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Prevalence of non-communicable diseases by age, gender and nationality in publicly funded primary care settings in Qatar

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ABSTRACT

Background In Qatar, as with other countries, non-communicable diseases (NCDs) have been the leading cause of death. This study aims to describe the prevalence of four NCDs clusters (cardiovascular diseases (coronary heart disease, stroke and peripheral vascular disease), cancers, chronic obstructive pulmonary diseases (COPD) and type 2 diabetes (T2DM)) by age, gender and nationality (Qataris and non-Qataris) accessing publicly funded primary care services to inform healthcare planning and strategies.

Methods Cross-sectional study design was used. Data for individuals aged ≥18 and who visited a publicly funded primary health centre in Qatar during 2017 were extracted from electronic medical records and analysed.

Results The findings showed that approximately 16.2 % of the study population (N = 68 421) had one or more of the four NCDs. The prevalence of NCDs showed an increasing trend with increasing age. Highest increases in the prevalence of NCDs were seen in a relatively young age group (30–49 years). The prevalence of all NCDs except cancers was higher in men. Prevalence rates of CHD and cancers in the study were found to be similar in both Qataris and non-Qataris; however, COPD and T2DM rates were higher in Qataris compared with non-Qataris. T2DM accounted for the highest prevalence of any NCD among both Qataris (230/1000) and non-Qataris (183/1000).

Conclusions Although not comprehensive and nationally representative, this study is suggestive of a higher prevalence of NCDs among a younger population, men and in Qatari, Western Asian, Southern Asian, Sub-Saharan Africans, South-Eastern Asians Northern African and Western European nationalities. Prevention, treatment and control of NCDs and their risk factors are a public health problem in Qatar, and resources need to be invested towards targeted interventions with a multisectoral approach.

INTRODUCTION

Non-communicable diseases (NCDs) are diseases or conditions which are non-transmittable and chronic in nature. The causes of NCDs are multifactorial; these diseases may arise from any combination of underlying, modifiable and non-modifiable risk factors.[1] Research indicates that socioeconomic, cultural, political and environmental determinants, including population ageing, globalisation, urbanisation and the accompanied nutrition transition, contribute to the increase in NCDs.[1] Four common behavioural risk factors (poor diet, physical inactivity, tobacco use and excessive alcohol consumption) are associated with four disease clusters (cardiovascular diseases (coronary heart disease, stroke and peripheral vascular disease), cancers, chronic obstructive pulmonary diseases (COPD) and type 2 diabetes (T2DM)) that account for about 80% of deaths from NCDs.[2]

The burden of NCDs is rising rapidly and has now become a major challenge to global development.[3] This is despite the fact that NCDs are preventable through feasible and cost-effective public health interventions. Globally, NCDs are responsible for 40 million deaths each year, equivalent to 70% of all deaths. Eighty per cent of all NCD deaths (32 million) are caused by the four disease clusters (cardiovascular diseases, cancers, COPD and diabetes).[4] Cardiovascular diseases accounts for the highest proportion of NCD deaths annually (17.7 million), followed by cancers (8.8 million), respiratory diseases (3.9 million) and diabetes (1.6 million).[4]

In Qatar, as with other countries, NCDs have been the leading cause of death.[5] In order to develop NCD-related action plans, policies and interventions, country-specific epidemiological information with regard to NCDs is essential. Studies such as the national STEPwise survey have been conducted and provide valuable information, however, they include Qataris only.[6] Given expatriates account for 88% of Qatar's population,[7] studies which also include them are required. This study aims to describe the prevalence of four NCDs clusters by age, gender and nationality (Qatari

and non-Qatari) accessing publicly funded primary care services to inform healthcare planning and strategies.

METHODOLOGY

Study setting

Qatar, a peninsular Arab country with a backed by the world's third-largest natural gas and oil reserves, has been investing significantly in its healthcare system. This includes a universal publicly funded primary healthcare service delivered by the Primary Healthcare Corporation (PHCC). PHCC is the largest primary care provider in the country publicly with 27 health centres (all accredited by Accreditation Canada International and distributed across three geographical regions).

Study population and data collection

The study population includes both Qataris and non-Qataris registered at a PHCC health centre, aged ≥18 and who visited a health centre between 1 January 2017 and 31 December 2017. Demographic and diagnosis data were extracted from the electronic medical records for the defined population.

Data analysis

All data were analysed using the 'Statistical Package for the Social Sciences' statistical software package. Basic descriptive statistics were used to analyse the population characteristics (age, gender and nationality; see online supplementary file for classification) and four NCDs clusters (cardiovascular diseases (coronary heart disease, stroke and peripheral vascular disease), cancers, COPD and T2DM).

Crude prevalence rates for NCDs by age, gender and nationality were calculated. Age-adjusted prevalence rates were also calculated using the WHO World Standard Population (2000–2025) to allow comparisons.[8]

Ethical considerations

The study presented a minimal risk of harm to its subjects, and the data collected for it were anonymised. None of the subjects' personal information was available to the research team. Overall, the study was conducted with integrity according to generally accepted ethical principles and was approved by the PHCC's independent ethics committee (PHCC/RS/18/02/003).

RESULTS

Population characteristics

The study found a total of 421 283 individuals accessed primary healthcare services in 2017 (table 1). Individuals in the 30–39 year age group accounted for approximately 33% of the population. 50.6% of the study population was women. 25.6% of the population was Qatari and 74.4% non-Qatari. The largest non-Qatari nationalities were represented by Southern Asian (30.4 %), Northern African (17 %) and Western Asian (13.6 %). They accounted for 61% of the total study population.

Prevalence of NCDs by age and gender

Approximately 16% (N=68 421) of the total study population had one or more NCD. The overall age-adjusted prevalence of CHD, stroke, PVD, cancers, COPD and T2DM in the population was 16, 1, 0.3, 6.1, 3 and 201.4 per 1000 population, respectively (table 2). Increasing age-adjusted prevalence rates with increasing age are observed. Higher rates were seen in men compared with women for all NCDs except cancers.

Prevalence of NCDs by nationality

Age-adjusted prevalence rates for CHD, strokes and PVD were similar in Qataris (CHD=15.07/1000; strokes=1.3/1000; PVD=0.27) and non-Qataris (CHD=16.59/1000; strokes=0.91/1000; PVD=0.29) (table 3). Among non-Qataris, CHD was most common in Southern Asians (19.3/1000) and Western Asians (17.3/1000); strokes were most common in Sub-Saharan Africans (1.65/1000) and Western Asians (0.97/1000); and PVD was most common in South-Eastern Asians (0.54/1000) and Western Asians (0.41/1000).

Age-adjusted prevalence rates for cancers were similar between Qataris (6.37/1000) and non-Qataris (6.01/1000) (table 4). Among non-Qataris, cancers were most common in Australian and New Zealanders (15.09/1000) and Northern Europeans (9.88/1000).

Qataris has a slightly higher (3.95/1000) age-adjusted prevalence rate for COPD compared with non-Qataris (2.64/1000) (table 5). Western Europeans (8.01/1000) and Western Asians (3.69/1000) had the highest prevalence among non-Qataris.

T2DM was higher in Qataris (230.4/1000) compared with non-Qataris (188.3/1000) (table 6). Southern Asians (219/1000) and Northern Africans (184/1000) were found to have the highest prevalence among non-Qataris.

DISCUSSION

Globally, the prevalence of risk factors, morbidity and mortality associated with NCDs is on the rise. Prevalence of NCD-related risk factors in the Gulf Cooperation Council (GCC) states has been reported to be among the highest in the world.[9] Therefore, in Qatar, a member of the GCC, epidemiological information to facilitate healthcare planning and strategies are much needed. This study is potentially the first comprehensive study describing the prevalence of NCDs which includes both Qatari and non-Qatari populations in publicly funded primary care settings. The study found 16.2% of the overall population in publicly funded primary care settings in Qatar had one or more NCD. This highlights the burden of NCDs in the country.

At ageing, many more people are exposed to the risk factors for long periods until the complications develop and they experience the clinical syndromes of NCDs.[10] Similar increasing trends were seen in the prevalence of NCDs with age in this study. Highest increases in the prevalence of NCDs were seen in a relatively young age group

Table 1 Population characteristics of patients attending publicly funded primary health centres in 2017 by age, gender and nationality

Nationality		18–29 years		30–39 years		40–49 years		50–59 years		≥60 years		Total %
		Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
Qatari (% of total)		20 569 (32.8%)	16 863 (37.3%)	14 049 (18.4%)	9469 (15.8%)	10 707 (25.0%)	7224 (16.5%)	9084 (36.0%)	5973 (20.6%)	7673 (47.8%)	6096 (30.6%)	**107 707 (25.6%)**
Non-Qatari	Northern Africa	9753	5404	14 109	12 883	6142	9315	3122	6004	1585	3279	**71 596 (17.0%)**
	Sub-Saharan Africa	2185	778	2860	1227	942	757	330	339	154	224	**9796 (2.3%)**
	Latin America and the Caribbean	39	20	96	37	55	35	44	27	16	14	**383 (0.1%)**
	Northern America	308	161	284	157	302	277	250	338	126	221	**2424 (0.6%)**
	Eastern and Central Asia	129	24	128	46	61	27	23	14	11	10	**473 (0.11%)**
	South-Eastern Asia	5605	443	14 975	1368	8846	1056	2792	613	487	168	**36 353 (8.6%)**
	Southern Asia	11 963	15 279	18 295	26 547	9978	19 047	5846	11 955	2764	6342	**128 016 (30.4%)**
	Western Asia (excluding Qatar)	11 177	5605	10 226	7224	5047	5210	3294	3183	3073	3335	**57 164 (13.6%)**
	Eastern Europe	135	26	232	54	102	38	31	22	18	20	**678 (0.2%)**
	Northern Europe	263	94	457	220	320	364	206	237	89	110	**2360 (0.6%)**
	Southern Europe	97	49	197	99	119	116	56	62	18	25	**838 (0.2%)**
	Western Europe	58	18	120	49	86	90	43	57	20	25	**566 (0.1%)**
	Australasia	34	21	51	31	51	52	52	54	12	31	**389 (0.1%)**
Non-Qatari (% of total)		42 233 (67.2%)	28 366 (62.7%)	62 447 (81.6%)	50 376 (84.2%)	32 192 (75.0%)	36 564 (83.5%)	16 183 (64.0%)	23 026 (79.4%)	8373 (52.2%)	13 804 (69.3%)	**313 564 (74.4%)**
Unknown		2	1	3	1	0	2	0	2	2	0	**13 (0.0%)**
Total All		62 804	45 230	76 498	59 846	42 899	43 790	25 267	29 001	16 048	19 900	**421 283 (100.0%)**

Table 2 Prevalence of four NCDs by age and gender in publicly funded primary health settings

NCD				18–29 years	30–39 years	40–49 years	50–59 years	≥60 years	Total	
Cardiovascular disease	Coronary heart disease and its complications	N		12	100	458	1144	2457	Male=3186 Female=986	4171
		Crude rate (/1000)		0.11	0.73	5.28	21.08	68.3	Male=16.1 Female=4.4	9.9
		Age-adjusted rate (/1000)	Male	0.15	1.22	8.6	32.5	89.9	22.2	16
			Female	0.08	0.4	1.9	8	41.7	8.86	
	Thrombotic/haemorrhagic stroke	N		6	15	49	69	150	Male=203 Female=86	289
		Crude rate (/1000)		0.06	0.11	0.6	1.27	4.2	Male=1 Female=0.4	0.69
		Age-adjusted rate (/1000)	Male	0.1	0.2	0.7	1.9	5.1	1.4	1
			Female	0.1	0.1	0.4	0.6	3	0.7	
	Peripheral vascular disease	N		4	8	17	19	38	Male=63 Female=23	86
		Crude rate (/1000)		0.1	0.1	0.2	0.4	1.1	Male=0.3 Female=0.1	0.2
		Age-adjusted rate (/1000)	Male	0.1	0.1	0.3	0.5	1.5	0.4	0.3
			Female	0.1	0.1	0.1	0.2	0.5	0.1	
Cancers		N		290	698	653	448	347	Male=800 Female=1636	2436
		Crude rate (/1000)		2.7	5.12	7.5	8.26	9.7	Male=4 Female=7.3	5.8
		Age-adjusted rate (/1000)	Male	2	3.26	4	5.07	9.9	4.4	6.1
			Female	3.2	6.58	11.2	11.91	9.4	7.7	
Chronic obstructive airway disease		N		37	78	145	192	418	Male=691 Female=179	870
		Crude rate (/1000)		0.3	0.57	1.7	3.5	11.6	Male=3.5 Female=0.8	2
		Age-adjusted rate (/1000)	Male	0.7	1	2.7	5.5	16.2	4.5	3
			Female	0.1	0.2	0.7	1.3	6	1.4	

Continued

Table 2 Continued

NCD			18–29 years	30–39 years	40–49 years	50–59 years	≥60 years	Total
Type 2 diabetes mellitus	N		1681	6996	14 842	20 728	20 571	Male=37 004 Female=27 814	64 818
	Crude rate (/1000)		15.6	51.3	171.2	382	572	Male=187 Female=124	153.9
	Age-adjusted rate (/1000)	Male	16.6	66.8	208	407.68	569	214.9	201.4
		Female	15	39.2	133.6	352.4	576.2	188.1	

NCD, non-communicable disease.

(30–49 years). These findings suggest the early onset of NCDs in the population that needs to be addressed.

Previous research has reported significant differences in health status and NCD prevalence between men and women.[11] These can be attributed to the different levels of exposure and vulnerability to NCD risk factors. Research findings show women compared with men are more likely to report worse overall health globally.[10] The findings of this study, however, found higher prevalence rates of NCDs (except cancers) in men compared with women. This can be attributed to a lower overall life expectancy in men in Qatar and their higher probability of dying between the ages of 15 and 60 years of age compared with women.[12] These findings suggest that gender differences in Qatar may be different to other countries and together highlight gender inequalities which need to be studied further.

Prevalence rates of CHD and cancers in the study were found to be similar in both Qataris and non-Qataris; however, COPD and T2DM rates were higher in Qataris compared with non-Qataris. In terms of non-Qataris by region, 7 of the 14 regional populations accounted for a majority of the NCDs-Qataris, North Americans, Australian and New Zealanders, Western Asian, Southern Asian, Northern African and Northern Europeans. T2DM accounted for the highest prevalence of any NCD among both Qataris (230/1000) and non-Qataris (183/1000). These findings are similar to those from other countries with a large number of migrants, for example, there is evidence from the UK suggesting differences in NCDs based on an individual's country of birth and ethnicity.[13]

Metabolic syndrome (MS) defined a combination of individual modifiable risk factors (abdominal obesity, raised blood pressure, raised fasting blood glucose, raised triglycerides and reduced high-density lipoprotein cholesterol) that are associated with NCDs.[6] In a previous study from Qatar, the prevalence of MS was found to be 28% among Qataris. The study also reported the prevalence of MS to significantly increase with age and higher in Qatari men compared with women.[6] These findings are in line with the findings of this study as the prevalence of NCD is attributable to the prevalence of MS. They suggest a need for a focused approach to addressing modifiable risk factors to reduce NCD prevalence in Qatar.

There are evidence that show NCD-related healthcare interventions are cost-effective if provided early compared with costly procedures at advanced stages of diseases.[14] Based on the observations of this study, any preventive strategies will require identifying socio-demographic and environmental correlates (particularly those influencing men and specific nationalities) and addressing risk factors. Primary care is for most patients the gateway to the healthcare system, yet in resource-limited settings, most primary healthcare is focused on acute episodic care and chronic disease is often deferred to specialist care delivered at secondary and tertiary centres.[15] The findings of the study call for improvement and greater investment in the prevention and control

Table 3 Prevalence of cardiovascular disease by nationality in publicly funded primary health settings

NCD		Nationality		18–29 years	30–39 years	40–49 years	50–59 years	≥60 years	N	Crude rate (/1000)	Age-adjusted rate (/1000) *
Cardiovascular disease	Coronary heart disease and its complications	**Qatari**		0.16	0.68	4.96	18.33	65.15	1284	11.92	15.07
		Non-Qatari	Northern Africa	0.2	1	5.37	22.57	55.72	590	8.24	14.19
			Sub-Saharan Africa	0	0.24	2.35	5.98	44.97	26	2.65	9.16
			Latin America and the Caribbean	0	0	0	0	(66.67)	2	5.22	(11.59)
			Northern America	0	0	6.91	18.71	69.16	39	16.09	15.99
			Eastern and Central Asia	0	0	11.36	(0)	(47.62)	2	4.23	(10.37)
			South-Eastern Asia	0	0.24	2.22	4.41	24.43	57	1.57	5.35
			Southern Asia	0.04	0.94	6.61	26.63	81.05	1447	11.3	19.35
			Western Asia (excluding Qatar)	0.11	0.55	5.77	22.56	74.28	700	11.73	17.37
			Eastern Europe	0	0	0	0	(105.26)	4	5.9	(18.29)
			Northern Europe	0	0	1.46	6.77	15.08	7	2.97	3.87
			Southern Europe	0	0	0	8.47	(46.51)	3	3.58	(9.3)
			Western Europe	0	0	5.68	0	(88.89)	5	8.83	(16.49)
			Australasia	0	0	0	28.3	(46.51)	5	12.85	(12.16)
		Non-Qatari (total)		0.08	0.74	5.37	22.14	70.34	2887	9.21	16.59
	Thrombotic/haemorrhagic stroke	Qatari		0.05	0.13	0.73	1.26	5.45	112	1.04	1.3
		Non-Qatari	Northern Africa	0	0.11	0.71	0.99	3.08	38	0.53	0.83
			Sub-Saharan Africa	0	0.24	1.18	0	7.94	6	0.61	1.65
			Latin America and the Caribbean	0	0	0	0	(0)	0	0	(0)
			Northern America	0	0	0	0	0	0	0	0
			Eastern and Central Asia	0	0	0	(0)	(0)	0	0	(0)
			South-Eastern Asia	0	0	0.61	0.29	1.53	8	0.22	0.42
			Southern Asia	0.11	0.16	0.41	1.74	3.4	84	0.66	0.98
			Western Asia (excluding Qatar)	0.06	0.05	0.47	1.2	3.9	40	0.67	0.97
			Eastern Europe	0	0	0	0	(0)	0	0	(0)
			Northern Europe	0	0	0	2.26	0	1	0.42	0.33
			Southern Europe	0	0	0	0	(0)	0	0	(0)
			Western Europe	0	0	0	0	(0)	0	0	(0)
			Australasia	0	0	0	0	(0)	0	0	(0)
		Non-Qatari (total)		0.06	0.11	0.52	1.28	3.38	177	0.56	0.91

Continued

Table 3 Continued

NCD		Nationality		18–29 years	30–39 years	40–49 years	50–59 years	≥60 years	N	Crude rate (/1000)	Age-adjusted rate (/1000) *
	Peripheral vascular disease	**Qatari**		0.05	0.04	0.11	0.27	1.09	24	0.22	0.27
		Non-Qatari	Northern Africa	0.07	0.19	0.39	0.66	0.21	19	0.27	0.27
			Sub-Saharan Africa	0	0	0	0	0	0	0	0
			Latin America and the Caribbean	0	0	0	0	(0)	0	0	(0)
			Northern America	0	0	0	1.7	0	1	0.41	0.25
			Eastern and Central Asia	0	0	0	(0)	(0)	0	0	(0)
			South-Eastern Asia	0	0.06	0	0	3.05	3	0.08	0.54
			Southern Asia	0	0	0.24	0.39	0.88	22	0.17	0.25
			Western Asia (excluding Qatar)	0.06	0.05	0.19	0.15	1.87	17	0.28	0.41
			Eastern Europe	0	0	0	0	(0)	0	0	(0)
			Northern Europe	0	0	0	0	0	0	0	0
			Southern Europe	0	0	0	0	(0)	0	0	(0)
			Western Europe	0	0	0	0	(0)	0	0	(0)
			Australasia	0	0	0	0	(0)	0	0	(0)
		Non-Qatari (total)		0.03	0.06	0.22	0.38	1.04	62	0.2	0.29

*Figures (rates) enclosed within parentheses were based (or one of its components) on <50 unweighted observations.

Table 4 Prevalence of cancer by nationality in publicly funded primary health settings

NCD	Nationality		18–29 years	30–39 years	40–49 years	50–59 years	≥60 years	N	Crude rate (/1000)	Age-adjusted rate (/1000)
Cancer	**Qatari**		2.19	4.34	8.53	10.76	9.8	634	5.89	6.37
	Non-Qatari	Northern Africa	3.17	6.78	9.7	8.88	9.66	509	7.11	7.09
		Sub-Saharan Africa	3.37	9.05	11.77	7.47	18.52	79	8.06	9.36
		Latin America and the Caribbean	0	15.04	11.11	0	(0)	3	7.83	(5.27)
		Northern America	2.13	9.07	13.82	18.71	11.53	28	11.55	9.79
		Eastern and Central Asia	6.54	0	0	(0)	(0)	1	2.11	(1.86)
		South-Eastern Asia	3.31	5.02	7.37	7.05	7.63	204	5.61	5.72
		Southern Asia	2.83	3.5	4.93	5.17	7.03	533	4.16	4.43
		Western Asia (excluding Qatar)	2.77	6.39	8.51	9.56	12.33	399	6.68	7.24
		Eastern Europe	0	10.49	7.14	18.87	(0)	5	7.37	(6.28)
		Northern Europe	5.6	10.34	11.7	9.03	15.08	24	10.17	9.88
		Southern Europe	0	3.38	17.02	25.42	(0)	8	9.55	(7.52)
		Western Europe	0	5.92	5.68	10	(22.22)	4	7.07	(7.61)
		Australasia	0	24.39	9.71	0	(46.51)	5	12.85	(15.09)
	Non-Qatari (total)		2.95	5.28	7.27	7.29	9.56	1802	5.75	6.01

Figures (rates) enclosed within parentheses were based (or one of its components) on <50 unweighted observations.
*Geographic regions as defined by the United Nations (see https://unstats.un.org/unsd/methodology/m49/).

Table 5 Prevalence of chronic obstructive airway disease by nationality in publicly funded primary health settings

NCD	Nationality		18–29 years	30–39 years	40–49 years	50–59 years	≥60 years	N	Crude rate (/1000)	Age-adjusted rate (/1000) *
Chronic obstructive airway disease	**Qatari**		0.59	0.77	3.07	4.25	14.09	353	3.28	3.96
	Non-Qatari	Northern Africa	0.26	0.67	1.75	2.85	9.25	120	1.68	2.55
		Sub-Saharan Africa	0	0.24	0.59	0	13.23	7	0.71	2.46
		Latin America and the Caribbean	0	0	0	0	(0)	0	0	(0)
		Northern America	0	0	3.45	0	17.29	8	3.3	3.64
		Eastern and Central Asia	0	0	0	(0)	(0)	0	0	(0)
		South-Eastern Asia	0.17	0.37	0.1	0.88	3.05	13	0.36	0.81
		Southern Asia	0.15	0.49	1.14	3.76	8.13	200	1.56	2.31
		Western Asia (excluding Qatar)	0.34	0.6	2.27	4.48	13.73	159	2.66	3.69
		Eastern Europe	0	3.5	0	0	(0)	1	1.47	(0.75)
		Northern Europe	0	0	2.92	0	10.05	4	1.69	2.29
		Southern Europe	0	0	0	0	(23.26)	1	1.19	(4.04)
		Western Europe	0	5.92	0	20	(22.22)	4	7.07	(8.01)
		Australasia	0	0	0	0	(0)	0	0	(0)
	Non-Qatari (total)		0.21	0.53	1.31	3.26	10.1	517	1.65	2.64

*Figures (rates) enclosed within parentheses were based (or one of its components) on <50 unweighted observations.

Table 6 Prevalence of type 2 diabetes mellitus by nationality in publicly funded primary health settings

NCD	Nationality		18–29 years	30–39 years	40–49 years	50–59 years	≥60 years	N	Crude rate (/1000)	Age-adjusted rate (/1000) *
Type 2 diabetes mellitus	**Qatari**		22.52	68.03	198.2	424.92	642.97	21 248	197.28	230.4
	Non-Qatari	Northern Africa	14.18	53.72	170.67	359.96	495.68	9999	139.66	184.95
		Sub-Saharan Africa	7.76	27.89	123.01	252.62	388.89	662	67.58	134.78
		Latin America and the Caribbean	0	15.04	55.56	112.68	(200)	21	54.83	(64.44)
		Northern America	8.53	13.61	72.54	207.48	340.06	292	120.46	107.68
		Eastern and Central Asia	0	17.24	34.09	(108.11)	(95.24)	12	25.37	(42.1)
		South-Eastern Asia	5.95	17.44	68.98	208.52	354.2	1946	53.53	109.72
		Southern Asia	10.76	61.75	211.02	434.19	587.2	22 263	173.91	219.72
		Western Asia (excluding Qatar)	14.62	40.82	144.17	329.8	526.69	8113	135.92	178.48
		Eastern Europe	0	0	28.57	132.08	(210.53)	19	28.02	(60.89)
		Northern Europe	16.81	20.68	54.09	124.15	216.08	155	65.68	74.59
		Southern Europe	6.85	3.38	12.77	93.22	(46.51)	18	21.48	(26.54)
		Western Europe	13.16	17.75	62.5	90	(222.22)	34	60.07	(70.63)
		Australasia	0	24.39	29.13	132.08	(395.35)	36	92.54	(98.34)
	Non-Qatari (Total)		11.87	47.83	164.17	365.48	528.39	43 570	138.95	188.3

*Figures (rates) enclosed within parentheses were based (or one of its components) on <50 unweighted observations.

of NCDs, in particular T2DM, by primary health institutions in Qatar. It must also be noted that appropriately qualified and trained public health professionals to have the appropriate expertise and skills to take the responsibility of planning and providing preventive interventions for NCD patients. Therefore, more investment in such professionals to manage the NCD epidemic in Qatar's primary healthcare system is necessary.

The study has a number of strengths and limitations. Strengths include an up-to-date prevalence of NCDs in primary care in Qatar. This provides a baseline for future longitudinal studies to monitor NCDs and risk factors as well as in health planning and future strategies. The limitations are as follows: First, this was a cross-sectional study and provides a snapshot of the burden at a particular moment in time. Second, the study included only patients who were ≥18 years and those who attended a PHCC health centres in 2017; therefore, it is not comprehensive and nationally representative.

CONCLUSIONS

Although not comprehensive and nationally representative, this study is suggestive of a higher prevalence of NCDs among a younger population, men and in Qatari, Western Asian, Southern Asian, Sub-Saharan Africans, South-Eastern Asians Northern African and Western European nationalities. Prevention, treatment and control of NCDs and their risk factors is a public health problem in Qatar, and resources need to be invested towards targeted interventions with a multisectoral approach.

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REFERENCES

1. Manning K, Senekal M, Harbron J. Non-communicable disease risk factors and treatment preference of obese patients in Cape Town. *Afr J Prim Health Care Fam Med* 2016;8.
2. Lozano R, Naghavi M, Foreman K, *et al*. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the global burden of Disease Study 2010. *The Lancet* 2012;380:2095–128.
3. Habib SH, Saha S. Burden of non-communicable disease: global overview. *Diabetes Metab Syndr* 2010;4:41–7.

4. World Health Organisation. Global status report on non-communicable diseases, 2014. Available: http://www.who.int/nmh/publications/ncd-status-report-2014/en/ [Accessed on 11th Jan 2018].
5. Al-Kaabi SK, Atherton A. *Impact of noncommunicable diseases in the state of Qatar*. CEOR: Clinico Economics and Outcomes Research, 2015: 7. 377–85.
6. Al-Thani MH, Al-Thani AAM, Cheema S, *et al*. Prevalence and determinants of metabolic syndrome in Qatar: results from a national Health survey. *BMJ Open* 2016;6:e009514.
7. Priya Dsouza Communications. Population of Qatar by nationality - 2017 report, 2017. Available: http://priyadsouza.com/population-of-qatar-by-nationality-in-2017/ [Accessed on 1th October 2018].
8. Ahmad O, Boschi-Pinto C, Lopez AD, *et al*. *Age standardization of rates: a new who standard*. Geneva: World Health Organization, 2001.
9. Khoja T, Rawaf S, Qidwai W, *et al*. Health care in Gulf Cooperation Council countries: a review of challenges and opportunities. *Cureus* 2017;9:e1586.
10. Abebe SM, Andargie G, Shimeka A, *et al*. The prevalence of non-communicable diseases in Northwest Ethiopia: survey of Dabat health and demographic surveillance system. *BMJ Open* 2017;7:e015496.
11. Liu Y, Liu G, Wu H, *et al*. Sex differences in non-communicable disease prevalence in China: a cross-sectional analysis of the China health and retirement longitudinal study in 2011. *BMJ Open* 2017;7:e017450.
12. World Health Organisation. Qatar, 2016. Available: http://www.who.int/countries/qat/en/ [Accessed on 1th Oct 2018].
13. Jayaweera H. Migrations and non-communicable diseases, 2013. Available: https://www.compas.ox.ac.uk/2013/migration-and-non-communicable-diseases/ [Accessed on 28th Mar 2019].
14. Endriyas M, Mekonnen E, Dana T, *et al*. Burden of NCDS in SNNP region, Ethiopia: a retrospective study. *BMC Health Serv Res* 2018;18.
15. Kane J, Landes M, Carroll C, *et al*. A systematic review of primary care models for non-communicable disease interventions in sub-Saharan Africa. *BMC Family Practice* 2017;18.