and destroys them, leading to a decrease in immunity over time and a higher probability of getting infected. The immune system becomes progressively weak, a condition referred to as AIDS or acquired immunodeficiency syndrome, and the infected body will ultimately be unable to fight infections, eventually resulting in death (Zuckerman, 2009).

In Qatar, the number of estimated new HIV infections is roughly constant (Table 4.2.2). Qatar was estimated to have 13 new HIV infection cases in 2010, gradually increasing to 18 new estimated cases of HIV infection in 2016. These estimations are made through the software "Spectrum" and are generated through complex modelling techniques. From 2014 to 2016, the new observed HIV cases were more likely to be among males and they account for the increasing trend of newly diagnosed HIV reported cases in Qatar (Figure 4.2.2). In Qatar, there were 6 new cases of HIV among males in 2014. It increased to 14 and 16 new cases of HIV among males in 2015 and 2016. Among women, the number of newly diagnosed HIV cases remained stable during the same period: There were 3 new HIV cases in 2014 and 2 new HIV cases in both years, 2015 and 2016. The total number of new HIV cases doubled from 2014 to 2016: it increased from 9 to 16 to 18 cases in 2014, 2015 and 2016 respectively.

The increase in newly diagnosed new HIV cases in Qatar might be due to a combination of increasing population in Qatar as well as increased testing due to raised awareness among healthcare providers and the public health sector (Personal communication with CDC, 2019)

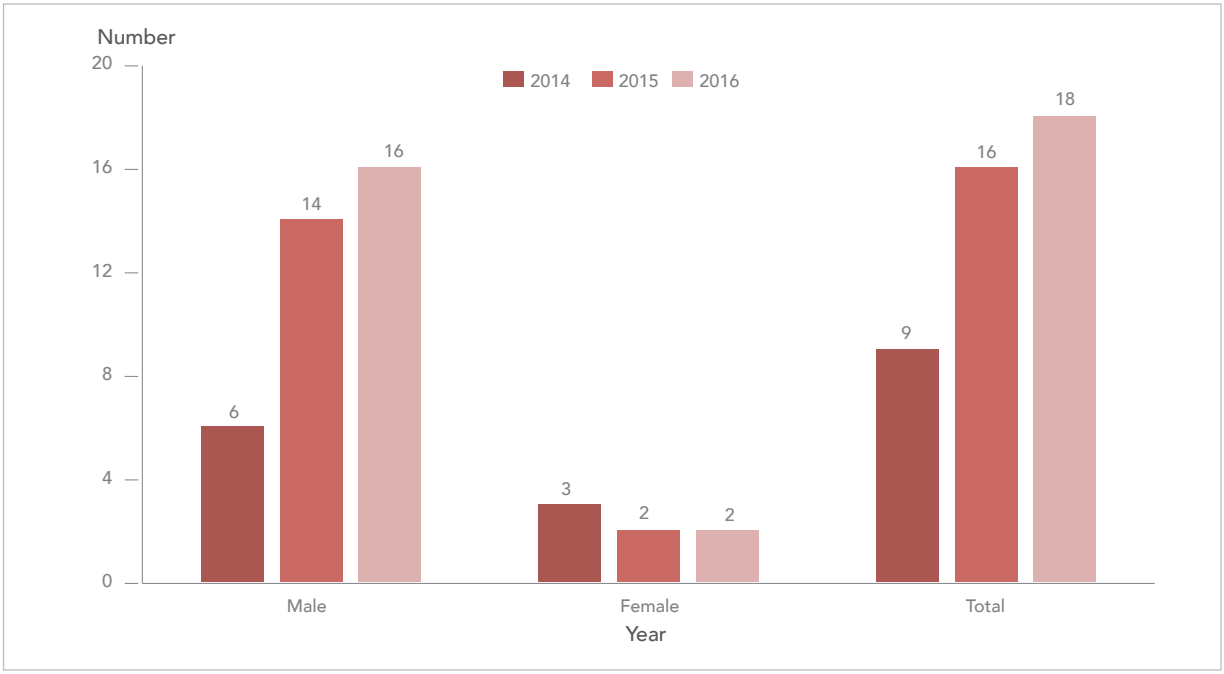
Table 4.2.2: Estimated number of new HIV infections, by year, 2010 to 2016

	2010	2011	2012	2013	2014	2015	2016
Number of new HIV infections	13	14	14	15	16	17	18

Source: Joint United Nations Programme on HIV and AIDS (UNAIDS)

Note: Generated using UNAIDS software "Spectrum". Numbers rounded to whole number.

Figure 4.2.2: Number of new reported cases of HIV/AIDS, by gender and year, 2014 to 2016



Source: Ministry of Public Health

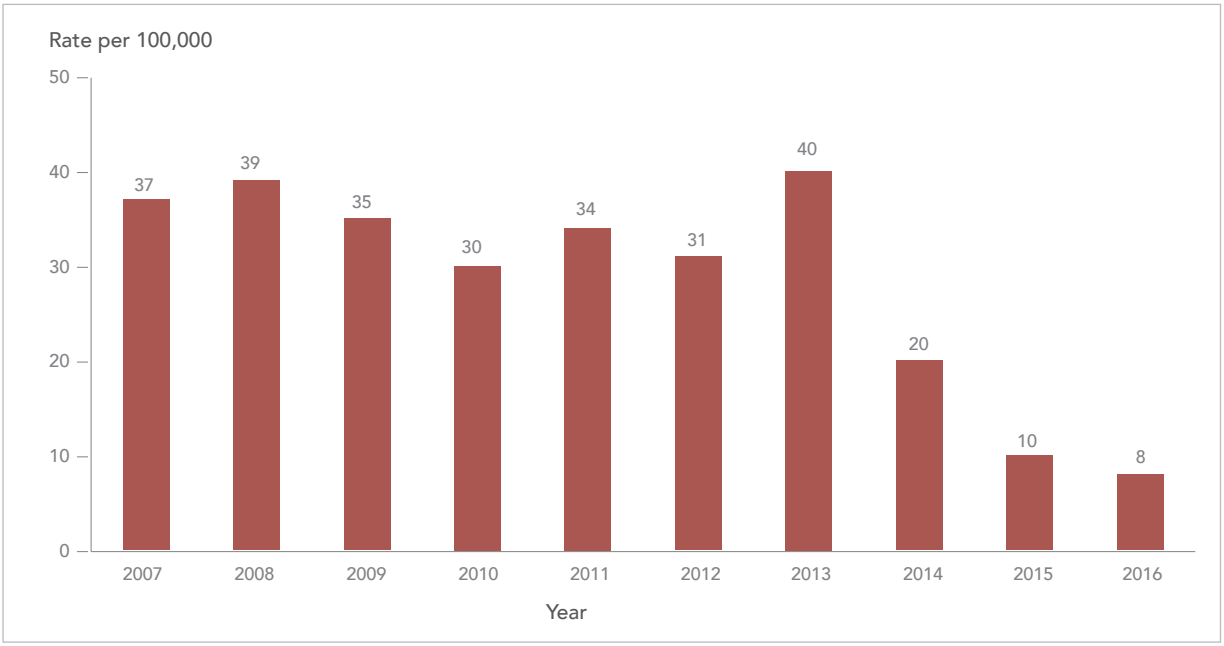
3.2.3 HEPATITIS B

Hepatitis B is an infectious disease caused by the hepatitis B virus. Hepatitis B is another sexually transmitted disease and just like HIV, it can be transmitted by transfer of infected blood, intravenous drug abuse (needle sharing) and from an infected mother to her infant during pregnancy (WHO, 2017). The infection can remain in the liver and would lead to a progressively deterioration of this organ and ultimately to liver cirrhosis, cancer and death (Chisari & Ferrari, 1995).

In Qatar, hepatitis B incidence rate has drastically declined over the past decade (Figure 4.2.3). It remained grossly stable from 2007 (37 cases per 100,000) to 2013 (40 cases per 100,000) before decreasing to 20, 10 and 8 cases per 100,000 in 2014, 2015 and 2016 respectively (Figure 4.2.3).

Like other sexually transmitted infections, Hepatitis B causes a public health threat (WHO, 2017). A number of public health interventions, such as immunization of newborns and mother-to-child prevention account for the decreasing trend in hepatitis B incidence rate (WHO, 2017).

Figure 4.2.3: Hepatitis B incidence rate per 100,000, by year, 2007 to 2016



Source: Ministry of Public Health

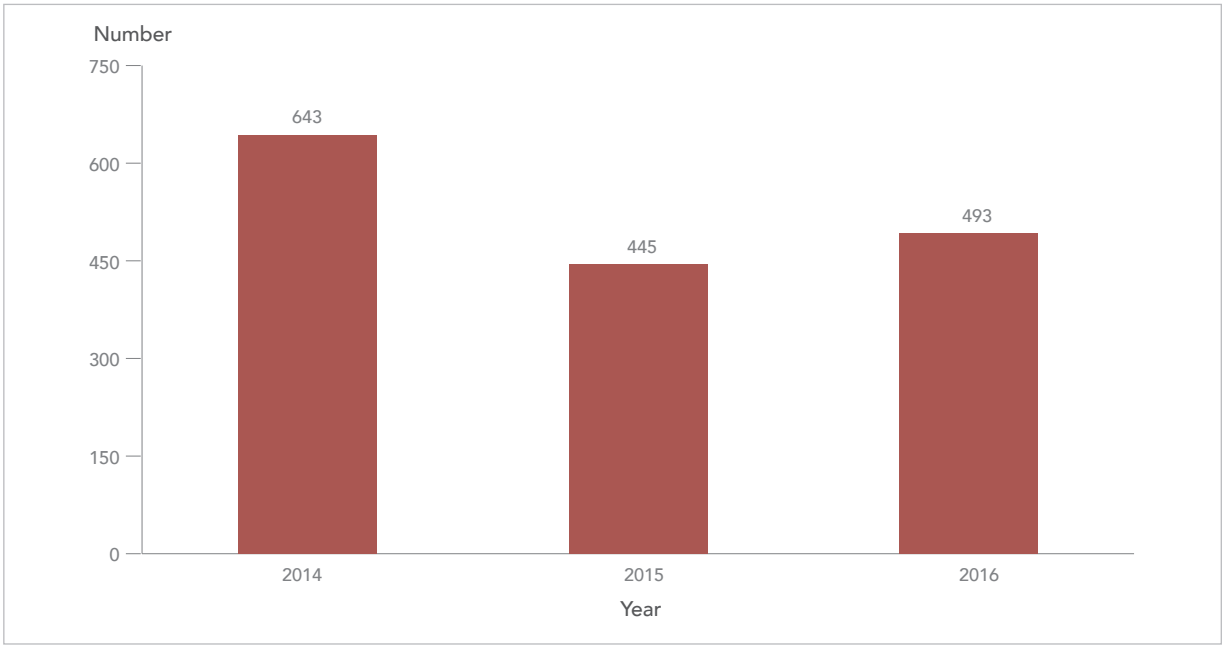
3.2.4 MALARIA

Malaria is an infectious disease caused by a type of parasite from the Plasmodium family. It is transmitted through the bite of a unique type of mosquito, the Anopheles. Malaria is endemic in certain geographic locations: it is predominantly found in the Sub-Saharan African region (90% of cases) as well as South-East Asia (7% cases) followed by the Eastern Mediterranean Region (2% of cases) (WHO, 2017). In other countries, such as Qatar, malaria is imported by people travelling from endemic region. In some sporadic cases there can be a local transmission originated by imported cases in the presence of the carrier mosquito.

In Qatar, there were 643, 445 and 493 cases of malaria reported in 2014, 2015 and 2016 respectively (Figure 4.2.4). Since 2014, malaria incidence rate was on the decline: it was 29 cases per 100,000 in 2014, decreasing to 18 and 19 cases per 100,000 in 2015 and 2016 respectively (Figure 4.2.5). Prior to 2014, malaria incidence rate was gradually increasing: it was reported to be 16 per 100,000 cases in 2007 and reached its peak in 2011 and 2012 with 39 cases per 100,000 in both years.

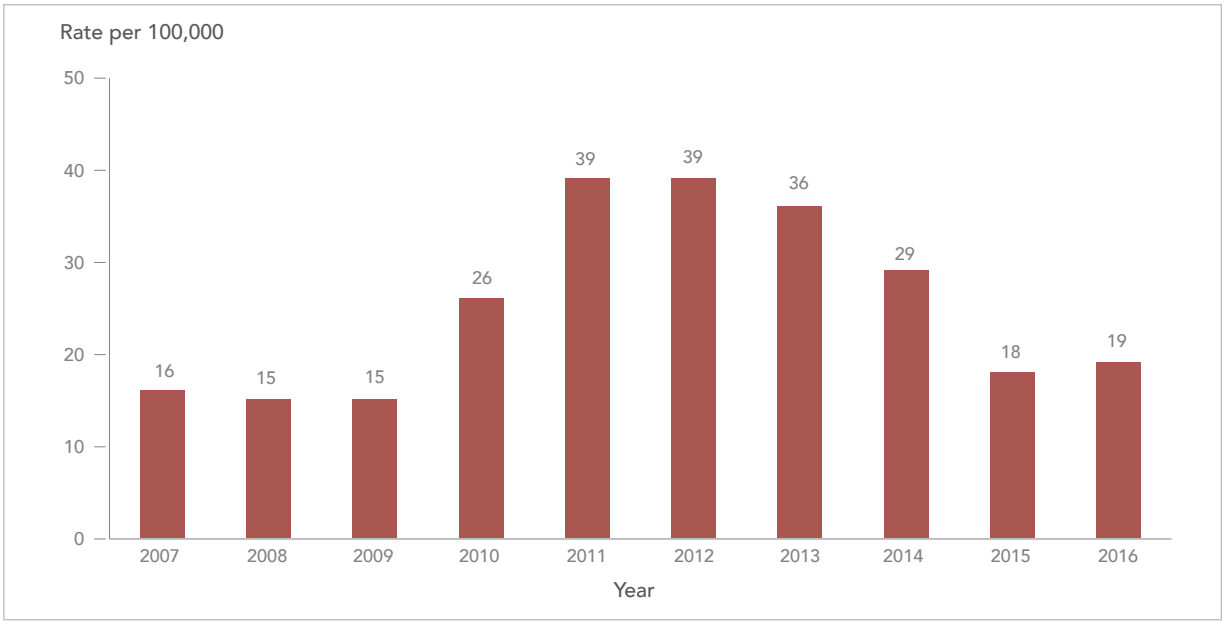
In 2016, WHO estimated the malaria incidence rate to be 63 cases per 1,000 population at risk globally and to be gradually decreasing worldwide (WHO, 2017)

Figure 4.2.4: Number of cases of malaria reported, by year, 2014-2016



Source: Ministry of Public Health

Figure 4.2.5: Malaria incidence rate per 100,000, by year, 2007 to 2016



Source: Ministry of Public Health

MEASLES

Measles is an infectious disease caused by a virus. It primarily affects the respiratory system and leads to a characteristic generalized rash on the patient's body. The measles virus is highly contagious and is transmitted from person to person through airborne droplets as well as close and direct contact (Tagbo & Ezeonwu, 2018). It can progress to severe pneumonia as well as debilitating brain injury (in rare cases) and other significant morbidity and mortality. Qatar has planned for the eradication of measles and there is an effective vaccination against measles that is widely used in the country.

In Qatar, 46, 28 and 30 cases were reported in 2014, 2015 and 2016 respectively (Table 4.2.3). The rates of measles cases over the past 3 years were 2.1, 0.7 and 1.1 cases per 100,000 population in 2014, 2015 and 2016 respectively (4.2.6).

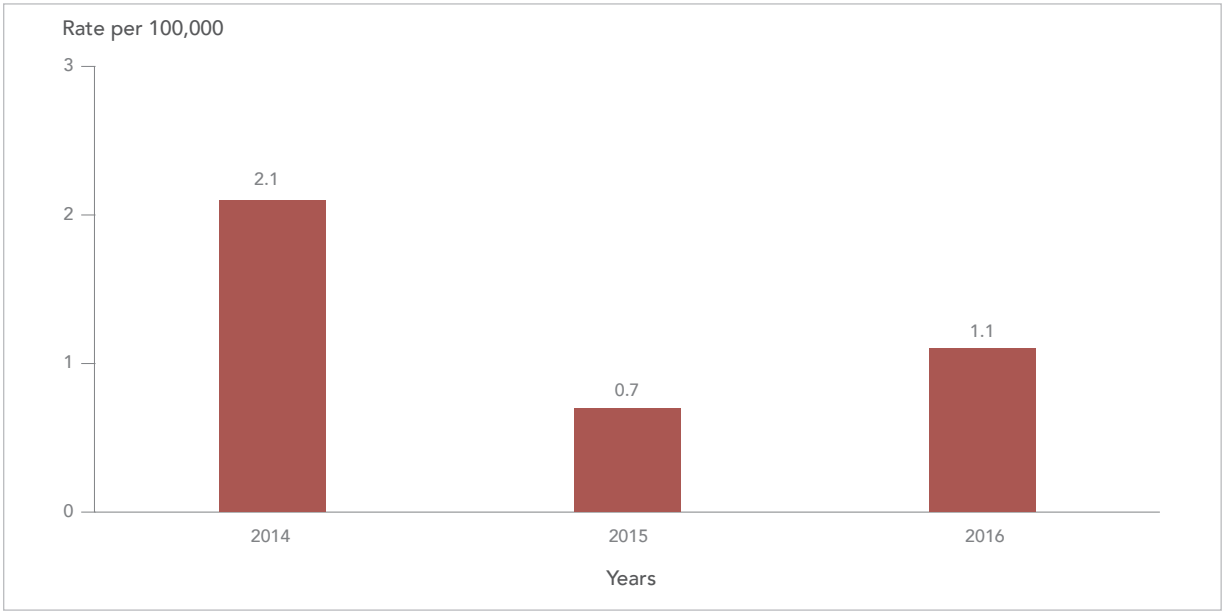
According to the Center of Disease Control (CDC), reported measles incidence rate decreased globally from 14,5 to 1,9 cases per 100,000, representing an 87% decrease from 2000 to 2016.

Table 4.2.3: Number of measles cases reported, by year, 2014 to 2016

YEAR	MEASLES
2014	46
2015	18
2016	30

Source: Ministry of Public Health

Figure 4.2.6: Rate of measles per 100,000, by year, 2014 to 2016



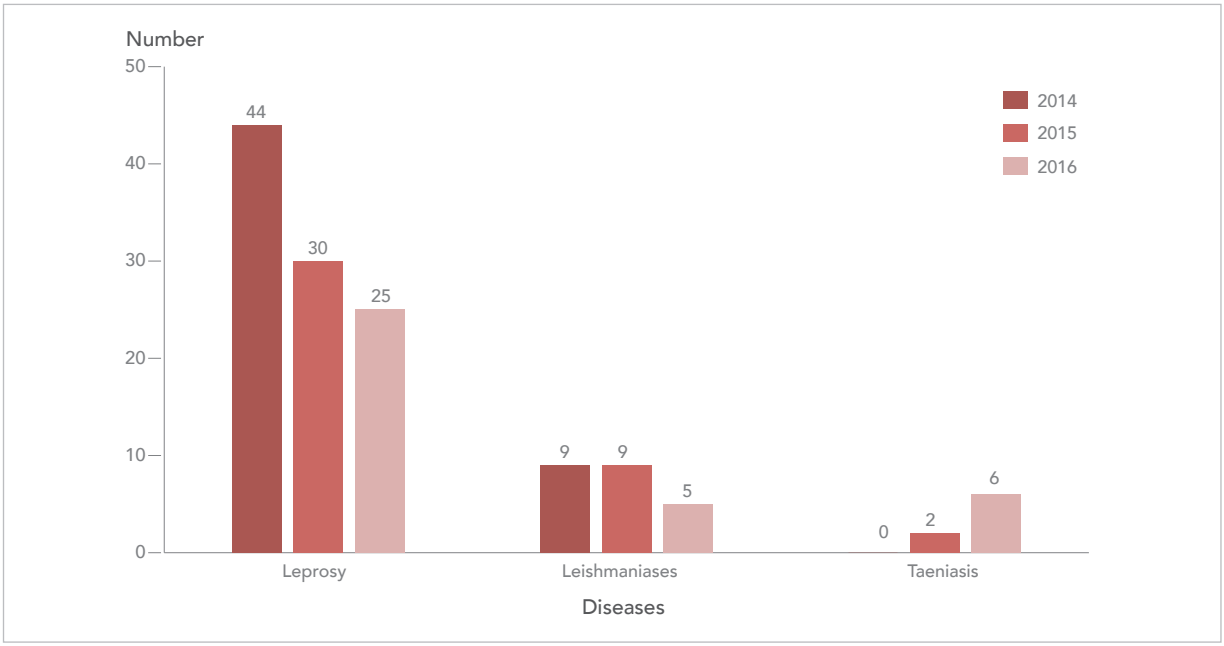
Source: Ministry of Public Health

NEGLECTED TROPICAL DISEASES

Neglected tropical diseases (NTD) is a group of diverse infectious diseases and are major disabling conditions. These diseases often result in significant morbidity such as disfigurement, blindness, brain injuries and often lead to death if not addressed promptly or left untreated (Hotez & Kamath, 2009). In our report, the focus was targeted on 3 diseases: Leprosy, Leishmaniasis and Taeniasis.

In Qatar NTD are mostly imported cases, although limited local transmission cannot be excluded (Personal communication with CDC, 2019). Leprosy was on the decline over the past 3 years, with 44, 30 and 25 cases in 2014, 2015 and 2016 respectively (Figure 4.2.7). Leishmaniasis cases also decreased over the same period: there were 9 reported cases in 2014 and 2015 and 5 cases in 2016. Emergence of Taeniasis has been reported after 2014 (0 cases) with 2 cases in 2015 and 6 cases in 2016.

Figure 4.2.7: Number of selected neglected tropical diseases cases, by disease type and year, 2014 to 2016



Source: Ministry of Public Health, Planning and Statistics Authority

5 RISK FACTORS

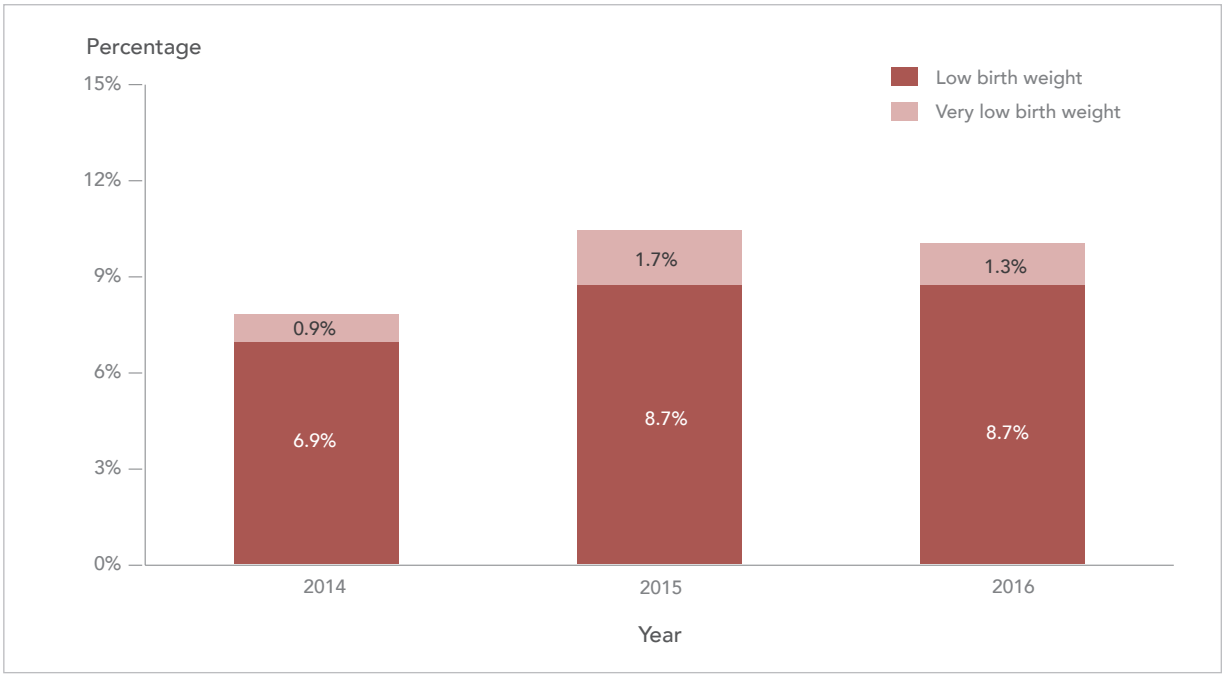
This chapter examines major risk factors for health including health-related behaviors and lifestyles such as dietary habits, tobacco consumption, obesity, physical activity in people of all age groups. The prevalence of most of these risk factors for developing diseases can be modified by public health interventions and policies (Singh, Reddy & Prabhakaran, 2011).

The World Health Organization defines low birth weight as infants weighing less than 2,500 grams at birth irrespective of the gestational age of the infant. Very low birth weight describes infants weighing less than 1500 grams at birth, irrespective of their gestational age (OECD/EU, 2018). It is a very important indicator of infant health, as low birth weight infants are at increased risk of health problems, disabilities, morbidities and even death. Some of the main risk factors for low birth weight include maternal smoking, alcohol consumption and poor nutrition during pregnancy, low body mass index, lower socioeconomic status, having had in-vitro fertilization treatment and multiple births, and a higher maternal age (OECD/EU, 2018).

The proportion of low birth weight infants in Qatar has increase between 2014 and 2016 from 7.8% in 2014 to 10.4% and 10.0% in 2015 and 2016 respectively (Figure 5.1). When analyzing the data by nationality (Figure 5.2), a higher proportion of low birth weight infants is observed among Qatari newborns (12.8%) compared to non-Qatari newborns (8.9%). Proportion of very low birth weight children (<1500 grams at birth) is slightly higher among Qatari newborns (1.5%) with respect to non-Qatari ones (1.3%). Most of the difference by nationality is attributable to newborns weighting between 1500 and 2499 grams at birth. The proportion of low birth weight newborns in Qatar is the highest among GCC countries (WHO EMRO, 2017)

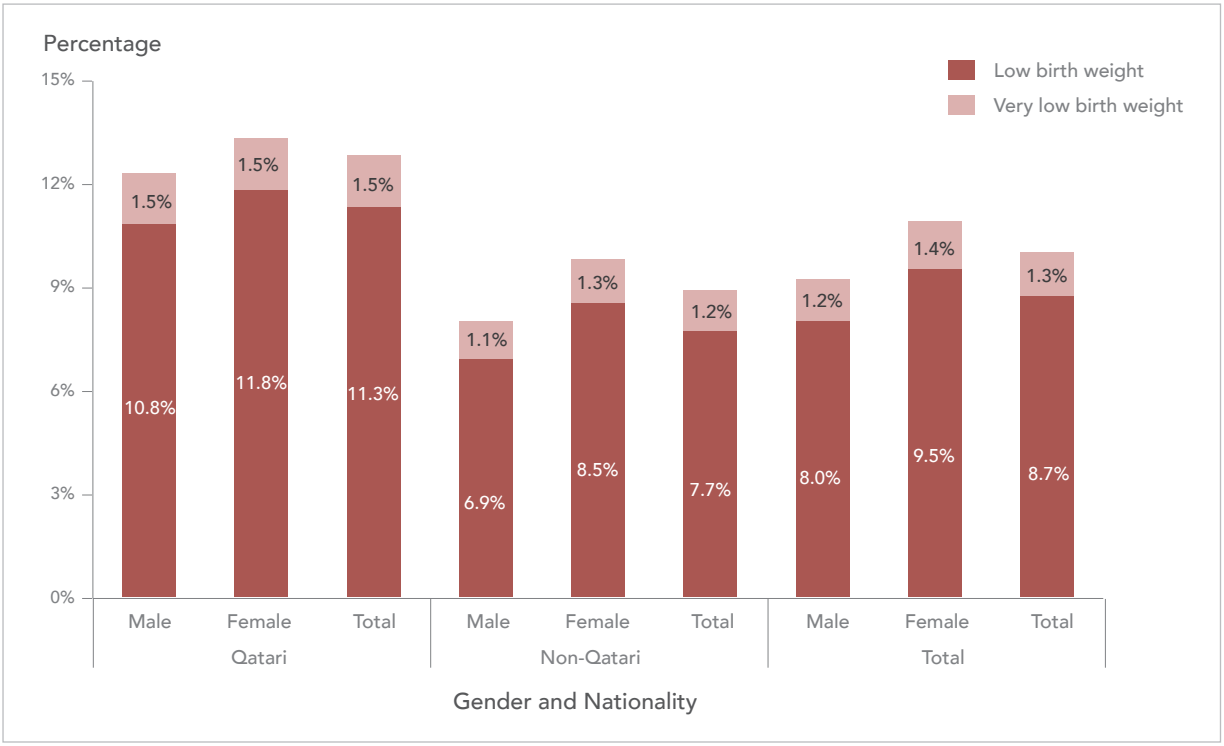
The increased usage of delivery management techniques such as labor induction and caesarean delivery, as well as in-vitro fertilization techniques and multiple pregnancies, may explain the increasing proportion of low birth weight newborns among total births (OECD/EU, 2018).

Figure 5.1: Percentage of newborn babies with very low (less than 1,500 grams) and low birth weight (1,500 to 2,499 grams), by year, 2014 to 2016



Source: Planning and Statistics Authority

Figure 5.2: Percentage of newborn babies with very low (less than 1,500 grams) and low birth weight (1,500 to 2,499 grams), by gender and nationality, 2016

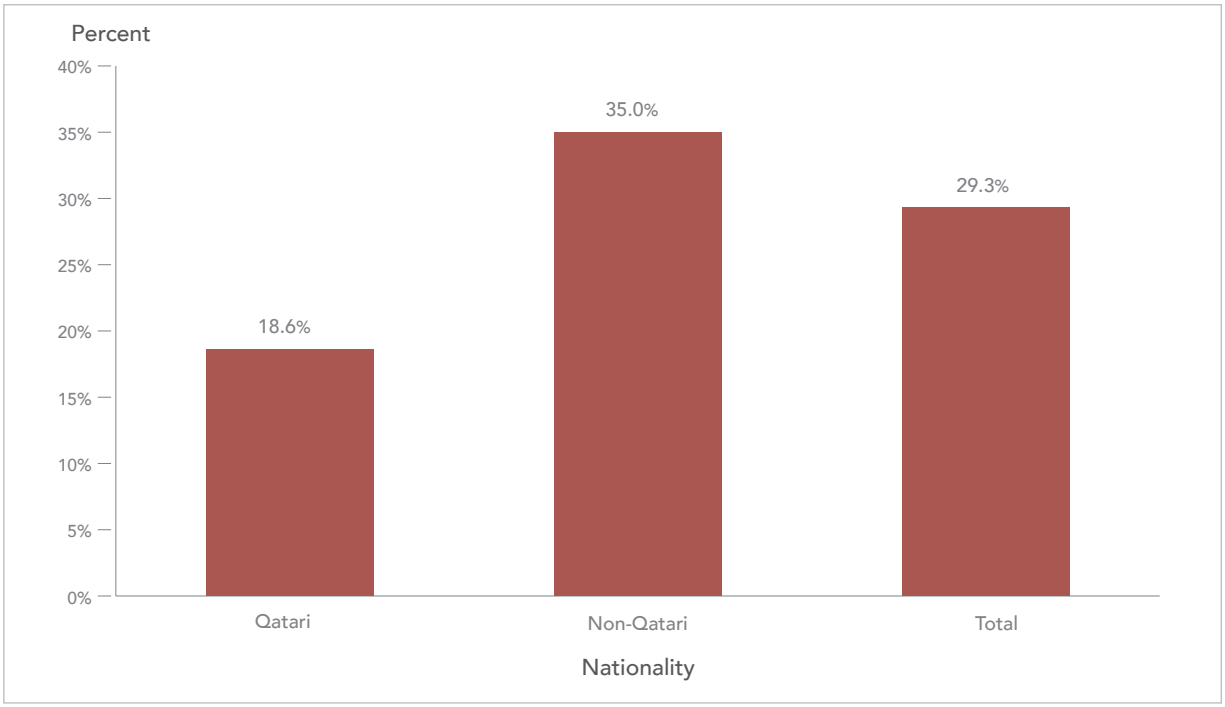


Source: Planning and Statistics Authority

Breastfeeding is a well-recognized way to provide ideal food and nutrients for the growth and development of newborns. According to the WHO, exclusive breastfeeding for 6 months is the optimal way of feeding infants (Greiner, 2014). Review of the evidence showed that breast milk promotes cognitive development, enhance the infant's immunity, leads to quicker recovery during illnesses and decrease infant mortality from common illnesses such as diarrhea and respiratory infections. In addition to unparalleled benefits for the infants, breastfeeding also promotes the mother's health and well-being. It strengthens the bond between the mother and the child and decreases the risks of breast and ovarian cancers (Gartner et al., 2005).

The total proportion of exclusively breastfed infants under 6 months of age in Qatar in 2012 was 29.3% (Figure 5.3). When data is analyzed by nationality (Figure 5.3), a higher proportion of exclusively breastfed infants under 6 months of age is observed among non-Qatari newborns (35%) as compared to Qatari newborns (18.6%). The total proportion of infants exclusively breastfed in Qatar is consistent with the exclusive breastfeeding rate of the WHO EMRO region that is below the global average. According to the WHO EMRO report 2017, it was estimated that 40% of infants under 6 months of age globally were exclusively breastfed, compared to 29% in the EMRO countries (WHO EMRO, 2017).

Figure 5.3: Percentage of infants under 6 months of age who were exclusively breastfed, by nationality, 2012



Source: Multiple Indicator Survey, 2012

Raised blood glucose is an indicator of Diabetes Mellitus. Diabetes Mellitus predisposes people to increased cardiovascular diseases such as heart attack and stroke and put people at risk for reduced vision and blindness, foot and leg amputation and renal failure (OECD, 2017).

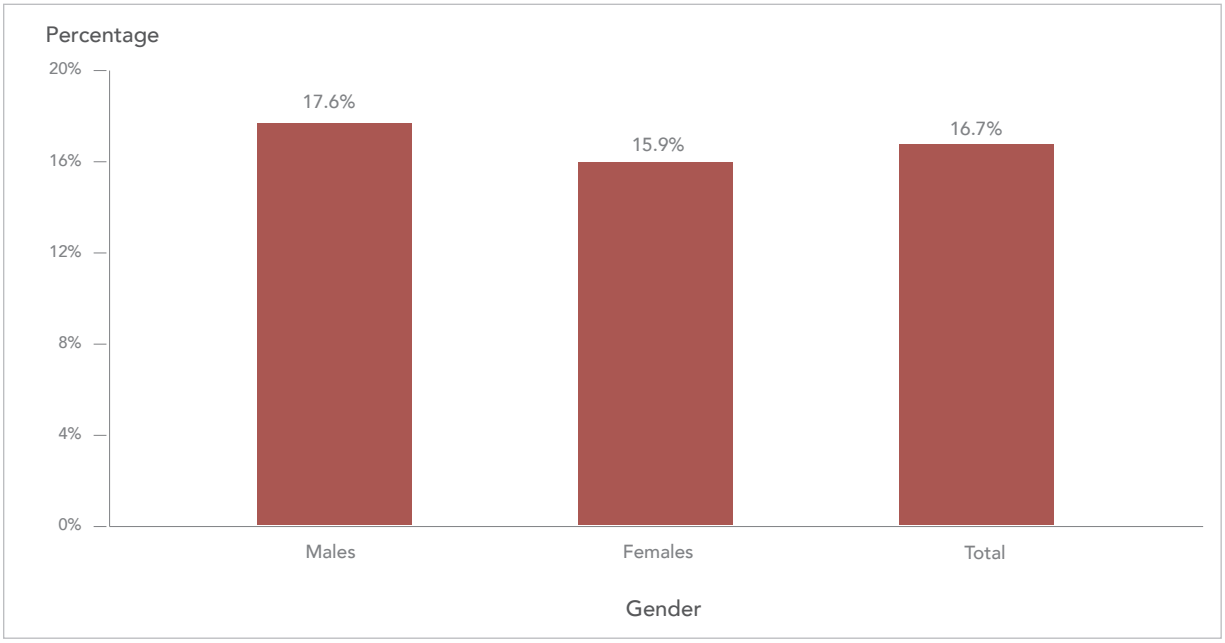
In Qatar's 2012 STEPwise survey, raised blood glucose was defined as having a plasma venous value greater than or equal to 7.0 mmol/L (126 mg/dl) or capillary whole blood value greater than or equal to 6.1 mmol/L (110 mg/dl). It has also included people currently on anti-diabetic medication.

Qatari males have a higher proportion of adults with raised blood glucose (17.6%) compared to Qatari females (15.9%) (Figure 5.4). It is estimated that 16.7% of the total Qatari population have raised blood glucose levels or is currently on medication for the treatment of Diabetes. (Figure 5.4). The proportion of Qatari adults having raised blood sugar or an established diagnosis of diabetes is high compared to the OECD countries, as it is estimated that 7% of all adults in the OECD countries were diabetics in 2015.

Diabetes prevalence has been rising slowly over the past decade in the majority of OECD countries (OECD, 2017). The risk factors which could explain this trend include obesity, malnutrition and physical inactivity.

It is worthwhile to note that STEPwise 2012 is the most recent STEPwise survey to date in Qatar and it only included Qataris. A new STEPwise survey to update figures is planned for early 2019.

Figure 5.4: Percentage of adults with raised blood glucose, by gender, 2012



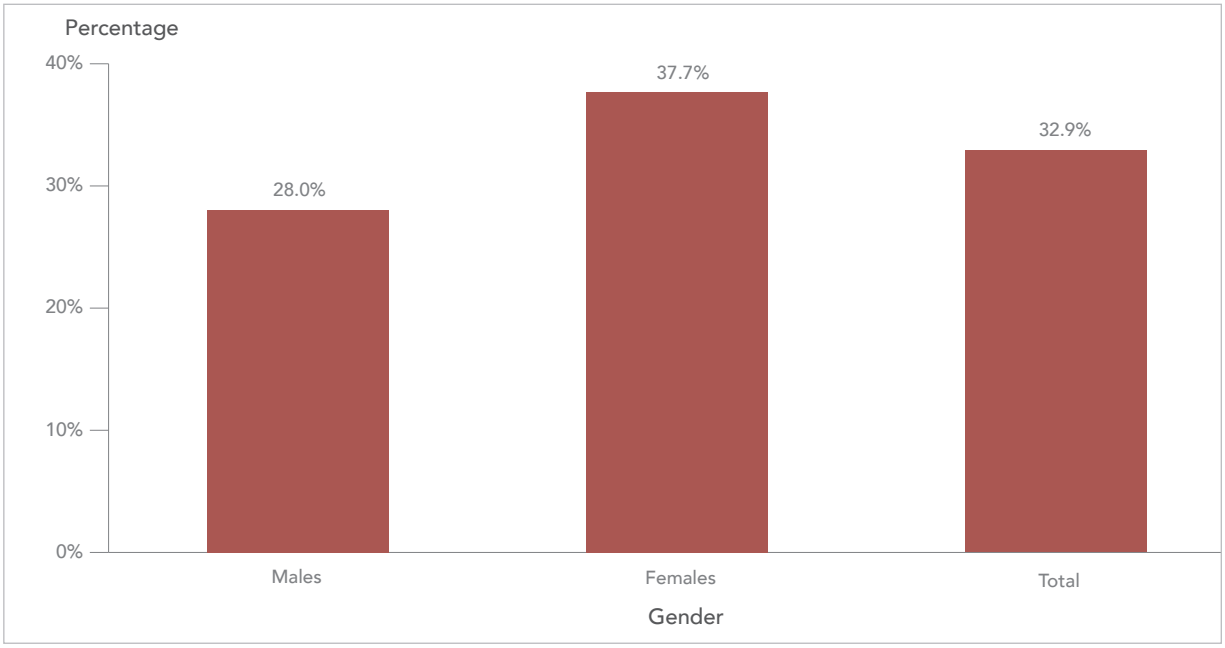
Source: STEPwise survey, 2012

Raised blood pressure, also referred to as hypertension, is a key risk factor for cardiovascular disease, often referred to as "the silent killer". People with uncontrolled and raised blood pressure are at increased risk of developing heart failure, myocardial infarctions, cerebrovascular accidents and strokes, kidney failure and a myriad of other diseases (Sowers, Epstein & Frohlich, 2001). In the 2012 STEPwise survey, raised blood pressure is defined as a patient having systolic blood pressure (SBP) equal to or greater than 140 mmHg and/or a diastolic blood pressure (DBP) equal to or greater than 90 mmHg, or the patient currently taking anti-hypertensive medications.

Qatari females have higher rates of raised blood pressure (37.7%), compared to Qatari males (28.0%). Overall, 1 out of 3 Qatari (32.9%) has hypertension. A similar finding has been reported by WHO. According to the World Health Statistics of 2012, it has been estimated that one in three adults worldwide is affected by hypertension

Hypertension is a preventable risk factor and optimal control of an individual's blood pressure, via lifestyle modification or anti-hypertensive medications, decreases the risk of its associated morbidity and mortality (Dean & Shuaib, 2011). Some of the risk factors that could lead to increased blood pressure include increased age, tobacco consumption, obesity, physical inactivity.

Figure 5.5: Percentage of adults with raised blood pressure, by gender, 2012



Source: STEPwise survey, 2012

Childhood overweight and obesity are strong predictors of obesity in adulthood as well as associated risk factors for chronic diseases such as diabetes, cardiovascular diseases and cancers. On the other hand, undernutrition among children, which includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies, impairs their ability to fully grow, develop (both physically and mentally), learn and play. (UNICEF/WHO/World Bank, 2018)

In Qatar, 2.8% of children under 5 were wasted in 2016. On the other hand, 6.0% and 2.3% of children under 5 were overweight and obese respectively (Table 5.1). In Qatar, among school-age children from 13 to 18, 22.3% and 22.5% of children within this age group were found to be overweight and obese respectively. On another hand, there was a small percentage of children aged 13 to 18 with recorded thinness (2.6%) and severe thinness (0.6%) (Table 5.2)

According to the WHO-JME report, 6.7% of children under 5 were considered overweight and 9.1% of children under 5 were wasted (moderate or severe) in the EMRO region, in 2016. (UNICEF/WHO/World Bank, 2018)

Childhood malnutrition has become one of the most serious public health challenges and its prevention starts with adequate maternal nutrition during pregnancy and adequate breastfeeding during the first two years of life. With the rise of unhealthy food habits, it is crucial for parents to ensure safe and proper food to their children as well as an environment and opportunities for physical activity among kids. On a national level, fighting childhood nutrition requires multi-sectoral nutrition programming, raising awareness on the health threats in poses, both short-term and long-term, as well as legislative and social interventions (UNICEF/WHO/World Bank, 2018)

Table 5.1: Percentage of children under 5 years with impaired nutritional status, by type of nutritional impairment[1], 2016

PERCENTAGE OF OBESITY, OVERWEIGHT AND WASTING	PERCENT
Children under 5 year who are wasted (moderate or severe)	2.8%
Children under 5 years who are overweight	6.0%
Children under 5 years who are obese	2.3%

Source: Primary Health Care Corporation, 2016

Table 5.2: Percentage of school children aged 13-18 years who are overweight, obese, thin or severely thin, by body mass index[1] and age, 2015-16

AGE	OBESE	OVERWEIGHT	THINNESS	SEVERE THINNESS	NORMAL
13	24.6%	24.2%	2.3%	0.6%	48.5%
14	23.5%	23.7%	2.2%	0.6%	50.0%
15	22.2%	21.6%	2.7%	0.6%	52.9%
16	20.4%	22.3%	3.0%	0.6%	53.7%
17	18.9%	19.8%	2.9%	0.6%	57.7%
18	20.3%	19.6%	3.2%	1.2%	55.6%
Total (13 to 18)	22.3%	22.5%	2.6%	0.6%	52.0%

Source: Growth monitoring data 2015-16, Ministry of Public Health

Overweight and obesity are most of the time related to a combination of a sedentary lifestyle and improper nutrition. Both overweight and obesity are well established risk factors for many chronic diseases, including diabetes, cardiovascular diseases, and cancer. They are one of the leading causes of years of life lost worldwide and in the OECD counties (OECD, 2017). Body Mass Index (BMI) is a measure to evaluate an individual's weight in relationship to his height. WHO states that adults above the age of 18 with a BMI of 25 or greater are considered overweight and adults with a BMI of 30 and above are considered obese (WHO, 2018).

The 2012 Qatar's STEPwise survey detected a higher proportion of overweight adult males (32.3%) as compared to the proportion of overweight females (25.1%) (Figure 5.6). However, the trend is reversed when analyzing obesity data with 43.2 % of females being obese compared to 39.5% of males. Overall, for both sexes, 28.7% of Qataris were classified as overweight and 41.4% were classified as obese. In 2015, 35% of the population across OECD countries was found to be overweight, and 19% was obese (OECD, 2017).

In the OECD, recent publications showed that obesity has risen in recent decades, and projections show that this trend will continue (OECD, 2017).

1 As per World Health Organization's definition, for children aged under 5 years: Overweight is a weight-for-height above 2 Standard Deviation (SD) of the WHO Child Growth Standard; Obesity ; Wasting is weight-for-height below 2 standard deviations of the WHO Child Growth Standards median

As per World Health Organization's definition, for children aged between 5 and 19 years: Overweight is a BMI-for-age greater than 1 Standard Deviation (SD) Above WHO Growth Reference median; Obesity is a BMI-for-age greater than 2 SD above the WHO Growth Reference median; Thinness is a BMI-for-age greater than 2 SD below the WHO Growth Reference median; Severe Thinness is a BMI-for-age greater than 3 SD below the WHO Growth Reference median

Figure 5.6: Percentage of Qatari adults aged 18 to 64 years who are overweight or obese, by body mass index and gender, 2012

Source: STEPwise survey, 2012

Women of reproductive age are at higher risk of developing anemia while pregnant and anemia in pregnancy is associated with low birth weight, premature birth and maternal mortality. Optimal nutrition, iron supplementation and routine follow up are highly recommended to prevent anemia in pregnant women. According to the WHO, anemia of pregnancy is defined as having hemoglobin level less than 11g/dL (WHO, 2018).

In Qatar, 27.1% of pregnant women were found to have anemia in 2016. This is a global health problem, with 40.1% of women developing anemia while pregnant worldwide (World Bank, 2019). Over the past 30 years, the prevalence of anemia during pregnancy has been steadily decreasing, from 43.4% in 1990 to 40.1% in 2016 (World Bank, 2019)

Table 5.3: Percentage of pregnant women with anemia, 2016

	PREGNANT WOMEN
Percentage	27.1%

Source: Selim NAA, Al-Mass M, Al-Kuwari M and Ismail MS. Assessment of Anemia, IDA and ID among Pregnants in Qatar: Cross Sectional Survey. SM J Public Health Epidemiol. 2016; 2(3): 1035.

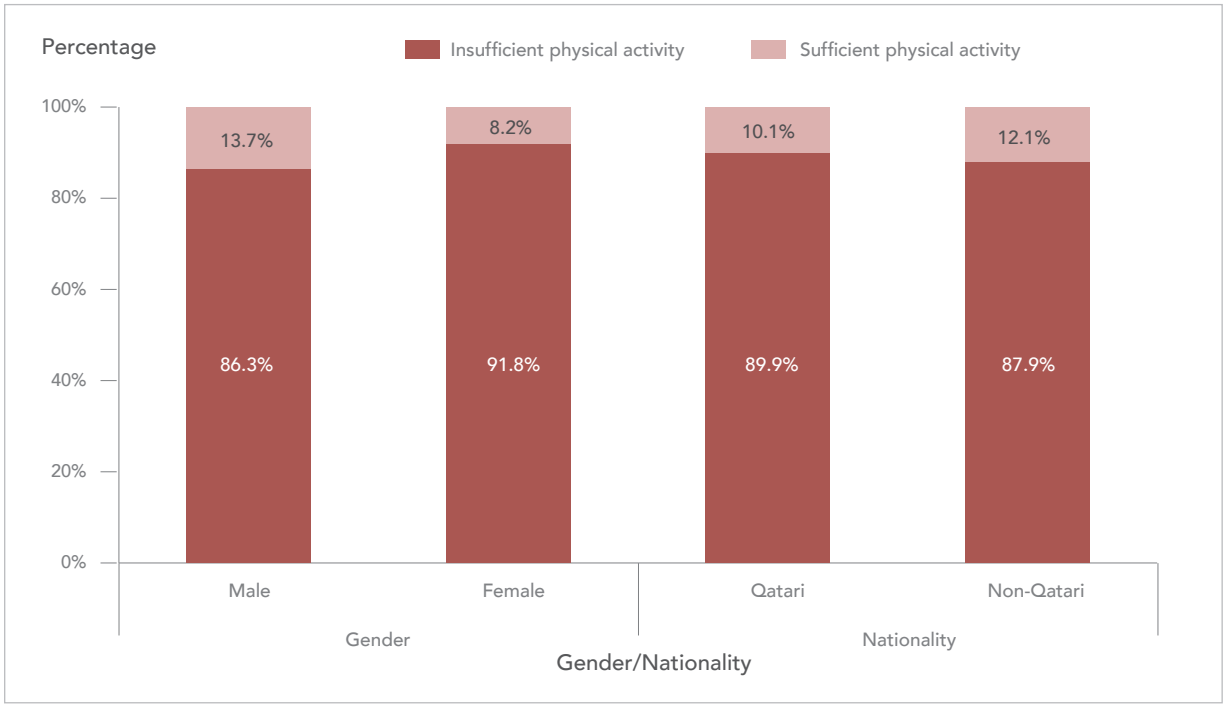
Low level of physical activity is a modifiable risk factor for a number of non-communicable diseases such as cardiovascular diseases, hypertension, diabetes as well as certain cancers. In addition to these benefits, physical activity has been shown to promote mental health well-being, relieve stress and improve academic achievement. The WHO recommends 60 minutes of moderate to vigorous daily physical activity for children aged 5 to 17. Moderate to vigorous activity refers to a physical activity undertaken for at least an hour which result in an increase in heart rate that could leave the child out of breath (OECD, 2017).

In Qatar, 13.7 % of boys and 8.2% percent of girls do meet the definition of adequate physical activity recommended by WHO. There is an increase in physical inactivity among females overall, a trend also found among OECD countries. When looking at nationalities, there is not much difference in physical activity between Qatari and non-Qatari children aged 5 to 17, with 89.9% of Qatari and 87.9% of non-Qatari children classified as having insufficient physical inactivity.

Among the OECD countries, only 14.5% of 15-year-old kids undertake, on average, moderate to vigorous daily physical activity. As previously mentioned, girls are at increased risk of physical inactivity compared to boys with 10% of girls meeting adequate physical activity recommended by WHO compared to 20% of boys in these countries (OECD, 2017).

Children and adolescent habits have been changing over time towards more sedentary behaviors. Internet use, smartphones and gadgets led to a decrease in physical activity

Figure 5.7: Number and percentage of activity level in school children aged 13-18 years[2], by level of physical activity, gender and nationality, 2015-16



Source: National school program, 2015-16

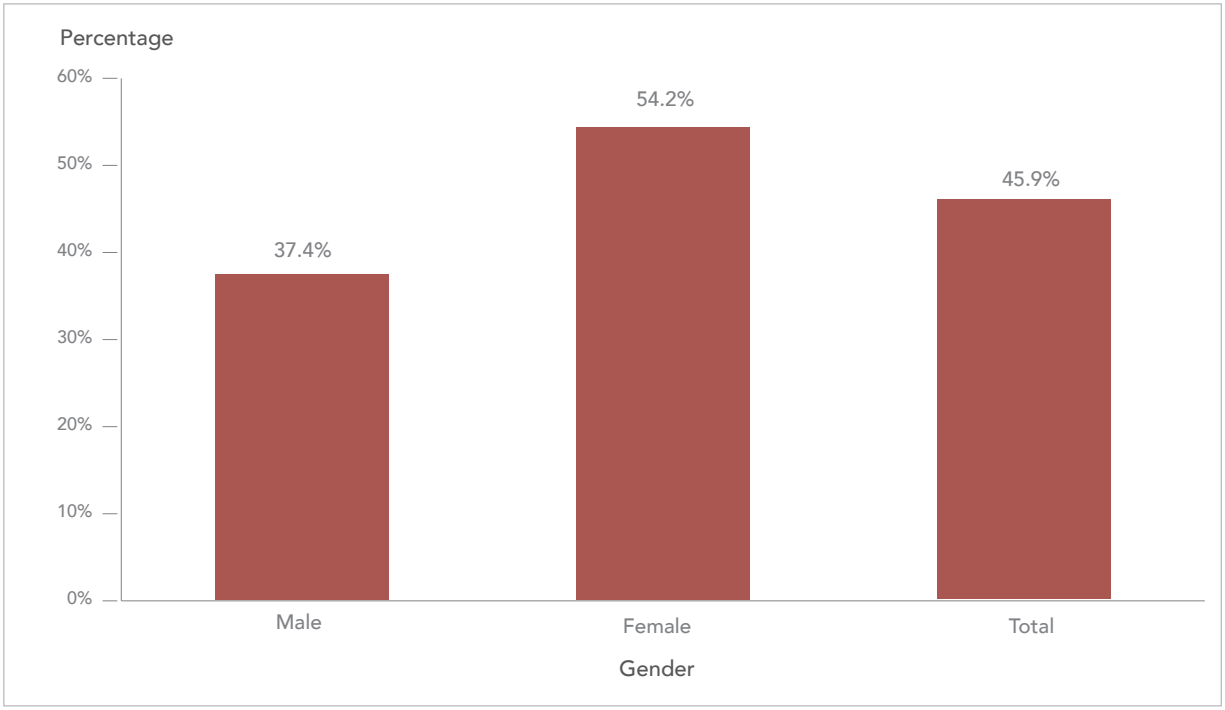
2 Overall sample size of 7,545 students. Sample size among 13-18 year old students of 4946, with 545 (11.0%) meeting physical activity recommendations and 4,401 (89.0%) not; Applied 60 minutes physical activity 7 days/week definition for 18 years old participants as well; Physical activity recommendation based on WHOs recommendation.

WHO recommends that adults conduct at least "600 metabolic equivalent minutes (MET minutes)" of physical activity - the equivalent of 150 minutes each week of brisk walking or 75 minutes per week of running, or an equivalent combination of the two (Kessaram et al., 2015). These criteria were used in the STEPwise survey 2012.

In Qatar, 54.2% of adult women and 37.4% of adult men aged 18 to 64 years are physically inactive according to WHO standards. Physical inactivity was higher in adult women compared to men, resulting in a 16.8 point average gender gap. The same trend was observed in OECD countries (OECD, 2017). On average, 45.9% of Qataris perform less than 600 MET minutes of physical activity per week.

Rates of physical activity across OECD countries are consistently higher in men compared to women, with 70.5% of adult men and 63% of adult women meeting WHO recommendations, except in Denmark. Through the OECD countries, 66.5% of adults, on average, engage in 150 minutes of moderate physical per week, compared to 54.1% of Qatari (OECD, 2017).

Figure 5.8: Percentage of adults 18 to 64 years who are insufficiently active, by gender, 2012



Source: STEPwise survey, 2012

The negative health consequences of tobacco on the human body and health are well known. Tobacco consumption increase the risks of cancers, stroke, coronary heart disease, respiratory diseases such as Chronic Obstructive Respiratory Diseases (COPD) and asthma. It can also cause a number of complications in newborns of smoking women, such as low birth weight (OECD, 2017).

The Global Youth Tobacco Survey (GYTS) done in 2013 captured the rate of smoking among young adolescents aged 13 to 15 years. In Qatar, 15.7 of children aged 13 to 15 years were found to smoke tobacco, with a higher prevalence of smokers among males (22.8%) compared to females (8.8%).

Table 5.4: Percentage of children aged 13 to 15 years who smoke tobacco, by gender, 2013

	MALES	FEMALES	BOTH SEXES
Percentage	22.8%	8.8%	15.7%

Source: Global Youth Tobacco Survey, 2013

The Global Adult Tobacco Survey (GATS) done in 2013 captured the rate of smoking among people aged 15 years and older.

There is consistently a high proportion of adult male smokers compared to adult female smokers. Among "Current Tobacco Users", 20.2% of adult male and 3.1% of adult female are classified in this category. 16.5% of adult males and 1.7% of adult female are classified in the "Daily Smokers" category. (Table 5.5)

Table 5.5: Percentage of adults 15 years and older who smoke Tobacco, by gender and nationality, 2013

		CURRENT TOBACCO USERS	DAILY SMOKERS
Gender	Male	20.2%	16.5%
	Female	3.1%	1.7%
Nationality	Qatari	10.5%	8.8%
	Non-Qatari	12.9%	9.8%
Total	Overall	12.1%	9.5%

Source: Global Adult Tobacco Survey, 2013

Improved drinking water is a type of water source that is flowing while being protected from contamination from the outside environment, especially with fecal matter. Examples include public tap and piper water into yards. Improved sanitation facility refers to the separation human excreta from human contact as to provide optimal hygiene and prevent the transmission of diseases.

In 2015, 100% of Qatari residents had access to improved drinking water and 98% of residents had access to improved sanitation facilities.

Living in an unsanitary or polluted environment has been linked with increased risk of illness, morbidity and mortality: for instance, 11.8 deaths per 100,000 have been attributed to unsafe water, unsafe sanitation and lack of hygiene in 2016, according to the World Bank (World Bank, 2019). Access to clean water and sanitation are both global priorities under the UN SDGs (GOAL 6): the aim is to end open defecation (goal 6.2) and achieve universal and equitable access to safe and affordable drinking water for all (goal 6.1), by 2030

Table 5.6: Percentage of residents who have access to improved drinking water and improved sanitation facilities, 2015

	ACCESS TO IMPROVED DRINKING WATER	ACCESS TO IMPROVED SANITATION FACILITIES
Percentage	100%	98%

Source: Planning and Statistics Authority

6 HEALTH FINANCING

Adequate health care resources are necessary to the functioning of health systems. Health expenditures include spending by both the private and public sectors as well as public health interventions, prevention programs and administration (OECD, 2017).

Health expenditure in relation to GDP relates to the country's spending on health care over time relative to spending on all the other goods and services. It depends on 2 factors: the growth in health spending as well as the overall economy of a country.

Qatar's total health expenditure represented 2.8%, 4.5% and 4.4% of the GDP in the years 2014, 2015 and 2016 respectively (Table 6.1).

These values are relatively low compared to the OECD average. In this group of countries, in 2015 it was estimated that, on average, health expenditure contributed to 9.0% of the GDP (OECD, 2017).

Table 6.1: Total health expenditure as a percentage of gross domestic product, by year, 2014 to 2016

	2014	2015	2016
Percentage	2.8%	4.5%	4.4%

Source: Ministry of Public Health

Another important indicator used to measure health financing is the total health expenditure per capita. It is defined as the sum of public and private health expenditures divided by the total population.

In Qatar, total health expenditure per capita was $2,581, $3,072 and $2,562 in 2014, 2015 and 2016, respectively. There has been a 19.0% increase in health expenditure per capita from 2014 to 2015, followed by a 16.6% decrease in health expenditure per capita from 2015 to 2016. (Table 6.2).

The aforementioned values for Qatar are low compared to the total health expenditure per capita average in the OECD countries. In 2016, the OECD health expenditure per capita was 4,003$ (OECD, 2017).

The financial resources that a country dedicates to provide health care for the population and the temporal evolution of the health expenditure result from the interaction of multiple social and economic factors as well as the structure of a country's health system.

Table 6.2: Total expenditure on health per capita, by year, 2014 to 2016

	2014	2015	2016
US$	$2,581	$3,072	$2,562

Source: Ministry of Public Health

Out-of-pocket expenditure are direct patient spending on health goods or services not covered by insurance. It is usually measured as a share of household consumption or as a percentage of total health expenditure and reflects the burden, in a specific population, to seek proper medical treatment without financial protection.

In Qatar, out-of-pocket expenditure was estimated to be 4.9%, 2.9% and 4.4% in 2014, 2015 and 2016 respectively (Table 6.3).

Among OECD members, out-of-pocket expenditure was estimated to be 20.0% of total health expenditure in 2015 (OECD, 2017).

The universal health coverage of Qatar's population explains the low use of personal financial resources to cover health care costs as compared to other developed countries.

Table 6.3: Out-of-pocket expenditure as a percentage of total health expenditure, by year, 2014 to 2016

	2014	2015	2016
Percentage	4.9%	2.9%	4.4%

Source: Ministry of Public Health

General net government expenditure on health as a percentage of general government expenditure is another indicator of health financing system. It measures the weight of public spending on health within the total value of the governmental operations and it also includes the compulsory health insurance

In Qatar, general net government expenditure on health was estimated to be 7.4%, 10.6% and 10.2% of the total government expenditure in 2014, 2015 and 2016 respectively.

Among OECD countries, it was estimated that government health spending schemes and health insurance accounted to 15.3% of the total government expenditure (OECD, 2017).

Table 6.4: General net government expenditure on health as a percentage of general government expenditure, by year, 2014 to 2016

	2014	2015	2016
Percentage	7.4%	10.6%	10.2%

Source: Ministry of Public Health

7 HEALTH WORKFORCE

Healthcare professionals and health providers are the backbone of any health system and they must be in sufficient numbers to offer the population the services they need. Doctors, nurses, dentist, pharmacists and allied health professionals constitute the health workforce of a country (OECD, 2017). Allied health professionals include medical sonographers, medical technologists, occupational and physical therapists, speech language, dietitians among others.

In Qatar, there were 23.2, 23.4 and 27.4 physicians per 10,000 population in 2014, 2015, 2016 (Table 7.1). This increasing trend of healthcare professionals has been found among dentists (from 6.6 to 8.2 per 100,000), nurses (60.7, 62.3 and 67.7 per 100,000) and pharmacists and pharmacist assistants (9.6 to 10.4 per 100,000) from 2014 to 2016. Allied health professionals were estimated to be 36.8 per 100,000 in 2014, 32.7 per 100,000 in 2015 and 33.7 per 100,000 in 2016. (Table 7.1)

In the OECD, it was estimated that the number of physicians was 34 per 10,000 in 2015, higher than the average number of physicians in Qatar for the same year. Nurses outnumber physicians and the average number of nurses in the OECD countries in 2015 (90 per 10,000) was also higher compared to Qatar (62 per 10,000) (OECD, 2017).

The number of doctors as well as other healthcare professionals per capita and per population varies widely across countries (OECD, 2017).

Table 7.1: Number of healthcare professionals per 10,000 population, by profession and year, 2014 to 2016

	2014	2015	2016
Physicians	23.2	23.4	27.4
Dentists	6.6	7.8	8.2
Nurses	60.7	62.3	67.7
Pharmacists and pharmacist assistants	9.6	9.9	10.4
Allied Health	36.8	32.7	33.7

Source: Ministry of Public Health

8 SERVICE DELIVERY

Service delivery encompasses the part of the health system where patients receive appropriate treatment, diagnostic test, intervention, disease prevention, rehabilitation, proper follow-up and continuum of care. It relates to the management and delivery of these health services in inpatient as well as outpatient facilities.

Advances in technology led to more refined medical imaging techniques which are drastically improving medical diagnosis and treatment. This section focuses on three imaging technologies: Computed Tomography, Radiotherapy and Magnetic Resonance Imaging.

In Qatar, the average number of computed tomography available per million population was relatively stable over the 3 year period, in both public and private health care sectors (Table 8.1). For the public sector, there were 4.1, 4.1 and 3.8 computed tomography scanners per million population in 2014, 2015 and 2016 respectively. In the private sector, there were 1.4, 1.2 and 1.1 computed tomography scanners per million population in 2014, 2015 and 2016 respectively (Table 8.1). On another hand, availability of radiotherapy has increased in Qatar: in the public health care sector, there were 0.9 and 0.8 radiotherapy equipment available per million population in 2014 and 2015 respectively before increasing to 2.7 per million population in 2016. A similar increase in availability was seen among Magnetic Resonance Imaging in Qatar: in the public sector there were 2.3, 2.9 and 3.8 Magnetic Resonance Imaging scanner per million population in 2014, 2015, 2016 respectively. In the private sector, there were 1.8, 1.6 and 1.9 Magnetic Resonance Imaging Scanner per million population in 2014, 2015 and 2016 respectively (Table 8.1).

Compared to the OECD countries, Qatar has fewer Computed Tomography (CT) and Magnetic Resonance Imaging (MRI). For instance, it was estimated that there were 15.9 MRI scanners per million population and 25.7 CT scanners per million population in 2015 (OECD, 2017).

Although, there are large variations in the use of CT and MRI scanners not only across countries, but also within countries, every country should assess its population's needs: insufficient units of imaging modalities could lead to restricted access and increased waiting time whereas excessive units might result in overuse and increased expenditure with no clear benefit to the patients (OECD, 2017).

Table 8.1: Number of selected medical devices in public and private health facilities per million population, by medical device, 2014 to 2016

YEAR	COMPUTED TOMOGRAPHY		RADIOTHERAPY		MAGNETIC RESONANCE IMAGING	
	PUBLIC	PRIVATE	PUBLIC	PRIVATE	PUBLIC	PRIVATE
2014	4.1	1.4	0.9	. .	2.3	1.8
2015	4.1	1.2	0.8	. .	2.9	1.6
2016	3.8	1.1	2.7	. .	3.8	1.9

Source: Ministry of Public Health

Note: Private radiotherapy data are not available (. .)

Other indicators for health service delivery are the number of health care facilities and the number of hospital beds relative to the population. They refer to the availability and access to health care facilities. The number of primary health care facilities measures availability of outpatient services for delivering treatment to patients at the primary health care level. The number of hospital beds, on the other hand, provides an indication of the resources available for delivering services to inpatients in hospitals (OECD, 2017).

In Qatar, the number of primary health care facilities was gradually increasing from 2014 to 2016 in the public sector: there were 21, 22 and 23 primary health care facilities in 2014, 2015 and 2016 respectively. The rate was constant with 0.09 primary health care facilities over the same period (Table 8.2). In Qatar, the number of beds was 2,072, 2,205 and 2,163 in 2014, 2015 and 2016 respectively among public hospitals (Table 8.3). The was a decreasing trend of the rate of hospital beds per 10,000 among public inpatient facilities in the same period (9.3, 9.0 and 8.3 beds per 10,000 population in the years 2014,2015 and 2016 respectively) (Table 8.3). For private inpatient facilities, there was a decreasing trend in both number and rate of beds per 10,000 from 2014 to 2016: there was 249, 226 and 226 beds in 2014, 2015 and 2016 respectively as well as a rate of 1.1, 0.9, 0.9 beds per 10,000 in 2014, 2015 and 2016 respectively (Table 8.3)

In the OECD, the average rate of hospital beds per 1,000 was 4.7 beds per 1,000 in 2015 (OECD, 2017).

The number of primary health care facilities and the number of hospital beds should be tailored to the population need and constantly monitored to provide adequate access and treatment coverage. A suboptimal number of health care facilities and hospital beds could result in longer waiting time and restricted access whereas an excess in the latter could result in inappropriate and wasted distribution of resources (OECD, 2017).

Table 8.2: Number of primary health care facilities per 10,000 population, 2014 to 2016

YEAR	PUBLIC	
	NUMBER	RATE PER 10,000
2014	21	0.09
2015	22	0.09
2016	23	0.09

Source: Ministry of Public Health

Table 8.3: Number of hospital beds and rate per 10,000 population, 2014 to 2016

YEAR	PUBLIC		PRIVATE	
	NUMBER	RATE	NUMBER	RATE
2014	2,072	9.3	249	1.1
2015	2,205	9.0	226	0.9
2016	2,163	8.3	226	0.9

Source: Ministry of Public Health

*Note: All-day care beds are not included; * includes Aspetar Beds*

Annual outpatient visits reflected the number of consultations with doctors mainly in primary health care clinics as well as hospital outpatient departments, including both generalists and specialists.

In Qatar, in 2013, it was estimated that there were 4.3 consultations per person (Table 8.4). In the OECD, there was 6.6 annual outpatient visits per person per year in 2013.

The number and type of doctor consultations can vary among different population groups in each country. The trend in visiting a general practitioner has been found to be equally distributed in most countries, but in nearly all countries, people with higher socioeconomic status were more likely to see a specialist than those with lower status and would report more frequent visits, according to an OECD study (Deveaux & de Looper, 2012).

Table 8.4: Annual outpatient visits per capita, 2013

	2013
Number per capita	4.3

Source: Ministry of Public Health

Note: Public facilities only

The percentage of deliveries attended by skilled health professionals is a reflection of the maternal and child health care system of a country. WHO reinforces that all women should have access to skilled care during pregnancy and childbirth to ensure prevention, detection and management of complications (WHO, 2004).

In Qatar, 100% of deliveries were attended by a skilled health professionals in 2016 (Table 8.5). By contrast, the World Data Bank estimated a worldwide average of 80.0% of deliveries attended by skilled health professionals.

Improvements in the coverage of the proportion of deliveries attended by skilled birthing professionals and their provision of care may explain the low maternal and infant mortality rates seen in Qatar.

Table 8.5: Percentage of deliveries attended by skilled birthing professionals, 2016

	2016
Percentage	100%

Source: Ministry of Public Health

9 COVERAGE OF SELECTED INTERVENTIONS

Efforts to effectively detect, treat and limit the debilitating health consequences of tuberculosis and malaria have been the target of many countries worldwide, as previously discussed in chapter 4.2 "Communicable Diseases".

In Qatar, Tuberculosis treatment success rate of new bacteriologically confirmed cases was 69% in 2016 (Table 9.1). This compares with the global average of 81% in the world, according to the World Bank data.

Concerning suspected malaria cases, 100% of suspected cases had a diagnostic test in 2014, 2015 and 2016 (Table 9.2), meeting WHO recommendations that every suspected new malaria case gets tested. The WHO African Region states that 87% of suspected malaria cases have had diagnostic testing in 2016.

Malaria and Tuberculosis both constitute public health threats and proper detection and treatment are essential to ensure a healthy population and to limit their spread. "WHO End TB" strategy aims at achieving the following goals: 80% decrease in new tuberculosis cases, 90% decrease in people dying from tuberculosis and achieve 100% protection of tuberculosis-affected families from catastrophic costs by 2030 (Lönnroth, K., & Raviglione, 2016).

Table 9.1: Tuberculosis treatment success rate (%) of new bacteriologically confirmed cases, 2016

PERCENT	2016
Tuberculosis treatment success rate of new bacteriologically confirmed cases, 2016	69%

Source: Ministry of Public Health

Table 9.2: Percentage of suspected malaria cases that have had a diagnostic test, by year, 2014 to 2016

	2014	2015	2016
Percentage	100%	100%	100%

Source: Ministry of Public Health

10 COUNTRY CAPACITY

WHO established a set of core capacities that are required to identify, assess, report events and attend public health threats and emergencies on a national and international level. The IHR capacity score (Table 9.1) describes and grades Qatar's capacity to prevent, detect, respond, and attend other hazards and provides an overall health security status as observed in 2016. This assessment has been carried out jointly with WHO and the details of the analysis are reported in the JEE report[3]

Table 9.1: The State of Qatar's International Health Regulations (IHR) capacity score, 2016.

PREVENT

CAPACITIES	INDICATORS	SCORE
National Legislation, Policy and Financing	P.1.1 Legislation, laws, regulations, administrative requirements, policies or other government instruments in place are sufficient for implementation of IHR	4
	P.1.2 The state can demonstrate that it has adjusted and aligned its domestic legislation, policies and administrative arrangements to enable compliance with the IHR (2005)	3
IHR Coordination, Communication and Advocacy	P.2.1 A functional mechanism is established for the coordination and integration of relevant sectors in the implementation of IHR	3
Antimicrobial Resistance	P.3.1 Antimicrobial resistance detection	3
	P.3.2 Surveillance of infections caused by AMR pathogens	3
	P.3.3 Health care-associated infection prevention and control programmes	3
	P.3.4 Antimicrobial stewardship activities	2
Zoonotic Diseases	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	3
	P.4.2 Veterinary or animal health workforce	3
	P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional	3
Food Safety	P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination	3
Biosafety and Biosecurity	P.6.1 Whole-of-government biosafety and biosecurity system is in place for human, animal, and agriculture facilities	3
	P.6.2 Biosafety and biosecurity training and practices	3
Immunization	P.7.1 Vaccine coverage (measles) as part of national programme	5
	P.7.2 National vaccine access and delivery	4

DETECT

CAPACITIES	INDICATORS	SCORE
National Laboratory System	D.1.1 Laboratory testing for detection of priority diseases	4
	D.1.2 Specimen referral and transport system	4
	D.1.3 Effective modern point of care and laboratory based diagnostics	4
	D.1.4 Laboratory Quality System	3
Real-Time Surveillance	D.2.1 Indicator and event based surveillance systems	4
	D.2.2 Inter-operable, interconnected, electronic real-time reporting system	3
	D.2.3 Analysis of surveillance data	3
	D.2.4 Syndromic surveillance systems	4
Reporting	D.3.1 System for efficient reporting to WHO, FAO and OIE	4
	D.3.2 Reporting network and protocols in country	4
Workforce Development	D.4.1 Human resources are available to implement IHR core capacity requirements	4
	D.4.2 Field Epidemiology Training Programme or other applied epidemiology training programme in place	3
	D.4.3 Workforce strategy	3

3 Retrieved from http://apps.who.int/iris/bitstream/10665/254509/1/WHO-WHE-CPI-2017.6-eng.pdf?ua=1

RESPOND

CAPACITIES	INDICATORS	SCORE
Preparedness	R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented	4
	R.1.2 Priority public health risks and resources are mapped and utilized	4
Emergency Response Operations	R.2.1 Capacity to Activate Emergency Operations	4
	R.2.2 Emergency Operations Center Operating Procedures and Plans	4
	R.2.3 Emergency Operations Program	3
	R.2.4 Case management procedures are implemented for IHR relevant hazards	3
Linking Public Health And Security Authorities	R.3.1 Public Health and Security Authorities, (e.g. Law Enforcement, Border Control, Customs) are linked during a suspect or confirmed biological event	5
Medical Countermeasures and Personnel Deployment	R.4.1 System is in place for sending and receiving medical countermeasures during a public health emergency	4
	R.4.2 System is in place for sending and receiving health personnel during a public health emergency	3
Risk Communication	R.5.1 Risk Communication Systems (plans, mechanisms, etc.)	3
	R.5.2 Internal and Partner Communication and Coordination	3
	R.5.3 Public Communication	3
	R.5.4 Communication engagement with affected communities	3
	R.5.5 Dynamic listening and rumour management	3

Point of entry

CAPACITIES	INDICATORS	SCORE
Points of entry	PoE.1 Routine capacities are established at Points of Entry	3
	PoE.2 Effective Public Health Response at Points of Entry	3
Chemical events	CE.1 Mechanisms are established and functioning for detecting and responding to chemical events or emergencies	3
	CE.2 Enabling environment is in place for management of chemical events	3
Radiation emergencies	RE.1 Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies	3
	RE.2 Enabling environment is in place for management of radiation emergencies	3

Source: World Health Organization

SCORE	CAPACITY
1	No capacity
2	Limited capacity
3	Developed capacity
4	Demonstrated capacity
5	Sustainable capacity

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