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ANALYSIS OF COVID – 19 MORTALITY, TAMIL NADU, INDIA 2020 – 2024

Selvavinayagam T.S [1], Abishek Stanislaus [1], Somasundaram A [1], Mohan Anandan [1], Sampath Palani [1]

(1) Directorate of Public Health & Preventive Medicine

Abstract

INTRODUCTION : Globally, around 760 million cases and 6.9 million deaths were recorded since 2019. Currently, COVID-19 has been extensively studied globally, and the available studies indicate diversity in information about COVID-19 across regions and countries, highlighting the need for localized studies.

OBJECTIVE : The objective of this study is to understand the demographic and clinical characteristics of those who died due to COVID-19 and estimate the time intervals between the onset of symptoms, admission, and death.

METHODOLOGY : We obtained COVID-19 data for 38086 deaths from the epidemic section of the Directorate of Public Health and Preventive Medicine, Tamil Nadu, a southern Indian state from 25th March 2020 to 4th January 2024. Categorical variables were summarized as frequencies and percentages, while continuous variables were presented as mean, standard deviation (SD), median, and interquartile range (IQR) as appropriate. Proportions for categorical variables were analyzed using the chi-squared test. The analyses were performed using SPSS version 25.0.

RESULTS : The mean age of the deceased was 62.9 years (SD: 13.7 years), Almost two-thirds, 66.7%, of the deceased were males. 24% of deceased were from Chennai district. The crude death rate was 10.0/100,000 population; the age-specific death rate was highest (64.89/ 100,000 population) in the age group 75 years and above. 79.4 % reported with one or more comorbidities with most common being Diabetes(52.3%), hypertension(40.8%) & Coronary Artery disease. The comorbidities are higher (92.7%) in age group and 75 years and above and (63.9%) is noted in 0-14 years age group. Breathlessness (77.5), fever (75.6) and cough(68.4%) were the most common symptoms and it was found higher in age group 15-44 years. There is no difference in median time interval between hospital admission and death among age group and gender except the place of admission where the private institutions was higher when compared to government institutions. The time interval between getting lab tested covid-19 positive and death was shorter among age group 0-14 years and higher in private institutions

CONCLUSION : The Covid-19 death rate is highest among elderly age group, male gender and people living in districts with higher urban coverage. The comorbidities are higher in age group 75 years and above. The time interval between admission and death was higher in private institutions. The time interval between getting lab tested covid-19 positive and death was shorter among age group 0-14 years and higher in private institutions

KEYWORDS : COVID-19 in India Age and sex-specific death rate Comorbidities of COVID-19 Time interval between infection and death.

INTRODUCTION

COVID-19, caused by the SARS-CoV-2 coronavirus, typically spreads through close contact between individuals. The disease became a global health threat due to its rapid spread across countries. Globally, approximately 760 million cases and 6.9 million deaths have been recorded since 2019.[1]

The initial cases were detected in Hubei Province, China, in December 2019[2], with the first death reported in January 2020. The World Health Organization (WHO) declared it a pandemic on March 11, 2020.[3] In India, the first COVID-19 case was reported in January 2020 in Kerala (4), with the first death occurring in March 2020 in Karnataka. In Tamil Nadu, a southern state in India, the first case was reported in March 2020, with the first death also occurring that month. As of March 5, 2024, Tamil Nadu has recorded a significant number of 3,611,330 COVID-19 positive cases and 38,086 deaths.[5] The virus exhibits varying degrees of clinical manifestations across different countries.[6] The number of cases and deaths recorded in the districts of Tamil Nadu varies.[5] Given the extensive global studies on COVID-19, there is a clear diversity of information across regions and countries, underscoring the need for localized studies.

OBJECTIVE

The objective of this study is to understand the demographic and clinical characteristics of individuals who died due to COVID-19 and to estimate the time intervals between the onset of symptoms, hospital admission, and death.

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Corresponding Author: Abishek.Stanislaus
e-mail : abishek299300@gmail.com

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METHODOLOGY

We obtained COVID-19 data from the epidemic section of the Directorate of Public Health and Preventive Medicine, Tamil Nadu, a southern Indian state. The data included variables such as case ID, district, address, age, gender, name of hospital, type of admitting hospital, presence of comorbidities, presenting symptoms, date of hospital admission, and date of death. The data was collected from the date of the first COVID-19 death (25th March 2020) to the last COVID-19 death (4th January 2024) reported in Tamil Nadu, totalling 38,086 deaths. All deaths were included for analysis. Cases with details of comorbidities or symptoms were included for the respective analyses. Time intervals between becoming positive, hospital admission, and death were calculated for cases where data was available. Categorical variables were summarized as frequencies and percentages, while continuous variables were presented as mean, standard deviation (SD), median, and interquartile range (IQR), as appropriate. Proportions for categorical variables were analyzed using the chi-squared test. The analyses were performed using SPSS version 25.0.

RESULTS

Socio-demographic characteristics and age- and sex-specific mortality

The mean age of the deceased was 62.9 years (SD: 13.7 years), with no significant difference between males (63.3 years; SD: 13.8 years) and females (62.1 years; SD: 13.5 years). The age group 60 to 74 years accounted for the highest percentage of deaths, nearly 42.9% (16,338). Almost two-thirds, 66.7% (25,385), of the deceased were males. Approximately one-fourth of the deceased (24%) were from Chennai district. Around 61.6% (23,445) of deaths were recorded in government institutions, 38.1% (14,503) in private institutions, and the remaining 0.4% (138) at home.

The crude death rate was 10.0 per 100,000 population; the age-specific death rate increased with age, reaching the highest (64.89 per 100,000 population) in the age group 75 years and above and the lowest (0.05 per 100,000 population) in the age group 0 to 14 years. The death rate was higher among men (13.31 per 100,000 population) compared to women (6.64 per 100,000 population). Kancheepuram district recorded the highest death rate of 27.80 per 100,000 population. All districts except seven (Kancheepuram, Chennai, Chengalpattu, Vellore, Thiruvallur, Coimbatore, and Kanniyakumari) recorded a death rate less than 10.00 per 100,000 population (Table 1).

Table 1: Age, gender, hospital and geographic specific death rate Covid-19, Tamil Nadu 2020- 2024

Variables	Description	Number of Deaths (n =38086)							Deaths per 100,000 population
		2020	2021	2022	2023	2024(till4th Jan)	Total	%	
Age	0 to 14 years	23	11	2			36	0.1	0.05
	15 to 44 years	897	2797	43	5	1	3743	9.8	2.07
	45 to 59 years	3095	6882	176	8		10161	26.7	13.96
	60 - 74 years	5437	10387	503	10	1	16338	42.9	40.55
	75 years and above	2697	4560	539	12		7808	20.5	64.89
Gender	Female	3323	8983	383	12		12701	33.3	6.64
	Male	8826	15654	880	23	2	25385	66.7	13.31
Place of Death	Government Institution	7908	14884	639	13	1	23445	61.6	-
	Private Institution	4239	9623	618	22	1	14503	38.1	-
	Home Death	2	130	6			138	0.4	-
Geography	Chennai	4100	4615	422	6	1	9144	24.0	25.32
	Coimbatore	646	1860	101	3	1	2611	6.9	14.27
	Chengalpattu	704	1751	108	1		2564	6.7	21.24
	Thiruvallur	672	1184	79	4		1939	5.1	15.48
	Salem	459	1269	35	2		1765	4.6	9.57
	Kancheepuram	422	874	40	2		1338	3.5	27.80
	Vellore	346	935	20	3		1304	3.4	15.80
	Madurai	460	744	50			1254	3.3	7.80
	Trichy	182	930	59	2		1173	3.1	8.14
	Kanyakumari	257	806	24			1087	2.9	10.99
	Thanjavur	237	790	34			1061	2.8	8.34
	Tiruppur	219	803	25	1		1048	2.8	7.97
	Other districts (26)	3441	8076	266	11		11794	31.0	5.75
	Other state/Country	4					4	0.0	-
	Total	12149	24637	1263	35	2	38086	100.0	10.00

Pre-existing comorbidities in deceased Covid-19 patients Tamil Nadu 2020- 2024

Among the 38,028 cases that reported the presence or absence of comorbidities, 79.4% (30,199) reported having one or more comorbidities. Diabetes was the most common comorbidity, associated with 52.3% of the deceased. Hypertension, coronary artery disease (CAD), chronic kidney disease (CKD), and hypothyroidism were present in 40.8%, 11.4%, 6.9%, and 3.1% of the deceased, respectively. The coexistence of diabetes and hypertension was found in 28.7% of the individuals, the coexistence of diabetes and CKD in 4.6%, the coexistence of diabetes and hypothyroidism in 1.9%, and the coexistence of diabetes, hypertension, and CAD in 5.9%.

All major comorbidities—diabetes, hypertension, CAD, and CKD—were significantly higher among males compared to females, except for hypothyroidism. The presence of comorbidities among those who died due to COVID-19 was significantly higher in the older age group (75 years and above, 92.7%) and remarkably higher in the younger age group (0-14 years, 63.9%). The percentage and number of deaths with comorbidities increased significantly with age among those who died due to COVID-19.

Deaths in private institutions had a higher percentage (83.8%) compared to government institutions (76.7%) due to comorbidities. Deaths associated with major comorbidities like diabetes, hypertension, and CAD were higher and statistically significant in private institutions compared to government institutions. The coexistence of diabetes and hypertension, as well as the coexistence of diabetes, hypertension, and CAD, were also higher and significant in private institutions. (Table 2)

Table 2 : Age, gender and hospital specific comorbidities in deceased Covid-19 patients, Tamil Nadu 2020- 2024

Comorbidities	Gender			Age Group						Place of death				Total (n=38028) %(n)
	Male (n=25341) %(n)	Female (n=12687) %(n)	p value	0-14 years (n=36) %(n)	15-44 years (n=3742) %(n)	45-59 years (n=10156) %(n)	60-74 years (n=16309) %(n)	75 years &above (n=7785) %(n)	p value	Government Institution (n=23391) %(n)	Private Institution (n=14499) %(n)	Home Death (n=138) %(n)	p value	
Presence of comorbidity*	78.3 (19853)	81.5 (10346)	<0.01	63.9 (23)	47.3 (1770)	67.8 (6887)	87.7 (14299)	92.7 (7220)	<0.01	76.7 (17934)	83.8 (12152)	81.9 (113)	<0.01	79.4 (30199)
One comorbidity	38.5 (9754)	40.0 (5070)		47.2 (17)	30.1 (1126)	34.5 (3505)	42.2 (6877)	42.4 (3299)		40.3 (9435)	36.9 (5349)	29.0 (40)		39.0 (14824)
Two comorbidity	25.2 (6398)	28.1 (3570)	<0.01	13.9 (5)	12.6 (472)	23.0 (2333)	29.4 (4795)	30.4 (2363)	<0.01	24.5 (5723)	28.9 (4195)	36.2 (50)	<0.01	26.2 (9968)
More than two comorbidities	14.6 (3691)	13.4 (1704)		2.8 (1)	4.6 (171)	10.3 (1045)	16.1 (2625)	19.9 (1553)		11.9 (2773)	18.0 (2607)	10.9 (15)		14.2 (5395)
Diabetes Mellitus	51.7 (13096)	53.5 (6782)	<0.01	2.8 (1)	27.2 (1019)	50.1 (5091)	58.5 (9546)	54.2 (4221)	<0.01	49.6 (11607)	56.5 (8192)	57.2 (79)	<0.01	52.3 (19878)
Hypertension	39.4 (9972)	43.8 (5552)	<0.01	0(0)	14.2 (533)	33.7 (3427)	46.1 (7515)	52.0 (4049)	<0.01	37.0 (8656)	46.9 (6795)	52.9 (73)	<0.01	40.8 (15524)
Coronary Artery Disease	13.1 (3310)	8.2 (1044)	<0.01	2.8 (1)	2.0 (73)	6.8 (689)	13.1 (2143)	18.6 (1448)	<0.01	9.7 (2279)	14.3 (2072)	2.2 (3)	<0.01	11.4 (4354)
Chronic Kidney Disease	7.4 (1881)	5.8 (742)	<0.01	5.6 (2)	5.2 (195)	6.7 (684)	7.2 (1175)	7.3 (567)	<0.01	6.7 (1557)	7.3 (1064)	1.4 (2)	<0.01	6.9 (2623)
Senility	7.6 (1933)	7.2 (916)	0.16	0(0)	0(0)	0(0)	10.5 (1712)	14.6 (1137)	<0.01	8.1 (1893)	6.6 (952)	2.9 (4)	<0.01	7.5 (2849)
Hypothyroidism	1.6 (416)	5.9 (744)	<0.01	0(0)	3.2 (120)	2.9 (297)	3.0 (497)	3.2 (246)	0.69	2.2 (514)	4.4 (645)	0.7 (1)	<0.01	3.1 (1160)
Cerebrovascular Accident	1.9 (489)	1.3 (162)	<0.01	0(0)	0.6 (23)	1.1 (110)	2.0 (326)	2.5 (192)	<0.01	1.8 (432)	1.5 (218)	0.7 (1)	0.03	1.7 (651)
Bronchial Asthma	1.4 (356)	2.2 (282)	<0.01	0(0)	1.6 (60)	1.5 (148)	1.5 (250)	2.3 (180)	<0.01	1.4 (338)	2.1 (298)	1.4 (2)	<0.01	1.7 (638)
Chronic Obstructive Pulmonary Disease	1.6 (416)	1.2 (152)	<0.01	0(0)	0.3 (11)	0.7 (72)	1.7 (281)	2.6 (204)	<0.01	1.3 (315)	1.7 (252)	0.7 (1)	0.01	1.5 (568)
Obesity	1.1 (278)	2.0 (257)	<0.01	0(0)	3.7 (137)	1.9 (190)	0.9 (154)	0.7 (54)	<0.01	1.3 (301)	1.6 (234)	0(0)	0.01	1.4 (535)
Cancer	0.8 (207)	1.0 (129)	0.05	8.3 (3)	1.1 (40)	0.9 (87)	0.9 (140)	0.8 (66)	<0.01	0.9 (203)	0.9 (132)	0.7 (1)		0.9 (336)
Tuberculosis	0.7 (173)	0.4 (48)	<0.01	2.8 (1)	0.9 (35)	0.6 (60)	0.5 (85)	0.5 (40)	0.01	0.7 (174)	0.3 (47)	0(0)	<0.01	0.6 (221)
Diabetes Mellitus & Hypertension	27.8 (7033)	30.7 (3900)	<0.01	0(0)	7.0 (263)	23.6 (2401)	33.8 (5513)	35.4 (2756)	<0.01	25.6 (5992)	33.7 (4886)	39.9 (55)	<0.01	28.7 (10933)
Diabetes Mellitus & Chronic Kidney Disease	4.9 (1247)	3.9 (495)	<0.01	0(0)	1.7 (63)	4.3 (437)	5.3 (863)	4.9 (379)	<0.01	4.2 (985)	5.2 (756)	0.7 (1)	<0.01	4.6 (1742)
Diabetes Mellitus & Hypothyroidism	1.1 (273)	3.5 (442)	<0.01	0(0)	1.2 (45)	1.7 (168)	2.1 (346)	2.0 (156)	<0.01	1.3 (302)	2.8 (412)	0.7 (1)	<0.01	1.9 (715)
Diabetes Mellitus & Obesity	0.4 (110)	1.0 (124)	<0.01	0(0)	1.3 (47)	0.8 (77)	0.5 (81)	0.4 (29)	<0.01	0.5 (122)	0.8 (112)	0(0)	0.01	0.6 (234)
Diabetes Mellitus & Hypertension & Coronary Artery Disease	6.5 (1640)	4.7 (592)	<0.01	0(0)	0.7 (26)	3.3 (340)	6.9 (1123)	9.5 (743)	<0.01	4.7 (1096)	7.8 (1134)	1.4 (2)	<0.01	5.9 (2232)

* 12 records had comorbidities with the comorbodity not being mentioned

Presented symptoms in deceased Covid-19 patients:

Among 31,270 deaths where the presence or absence of presenting symptoms of COVID-19 patients were reported, breathing difficulty was the most common symptom, present in 77.5% of the patients (77.3% of men, 77.7% of women).

Fever was reported in 75.6% (75.8% of men, 75.0% of women), and 68.4% had a cough (68.8% of men, 67.5% of women).

Additionally, 44.7% had fever, cough, and breathing difficulty together (45.0% of men, 44.2% of women), with statistically significant differences for fever being higher in men and breathing difficulty being higher in women.

Generalized weakness/myalgia/tiredness, diarrhoea, and sore throat were reported by 4.3%, 1.7%, and 1.0% of the patients, respectively, with women reporting significantly higher rates of diarrhoea than men (p < 0.001). Fever, cough, and breathing difficulty were significantly higher among the age group 15-44 years (p < 0.001). Diarrhoea and generalized weakness/myalgia/tiredness were significantly higher among the elderly age group 75 years and above (p < 0.001 and p = 0.04, respectively).

Fever, cough, diarrhoea, and generalized weakness/myalgia/tiredness were reported to be significantly higher among those who died in private institutions (p < 0.001), while breathing difficulty and the combination of fever, cough, and breathing difficulty were reported to be significantly higher among those who died in government institutions (p < 0.001). (Table-3).

Table 4: Age, gender and hospital specific presenting symptoms in deceased Covid-19 patients, Tamil Nadu 2020- 2024

Presenting Symptom	Gender			Age Group						Place of death				Total (n=31270) %(n)
	Male (n=20647) %(n)	Female (n=10623) %(n)	p value	0-14 years (n=14) %(n)	15-44 years (n=3067) %(n)	45-59 years (n=8275) %(n)	60-74 years (n=13423) %(n)	75 years &above (n=6491) %(n)	p value	Government Institution (n=17501) %(n)	Private Institution (n=13758) %(n)	Home Death (n=11) %(n)	p value	
Fever	75.8 (15658)	75.0 (7972)	0.04	57.1 (8)	79.0 (2424)	76.6 (6335)	75.3 (10108)	73.3 (4755)	<0.01	73.3 (12829)	78.4 (10792)	81.8 (9)	< 0.001	75.6 (23630)
Cough	68.8 (14200)	67.5 (7175)	0.3	35.7 (5)	73.3 (2248)	70.4 (5824)	68.2 (9150)	63.9 (4148)	<0.01	68.3 (11957)	68.4 (9410)	72.7 (8)	< 0.001	68.4 (21375)
Breathing difficulty	77.3 (15968)	77.7 (8259)	<0.01	35.7 (5)	81.0 (2483)	79.9 (6610)	77.5 (10400)	72.9 (4729)	<0.01	83.5 (14615)	69.8 (9607)	45.5 (5)	< 0.001	77.5 (24227)
Diarrohea	1.5 (300)	2.1 (221)	<0.01	0 (0)	1.1 (33)	1.4 (116)	1.8 (240)	2.0 (132)	<0.01	1.3 (229)	2.1 (292)	0 (0)	< 0.001	1.7 (521)
Myalgia/weakness/ tiredness	4.3 (889)	4.4 (463)	0.47	0 (0)	4.0 (123)	4.0 (335)	4.3 (576)	4.9 (318)	0.04	3.6 (637)	5.2 (715)	0 (0)	< 0.001	4.3 (1352)
Sore throat	1.1 (217)	0.9 (100)	0.49	0 (0)	1.0 (32)	1.1 (89)	1.0 (137)	0.9 (59)	0.89	1.2 (207)	0.8 (110)	0 (0)	0.24	1.0 (317)
Fever, breathing difficulty and cough	45.0 (9281)	44.2 (4691)	0.48	7.1 (1)	51.8 (1590)	47.3 (3912)	44.2 (5927)	39.2 (2542)	<0.01	46.4 (8125)	42.5 (5844)	27.3 (3)	< 0.001	44.7 (13972)

Time intervals between lab testing covid-19 positive and death; admission and death in deceased Covid-19 patients, Tamil Nadu 2020- 2024:

The median time interval between testing COVID-19 positive and death was 5 days (IQR: 2, 9), with significant differences among age groups (p < 0.01). The shortest interval was observed in the 0-14 years age group (2 days, IQR: 1-7), and the longest interval was observed in private institutions (6 days, IQR: 3-10).

The median time interval between admission and death was 4 days (IQR: 2, 8), with significant differences among age groups (p < 0.01). The shortest interval was in the 0-14 years age group (1-5.8 days, IQR). There were also significant differences based on the place of death (p < 0.01), with the longest interval in private institutions (6 days, IQR: 3-10) compared to government institutions (4 days, IQR: 2-7) (Table-4).

Table 4: Age, gender and hospital specific time intervals

Variable	Description	Time interval between lab testing covid 19 positive and Death (n=38086)						Time interval between hospital admission and Death (n=37948)					
		N	Mean	Median	SD	IQR	P Value	N	Mean	Median	SD	IQR	P Value
Age group	0 - 14 years	36	4.3	2	4.8	1 -7		36	4.7	4	4.6	1-5.8	
	15 - 44 years	3743	6.2	5	5.6	2-9		3736	5.7	4	5.1	2-8	
	45 -69 years	10161	6	4	5.5	2- 9	<0.01	10146	5.6	4	5.1	2-8	<0.01
	60 -74 years	16338	5.9	5	5.3	2-9		16299	5.7	4	5	2-8	
	75 years and above	7808	5.6	4	4.9	2-8		7731	5.5	4	4.7	2-8	
Gender	Male	25385	5.9	5	5.3	2-9	0.06	25310	5.7	4	5	2-8	0.02
	Female	12701	5.7	4	5.2	2-8		12638	5.5	4	4.9	2-8	
Place of Death	Government Institution	23445	5.1	4	4.9	1-7		23445	4.8	4	4.4	2-7	
	Private Institution	14503	7.1	6	5.8	3-10	<0.01	14503	7.1	6	5.5	3-10	<0.01
	Home Death	138	3.8	3	4.1	0-6							
Total		38086	5.9	5	5.3	2-9		37948	5.7	4	5	2-8	

DISCUSSION

It is clearly established that COVID-19 exhibits demographic diversity across regions and countries. While many studies from other countries have analysed the characteristics of COVID-19 deaths, there has been no comprehensive study analysing the entire COVID-19 deaths from 2020 to 2024 in Tamil Nadu state. Our study described the demographic and clinical characteristics of deceased COVID-19 patients and estimated the time intervals between the date of lab testing positive to death and admission to death. This might help develop geographically specific public health interventions.

Our study indicated diversity in death rates among gender, age groups, and geography. The death rate increased with age, confirming existing evidence that age is one of the most significant risk factors. The increasing death rate with age may be due to the presence of more comorbidities and decreased immunity among the elderly. [7,8]

Our study reported that almost two-thirds of deaths (66.7%) were among males, which was almost double compared to females (Males - 13.31/100,000 population; Females - 6.64/100,000 population). This higher mortality pattern among males is consistent with another study from Italy (8). Genetics, epigenetics, and inborn errors of immunity may account for the disparity in mortality among men and women with COVID-19.[9]

Geographically, deaths were noted to be high in districts with higher urban coverage. A study showed that mortality was higher among those with comorbidities.[8,9] Comorbidities are major risk factors for COVID-19.[10]

A study noted that 75% of personnel with COVID-19 who were hospitalized had at least one comorbidity, with common comorbidities being hypertension, diabetes, cancer, neurodegenerative diseases, cardiovascular diseases, obesity, and kidney diseases.[11] Another study reported that 399 (25.1%) patients had one comorbidity, and 130 (8.2%) patients had two or more comorbidities.[12] In our study, the presence of comorbidities among the deceased was found to be 79.4%, with 39% having one comorbidity, 26.2%

having two comorbidities, and 14.2% having more than two comorbidities.

The percentage of comorbidities increased with age. Hypertension (16.9%), diabetes (8.2%), cardiovascular diseases (3.7%), and chronic kidney disease (1.3%) were the most common comorbidities in all COVID-19 patients.[12] Another study noted comorbidities such as cardiovascular or cerebrovascular diseases, diabetes, digestive system diseases, and malignant tumors.[13] In our study, the most common comorbidities noted were diabetes (52.3%), followed by hypertension (40.8%) and coronary artery diseases (11.4%). Other specific comorbidities noted were chronic kidney disease and hypothyroidism, especially among women. Significant comorbidity combinations included diabetes associated with hypertension, chronic kidney disease, obesity, and hypothyroidism.

Comorbidities in the younger age group were higher compared to the subsequent age group. The most common symptoms noted were fever, fatigue, and dry cough.[12,13,14,15]. A meta-analysis showed fever as the most common symptom, followed by dry cough and fatigue.[16] In our study, the most common symptoms noted were breathing difficulty (77.5%), fever (75.6%), and cough (68.4%), with these three symptoms altogether noted in 44.7% of patients who died due to COVID-19. These symptoms were found to be higher in the age group 15-44 years.

A study conducted on COVID-19 mortality cases from Tamil Nadu from March to April 2020 found the median time interval between hospital admission and death to be 4 days, with a significant difference between patients admitted in private and public hospitals.[17] In our study, the same median time interval between hospital admission and death was 4 days, with a significant difference; a higher difference of 6 days median time interval was noted among private institutions. In other countries, the median time interval was higher with a wide range of time intervals.[18-21]

The time interval between testing positive for COVID-19 and death had a median time interval of 5 days, with a significant difference between COVID-19 deaths occurring in government institutions and private institutions. The median time interval between testing positive and death was very short among the age group 0-14 years.

CONCLUSION

The COVID-19 death rate is highest among the elderly age group, male gender, and people living in districts with higher urban coverage. Comorbidities are seen in most patients, varying across age groups, with a higher prevalence in the elderly (75 years and above) and a notable percentage in the 0-14 years age group. Breathlessness, fever, and cough were the most common symptoms found in the 15-44 years age group. There was no significant difference in the median time interval between hospital admission and death across age groups and gender, except for the place of admission, where the interval was higher in private institutions compared to government institutions. The time interval between testing positive for COVID-19 and death was shorter among the 0-14 years age group and higher in private institutions.

LIMITATIONS

The data of presence or absence of comorbidities was not available for few records. Without complete data, the analysis might not fully represent the population and the missing information might systematically differ from the recorded data. The absence of data reduces the sample size, which can decrease the statistical power of the study. This makes it harder to detect significant differences or associations, especially in subgroup analyses.

CONFLICT OF INTEREST

None

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