Research Article

Retrospective study on change in mortality pattern: A 5 year study in a single cemetery, Thrissur District

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(Received: 05-04-2025 Revised: 28-06-2025 Accepted: 01-07-2025)

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ABSTRACT

Background: Mortality patterns have changed significantly in recent years, with global studies reporting a shift towards younger age groups. However, limited data exist on such trends in Kerala. This study examines age- and sex-specific mortality patterns over five years (2018–2022) using cemetery records from Thrissur District.

Methods: A retrospective cross-sectional study was conducted using death records from a single cemetery in Thrissur Corporation. Data on age, sex, and year of death were collected and analyzed using SPSS version 25. Descriptive statistics, including frequencies and proportions, were used to assess trends.

Results: A total of 8,636 deaths were recorded, with a mean age of 63 years. Male deaths (51%) were more prevalent than female deaths (41%), with infant deaths accounting for 8%. Over 75% of male deaths occurred between 20–59 years, while female deaths were more common in those aged >60 years ($p < 0.001$). The highest proportion of deaths occurred in 2018 (22%), with a subsequent decline to 15% in 2022. The 70–79 age group had the highest mortality rate, followed by the 80–89 and 60–69 age groups.

Conclusion: Younger and middle-aged males had higher mortality rates, while elderly females accounted for most deaths. These findings highlight the need for targeted public health interventions to reduce premature mortality and improve healthcare access. Future studies incorporating multiple cemeteries and hospital records would provide a more comprehensive understanding of mortality trends in Kerala.

Keywords: Mortality patterns, cemetery records, age-specific mortality, sex-specific mortality, premature mortality, public health, epidemiology, mortality trends.

1. INTRODUCTION

Recent trends indicate significant changes in mortality patterns, particularly in the age at death within populations. An international study across 14 countries reported a shift in mortality towards younger age groups in the post-COVID era compared to pre-COVID periods [1]. Additionally, studies from the United States have shown higher mortality rates in men than in women [2].

The increase in mortality rates has been greater than expected based on observed seroprevalence and international infection fatality rates, particularly among the youngest and oldest age groups [3]. Another study attributes rising mortality to high population density, especially in regions with a large elderly population and individuals with severe comorbidities [4, 5].

In Kerala, the Annual Vital Statistics Report (2023) indicated that the number of registered deaths was higher in 2021 than in 2020, with more male deaths than female deaths. The crude death rate rose from 7.17 per 1,000 population in 2020 to 9.66 in 2021 [6]. Factors such as the increasing prevalence of non-communicable diseases, an aging population, and post-COVID

complications have contributed to the overall rise in mortality rates in Kerala [7].

Whether similar patterns are observed in Thrissur district remains unexplored. This study was conducted to analyze reported deaths by collecting data from cemetery death registers in Thrissur district. Information on deaths can be obtained from various sources, including death registries maintained by local bodies, hospital records, and cremation or burial ground registers. Among these, cremation and burial ground registers are particularly valuable as they provide geographically specific data with fewer chances of underreporting.

This study aims to examine changes in age and sex-specific mortality patterns in Thrissur district during 2018–2022, addressing the gap in scientific literature on this topic in Kerala.

2. MATERIALS & METHODS

This study was conducted following approval from the Institutional Ethics Committee (IEC No. 122/23/IEC/JMMC&RI). A widely used cemetery within the Thrissur Corporation area was selected through convenience sampling. The study period spanned from January 2018 to December 2022. Data were collected using consecutive sampling from the registers maintained at the site.

In the study setting, adults and elderly individuals were generally cremated at the crematorium, while infants and young children were buried in designated burial grounds. To maintain clarity and consistency in terminology, the term "cemetery" is used generically in this manuscript to refer to all sites of final disposition-whether crematorium or burial ground—unless otherwise specified.

Information extracted from the registers included age, sex, religion, and place of death. Data were entered into a structured Google Form and exported to Microsoft Excel for coding and organization. Statistical analysis was performed using SPSS version 25. Descriptive analysis included frequencies and proportions. The total number of deaths during the study period, stratified by gender and age group, was presented in tables and graphs.

3. RESULTS

A data of 8636 deaths reported in a period between 2018 and 2022 were collected from a single cemetery of Thrissur District. The mean age was observed to be 63 years. More than half of the total deaths in the population were males (51%) (Fig. 1).

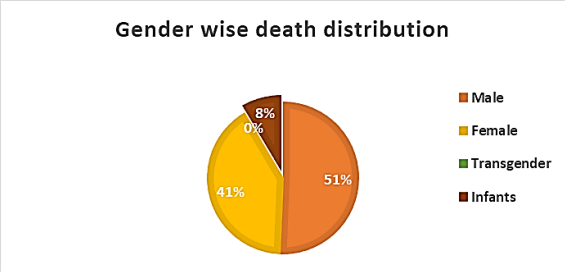


Fig. 1: Gender-wise death distribution

Male deaths occurred more frequently in the younger and middle-aged groups (<60 years), whereas female deaths were more common in those aged >60 years (Fig 2). When the age of death between males and females were compared, there was a significant difference (P value = < 0.001).

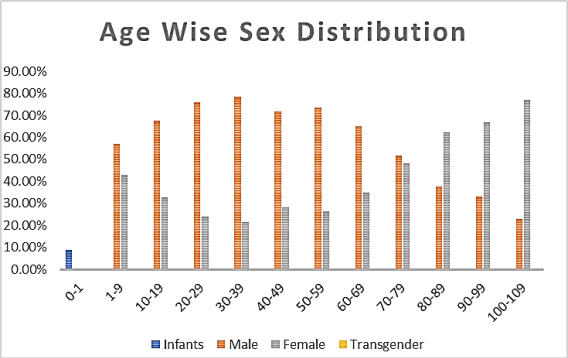


Fig. 2: Age-wise Sex distribution

The results of this retrospective study, covering five years (2018–2022), indicated that the highest proportion of deaths occurred in 2018 (22%).

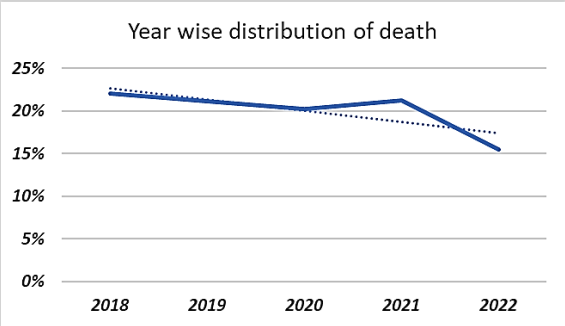


Fig. 3: Year-wise distribution of death

The rate remained relatively stable over the next three years before declining to 15% in 2022 (Fig. 3).

It was observed that there was a surge in death among the age group between 70-79 years during all the five years, followed by age group between 80-89 years and 60-69 years (Fig. 4).

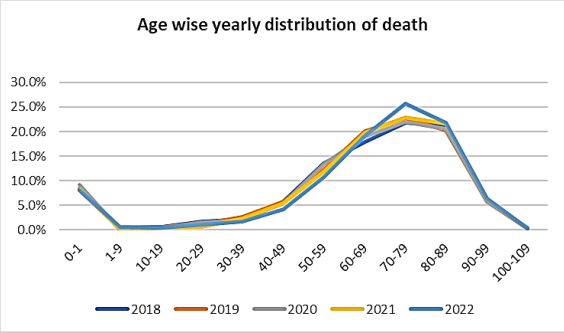
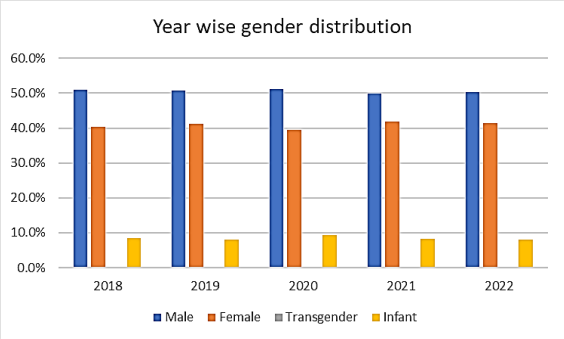


Fig. 4: Age-wise yearly distribution of death

Male deaths were predominant across all five years, accounting for approximately 51% of total deaths, while female deaths constituted around 41%. Infant deaths, for which sex was not recorded in the death registry, made up 8% (Fig. 5).



Graph 5: Year-wise gender distribution

4. DISCUSSION

The present study analysed mortality patterns in the Thrissur Corporation area from 2018 to 2022 using cemetery register data. The findings indicate a significant shift in the age and sex distribution of mortality, with a notable predominance of male deaths in younger and middle-aged groups and female deaths in older age groups.

In the present study, there was a significant proportion of male deaths occurring in the age group of 20–59 years. This aligns with previous studies indicating excess mortality among men in same age group [2]. Factors such as occupational exposure, comorbidities, and differential healthcare-seeking behaviors between genders may have contributed to this trend [3]. Moreover, excess male mortality in these age groups may also be associated with external causes such as road traffic injuries, which remain a major cause of premature death in India [8] Moreover, the higher number of reported male deaths in younger age groups may reflect external factors such as occupational hazards, accidents, and lifestyle-associated risks.

The predominance of female deaths in older age groups (>60 years) reflects the demographic reality of greater life expectancy among women in Kerala and India at large [5, 9]. This pattern has also been observed globally, where women tend to live longer but may experience extended periods of morbidity [10].

A study from Vienna, reports a shift in mortality towards younger age groups in the post-COVID era [1]. However, in the present study, the observed mean age of death was 63 years. While this trend was not strongly observed in our dataset, the impact of COVID-19 on mortality composition cannot be overlooked. Nationally, India experienced increased mortality during and after the pandemic years, with significant regional variation [11]. Additionally, the Kerala Annual Vital Statistics Report (2023) noted an increase in crude death rates from 7.17 in 2020 to 9.66 in 2021, supporting our findings of an overall rise in mortality [4].

In our study, the year 2018 recorded the highest proportion of deaths (22%), followed by relatively stable figures in the next three years, with a decline to 15% in 2022. This drop could be attributed to delayed registrations, pandemic-related disruptions, or population migration. The concentration of deaths in the 70–79 age group across all years is reflective of the aging population in Kerala and the growing burden of non-communicable diseases (NCDs) such as cardiovascular disease, diabetes, and cancer [9].

Post-COVID complications and long-term sequelae may also have contributed to increased vulnerability among the elderly. According to the Global Burden of Disease data and other population-level analyses, the indirect effects of

the pandemic-including healthcare disruptions, delayed diagnoses, and unmanaged chronic conditions-have led to excess mortality not always captured in standard reporting [6, 7].

An important strength of this study is its use of cemetery records, which offer a continuous, location-specific source of mortality data that may complement civil registration and hospital-based systems. However, the study is limited to a single cemetery, which may not be representative of the entire Thrissur District.

In the future, we can aim to expand the scope of data collection to multiple cemeteries and include hospital records to obtain a more comprehensive understanding of mortality trends. Additionally, further investigations into the impact of post-COVID complications and socio-economic factors on mortality would provide valuable insights.

5. CONCLUSION

Our study highlights a discernible shift in the mortality pattern in Thrissur District, with younger and middle-aged males experiencing higher mortality rates and elderly females constituting the majority of deaths. These findings emphasize the need for targeted public health interventions, especially for high-risk male populations, to address premature mortality and improve healthcare accessibility.

6. LIMITATIONS

One limitation of this study is the lack of uniform access to detailed cause-of-death information. While certain cemeteries, especially those affiliated with hospitals, may receive data sheets containing clinical details, many of the records reviewed lacked such information or used non-standardized terminology. To maintain consistency and avoid misclassification bias, only directly available cause-of-death entries from the cemetery registers were considered. This may limit the accuracy of mortality pattern interpretation. Another limitation is that the study is limited to a single cemetery, which may not be representative of the entire Thrissur District.

Acknowledgement

We sincerely express our gratitude to the management and staff of Vadookara Crematorium, Thrissur, for their valuable support in providing access to cemetery records for this study.

Conflict of Interest

There are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

Funding Information

No Funding was received for this research work.

Ethical Information

The Institutional ethical committee approved the study

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