

Short Communication

Analysis of the risk factors in SARS-CoV-2: gender and age

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ABSTRACT

Age and gender are key indicators of health to understand the extent to which outbreaks affect a specific age group or gender. Therefore, the present study was conducted to know whether gender equality in SARS-CoV-2 infections prevails across different age groups in the Dadra and Nagar Haveli district of the UT of Dadra and Nagar Haveli and Daman and Diu, India. The secondary data were collected up to 21st September 2020 through public health surveillance activities undertaken by, Integrated Disease Surveillance Programme, UT of the Dadra Nagar Haveli and Daman Diu. Till date, a total of 37.89 thousand samples were tested for detection of SARS-CoV-2. Only 1429 (3.76%) samples were found positive for SARS-CoV-2. Out of total positive cases, 71.38% were male and 28.62% were female. The maximum case was encountered in the working-age group (between 19 to 50 years). However, the highest positivity rate (8.5%) was encountered in the age group of more than 50 years.

Keywords: SARS-CoV-2, Epidemiology, Age, Gender

INTRODUCTION

The ongoing SARS-CoV-2 pandemic has been announced by the World Health Organization (WHO). In India, the first case of SARS-CoV-2 was reported on January 30, 2020, in the Thrissur district of Kerala, having a travel history of Wuhan, China. The risk of infection, fatality rates, and treatment responses across different countries, age groups, and demographic groups are diverse.¹ Age and gender are key indicators of health to understand the extent to which outbreaks affect a specific age groups or gender. It is a fundamental step to evaluate the primary and secondary effects of a health emergency in the communities.² The previous workers have been revealed that the males are more at risk for worse outcomes and death with SARS-CoV-2.³ The X chromosome is known to contain the largest number of immune-related genes in the whole genome. With their XX chromosome, the female has a double copy of key immune genes compared to the single copy in XY male.⁴

Thus females immune systems are generally more responsive to infections.⁵ This might mean female may more able to tackle the SARS-CoV-2 more effectively but this has not yet been proven. The present study was conducted to know whether gender equality in SARS-CoV-2 infections prevails across different age groups in the Dadra and Nagar Haveli district of the UT of Dadra and Nagar Haveli and Daman and Diu, India.

METHODS

The District of Dadra and Nagar Haveli is located at latitude - 20° 54' 41" N to 20° 21' 36" N, Longitude - 72° 54' 41" N to 73° 13' 13" N in the Western Ghats of India. In recent years this has undergone a large-scale development through urbanization and industrialization. The 487 km² area is hilly, forested, occupied by mainly tribes (population 3.42 lakh) in 72 villages and one town. Due to owing to the subsidiary in taxes to industries approximately 2.5 lakh skilled and unskilled workforce

comes to Dadra and Nagar Haveli from different states of India. The secondary data of SARS-CoV-2 were generated through public health surveillance activities undertaken by, Integrated Disease Surveillance Programme, UT of the Dadra Nagar Haveli and Daman Diu. All samples were collected and tested in the laboratory of the Shri Vinoba Bhavé Civil Hospital which is approved by the Indian Council of Medical Research (ICMR), New Delhi for the testing of SARS-CoV-2. The testing guidelines were followed as and when provided by the Government of India and ICMR.

RESULTS

The number of SARS-CoV-2 confirmed cases in the District Dadra Nagar Haveli reached 1429 by 30th September 2020, after the first confirmed case was diagnosed in the district on 5th May 2020 (Week No 19).

The epidemic curve based on weekly data showed that cases have started rapidly rising since 27th Week of 2020 and reached on pick in 31st week of 2020. Out of total positives cases, 71.38% were males and 28.62 % were females. Based on age, the group of 19-35 years was noted more prone. Out of total cases, 615 cases (43.04%) were reported in the age group of 19-35 years, followed by 434 cases (30.37%) in the age group of 36 to 50 years, 270 cases (18.89 %) in the age group of more than 50 years, 50 cases (3.50 %) in the age group of 13-18 years, 41 cases (2.87 %) in the age group of 6-12 years, 14 cases (1.0 %) in the age group of 1-5 years and 5 cases (2.67%) in the age group of below 1 year (Table 1). Total 28997 samples were collected from male and 8989 samples were collected from females. The scenario of sample positivity rate in gender and age-wise is quite different, the positivity rate in females (4.55%) was found greater than males (3.52%) (Figure 1).

Table 1: Showing characteristics of the case of SARS-CoV-2 in the Dadra Nagar Haveli.

S. no.	Age	Total sample collection		Total positive cases		Positivity rate		M: F
		Male	Female	Male	Female	Male	Female	
1	<1	91	96	2	3	2.2	3.13	1: 1.4
2	1 to 5	493	406	9	5	1.83	1.23	1: 0.7
3	6 to 12	970	740	20	21	2.06	2.84	1: 1.4
4	13 to 18	875	591	27	23	3.09	3.89	1: 1.3
5	19 to 35	17403	4429	416	199	2.39	4.49	1: 1.9
6	36 to 50	6855	1877	344	90	5.02	4.79	1: 1.0
7	50<	2310	850	202	68	8.74	8	1: 0.9
	Total	28997	8989	1020	409	3.52	4.55	1: 1.3

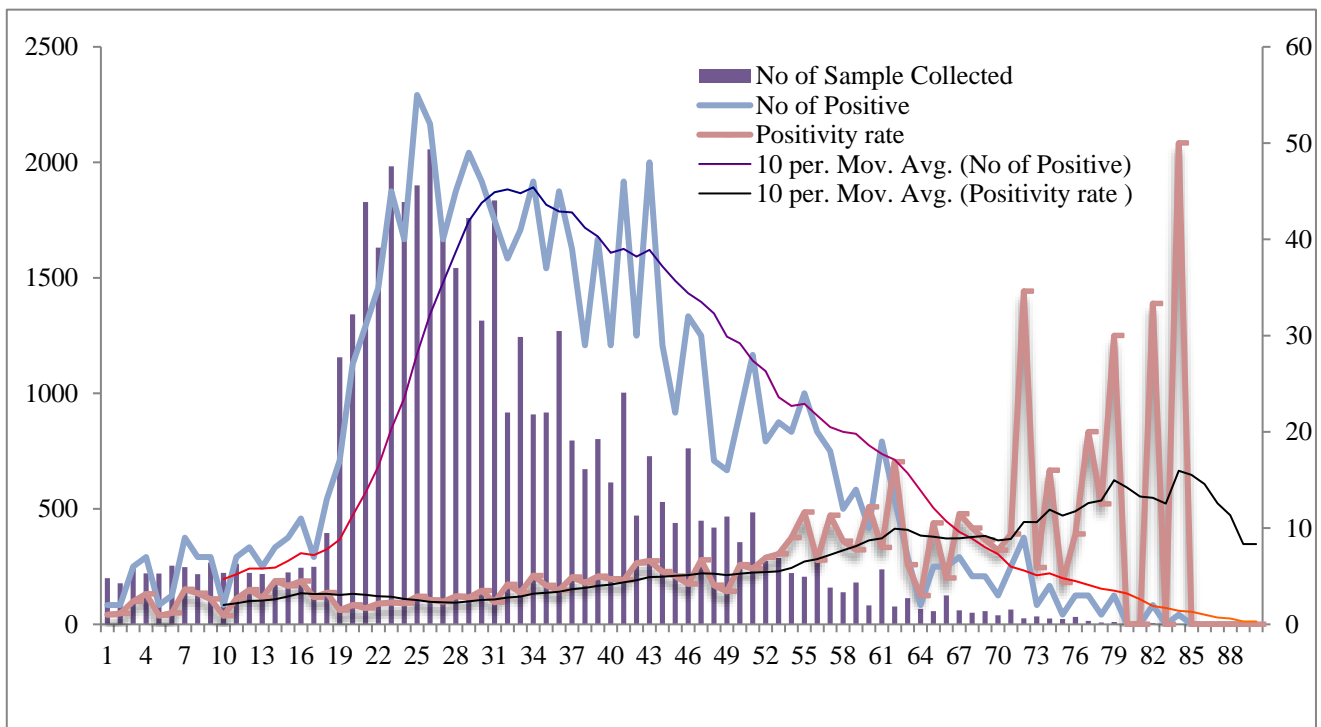


Figure 1: The frequency distribution of SARS-CoV-2 cases in the district of the Dadra Nagar Haveli, India.

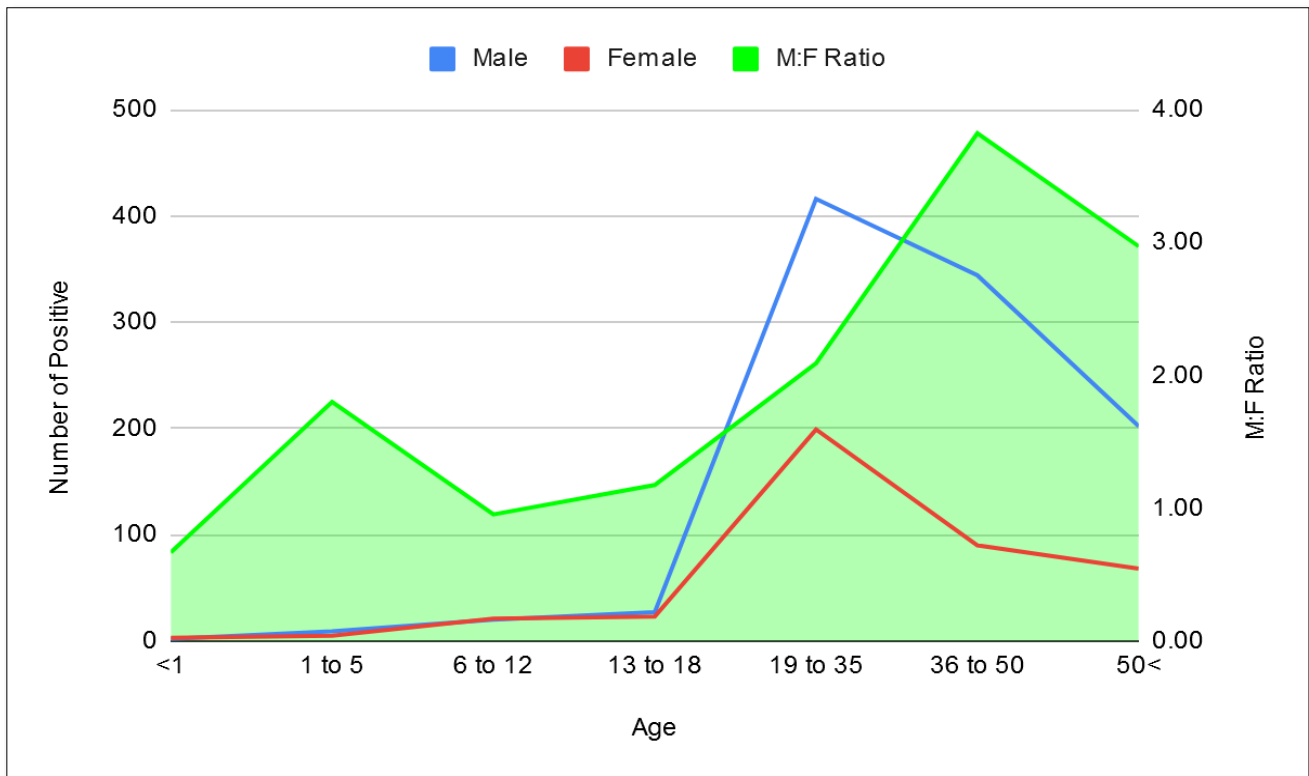


Figure 2: The positivity rate of SARS-CoV-2 in the different age and gender.

The maximum positivity (8.5%) was reported in the age group of more than 50 years followed by 4.97 % in the age group of 36 to 50 years, 3.41 % in the age group of 12 to 19 years, 2.82 % in the age group of 19 to 35 years, 2.4% in both age group of 6 to 12 years and below 1 year and 1.56 % in the age group of 1 to 5 years. The gender and age-wise positivity rate is depicted in Figure 2.

DISCUSSION

The sample positivity rate is a ratio of all positive tests to the total tests conducted. It is an indicator of the testing capacities of any territory and identification of the high-risk group. The literature indicates that age and gender are the most important epidemiological factors to analyze the risk of the disease.⁶ At this point in time, the positivity rate of India is 8.73%, and the highest numbers of cases were reported in the productive age group. Most of the researchers are monitoring the gender-wise and age-wise positivity rate but it's calculated on the basis of the number of positive cases.⁷ The data of positivity rate in pursuance of gender-wise and age-wise samples collected are still lacking. In the present study, the sample positivity rate of SARS-CoV-2 was found the male-biased, and maximum case of SARS-CoV-2 were encountered in the working-age group (between the age of 19 to 50 years), the results of the study are in accordance to the previous studies.^{3,7} This variation might be due following cause 1) due to single-gender (male) migration in the UT and 2) The working-age group more exposure to infection and 3) It due to inequality in the

sample tested in the different age group. But when we analyzed on the basis of, how many samples collected from particular gender or age group than the scenario of sample positivity rate are quite different, the positivity rate in females was found greater than male and the maximum positivity was noted in the age group of more than 50 years. The variation in the male-female ratio was might be due to the variation in the gender-wise sample tested. While early evidence indicated that males have higher overall burden across the world, the researchers said. According to scientists, elderly males and females both display high mortality risk and require special care when infected.³

CONCLUSION

It's true, the maximum cases of SARS-CoV-2 were the male and the maximum number of cases were found in the working age group (19 to 35 years), but the sample positivity rate correspond to age and gender wise sample collected showing the elderly and female high risk of infection. According to the result of the present study, the elderly and females both display a high risk of infection and require special attention in COVID -19 pandemic.

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