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MORTALITY TRENDS OF GENDER AND AGE SPECIFIC GROUPS IN DISTRICTS OF TAMIL NADU 2018-2022

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Abstract

INTRODUCTION : Mortality statistics provide valuable insights for assessing community health status. The mortality of Tamil Nadu was studied and it was noted that there is higher mortality in males compared to female and mortality is higher in 60 + age group for the year 2019- 2022. (3) This study is done to describe the mortality trends noted by districts, age and gender in Tamil Nadu from 2018-2022.

OBJECTIVES : The objective is to analyse whether there is any difference by describing the mortality trends among different age groups, genders in the districts of Tamil Nadu by age groups and gender for the years 2018-2022

METHODOLOGY : The study design was a cross sectional retrospective study of the mortality in Tamil Nadu State for the period 1st January 2018 -31st December 2022. The study population taken for this study is all registered deaths in Civil Registration System (CRS) of Tamil Nadu. We included all deaths reported in Civil Registration System during the 2018-2022.

RESULTS : Overall there was an increase in male mortality of Vellore district in 2022 while comparing to other districts with 2021. In less than 1 years age group crude mortality rate is still in increasing trend except 8 districts in 2022. In the age group 1 to 4 years the overall mortality rate is decreasing only in 4 districts while increasing in other districts. Female mortality is high in 12 districts in the age 1 to 4 years group while compared to male mortality in 2022. It was noted that from age group 15 years and above the male mortality is higher compared to female in all districts. There is higher mortality in the age group 55 years and above and the mortality difference between both genders has reduced in 2022 since 2018.

CONCLUSION : The mortality rates have started to decrease in all the districts of Tamil Nadu in 2022 except Vellore. Male mortality is higher in age group 15 years and above in all districts. Female mortality is high in 12 districts in age group 1 to 4 years. There is diversity in mortality within districts when compared with age and gender.

KEYWORDS : Tamil Nadu, Mortality, Age group, Gender

INTRODUCTION

Mortality statistics provide valuable insights for assessing community health status. It helps to understand the health status of the population and its differentials among the different population sub groups.[1] Mortality statistics is used to formulate health plans and policies. The data of mortality for different age groups and gender is an important cornerstone for public policy action. [2] The mortality data is taken from Civil Registration System (CRS). The CRS in India began in the middle of 19th century which enables the continuous and permanent recording of births and deaths under a statutory regime. The registration of birth and death was unified and made compulsory in 1969 through an act known as Registration of Birth and Death Act.[3] In Tamil Nadu the CRS is digitized since 2018. The data is collected in manual forms and then digitized in an online portal by the birth and death registrars. The mortality data from CRS is compiled in the state through State Bureau of Health Intelligence (SBHI) section under Directorate of Public Health and Preventive Medicine. The mortality data of Tamil Nadu from CRS was studied and it was noted that there is higher mortality in males compared to female and mortality is higher in 60 + age group for the year 2019- 2022.[4] The mortality data is to be compared geographically by districts to learn whether there is difference in mortality by age group and gender to identify issues and create geographic specific health plans. The study is done to describe the mortality trends noted by districts, age and gender in Tamil Nadu from 2018-2022. Analysing the mortality trends by age groups, gender and district may give valuable insights for public health interventions. This approach may help to decide the requirement of services at the right place and for the right group of population.

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OBJECTIVES

The objective is to analyse whether there is any difference by describing the mortality trends among different age groups, genders in the districts of Tamil Nadu by age groups and gender for the years 2018-2022.

METHODOLOGY

The study design was a cross sectional retrospective study of the mortality in Tamil Nadu State for the period 1st January 2018 - 31st December 2022. The study population taken for this study is all registered deaths in Civil Registration System (CRS) of Tamil Nadu. We included all deaths reported in Civil Registration System during the years 2018-2022.

Operational Definitions :

We defined gender specific crude mortality rate as deaths during data period (2018-2022) due to all causes of the particular gender divided by enumerated population of the same gender multiplied by 1000 (5)

We defined age group specific crude mortality rate as deaths during data period (2018-2022) due to all causes of the particular age group by total enumerated population of the same age multiplied by 1000 (5)

SAMPLE SIZE :

We considered all deaths from the year 2018 to 2022 reported in CRS software and were taken for the study.

INCLUSION CRITERIA :

The deaths which had their residence as Tamil Nadu State were taken for the study.

EXCLUSION CRITERIA :

The deaths which were not a resident of Tamil Nadu and not properly mapped to any of the districts of Tamil Nadu were not taken for the study.

DATA COLLECTION PROCEDURE :

We collected the mortality data for the deaths registered in the year 2018 to 2022 by place of residence from CRS software from State Bureau of Health intelligence & population data maintained at statistical division of Public Health Department as enumerated from Census 2011. The enumerated population for age and gender was calculated using the data from the report of the technical group on population projections. All data collected and compiled using excel sheets.

DATA ANALYSIS :

We calculated gender specific mortality, Age group wise mortality & district wise mortality using proportions for each category of mortality. We used Excel Software for analysis.

HUMAN SUBJECT PROTECTION :

The study got approved by Institutional Ethics Committee of Tamil Nadu Public Health department; the privacy and confidentiality was maintained in such a way that no personal data was used or revealed during analysis or report preparation & presentation.

RESULTS

The gender specific Crude mortality rate is gradually increasing from the year 2018 and significantly peaking for all the districts for both male and female gender in the year 2021 and gradually decreasing in the year 2022. Among the 5 years the gender specific Crude mortality rate of males in Virudhunagar (28.9) is the highest in 2021 and among females it is highest in Kancheepuram (11.6) in 2022. When comparing among districts, all districts had higher male mortality and the mortality was decreased in 2022 compared to 2021 except Vellore where the male mortality is increasing. The gender specific Crude mortality rate among males and females is significantly higher in 2022 compared to 2018 in Kancheepuram. When comparing the gender specific Crude mortality rate of male and female mortality within the districts the difference is highest in Virudhunagar in 2021 and 2020 (Table 1).

Table 1: Crude mortality rate in districts of Tamil Nadu by Gender 2018- 2022

District	Male					Female					All deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	10.3	11.4	11.9	14.7	11.7	6.6	7.4	8.1	10.1	8.1	8.5	9.4	10.0	12.4	9.9
Chengalpattu	7.5	9.8	11.0	14.0	8.9	5.2	6.5	7.6	9.8	6.4	6.4	8.1	9.3	11.9	7.6
Kancheepuram					16.5					11.6					14.0
Chennai	4.1	8.4	9.8	12.0	8.3	2.8	6.1	7.0	9.0	6.3	3.4	7.2	8.4	10.5	7.3
Coimbatore	10.7	10.8	11.5	15.0	11.9	6.8	7.1	7.5	10.2	8.2	8.8	8.9	9.5	12.6	10.1
Cuddalore	8.2	8.4	9.6	11.9	9.6	5.0	5.4	6.4	8.3	6.7	6.6	6.9	8.0	10.1	8.1
Dharmapuri	7.4	8.9	8.8	11.7	9.5	4.8	5.6	5.9	8.2	6.3	6.1	7.3	7.3	9.9	7.9
Dindigul	10.1	11.1	11.4	14.6	11.0	6.7	7.7	7.9	10.1	7.9	8.4	9.4	9.6	12.4	9.4
Erode	10.6	11.4	11.7	15.1	12.4	7.1	7.6	8.0	10.3	8.7	8.8	9.5	9.8	12.7	10.5
Villupuram	8.6	9.2	9.6	11.6	9.1	5.4	5.9	6.3	8.0	6.1	7.0	7.6	8.0	9.8	7.6
Kallakurichi					9.1					5.8					7.5
Kanniyakumari	8.9	9.2	10.0	11.4	10.0	6.7	6.8	7.5	9.1	8.0	7.8	8.0	8.7	10.3	9.0
Karur	10.4	10.9	11.3	14.1	11.4	7.4	7.8	8.1	10.5	8.6	8.9	9.3	9.7	12.3	10.0
Krishnagiri	8.1	8.6	9.3	12.0	9.3	4.9	5.4	6.0	7.9	6.3	6.5	7.0	7.7	9.9	7.8
Madurai	9.2	10.1	11.4	13.7	10.7	6.3	6.9	7.5	9.7	7.7	7.7	8.5	9.5	11.7	9.2
Mayiladuthurai	7.4	9.0	10.2	12.5	10.1	4.6	5.9	6.8	9.1	7.6	6.0	7.5	8.5	10.8	8.9
Nagapattinam					10.9					7.5					9.2
Namakkal	9.8	10.5	10.9	13.6	11.1	6.8	7.5	7.8	10.1	8.0	8.3	9.0	9.4	11.9	9.5
Perambalur	10.2	11.2	12.4	15.3	11.4	7.0	8.0	8.2	10.4	8.1	8.6	9.6	10.3	12.8	9.8
Pudukottai	9.1	10.5	11.2	14.0	11.3	5.6	6.6	6.8	8.9	7.2	7.4	8.6	9.0	11.4	9.3
Ramanathapuram	8.4	9.7	10.8	13.1	10.8	5.4	6.4	6.8	8.9	7.0	6.9	8.1	8.8	11.0	8.9
Salem	8.4	9.6	10.4	14.3	10.4	5.5	6.4	6.8	9.8	7.2	7.0	8.0	8.6	12.0	8.8
Sivaganga	9.1	11.5	11.9	14.9	12.1	5.8	7.7	8.1	10.3	8.4	7.5	9.6	10.0	12.6	10.3
Tirunelveli	9.9	10.6	11.1	12.9	11.1	7.5	8.1	8.6	10.0	8.7	8.7	9.4	9.9	11.4	9.9
Tenkasi					11.2					8.9					10.0
Thanjavur	9.5	10.4	11.1	13.5	11.0	6.1	6.8	7.4	9.7	8.0	7.8	8.6	9.3	11.6	9.5
The Nilgris	7.2	8.7	9.1	10.6	9.5	4.7	5.7	6.4	7.7	6.8	6.0	7.2	7.7	9.1	8.1
Theni	10.3	10.5	11.8	13.9	11.3	6.8	7.0	8.0	9.7	7.9	8.6	8.7	9.9	11.8	9.6
Thiruvallur	8.1	10.6	11.0	13.3	11.1	5.5	7.3	7.6	9.6	8.0	6.8	8.9	9.3	11.4	9.5
Thiruvarur	10.6	10.2	10.7	13.8	11.0	6.8	7.0	7.3	9.6	7.5	8.7	8.6	9.0	11.7	9.3
Thoothukudi	9.3	10.2	10.8	13.1	10.4	6.9	7.8	7.9	9.8	7.6	8.1	9.0	9.4	11.5	9.0
Tiruchirapalli	9.3	10.4	11.2	13.4	10.5	6.6	7.4	7.8	10.0	7.8	8.0	8.9	9.5	11.7	9.2
Tiruppur	10.0	10.2	10.8	14.1	11.4	6.2	6.6	7.1	9.3	7.5	8.1	8.4	9.0	11.7	9.5
Tiruvannamalai	8.9	10.0	10.5	13.0	10.5	6.2	7.0	7.3	9.4	7.4	7.5	8.5	8.9	11.2	9.0
Vellore	7.6	9.0	8.9	5.5	10.1	5.3	6.4	7.0	9.6	7.4	6.5	7.7	8.0	7.6	8.8
Ranipet					9.8					7.5					8.6
Tirupathur					9.5					7.0					8.3
Virudhunagar	10.1	11.5	14.0	28.9	12.0	6.9	8.1	8.5	10.2	8.8	8.5	9.8	11.2	19.6	10.4
Tamil Nadu	9.0	10.1	10.8	13.6	10.7	6.0	6.9	7.4	9.5	7.6	7.5	8.5	9.1	11.5	9.2

Table 2 : Crude mortality rate in districts of Tamil Nadu by Age group less than 1 year and by gender 2018- 2022

District	Age Group <1 year														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	12	16	10	15	15	14.0	14.3	11.2	14.1	11.8	12.8	15.3	10.6	14.4	13.7
Chengalpattu	6	9	9	10	8	5.3	8.2	7.1	7.3	6.2	5.8	8.5	8.1	8.8	7.2
Kancheepuram					22					15.8					19.0
Chennai	7	13	13	10	12	5.3	11.3	11.1	8.7	9.4	6.1	12.3	12.2	9.2	10.6
Coimbatore	8	8	7	10	10	6.6	5.8	5.2	5.3	6.0	7.4	7.1	6.3	7.6	7.9
Cuddalore	7	8	7	8	10	5.0	5.9	6.0	7.7	7.5	6.1	6.9	6.4	8.1	8.8
Dharmapuri	16	18	16	22	18	12.6	16.7	15.5	14.5	14.1	14.4	17.5	16.0	18.2	15.9
Dindigul	12	11	10	13	12	8.5	9.2	8.9	9.8	11.2	10.2	10.2	9.6	11.4	11.7
Erode	6	7	6	8	6	4.2	5.8	3.7	4.3	5.4	5.3	6.2	5.0	6.2	6.0
Villupuram	6	9	10	11	8	6.2	6.5	6.6	8.7	6.5	6.3	8.1	8.2	9.8	7.1
Kallakurichi					16					9.9					13.1
Kanniyakumari	4	4	5	5	5	4.1	3.3	3.9	3.3	3.9	4.3	3.9	4.3	3.9	4.5
Karur	9	13	10	16	17	6.6	8.0	7.8	10.3	10.1	7.7	10.5	8.9	13.1	13.6
Krishnagiri	11	13	14	16	15	7.6	12.5	10.5	10.8	11.1	9.4	12.6	12.1	13.3	13.2
Madurai	12	13	12	15	16	10.0	11.6	9.1	12.0	13.6	11.2	12.2	10.9	13.5	14.8
Mayiladuthurai	9	9	8	10	11	7.8	8.3	5.8	7.9	10.1	8.2	8.5	6.9	8.7	10.6
Nagapattinam					15					9.2					12.4
Namakkal	7	7	7	9	10	6.7	7.0	5.5	7.9	8.0	6.9	7.3	6.2	8.3	9.0
Perambalur	7	15	11	14	14	9.7	12.0	7.3	9.8	10.0	8.3	13.4	9.5	12.1	12.2
Pudukottai	13	14	15	14	13	8.9	10.9	11.3	10.4	9.6	10.9	12.5	13.4	12.4	11.6
Ramanathapuram	10	11	8	10	11	9.9	8.9	7.9	5.7	10.0	9.9	9.9	7.9	7.7	10.4
Salem	10	12	11	14	14	8.5	11.1	8.0	10.0	10.8	9.3	11.8	9.7	11.9	12.3
Sivaganga	10	11	9	11	12	9.4	8.2	7.7	6.7	12.1	9.5	9.9	8.4	8.8	11.9
Tirunelveli	11	10	10	12	14	10.6	7.1	8.7	8.9	7.6	10.8	8.9	9.2	10.3	10.8
Tenkasi					14					9.6					12.0
Thanjavur	11	13	12	17	17	10.1	9.5	9.8	13.6	14.5	10.4	11.3	11.0	15.3	15.8
The Nilgris	6	6	8	10	6	3.4	4.4	7.3	3.4	4.3	4.5	5.1	7.6	7.1	5.1
Theni	17	14	13	12	12	12.4	11.3	8.4	13.2	10.7	14.7	12.5	11.1	12.8	11.5
Thiruvallur	4	8	5	10	11	4.4	7.1	6.2	7.8	9.8	4.4	7.5	5.7	9.1	10.2
Thiruvarur	12	12	10	13	19	8.5	11.3	9.7	9.5	12.3	10.2	11.5	10.1	11.3	15.6
Thoothukudi	11	11	9	11	13	9.2	8.9	8.2	7.3	7.8	10.0	9.9	8.8	9.2	10.3
Tiruchirapalli	10	12	10	13	12	8.8	8.5	8.2	9.4	9.9	9.3	10.4	9.3	11.1	11.2
Tiruppur	7	9	7	9	10	6.1	6.8	5.5	4.7	6.2	6.4	7.8	6.1	7.0	8.0
Tiruvannamalai	9	14	13	16	15	7.7	11.0	8.3	11.2	9.9	8.2	12.5	10.6	13.5	12.4
Vellore	12	14	14	14	17	8.4	10.3	11.3	11.4	11.9	10.1	12.4	12.6	12.7	14.4
Ranipet					16					10.7					13.4
Tirupathur					14					13.4					13.9
Virudhunagar	11	11	10	12	12	9.2	9.0	8.6	8.3	10.2	10.1	10.1	9.2	10.3	11.3
Tamil Nadu	**9**	**11**	**10**	**12**	**13**	**8**	**9**	**8**	**9**	**10**	**9**	**10**	**9**	**11**	**11**

Table 3: Crude mortality rate in districts of Tamil Nadu by Age group 1- 4 years and by gender 2018- 2022

District	Age group : 1 to 4 years														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	0.6	0.5	0.3	0.7	0.5	0.4	0.2	0.2	0.6	0.6	0.5	0.4	0.2	0.7	0.6
Chengalpattu	0.4	0.4	0.3	0.5	0.4	0.4	0.4	0.3	0.5	0.3	0.4	0.4	0.3	0.5	0.3
Kancheepuram					1.0					1.0					1.0
Chennai	0.2	0.6	0.5	0.5	0.5	0.3	0.5	0.4	0.4	0.4	0.3	0.6	0.4	0.4	0.4
Coimbatore	0.3	0.3	0.2	0.4	0.4	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.2	0.4	0.4
Cuddalore	0.5	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.3
Dharmapuri	0.5	0.7	0.3	0.5	0.5	0.4	0.5	0.2	0.4	0.6	0.5	0.6	0.3	0.5	0.6
Dindigul	0.5	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.4	0.6	0.4	0.4	0.3	0.4	0.5
Erode	0.3	0.4	0.1	0.1	0.4	0.3	0.2	0.2	0.1	0.3	0.3	0.3	0.2	0.1	0.3
Villupuram	0.3	0.4	0.3	0.6	0.6	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.4
Kallakurichi					0.6					0.4					0.5
Kanniyakumari	0.3	0.2	0.1	0.2	0.3	0.3	0.1	0.1	0.3	0.3	0.3	0.2	0.1	0.2	0.3
Karur	0.5	0.5	0.3	0.8	0.6	0.2	0.3	0.2	0.5	0.5	0.4	0.4	0.3	0.6	0.5
Krishnagiri	0.4	0.7	0.6	0.5	0.6	0.5	0.5	0.3	0.4	0.6	0.4	0.6	0.4	0.5	0.6
Madurai	0.5	0.4	0.5	0.4	0.6	0.4	0.4	0.3	0.5	0.4	0.4	0.4	0.4	0.5	0.5
Mayiladuthurai	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
Nagapattinam					0.7					0.3					0.5
Namakkal	0.2	0.4	0.2	0.3	0.5	0.3	0.1	0.2	0.3	0.4	0.2	0.3	0.2	0.3	0.4
Perambalur	0.5	0.5	0.6	0.6	1.3	0.3	0.6	0.7	0.5	0.5	0.4	0.5	0.6	0.5	0.9
Pudukottai	0.5	0.7	0.4	0.5	0.5	0.5	0.6	0.4	0.5	0.5	0.5	0.7	0.4	0.5	0.5
Ramanathapuram	0.5	0.3	0.6	0.4	0.5	0.4	0.5	0.3	0.4	0.6	0.4	0.4	0.4	0.4	0.5
Salem	0.5	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.5	0.4	0.3	0.4	0.4	0.5
Sivaganga	0.5	0.3	0.5	0.4	0.4	0.5	0.6	0.2	0.6	0.4	0.5	0.4	0.3	0.5	0.4
Tirunelveli	0.5	0.5	0.4	0.5	0.6	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.5	0.5
Tenkasi					0.4					0.4					0.4
Thanjavur	0.4	0.5	0.4	0.6	0.4	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.6	0.5
The Nilgris	0.1	0.4	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.3	0.1	0.2	0.2
Theni	0.6	0.4	0.1	0.5	0.4	0.5	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.5	0.4
Thiruvallur	0.3	0.7	0.3	0.3	0.4	0.3	0.6	0.2	0.3	0.3	0.3	0.6	0.3	0.3	0.3
Thiruvarur	0.2	0.5	0.5	0.5	0.5	0.4	0.2	0.3	0.4	0.5	0.3	0.3	0.4	0.4	0.5
Thoothukudi	0.4	0.4	0.3	0.5	0.3	0.5	0.4	0.3	0.5	0.4	0.5	0.4	0.3	0.5	0.3
Tiruchirapalli	0.3	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.4	0.5	0.3	0.5	0.4
Tiruppur	0.3	0.5	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.4	0.3
Tiruvannamalai	0.6	0.6	0.6	0.6	0.7	0.4	0.6	0.4	0.6	0.6	0.5	0.6	0.5	0.6	0.6
Vellore	0.6	0.6	0.3	0.7	0.5	0.5	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.6	0.6
Ranipet					0.4					0.6					0.5
Tirupathur					0.7					0.9					0.8
Virudhunagar	0.4	0.4	0.2	0.4	0.4	0.2	0.3	0.4	0.4	0.6	0.3	0.4	0.3	0.4	0.5
Tamil Nadu	**0.4**	**0.5**	**0.3**	**0.5**	**0.5**	**0.3**	**0.4**	**0.3**	**0.4**	**0.5**	**0.4**	**0.4**	**0.3**	**0.4**	**0.5**

Age group less than 5 years:

The age group specific Crude mortality rate in this age group is gradually increasing from the year 2018 and significantly peaking for all the districts in the year 2021 and mortality rate is increasing further in 2022 for age group less than 1 year in districts except Ariyalur, Chengalpattu, Dharmapuri, Erode, Villupuram, Krishnagiri, Pudukottai, The Nilgris, Theni & Tiruvannamalai while compared to 2021. In the age group less than 1 year while comparing with gender within the districts it was noted that the male mortality is higher in all districts (except Sivaganga), while compared with female mortality in 2022. In age group 1 to 4 years Higher male mortality in 2022 is noted when comparing with 2018. Female mortality is high in 12 districts(Ariyalur, Dharmapuri, Dindigul, Ramanathapuram, Thanjavur, Nilgris, The Theni, Thoothukudi, Vellore, Ranipet, Tirupathur and Virudhunagar) in this age group while compared to male mortality in 2022. (Table 2 & 3).

Table 4 : Crude mortality rate in districts of Tamil Nadu by Age group 5- 14 years and by gender 2018- 2022

District	Age group 5 to 14 years														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	0.4	0.5	0.3	0.4	0.5	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.3	0.4	0.5
Chengalpattu	0.3	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.2
Kancheepuram					0.6					0.6					0.6
Chennai	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.3
Coimbatore	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3
Cuddalore	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Dharmapuri	0.3	0.4	0.3	0.4	0.3	0.2	0.4	0.2	0.5	0.2	0.3	0.4	0.2	0.4	0.3
Dindigul	0.4	0.5	0.4	0.4	0.3	0.3	0.4	0.2	0.3	0.3	0.4	0.4	0.3	0.4	0.3
Erode	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3
Villupuram	0.5	0.4	0.3	0.5	0.3	0.2	0.3	0.3	0.4	0.2	0.4	0.4	0.3	0.4	0.3
Kallakurichi					0.4					0.3					0.3
Kanniyakumari	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Karur	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.4	0.3	0.2	0.2	0.3	0.3	0.3
Krishnagiri	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4
Madurai	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4
Mayiladuthurai	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.4	0.3	0.3	0.3	0.2	0.3	0.3
Nagapattinam					0.5					0.3					0.4
Namakkal	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3
Perambalur	0.7	0.4	0.4	0.7	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.4	0.3	0.5	0.4
Pudukottai	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3
Ramanathapuram	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3
Salem	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.4	0.2	0.3	0.3	0.3	0.4	0.2
Sivaganga	0.3	0.3	0.3	0.5	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3
Tirunelveli	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3
Tenkasi					0.5					0.3					0.4
Thanjavur	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3
The Nilgris	0.3	0.3	0.1	0.3	0.2	0.1	0.3	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2
Theni	0.4	0.5	0.3	0.5	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.4
Thiruvallur	0.3	0.4	0.3	0.4	0.4	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.4
Thiruvarur	0.4	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.4	0.2	0.3	0.2	0.2	0.3	0.3
Thoothukudi	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3
Tiruchirapalli	0.4	0.4	0.3	0.4	0.4	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Tiruppur	0.3	0.3	0.2	0.3	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3
Tiruvannamalai	0.5	0.5	0.4	0.6	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.4
Vellore	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4
Ranipet					0.3					0.4					0.4
Tirupathur					0.4					0.4					0.4
Virudhunagar	0.3	0.5	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4
Tamil Nadu	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**

Age group 5 to 44 years:

The age group specific Crude mortality rate is almost static from the year 2018 with slight increase and decrease in all the districts with no significantly peaking for all the districts in the year 2021. In this age group overall mortality is increasing in districts (5-14 years – 15 districts, 15-24 years- 28 districts, 25-34 years- 29 districts, 35-44 years – 32 districts) as age group increases. The male mortality is increased (5-14 years – 14 districts, 15-24 years- 34 districts, 25-34 years- 35 districts, 35-44 years – 34 districts) and female mortality is increased (5-14 years – 17 districts, 15-24 years- 20 districts, 25-34 years- 19 districts, 35-44 years

– 23 districts) in 2022 when compared within gender in 2018 . In this age group while comparing with gender within the districts it was noted the male mortality is higher while compared to female mortality (Table 4, 5, 6 & 7).

Table 5 : Crude mortality rate in districts of Tamil Nadu by Age group 15- 24 years and by gender 2018- 2022

District	Age group 15 to 24 years														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	1.8	1.9	1.6	1.7	1.9	1.5	1.5	1.2	1.3	1.2	1.6	1.7	1.4	1.5	1.5
Chengalpattu	1.2	1.7	1.3	1.7	1.4	0.7	0.8	0.8	0.9	0.7	1.0	1.2	1.1	1.3	1.0
Kancheepuram					2.7					1.6					2.1
Chennai	0.7	1.3	1.0	1.2	1.1	0.4	0.7	0.6	0.7	0.5	0.6	1.0	0.8	0.9	0.8
Coimbatore	1.4	1.5	1.2	1.4	1.6	0.6	0.7	0.6	0.7	0.7	1.0	1.1	0.9	1.0	1.1
Cuddalore	1.3	1.4	1.2	1.4	1.4	0.8	0.9	0.9	0.9	0.9	1.1	1.1	1.0	1.2	1.1
Dharmapuri	1.4	1.4	1.4	1.7	1.8	0.8	0.9	0.9	1.1	0.9	1.1	1.1	1.2	1.4	1.4
Dindigul	1.5	1.6	1.3	1.7	1.7	0.7	1.0	0.9	1.0	0.8	1.1	1.3	1.1	1.4	1.2
Erode	1.2	1.4	1.2	1.2	1.4	0.5	0.7	0.7	0.8	0.7	0.9	1.1	1.0	1.0	1.0
Villupuram	1.2	1.3	1.2	1.4	1.4	0.9	0.9	0.9	0.9	0.8	1.1	1.1	1.0	1.2	1.1
Kallakurichi					1.4					1.1					1.3
Kanniyakumari	1.3	1.2	0.8	1.0	1.0	0.4	0.4	0.3	0.4	0.4	0.9	0.8	0.6	0.7	0.7
Karur	1.3	1.4	1.2	1.5	1.5	0.9	0.8	0.7	0.8	0.8	1.1	1.1	1.0	1.2	1.2
Krishnagiri	1.5	1.6	1.7	1.9	2.1	1.1	0.9	1.0	1.1	1.0	1.3	1.3	1.3	1.5	1.5
Madurai	1.5	1.4	1.3	1.8	1.6	0.8	0.9	0.8	1.1	1.0	1.2	1.2	1.1	1.4	1.3
Mayiladuthurai	1.2	1.2	1.2	1.4	1.5	0.7	0.9	0.8	1.0	0.8	0.9	1.1	1.0	1.2	1.2
Nagapattinam					1.7					0.7					1.2
Namakkal	1.1	1.2	1.1	1.5	1.5	0.6	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.2	1.2
Perambalur	1.4	1.6	1.8	1.7	1.6	1.6	1.3	1.1	1.3	1.1	1.5	1.5	1.5	1.5	1.4
Pudukottai	1.2	1.5	1.3	1.6	1.7	0.9	1.1	1.0	0.9	0.8	1.0	1.3	1.1	1.3	1.3
Ramanathapuram	1.3	1.4	1.2	1.4	1.6	0.8	0.9	1.1	0.9	0.9	1.1	1.1	1.2	1.2	1.3
Salem	1.2	1.3	1.3	1.4	1.3	0.7	0.8	0.7	0.9	0.7	1.0	1.0	1.0	1.1	1.0
Sivaganga	1.1	1.3	1.2	1.9	1.7	0.9	1.0	0.8	1.0	0.9	1.0	1.2	1.0	1.4	1.3
Tirunelveli	1.2	1.4	1.3	1.6	1.5	0.8	0.8	0.8	0.9	1.1	1.0	1.1	1.0	1.3	1.3
Tenkasi					2.0					1.1					1.5
Thanjavur	1.4	1.5	1.3	1.5	1.7	0.9	1.1	0.9	1.1	1.0	1.1	1.3	1.1	1.3	1.3
The Nilgris	1.0	1.3	1.1	1.0	1.4	0.6	0.7	0.7	0.6	0.6	0.8	1.0	0.9	0.8	1.0
Theni	1.5	1.5	1.5	1.7	1.5	0.8	0.8	0.7	1.1	0.9	1.2	1.2	1.1	1.4	1.2
Thiruvallur	1.4	1.7	1.4	1.7	1.9	0.8	0.9	0.8	1.0	0.9	1.1	1.3	1.1	1.4	1.4
Thiruvarur	1.5	1.3	1.2	1.6	1.7	0.9	1.0	0.9	1.1	0.8	1.2	1.1	1.1	1.4	1.2
Thoothukudi	1.3	1.5	1.3	1.6	1.5	0.8	0.8	0.7	1.0	0.7	1.0	1.2	1.0	1.3	1.1
Tiruchirapalli	1.2	1.5	1.3	1.4	1.5	0.9	1.0	0.9	0.9	0.8	1.1	1.2	1.1	1.2	1.2
Tiruppur	1.4	1.5	1.2	1.4	1.6	0.7	0.7	0.7	0.7	0.7	1.1	1.1	1.0	1.1	1.2
Tiruvannamalai	1.4	1.4	1.3	1.7	1.4	1.0	0.9	0.9	1.2	0.9	1.2	1.2	1.1	1.5	1.2
Vellore	1.2	1.5	1.2	1.5	1.5	0.7	0.9	0.8	1.1	0.7	0.9	1.2	1.0	1.3	1.1
Ranipet					1.2					0.9					1.1
Tirupathur					1.6					1.1					1.4
Virudhunagar	1.4	1.5	1.3	1.7	1.8	0.9	1.1	0.9	1.1	1.2	1.1	1.3	1.1	1.4	1.5
Tamil Nadu	**1.3**	**1.4**	**1.3**	**1.5**	**1.6**	**0.8**	**0.9**	**0.8**	**0.9**	**0.9**	**1.1**	**1.2**	**1.1**	**1.2**	**1.2**

Table 6 : Crude mortality rate in districts of Tamil Nadu by Age group 25- 34 years and by gender 2018- 2022

District	Age group 25 to 34 years														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	3.1	3.0	3.5	3.2	3.4	1.5	1.6	1.4	1.4	1.2	2.3	2.3	2.4	2.3	2.2
Chengalpattu	2.5	2.9	2.7	3.5	2.6	0.8	1.1	1.1	1.3	0.8	1.7	2.0	1.9	2.4	1.7
Kancheepuram					5.1					1.9					3.4
Chennai	1.3	2.4	2.1	2.8	2.1	0.5	0.9	1.0	1.1	0.7	0.9	1.6	1.5	1.9	1.4
Coimbatore	2.6	2.4	2.4	3.0	2.9	1.0	0.8	0.9	1.0	0.9	1.8	1.6	1.6	2.0	1.9
Cuddalore	2.4	2.3	2.2	2.6	2.5	1.0	1.0	0.8	1.0	0.9	1.7	1.6	1.5	1.8	1.7
Dharmapuri	2.0	2.4	2.5	3.0	2.5	1.0	1.1	0.8	1.1	1.0	1.5	1.7	1.6	2.1	1.8
Dindigul	2.4	2.8	2.5	3.1	2.6	1.1	1.1	1.1	1.2	1.0	1.7	1.9	1.8	2.1	1.8
Erode	2.4	2.4	2.1	2.6	2.5	0.9	0.9	0.9	1.0	0.8	1.6	1.7	1.5	1.8	1.7
Villupuram	2.5	2.6	2.5	3.0	2.6	1.1	1.1	1.0	1.1	0.8	1.8	1.8	1.8	2.0	1.7
Kallakurichi					2.6					1.2					1.9
Kanniyakumari	1.9	1.6	1.7	1.7	1.8	0.5	0.5	0.5	0.6	0.5	1.2	1.1	1.1	1.1	1.1
Karur	2.4	2.1	2.1	2.7	2.4	1.0	1.0	0.8	1.1	0.9	1.7	1.5	1.5	1.9	1.6
Krishnagiri	2.5	2.5	2.6	3.6	3.1	0.8	1.2	1.2	1.4	1.1	1.7	1.8	1.9	2.5	2.1
Madurai	2.5	2.9	2.7	3.0	2.6	1.0	1.1	1.0	1.2	1.1	1.8	2.0	1.9	2.1	1.8
Mayiladuthurai	1.8	2.5	2.2	2.8	2.4	0.9	1.1	1.1	1.2	1.0	1.3	1.8	1.7	2.0	1.7
Nagapattinam					3.1					1.2					2.1
Namakkal	2.1	2.4	1.9	2.5	2.5	0.9	0.8	0.8	1.0	1.0	1.5	1.6	1.4	1.7	1.7
Perambalur	2.6	3.0	3.3	3.9	3.2	1.2	1.4	1.3	1.7	1.3	1.9	2.2	2.3	2.7	2.2
Pudukottai	2.1	3.1	2.5	2.9	2.6	1.1	1.0	1.1	1.4	1.0	1.6	2.0	1.8	2.1	1.8
Ramanathapuram	2.2	2.5	2.3	2.9	2.5	0.9	0.9	1.0	1.3	1.0	1.5	1.7	1.6	2.1	1.7
Salem	2.2	2.3	2.2	3.1	2.5	0.9	1.0	0.9	1.2	1.0	1.5	1.6	1.6	2.2	1.7
Sivaganga	2.2	2.5	2.2	2.6	2.7	0.9	1.2	0.9	1.2	1.1	1.6	1.8	1.6	1.9	1.9
Tirunelveli	2.3	2.4	2.5	2.7	2.7	1.1	1.3	1.1	1.3	1.2	1.7	1.8	1.8	2.0	1.9
Tenkasi					2.5					1.3					1.9
Thanjavur	2.6	2.8	2.5	2.7	2.9	1.2	1.1	1.1	1.2	1.1	1.9	1.9	1.8	2.0	2.0
The Nilgris	2.1	2.1	2.3	2.5	2.2	0.9	0.8	0.7	0.8	0.7	1.5	1.4	1.5	1.6	1.5
Theni	3.0	2.9	2.7	3.4	3.2	1.2	1.2	1.3	1.3	1.0	2.1	2.0	2.0	2.4	2.1
Thiruvallur	2.5	3.3	2.8	3.5	3.1	0.9	1.1	1.1	1.2	1.1	1.7	2.2	2.0	2.3	2.1
Thiruvarur	2.4	2.3	2.3	2.9	2.6	1.2	1.2	1.1	1.2	1.2	1.8	1.8	1.7	2.1	1.9
Thoothukudi	2.3	2.6	2.5	3.0	2.5	1.0	1.0	0.9	1.3	0.9	1.6	1.8	1.7	2.1	1.7
Tiruchirapalli	2.4	2.5	2.3	2.6	2.6	1.1	1.1	1.0	1.2	1.0	1.7	1.8	1.6	1.9	1.8
Tiruppur	2.5	2.9	2.4	3.2	2.9	0.8	0.9	0.8	1.2	1.0	1.7	1.9	1.6	2.2	1.9
Tiruvannamalai	2.4	3.0	2.6	3.1	2.6	1.1	1.3	1.2	1.4	1.0	1.7	2.1	1.9	2.2	1.8
Vellore	2.1	2.5	2.3	3.0	2.8	1.0	1.2	1.0	1.3	1.1	1.5	1.9	1.6	2.1	1.9
Ranipet					2.4					1.0					1.7
Tirupathur					2.9					1.2					2.1
Virudhunagar	2.8	3.1	2.9	3.3	3.3	1.0	1.3	1.2	1.5	1.4	1.9	2.2	2.0	2.4	2.3
Tamil Nadu	**2.3**	**2.6**	**2.5**	**3.0**	**2.7**	**1.0**	**1.1**	**1.0**	**1.2**	**1.0**	**1.7**	**1.8**	**1.7**	**2.1**	**1.9**

Table 7 : Crude mortality rate in districts of Tamil Nadu by Age group 35- 44 years and by gender 2018- 2022

District	Age group 35 to 44														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	5.4	6.0	6.1	6.7	6.4	2.0	2.3	2.0	2.7	2.2	3.7	4.1	4.0	4.7	4.2
Chengalpattu	4.1	5.6	5.5	7.2	4.6	1.4	2.0	2.1	2.8	1.6	2.7	3.7	3.8	4.9	3.1
Kancheepuram					9.1					3.4					6.2
Chennai	2.3	4.8	4.7	6.2	4.3	0.8	1.7	1.9	2.5	1.5	1.5	3.2	3.3	4.3	2.8
Coimbatore	5.4	5.4	5.5	6.5	5.6	1.9	1.8	1.7	2.4	1.8	3.6	3.6	3.6	4.4	3.7
Cuddalore	4.6	4.6	4.7	5.7	4.9	1.6	1.8	1.9	2.3	1.9	3.1	3.2	3.3	4.0	3.4
Dharmapuri	3.5	4.8	4.1	5.7	4.5	1.6	1.6	1.6	2.4	1.7	2.6	3.2	2.8	4.0	3.0
Dindigul	5.2	5.9	5.3	6.7	5.2	2.0	2.5	2.2	2.6	1.9	3.6	4.2	3.7	4.6	3.5
Erode	5.3	5.3	5.3	6.5	5.5	1.7	1.9	1.7	2.4	1.9	3.5	3.6	3.5	4.4	3.6
Villupuram	4.5	5.0	5.1	5.9	4.9	1.7	1.7	1.6	2.1	1.4	3.1	3.3	3.3	3.9	3.1
Kallakurichi					4.8					1.7					3.2
Kanniyakumari	3.3	3.6	3.7	3.9	3.5	1.1	1.2	1.1	1.5	1.0	2.2	2.3	2.4	2.7	2.2
Karur	4.8	4.6	4.6	6.0	4.3	2.1	2.1	1.8	2.2	1.8	3.4	3.3	3.1	4.0	3.0
Krishnagiri	4.3	5.3	5.3	7.0	5.5	1.5	1.8	1.9	2.6	2.1	2.9	3.5	3.6	4.8	3.8
Madurai	4.8	5.5	5.6	6.5	5.6	2.0	2.3	2.1	2.7	2.0	3.4	3.9	3.8	4.6	3.8
Mayiladuthurai	3.8	5.0	4.9	5.3	4.6	1.5	2.1	2.0	2.3	2.1	2.6	3.5	3.4	3.8	3.3
Nagapattinam					5.5					1.9					3.7
Namakkal	4.3	4.5	4.5	5.1	4.6	1.7	1.9	1.7	2.1	1.4	2.9	3.2	3.1	3.6	3.0
Perambalur	5.5	6.2	6.2	6.6	6.0	1.9	2.7	2.0	2.7	2.2	3.7	4.4	4.1	4.6	4.0
Pudukottai	4.6	5.4	5.5	6.4	5.5	1.7	2.0	1.9	2.2	1.8	3.2	3.7	3.6	4.2	3.6
Ramanathapuram	4.1	4.6	4.4	5.7	5.1	1.5	2.0	1.6	2.3	1.8	2.8	3.3	3.0	3.9	3.4
Salem	4.3	4.5	4.7	6.7	4.7	1.7	1.8	1.9	2.7	1.7	2.9	3.1	3.2	4.6	3.2
Sivaganga	4.3	5.2	4.9	5.9	5.3	1.4	2.0	1.9	2.3	1.7	2.9	3.5	3.3	4.0	3.5
Tirunelveli	4.3	4.9	4.8	5.7	5.2	2.1	2.2	2.2	2.4	2.0	3.1	3.5	3.5	4.0	3.5
Tenkasi					5.1					2.3					3.7
Thanjavur	5.2	5.5	4.9	5.9	5.2	1.8	2.0	2.2	2.5	2.1	3.4	3.7	3.5	4.2	3.6
The Nilgris	4.5	4.8	4.8	5.2	5.8	1.2	1.5	1.6	1.8	1.6	2.8	3.1	3.2	3.4	3.7
Theni	5.5	5.6	5.8	7.1	6.1	2.3	2.2	2.5	3.0	2.3	3.8	3.9	4.1	5.0	4.1
Thiruvallur	4.8	6.3	6.0	6.9	6.1	1.6	2.2	2.3	2.7	2.2	3.2	4.2	4.1	4.7	4.1
Thiruvarur	4.6	5.6	5.2	5.7	4.8	2.1	2.1	1.8	2.7	1.9	3.3	3.8	3.4	4.1	3.3
Thoothukudi	4.4	4.7	5.3	5.7	4.9	1.8	1.9	2.1	2.5	1.9	3.1	3.3	3.7	4.1	3.4
Tiruchirapalli	4.8	5.4	5.2	5.7	4.8	1.9	2.1	2.1	2.3	1.8	3.3	3.7	3.6	4.0	3.3
Tiruppur	5.2	5.3	5.5	6.7	5.8	1.7	1.8	1.9	2.6	1.6	3.4	3.5	3.6	4.5	3.7
Tiruvannamalai	4.7	5.2	5.2	6.2	5.7	1.8	1.9	2.1	2.5	1.8	3.2	3.5	3.6	4.3	3.7
Vellore	4.1	5.1	4.7	6.5	5.4	1.9	2.2	2.3	3.0	2.0	3.0	3.6	3.4	4.7	3.7
Ranipet					4.6					2.0					3.3
Tirupathur					5.3					2.2					3.7
Virudhunagar	5.3	6.0	6.1	7.3	6.2	2.0	2.5	2.4	3.1	2.4	3.6	4.2	4.2	5.1	4.3
Tamil Nadu	**4.6**	**5.2**	**5.1**	**6.1**	**5.3**	**1.7**	**2.0**	**1.9**	**2.5**	**1.9**	**3.1**	**3.6**	**3.5**	**4.3**	**3.6**

Table 8 : Crude mortality rate in districts of Tamil Nadu by Age group 45- 54 years and by gender 2018- 2022

District	Age group 45 to 54 years														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	10.7	11.8	12.6	13.5	10.5	5.3	6.3	6.8	7.4	6.4	8.0	9.0	9.7	10.4	8.4
Chengalpattu	8.4	10.8	12.3	14.2	8.7	3.8	4.4	5.6	7.1	3.8	6.1	7.6	8.9	10.6	6.2
Kancheepuram					18.0					8.4					13.0
Chennai	5.0	10.4	10.7	12.9	8.9	2.1	4.3	5.1	6.5	4.1	3.5	7.3	7.9	9.6	6.5
Coimbatore	12.0	11.9	13.0	15.6	12.2	4.6	5.0	5.0	7.1	4.9	8.2	8.4	9.0	11.3	8.5
Cuddalore	9.3	9.5	10.6	12.4	10.5	4.2	4.7	5.4	6.7	4.8	6.7	7.1	8.0	9.5	7.6
Dharmapuri	7.8	9.8	9.6	11.5	9.7	3.4	4.2	3.9	5.5	3.8	5.6	7.0	6.7	8.4	6.7
Dindigul	10.8	12.1	12.2	13.9	11.7	5.5	5.6	5.8	7.0	5.4	8.2	8.8	9.0	10.4	8.5
Erode	10.7	11.6	11.6	13.5	11.8	4.3	5.0	5.5	6.7	4.7	7.5	8.3	8.5	10.0	8.1
Villupuram	9.2	9.8	9.7	10.7	8.4	4.0	4.5	4.6	5.8	3.6	6.6	7.2	7.1	8.2	5.9
Kallakurichi					9.0					4.2					6.5
Kanniyakumari	7.2	8.1	8.1	9.0	7.8	3.4	3.4	3.8	4.3	3.9	5.3	5.7	6.0	6.6	5.8
Karur	10.6	11.1	10.9	13.5	10.3	4.9	4.5	5.5	6.5	4.9	7.7	7.8	8.2	9.9	7.6
Krishnagiri	8.1	9.5	10.1	12.7	9.8	3.7	4.3	4.8	6.5	4.1	5.9	6.9	7.4	9.5	6.9
Madurai	10.2	11.6	12.8	15.0	11.5	4.9	5.3	6.0	7.2	5.3	7.5	8.4	9.4	11.0	8.3
Mayiladuthurai	8.5	10.5	10.6	11.9	9.5	3.9	5.0	5.7	7.2	6.4	6.2	7.8	8.1	9.5	7.9
Nagapattinam					11.6					5.6					8.5
Namakkal	9.4	10.5	10.3	13.3	9.8	4.1	4.9	4.5	6.3	4.2	6.7	7.7	7.4	9.7	6.9
Perambalur	11.5	12.3	11.9	15.4	11.9	5.2	6.3	6.6	7.3	5.9	8.3	9.2	9.2	11.3	8.8
Pudukottai	10.1	12.3	12.5	14.5	12.1	4.3	4.8	5.0	6.5	4.9	7.2	8.5	8.7	10.4	8.4
Ramanathapuram	8.9	10.3	11.5	12.9	10.7	3.8	4.6	4.7	6.3	4.8	6.4	7.4	8.1	9.5	7.7
Salem	9.1	10.0	10.8	14.7	10.2	3.9	4.8	5.1	7.2	4.5	6.5	7.4	7.9	10.9	7.3
Sivaganga	10.0	11.6	11.2	13.9	11.9	4.0	5.0	5.2	6.3	4.9	7.0	8.3	8.2	10.0	8.3
Tirunelveli	9.5	10.5	10.5	11.6	10.8	4.8	5.0	5.7	6.2	4.4	7.2	7.7	8.1	8.8	7.5
Tenkasi					10.4					4.7					7.5
Thanjavur	10.6	11.9	12.4	14.2	11.6	5.1	5.6	6.0	7.4	5.6	7.8	8.7	9.2	10.7	8.5
The Nilgris	9.0	10.2	9.6	11.6	10.4	3.5	4.2	4.5	5.0	4.4	6.2	7.2	7.0	8.2	7.3
Theni	12.1	12.1	12.4	14.1	12.9	5.4	5.8	6.5	7.7	5.4	8.7	8.9	9.4	10.8	9.0
Thiruvallur	10.0	13.2	12.8	15.2	12.2	4.3	5.6	6.2	7.6	5.7	7.2	9.4	9.5	11.3	8.9
Thiruvarur	12.2	11.3	11.5	14.1	11.3	6.4	6.2	6.3	7.9	5.7	9.2	8.7	8.9	10.9	8.4
Thoothukudi	9.4	10.1	10.4	12.3	10.4	4.4	5.2	5.4	6.2	4.5	6.9	7.7	7.9	9.2	7.4
Tiruchirapalli	10.3	11.2	11.3	12.5	10.8	4.8	5.5	5.7	6.5	4.7	7.5	8.3	8.5	9.4	7.7
Tiruppur	10.9	11.4	12.4	15.1	12.6	4.1	4.5	5.0	6.3	4.5	7.5	7.9	8.6	10.6	8.4
Tiruvannamalai	8.6	10.0	10.4	12.5	10.2	4.2	5.1	5.2	6.3	4.4	6.4	7.5	7.8	9.3	7.2
Vellore	8.6	10.4	10.7	13.5	11.5	4.6	5.3	6.1	8.0	5.5	6.6	7.8	8.3	10.7	8.4
Ranipet					9.9					4.8					7.3
Tirupathur					9.7					5.3					7.4
Virudhunagar	11.3	12.8	13.7	15.2	12.5	5.3	5.9	6.9	7.4	6.2	8.3	9.3	10.3	11.2	9.3
Tamil Nadu	**9.7**	**11.0**	**11.3**	**13.3**	**10.9**	**4.4**	**5.0**	**5.4**	**6.7**	**5.0**	**7.0**	**8.0**	**8.3**	**9.9**	**7.9**

Table 9 : Crude mortality rate in districts of Tamil Nadu by Age group 55- 69 years and by gender 2018- 2022

District	Age group 55 to 69 years														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	24.3	28.7	29.6	33.1	25.0	16.7	19.7	20.3	21.4	16.3	20.4	24.1	24.9	27.1	20.6
Chengalpattu	19.9	25.5	30.0	33.7	19.7	12.5	15.5	18.6	22.4	13.2	16.2	20.4	24.2	27.9	16.4
Kancheepuram					39.2					25.6					32.3
Chennai	10.3	21.2	26.2	29.2	18.8	6.4	13.4	16.6	20.1	12.6	8.3	17.2	21.3	24.5	15.7
Coimbatore	28.0	29.0	31.2	37.1	28.1	15.0	16.1	16.9	22.4	16.0	21.4	22.4	23.9	29.6	21.9
Cuddalore	23.0	23.8	27.4	29.5	23.1	14.0	14.7	17.3	20.4	15.5	18.4	19.2	22.3	24.9	19.3
Dharmapuri	19.9	23.8	22.8	28.0	22.0	12.2	13.9	14.5	19.1	13.1	16.0	18.8	18.6	23.5	17.5
Dindigul	28.1	29.9	30.2	35.0	26.0	17.7	19.9	19.2	22.1	16.3	22.8	24.8	24.6	28.4	21.1
Erode	27.2	30.2	30.6	35.5	28.5	16.8	17.4	17.5	21.6	17.0	21.9	23.7	24.0	28.4	22.6
Villupuram	24.3	25.5	26.3	27.5	20.3	15.9	17.2	17.4	18.7	13.0	20.1	21.3	21.7	23.0	16.6
Kallakurichi					21.3					14.3					17.7
Kanniyakumari	22.8	23.0	25.8	25.7	22.5	14.7	15.7	17.7	19.3	15.6	18.7	19.3	21.7	22.4	19.0
Karur	27.2	28.4	29.3	32.6	25.5	18.1	19.6	19.2	22.7	17.4	22.6	23.9	24.1	27.5	21.3
Krishnagiri	20.7	22.5	24.6	28.0	20.4	11.9	13.1	14.0	18.0	13.6	16.2	17.7	19.2	22.9	16.9
Madurai	26.0	28.3	30.9	33.9	26.3	16.2	18.0	19.5	23.0	17.0	21.0	23.1	25.1	28.3	21.5
Mayiladuthurai	21.8	25.1	28.5	30.3	24.9	12.2	15.9	17.2	21.5	17.7	16.9	20.4	22.7	25.8	21.2
Nagapattinam					24.5					16.8					20.6
Namakkal	27.0	27.8	29.5	32.4	25.5	15.8	18.0	17.1	21.8	15.4	21.3	22.8	23.2	27.0	20.3
Perambalur	26.6	29.8	31.4	36.2	25.3	18.9	22.3	20.8	24.4	17.6	22.7	26.0	26.0	30.2	21.4
Pudukottai	25.5	28.0	30.0	32.4	26.4	15.5	18.5	17.7	20.8	16.8	20.4	23.2	23.8	26.5	21.5
Ramanathapuram	24.8	27.8	30.5	32.6	26.0	14.5	17.6	18.2	22.0	16.0	19.6	22.6	24.3	27.2	20.9
Salem	22.2	25.0	28.0	34.5	24.1	13.4	15.0	16.4	22.9	14.6	17.7	19.9	22.1	28.5	19.2
Sivaganga	24.0	30.8	32.1	34.4	27.9	14.7	21.0	21.6	23.5	18.1	19.3	25.8	26.8	28.8	22.9
Tirunelveli	26.8	28.2	29.1	30.4	24.9	17.5	19.4	20.1	20.8	16.9	22.1	23.8	24.5	25.5	20.8
Tenkasi					26.7					18.3					22.4
Thanjavur	26.5	29.1	31.4	33.2	26.1	16.5	18.4	19.3	23.0	18.3	21.4	23.7	25.3	28.0	22.1
The Nilgris	22.0	27.3	28.5	27.4	24.4	12.9	15.5	16.2	17.8	15.6	17.3	21.3	22.3	22.5	19.9
Theni	28.2	29.5	33.7	34.4	27.1	17.1	17.7	19.4	21.2	16.9	22.5	23.5	26.4	27.7	21.9
Thiruvallur	23.5	30.0	32.2	34.5	27.9	14.5	19.3	20.4	24.2	18.5	18.9	24.6	26.2	29.2	23.1
Thiruvarur	32.0	30.5	30.6	35.3	27.1	19.5	20.7	19.5	23.6	18.2	25.7	25.5	25.0	29.3	22.5
Thoothukudi	23.2	25.7	27.8	30.3	23.1	15.9	17.6	18.0	20.7	14.7	19.5	21.6	22.9	25.4	18.8
Tiruchirapalli	25.4	27.7	30.1	32.0	23.9	16.9	18.6	19.4	22.7	16.2	21.1	23.1	24.7	27.3	19.9
Tiruppur	25.2	25.4	28.4	33.4	26.1	14.1	14.8	15.8	20.0	15.0	19.6	20.0	22.0	26.6	20.4
Tiruvannamalai	24.2	26.1	27.3	30.8	23.8	15.5	17.6	18.5	21.0	16.3	19.8	21.8	22.8	25.8	19.9
Vellore	21.5	25.5	26.5	31.9	24.1	13.7	16.6	17.7	23.1	16.2	17.5	21.0	22.0	27.4	20.1
Ranipet					24.0					16.4					20.1
Tirupathur					24.2					16.8					20.4
Virudhunagar	27.2	31.4	34.9	34.8	28.9	17.6	20.2	20.4	22.5	18.6	22.3	25.7	27.5	28.5	23.6
Tamil Nadu	**24.4**	**27.2**	**29.2**	**32.2**	**25.1**	**15.1**	**17.5**	**18.2**	**21.5**	**16.4**	**19.7**	**22.3**	**23.6**	**26.7**	**20.6**

Table 10 : Crude mortality rate in districts of Tamil Nadu by Age group 70 years and above by gender 2018- 2022

District	Age group 70 years and above														
	Male					Female					All Deaths				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Ariyalur	92.2	96.4	105.8	119.9	91.0	57.5	62.9	75.9	82.8	64.9	74.1	79.0	90.3	100.2	77.1
Chengalpattu	59.7	78.4	92.8	101.7	67.1	52.0	65.2	75.8	79.1	56.1	55.7	71.6	83.9	89.7	61.3
Kancheepuram					109.6					90.0					99.2
Chennai	30.7	64.1	84.8	86.4	60.7	28.0	63.2	72.4	73.5	56.3	29.3	63.7	78.3	79.5	58.4
Coimbatore	92.9	91.7	99.7	113.8	89.3	73.4	76.5	83.5	88.9	76.7	82.8	83.8	91.3	100.6	82.6
Cuddalore	61.2	64.2	79.0	86.7	66.8	41.6	45.6	58.3	61.9	51.5	51.0	54.5	68.2	73.6	58.7
Dharmapuri	57.5	69.5	72.4	82.5	66.5	42.6	50.1	56.7	61.8	52.4	49.7	59.4	64.3	71.5	59.0
Dindigul	81.4	90.9	100.5	112.9	79.6	60.8	72.8	79.4	84.3	67.1	70.7	81.5	89.5	97.7	73.0
Erode	97.0	104.7	112.5	127.1	101.7	78.0	84.2	89.8	93.1	82.6	87.1	94.1	100.7	109.0	91.6
Villupuram	66.9	72.2	81.6	87.9	69.7	45.5	50.1	57.7	62.0	53.5	55.8	60.7	69.2	74.2	61.1
Kallakurichi					63.3					41.0					51.5
Kanniyakumari	91.4	94.3	104.5	105.9	91.3	81.0	81.5	89.8	88.9	80.4	86.0	87.7	96.9	96.9	85.5
Karur	93.5	100.2	110.4	114.0	94.6	76.9	81.5	88.7	92.4	78.1	84.9	90.5	99.1	102.5	85.9
Krishnagiri	67.0	65.0	73.9	81.1	61.6	45.7	47.9	56.0	57.1	49.4	55.9	56.1	64.6	68.3	55.1
Madurai	69.0	76.5	95.0	96.1	71.2	56.9	63.7	72.1	75.2	61.0	62.7	69.9	83.1	85.0	65.8
Mayiladuthurai	54.0	70.1	87.9	96.7	74.8	39.7	50.0	64.8	70.4	57.6	46.6	59.6	75.9	82.7	65.7
Nagapattinam					77.8					60.3					68.5
Namakkal	88.5	96.3	105.5	111.0	89.5	73.2	80.9	89.4	90.2	76.0	80.5	88.3	97.1	100.0	82.3
Perambalur	84.7	90.9	112.4	115.0	83.2	61.2	67.4	79.3	81.0	64.9	72.5	78.6	95.2	97.0	73.5
Pudukottai	72.7	83.1	93.8	107.1	81.9	48.8	58.4	64.1	70.1	56.9	60.2	70.2	78.3	87.4	68.6
Ramanathapuram	64.4	78.6	93.1	98.9	79.3	48.0	56.7	65.2	67.8	55.0	55.8	67.2	78.6	82.4	66.4
Salem	69.9	83.9	93.2	107.0	79.1	54.0	63.9	69.6	77.6	63.9	61.6	73.5	80.9	91.4	71.0
Sivaganga	77.7	103.2	112.6	123.1	94.2	57.0	72.9	80.5	87.2	73.2	66.9	87.4	95.9	104.0	83.1
Tirunelveli	89.6	96.1	105.4	102.5	86.2	78.3	84.7	91.9	88.3	80.7	83.7	90.2	98.4	95.0	83.2
Tenkasi					83.9					78.2					80.9
Thanjavur	72.8	79.7	93.8	99.8	78.3	53.1	59.5	68.6	73.9	62.4	62.5	69.2	80.7	86.0	69.9
The Nilgris	48.0	59.4	67.0	72.5	62.1	43.2	53.1	64.1	65.1	56.5	45.5	56.1	65.5	68.6	59.1
Theni	78.5	79.1	97.8	98.2	76.6	61.5	63.9	78.4	75.4	64.6	69.6	71.2	87.7	86.1	70.3
Thiruvallur	56.9	74.2	83.1	85.1	71.2	51.7	67.5	71.0	70.6	62.5	54.2	70.7	76.8	77.4	66.6
Thiruvarur	79.8	76.6	87.9	101.4	78.5	54.8	55.4	67.0	70.5	55.4	66.8	65.6	77.0	85.0	66.3
Thoothukudi	85.0	93.3	98.8	105.3	79.9	72.8	84.6	86.1	85.5	69.5	78.7	88.7	92.2	94.8	74.4
Tiruchirapalli	76.2	87.5	100.8	105.4	79.0	62.6	72.7	78.5	83.5	68.9	69.1	79.8	89.2	93.8	73.7
Tiruppur	88.8	88.3	94.7	106.2	83.6	66.6	70.3	77.0	79.5	68.7	77.3	79.0	85.5	92.0	75.7
Tiruvannamalai	73.9	84.5	92.3	97.8	78.5	59.2	66.4	71.2	75.4	61.7	66.3	75.1	81.4	85.9	69.6
Vellore	56.8	65.4	78.5	87.1	67.0	46.1	57.0	64.1	69.8	59.0	51.2	61.0	71.0	77.9	62.7
Ranipet					69.8					61.1					65.2
Tirupathur					59.6					49.3					54.1
Virudhunagar	81.7	93.3	107.6	103.4	83.4	66.1	78.0	84.5	82.4	72.6	73.6	85.3	95.6	92.3	77.6
Tamil Nadu	**73.8**	**82.9**	**94.4**	**101.2**	**78.5**	**57.4**	**65.9**	**74.1**	**77.0**	**64.2**	**65.3**	**74.0**	**83.8**	**88.4**	**70.9**

– 34 districts, 55-69 years- 27 districts, 70 years and above - 29 districts). The male mortality is increased (45-54 years – 33 districts, 55-69 years- 20 districts, 70 years and above - 25 districts) and female mortality is increased (45-54 years – 29 districts, 55-69 years- 26 districts, 70 years and above -34districts) in 2022 when compared within gender in 2018 .In this age group while comparing with gender within the districts it was noted the male mortality is higher while compared to female mortality and certain districts in each age group had mortality way more higher among males when compared with opposite gender (Table 8, 9 & 10).

DISCUSSION

The mortality in Tamil Nadu has increased during Covid -19 overall and by all age groups and gender and later started to decrease in 2022. The mortality pattern is high in male compared to female for the state of Tamil Nadu (4). Age-specific death rates in USA were lower for most age groups, except for infants and the very old for which death rates were higher. Age-specific death rates were lower for most age groups, except infants and those 75 years and over among males (7). In a study from Scotland there was increase in the diversity of mortality (8). Increased mortality is noted in age group less than 5 years compared to age group 5- 44 years and increased mortality in males in a study done in Tamil Nadu(6). Overall, the districts when compared, all districts had higher male mortality and the mortality decreased in 2022 compared to 2021 except Vellore where the male mortality is still increasing. This mortality increase in Vellore district must be studied as the pattern is not noted in any of the other districts. The gender specific crude mortality rate for males is highest in Virudhunagar during 2021, in females it is highest in Kancheepuram in 2022 on comparison for the years 2018-2022.The mortality in less than 1 year age group is still increasing compared to 2021 except 8 districts (Ariyalur, Dharmapuri, Erode, Krishnagiri, Pudukottai, The Nilgris, Theni & Tiruvannamalai. Sivaganga has higher female mortality in less than 1 age group compared to male mortality. In the age group 1 to 4 years the overall mortality rate is decreasing only in Cuddalore, Sivaganga, Theni and Thoothukudi while increasing in other districts with higher male mortality in 2022 when comparing with 2018.Female mortality is high in 12 districts in the age group 1 to 4 while compared to male mortality in 2022 in this age group. It was noted that from age group 15 and above the male mortality is higher compared to female in all districts. There is higher mortality in the age group 55 and above and the mortality difference between both genders has reduced in 2022 since

2018. The pattern of mortality is almost same as found in developed countries as mortality is higher in elderly age group and diversity of mortality is noted compared to districts.

CONCLUSION

Overall Vellore alone had male mortality still increasing while other districts started decreasing their mortality rate during 2022 when compared with 2021. The gender specific crude mortality rate for males and female is highest during Covid 19 and lowest in Chennai during 2018, on comparison for the years 2018-2022. In less than 1 age group crude mortality rate is still in increasing trend except 8 districts in 2022, Sivaganga district has less male mortality compared to female in this age group in 2022. In the age group 1 to 4 the overall mortality rate is decreasing only in Cuddalore, Sivaganga, Theni and Thoothukudi while increasing in other districts. Higher male mortality in 2022 is noted when comparing with 2018 and Female mortality is high in 12 districts in this age group while compared to male mortality in 2022. There is no significant peaking of mortality during Covid-19 in the age group 5 to 44. It was noted that from age group 15 and above the male mortality is higher compared to female in all districts. There is higher mortality in the age group 55 and above and the mortality difference between both genders has reduced in 2022 since 2018.

RECOMMENDATIONS

The districts with increased mortality in particular age group 0-5 has to be studied. The reasons for the increased mortality in particular gender in comparison with the other gender has to be studied. Cause wise mortality of all the deaths may give a clear picture in pinpointing the reason for higher mortality.

LIMITATIONS

The numbers taken into consideration are the deaths registered in the CRVS. The deaths of the resident of Tamil Nadu occurred in other state or country has not been considered due to lack of data.

CONFLICT OF INTEREST None

REFERENCES

1. Population Analysis for Policies & Programmes [Internet]. [cited 2022 Oct 8]. Available from: https://papp.iussp.org/ sessions/papp101_s06/PAPP101_s06_030_010.html

2. Wang H, Dwyer-Lindgren L, Lofgren KT, et al. Age-specific and sex-specific mortality in 187 countries, 1970-2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012;380(9859):2071-2094. doi:10.1016/S0140-6736(12)61719-X

3. TRAINING MANUAL for Civil Registration Functionaries in India (1st ed.). (2012). Office of the RegistrarGeneral,India. https://crsorgi.gov.in/web/uploads/download/CRS_mannual_Hindi_English.pdf

4. Stanislaus, "IMPACT OF PANDEMIC ON MORTALITY TRENDS IN TAMIL NADU 2019-2022."Volume 3 Issue 2 TNJPHMR

5."Indicator Metadata Registry Details." Accessed March 14, 2024. https://www.who.int/data/gho/indicator-metadata-registry/imr-details/5668.

6. Venkata Raghava Mohan , J. Muliyil, Mortality patterns and the effect of socioeconomic factors on mortality in rural Tamil Nadu, south India: a community-based cohort study, Transactions of The Royal Society of Tropical Medicine and Hygiene, Volume 103, Issue 8, August 2009, Pages 801–806, https://doi.org/10.1016/j.trstmh.2009.04.014

7. Anderson, Robert N. "The Effect of Revised Populations on Mortality Statistics for the United States, 2000," n.d.

8. McMonagle C, Brown D, Reeve R, Mancy R. Trends in the diversity of mortality causes and age-standardised mortality rates among subpopulations within Scotland, 2001-2019. SSM Popul Health. 2022 Aug 13;19:101192. doi: 10.1016/j.ssmph.2022.101192. PMID: 36039349; PMCID: PMC9418986.