

Seroprevalence of SARS-CoV2 in Qatar: a longitudinal epidemiological study

Farah Shurrab¹, Hadeel Al-Jighefee¹, Salma Younes¹, Duaa Al-Sadeq¹, Asmaa Althani^{1,2}, Hadi Yassine¹, Mohamed Syed³, Ahmed Al Nuaimi³, Hamda Abdulla³, Gheyath Nasrallah^{1,2}

¹ Biomedical research center (BRC) , ² Department of Biomedical sciences, college of Health Science, ³ Primary Health Care Corporation

Abstract

In Qatar, the first COVID-19 cases were reported on the 29th of February 2020, and the numbers increased dramatically within few months. Primary Health Care Corporation in collaboration with Qatar University's Biomedical Research Centre initiated a three-phase longitudinal epidemiological study to obtain precise estimates of point and period prevalence by age, gender and nationality. The first phase of the study is done and included 2084 individuals. The results showed that the overall prevalence was 11.1%. However, the point prevalence and the period prevalence of SARS-CoV2 was 1.6 and 9.5 % resp. IgG prevalence was higher amongst 18-39-year old (10 %) and ≥ 60 (11.9 %), and higher in males (11.6 %) compared with females (6.2 %), and higher incidences were reported among Highest amongst North African (10.9 %) and Southern Asian (15.1 %) nationalities.

Objective

- To conduct a three-phase longitudinal epidemiological study to obtain a precise estimate of SARS-CoV-2 seroprevalence by age, gender and nationality that represent the national Qatar's general population

Introduction

The novel coronavirus rapidly spread across the globe resulting in a formidable outbreak. Soon, the World Health Organization (WHO) announced the outbreak as a public health emergency of international concern in January 2020. In Qatar, the first COVID-19 cases were reported on the 29th of February 2020, and the numbers increased dramatically within few months. In July 2020, Primary Health Care Corporation in collaboration with Qatar University's Biomedical Research Centre initiated a three-phase longitudinal epidemiological study to obtain a precise seroprevalence estimate in Qatar.

Methodology

Study design and population

- A 3 phases study, 3-months time interval between each phase. A stratified random sampling technique was utilized. 16 strata were defined using age, gender nationality.

Participant recruitment

- Eligible participants were extracted from PHCC's electronic medical records. Participants were sent SMS to participate in the study

Data collection and analysis

- Nasal and oropharyngeal swab and blood samples were collected.
- Samples were analyzed using RT-PCT for active infection and IgG serology for previous infection using Mindray CL-900i automated analyzer

Results and Discussion

Table 1: Prevalence and Active COVID-19 infection by age, gender, nationality and municipality.

	Active COVID-19 Infection (RT-PCR)		Prevalence of COVID-19 Infection (Blood IgG)	
	Positive Test Results N (%)	Total Tested N	Positive Test Results N (%)	Total Tested N
Age				
10-17	5 (1.4)	356	25 (7.1)	352
18-39	17 (1.9)	918	91 (10)	913
40-59	10 (1.5)	659	56 (8.5)	661
≥ 60	0	128	15 (11.9)	126
Female	14 (1.5)	953	59 (6.2)	949
Male	18 (1.6)	1108	128 (11.6)	1103
Nationality				
Qatar	3 (0.6)	486	19 (3.9)	485
Northern Africa	3 (0.7)	412	45 (10.9)	412
South-eastern Asia	2 (1.4)	139	11 (8)	138
Southern Asia	14 (3)	470	57 (15.1)	376
Western Asia	7 (1.8)	381	48 (5.6)	861
(excluding Qatar)				
Northern America	1 (3.1)	32	2 (6.1)	33
Europe	1 (1.1)	88	1 (1.1)	87
Others	1 (1.9)	53	4 (7.5)	53
Municipality				
Ad-Dawhah	10 (1.3)	752	79 (10.6)	748
Al Rayyan	14 (2.1)	660	52 (7.9)	655
Al Daayen	0 (0)	117	4 (3.4)	116
Umm Salal	2 (1.5)	130	9 (6.9)	130
Al Khor	3 (6.1)	49	5 (10.2)	49
Al Shamal	0 (0) *	5	1 (20) *	5
Al-Shahaniya	0 (0) *	17	4 (23.5) *	17
Al Wakrah	1 (0.5)	221	16 (7.2)	221

* These percentages should be interpreted with caution as they are based on very small denominators (N < 30)

1. Prevalence and active COVID-19 infection by age.

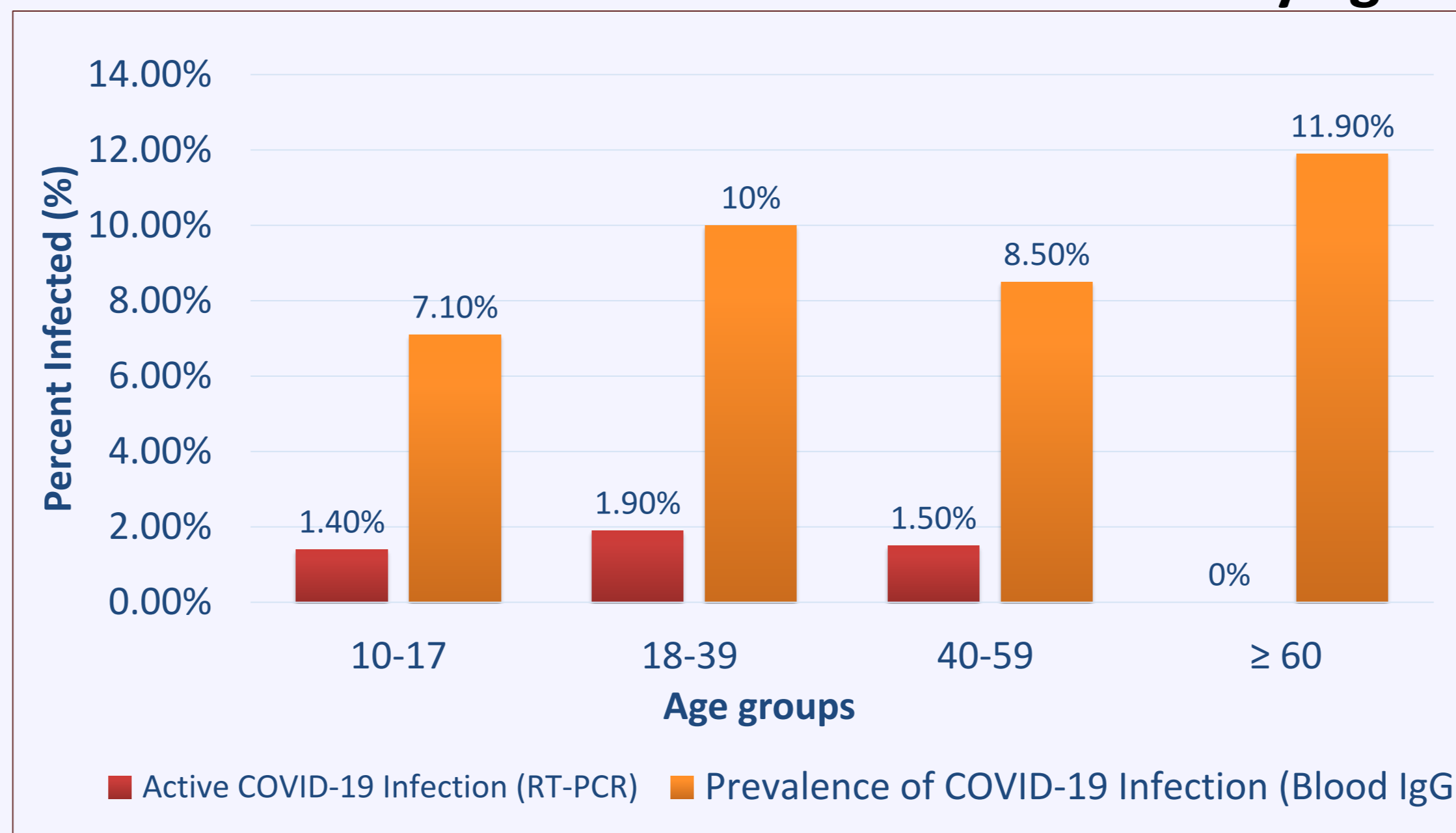


Figure 1: this figure shows the percentage of COVID-19 prevalence and active infection among age groups. Active COVID-19 infection was almost similar across all age groups (1.5-1.9%) except for except ≥ 60 (0 %). Prevalence of COVID-19 (IgG positive) was higher amongst 18-39-year olds (10 %) and ≥ 60 (11.9 %)

2. Prevalence and active COVID-19 infection by gender.

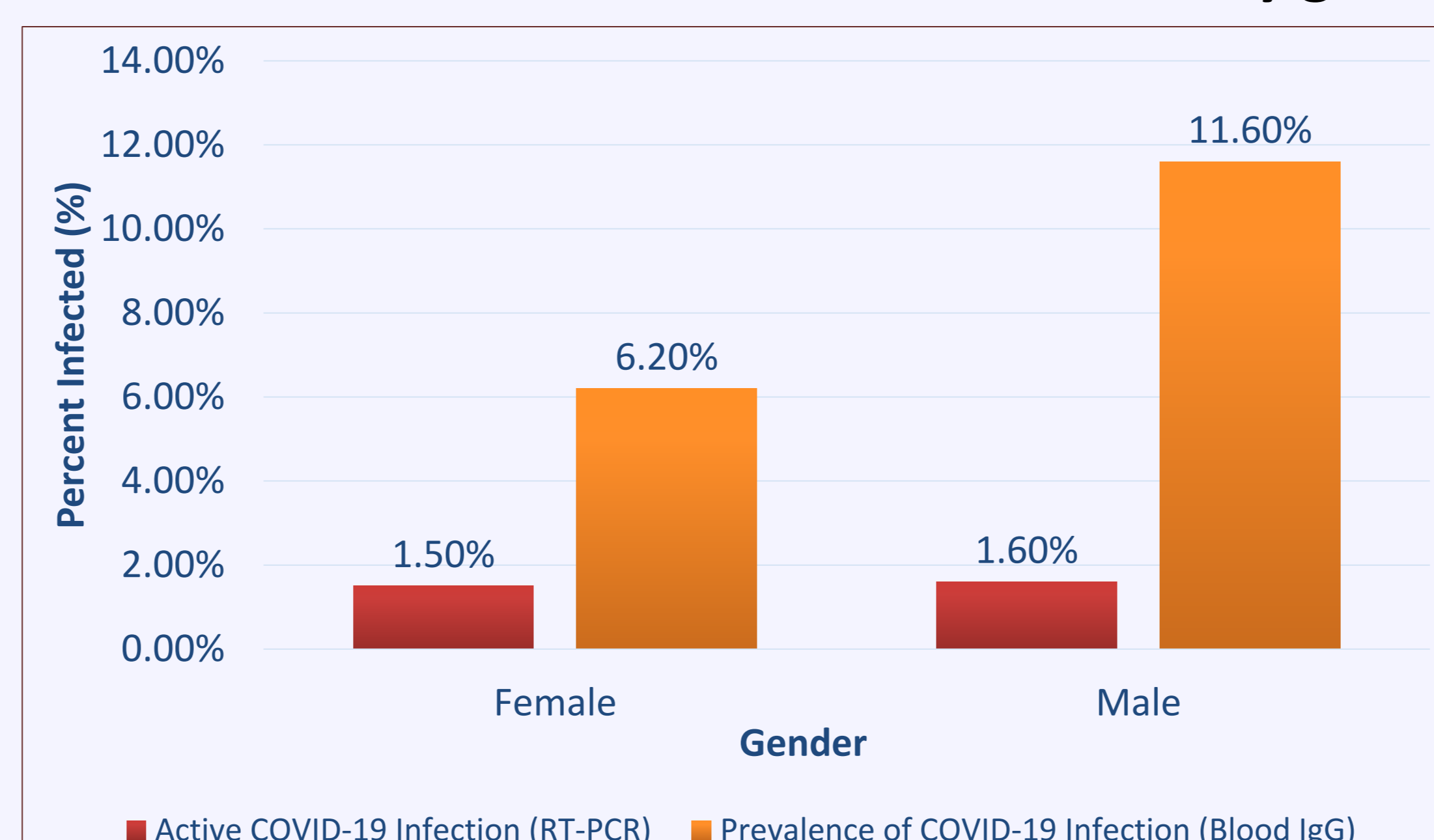


Figure 2: this figure shows the percentage of COVID-19 prevalence and active infection by gender. Active cases were Almost similar across both genders (1.5 % -1.6 %), while IgG prevalence was higher in males (11.6 %) compared with females (6.2 %)

3. Prevalence and active COVID-19 infection by nationality .

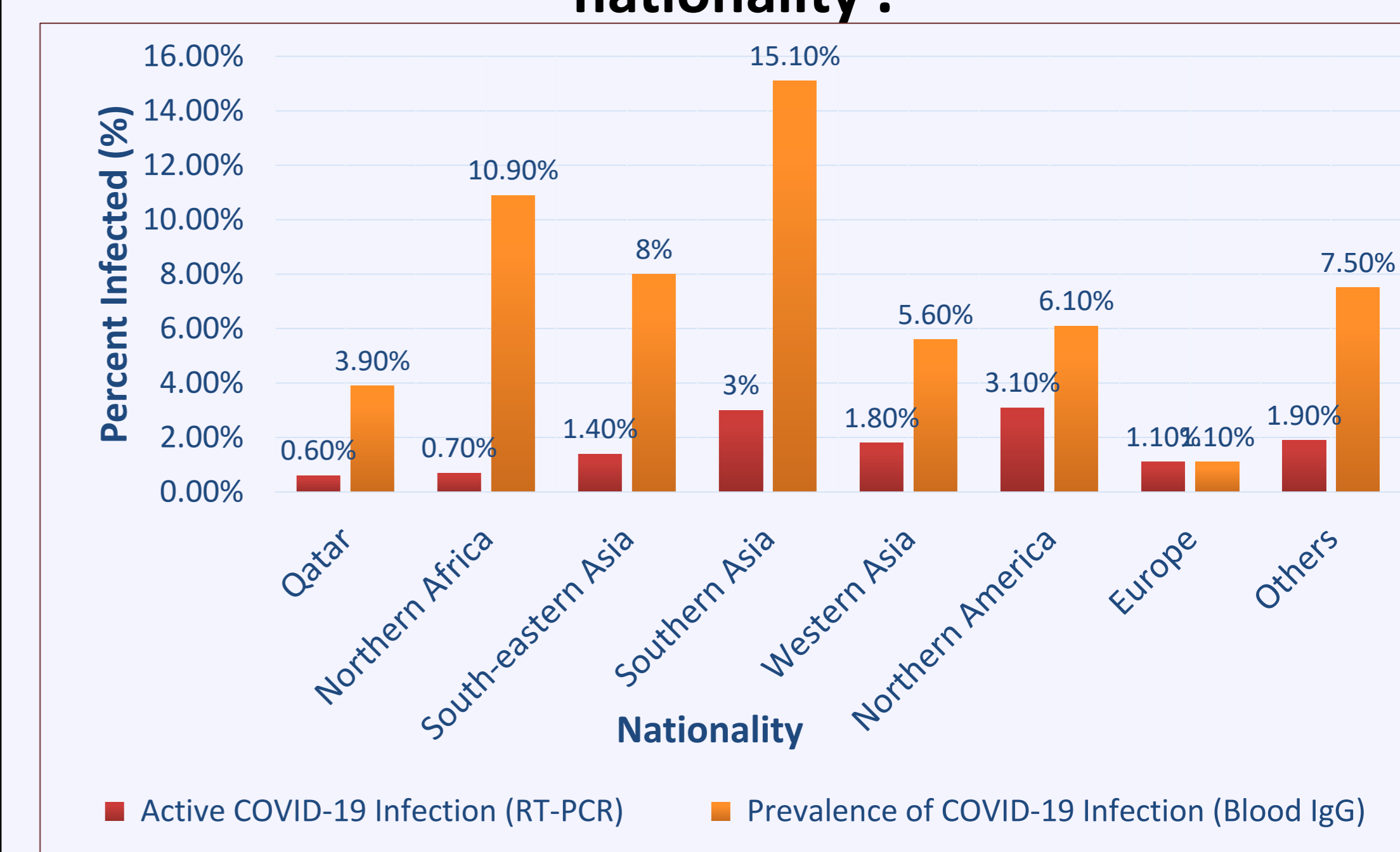


Figure 3: this figure shows the percentage of COVID-19 prevalence and active infection among nationalities in Qatar. Active Covid-19 infection was higher amongst North American (3.1 %) and Southern Asian (3 %) nationalities. While North African (10.9 %) and Southern Asian (15.1 %) nationalities had higher IgG prevalence.

4. Prevalence and active COVID-19 infection by municipality

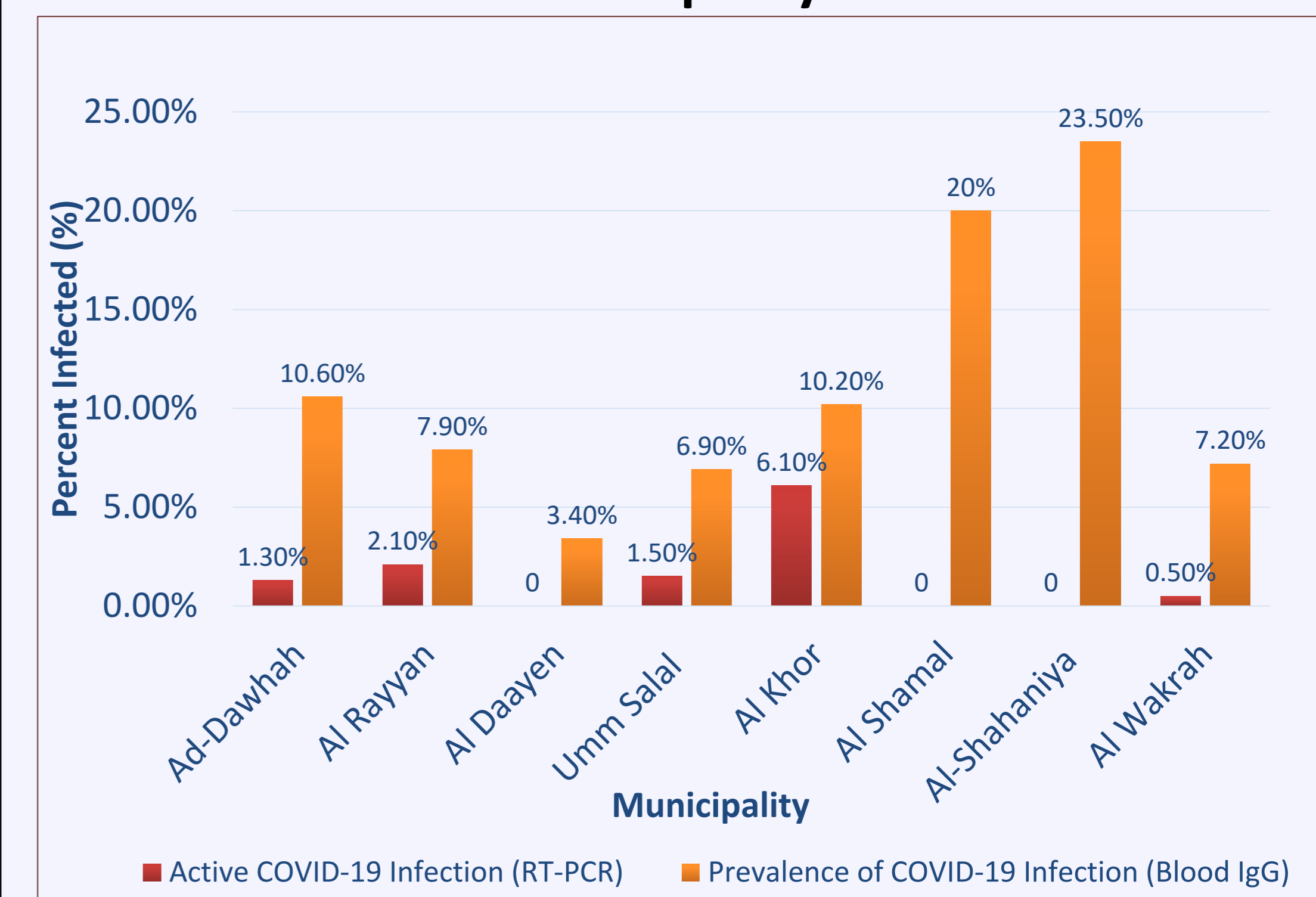


Figure 4: this figure shows the percentage of COVID-19 prevalence and active infection among municipalities. Highest active COVID-19 cases were in Al Khor municipality (6.1 %), and highest prevalence incidence were Al Shahaniya (23.5 %), Al Shamal (20 %) and Al Khor (10.2 %)

Table 2: overall point and period prevalence of COVID-19 infection

Positive Results	Previous RT-PCR		Current RT-PCR [†]		Serology [‡]		Point Prevalence		Period Prevalence	
	Total	Positive Results	Total	Positive Results	Total	%	95 % CI	%	95 % CI	
N (%)	N	N (%)	N	N (%)	N					
61 (2.9 %)	2084	32 (1.6)	2061	187 (9.1)	2052	1.6	1.1 - 2.2	9.5	8.2 - 10.8	

Conclusion

In conclusion, the overall point prevalence and period prevalence of SARS-CoV2 was 1.6 and 9.5 % respectively. The findings suggest significant asymptomatic SARS-CoV2 infection in the population. More importantly, despite the significant number of RT-PCR tests undertaken in the country, the study found a considerable difference in previous RT-PCR positive test results (1.6 %) and period prevalence (9.5 %). This highlights the limitations of using RT-PCR as a screening tool unless undertaken using a robust sampling methodology. As the study was designed to represent Qatar's population, there was notable differences in period prevalence of SARS-CoV2 infection by age, gender, nationality and municipality.

References

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