Nursing Home Cares in Response to Different Diseases: Based on Data from Six Chinese Provinces and Cities

Zhuqi Yu, Ruoxi Yang, Qing Zeng, and Liyuan Jiao[(✉)]

School of Statistics and Data Science, Zhuhai College of Science and Technology, Zhuhai, China
jiaoly1212@163.com

Abstract. This study servers as a statistical analysis of the top 10 causes of annual mortality across nine provinces and cities in China, including the regions of Beijing, Tianjin, and Hebei, and the Guangdong, Hong Kong, and Macao Greater Bay Area over the period of 2013–2022. The findings indicate that malignant neoplasms and cardiovascular disease are the two dominant contributors to mortality in these regions. Furthermore, an extensive literature review is conducted on the top 10 causes of death in Beijing as documented by the Beijing Health and Health Big Data and Policy Research Center in 2021. This systematic analysis enabled us to engage in a discursive examination of various care modalities for elderly residents in nursing homes who are grappling with these conditions. Due to space limitation, part of the review and expectation is attached to this article as URLs in the appendix.

Keywords: health and elderly care · nursing · mortality factors · nursing home care

1 Introduction

Every year in China, a significant number of patients succumb to various diseases, with heart diseases, malignant tumors, cerebrovascular diseases, respiratory diseases, injuries and poisoning, among others, being the most persistent contributors to the country's mortality rate. Although the ranking of these diseases may differ slightly across cities, they are largely uniform, and thus, pose a significant risk to the general population. The situation is especially dire for the elderly demographic, who, owing to their advanced age, are susceptible to underlying illnesses, and when afflicted with these diseases, are more likely to experience comorbidities and death.

Consequently, a comprehensive data analysis is conducted herein on the causes of death, mortality rate, and composition in various provinces and cities across China. The analysis was supplemented by referring to a substantial number of authoritative medical studies on relevant diseases. The findings herein are reliable and assumed to be highly accurate.

The objective of the research is to provide professional, data-driven recommendations and guidance to nursing homes and other community institutions, with the goal of

contributing to the "development of the elderly care enterprise and industry" mentioned in the 20th National Congress report [1].

2   Data Collection and Analysis

2.1   Data Analysis

The data collected was performed with the SPSS software to construct bar graphs and display the mortality rate (1/100,000) as the dependent variable at the y axis, and the cause of death as the independent variable as the x axis (see Fig. 1).

From the bar charts, it was clear that malignancy and heart disease had the highest mortality rates. It is evident of the high mortality rates of malignant tumor, heart disease, circulatory disease, and tumor, among others, and next the results are refined in a region-wise manner.

Further analysis was conducted using SPSS software to construct bar graphs for malignancy and heart disease, treating the mortality rate (1/100,000) as the dependent variable at the y axis, the name of the cause of death as the independent variable at the x axis, and the provinces as the labels (see Fig. 2).

The bar chart provided a more explicit distribution of mortality rates from malignant tumors and heart disease in Macao, Beijing, Hebei, Tianjin and Hong Kong. The bar charts revealed that the mortality rates for malignant tumors were relatively consistent across regions, with Hong Kong having the highest rate, whereas the mortality rates for heart disease varied greatly, with Macau having the lowest rate and Tianjin having the highest rate. The results showed that the mortality rate for malignant tumors was not significantly correlated with the regions, whereas the mortality rate for heart disease showed a stronger correlation with the regions.
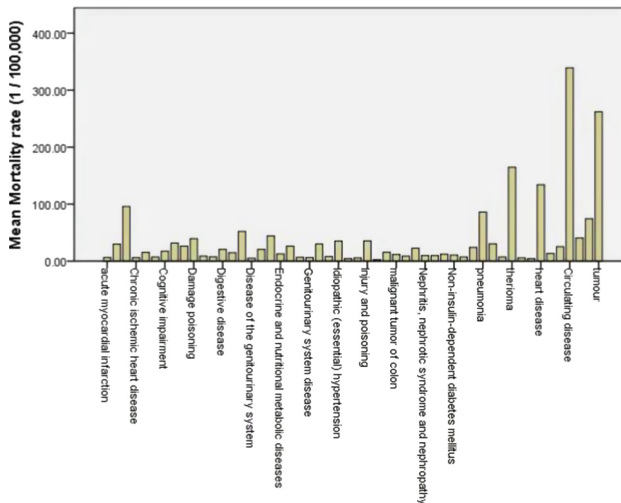

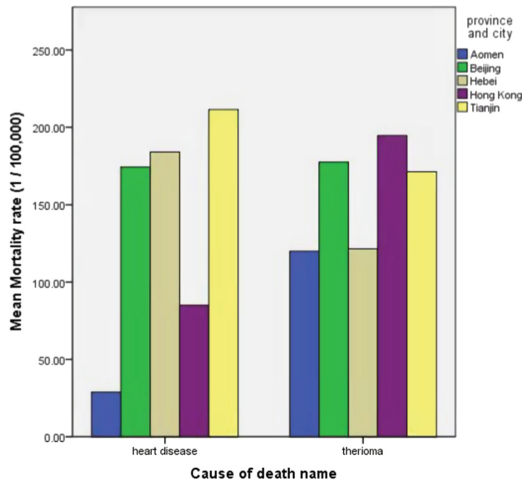**Fig. 1.** Figure of mortality rate (1/100,000) and the cause of death

Fig. 2. Figure of mortality rate (1/100,000) and heart disease & therioma

2.2 Based on Beijing's Data: Implications for Nursing Homes in Treating Elderly with Underlying Diseases

The Beijing Center for Health Data and Health Policy Research, published in 2021, identified the top ten diseases contributing to mortality in Beijing and classified them into thirteen categories. This study provides an overview of the nursing home care required for each disease and suggests methods to improve the care services provided. The first two diseases are listed here, with the remaining eleven diseases being accessible through attached links at the end.

2.2.1 Heart Disease (HD)

Heart disease is a paramount contributor to mortality and requires cognizant consideration and action on the part of nursing homes. Manuel Martínez-Sellés et al. (2009) posited that the advanced age of patients should not be subjected to undue distress, and that palliative care affords these individuals the ability to manage their symptoms while being situated in a familiar and comfortable environment [2]. Paulo Roque Obreli Neto et al. (2011) recommended that family physicians and pharmacotherapy professionals be involved in formulating service plans, asserting that proactively preventing coronary heart disease is more cost-efficient than its treatment [3]. Carlos Rodríguez Pascual et al. (2011) noted that the life expectancy of the elderly is lower compared to their younger counterparts, and that interventions should be executed in the short- or medium-term to improve their quality of life [4]. An interim analysis of the GREACE trial by Vasilios G. Athyros et al. (2013) indicated that the clinical benefits of statin therapy increase with age, and that the benefits are comparable in patients with coronary heart disease [5]. Eva Prescott et al. (2019) emphasized the significance of cardiac rehabilitation, which is characterized by risk factors, psychological distress, and exercise capacity [6]. Hai-jiang Dai et al. (2022) discovered three primary modifiable risk factors in their study of

IHD: dietary risk, high systolic blood pressure, and elevated LDL cholesterol levels. [7] Kelsey C. Stoltzfus et al. (2020) found that the odds of death due to heart disease varied according to age at diagnosis, gender, race, marital status, stage of primary cancer, time of diagnosis, and surgical intervention [8].

Nursing homes should establish a professional medical team to perform a comprehensive and multifactorial medical analysis and evaluation of the patient. They should respect the patient's preferences, minimize unnecessary pain and medical expenses in the late stages, regulate the patient's diet, closely monitor their blood sugar levels, pay attention to their psychological state, and encourage physical activity. Caregivers should be trained in heart disease to prepare the elderly for its potential risks. Nursing homes should enhance the clothing, food, and living conditions of the elderly with heart disease, provide them with appropriate monitoring equipment, and formulate healthy living plans. They should also closely monitor elderly individuals who are at risk of heart disease and provide treatment options as needed. Additionally, nursing homes should collaborate with hospitals to improve the availability of heart disease medications and work with blood centers to ensure timely blood supply and maintain the elderly's overall health.

2.2.2   Respiratory Diseases (RS)

As one of the leading contributors to mortality, respiratory diseases demand attention from nursing homes. Antoine Guillon et al. (2020) conducted an 8-year study in France and found an increasing number of elderly patients being admitted to ICUs for respiratory diseases, accompanied by a rise in mortality rates [9]. Lucile Laporte et al. (2018) advised the expansion of healthcare spending for patients with respiratory diseases, given that an aging population increases the utilization of such resources [10]. Anabela Silva (2021) compared self-care and rehabilitation care interventions for patients with COPD, and a review of 11 rehabilitation care indicators from eight relevant literature experiments demonstrated that rehabilitation care enhances health quality [11]. Alastair Watson et al. (2021) argued that healthcare providers should be aware of respiratory viruses and the importance of diagnosing patients and detecting respiratory virus outbreaks, especially for preventing transmission among the elderly [12]. Chisato Ohashi et al. (2022) contend that COPD causes frailty and that the development of health support systems is instrumental in helping patients maintain adequate nutrition, engage in physical activity, and participate in social activities, thereby preventing frailty [13]. Gulshan Sharma et al. (2006) conducted a study on respiratory changes in the elderly population and concluded that the elderly are more prone to ventilatory failure and at greater risk of contracting respiratory diseases, while [14] Jarosław Stoliński et al. (2016) provided a surgical approach aimed at improving the function of the respiratory system in elderly patients [15].

Nursing homes caring for elderly individuals with respiratory diseases should (1) conduct assessments of the type of virus and its contagiousness, (2) evaluate the physical condition of the elderly and the feasibility of rehabilitation training, (3) support and improve medical systems, if the funds and resources permit, (4) intervene in elderly patients with respiratory diseases, (5) and provide individualized care programs for those undergoing respiratory surgery. The continued growth of the aging population will likely result in an increase in the number of elderly individuals with respiratory diseases,

necessitating focused attention from nursing homes. Scientific assessment tools and consideration of the elderly's ability to improve their disease through exercise, improved diet, and socialization should also be taken into account, as these measures have been proved to be effective for disease relief.

3   Conclusion

In conclusion, the research highlights the need for nursing homes to (1) prioritize good interventions for both the disease and overall well-being of the elderly, (2) improve the medical system for various diseases and enhance the standard of care, and (3) increase attention towards elderly patients' mental health and encourage a positive outlook towards life.

Despite the insights garnered from this study, it is acknowledged the existing limitations. In terms of research methods, the sample size of collected data is insufficient, and in terms of research subject, the connection between theory and specific practice is inadequate. Future research endeavors should aim to increase the sample size of collected data and delve deeper into the analysis, as well as to increase the focus on practical research for different disease care modalities in nursing homes.

References

1. CPC Congress, 2022. Hold high the great banner of socialism with Chinese characteristics and unite and struggle for the comprehensive construction of a modern socialist country
2. Martínez-Sellés, M., Vidán, M. T., López-Palop, R., Rexach, L., Sánchez, E., Datino, T., ...& Bañuelos, C. (2009). End-stage heart disease in the elderly. Revista Española de Cardiología (English Edition), 62(4), 409-421.
3. Neto, P. R. O., Marusic, S., de Lyra Júnior, D. P., Pilger, D., Cruciol-Souza, J. M., Gaeti, W. P., & Cuman, R. K. N. (2011). Effect of a 36-month pharmaceutical care program on the coronary heart disease risk in elderly diabetic and hypertensive patients. Journal of Pharmacy & Pharmaceutical Sciences, 14(2), 249-263.
4. Pascual, C. R., Galán, E. P., Guerrero, J. L. G., Colino, R. M., Soler, P. A., Calvo, M. H., & Rodríguez-Artalejo, F. (2011). Rationale and methods of the multicenter randomised trial of a heart failure management programme among geriatric patients (HF-Geriatrics). BMC Public Health, 11(1), 1-8.
5. Athyros, V. G., Katsiki, N., Tziomalos, K., Gossios, T. D., Theocharidou, E., Gkaliagkousi,E., ... & Mikhailidis, D. (2013). Statins and cardiovascular outcomes in elderly and younger patients with coronary artery disease: a post hoc analysis of the GREACE study. Archives of Medical Science, 9(3), 418-426.
6. Prescott, E., Mikkelsen, N., Holdgaard, A., Eser, P., Marcin, T., Wilhelm, M., ... & de Kluiver, E. P. (2019). Cardiac rehabilitation in the elderly patient in eight rehabilitation units in Western Europe: Baseline data from the EU-CaRE multicentre observational study. European journal of preventive cardiology, 26(10), 1052-1063.

7. Dai, H., Much, A. A., Maor, E., Asher, E., Younis, A., Xu, Y., ... & Bragazzi, N. L. (2022).Global, regional, and national burden of ischaemic heart disease and its attributable risk factors, 1990–2017: results from the Global Burden of Disease Study 2017. European Heart Journal-Quality of Care and Clinical Outcomes, 8(1), 50-60.

8. Stoltzfus, K. C., Zhang, Y., Sturgeon, K., Sinoway, L. I., Trifiletti, D. M., Chinchilli, V. M., &Zaorsky, N. G. (2020). Fatal heart disease among cancer patients. Nature communications, 11(1), 1-8.

9. Guillon, A., Hermetet, C., Barker, K. A., Jouan, Y., Gaborit, C., Ehrmann, S., ... & Grammatico-Guillon, L. (2020). Long-term survival of elderly patients after intensive care unit admission for acute respiratory infection: a population-based, propensity score-matched cohort study. Critical Care, 24(1), 1-9.

10. Laporte, L., Hermetet, C., Jouan, Y., Gaborit, C., Rouve, E., Shea, K. M., ... & Guillon, A. (2018). Ten-year trends in intensive care admissions for respiratory infections in the elderly. Annals of Intensive Care, 8(1), 1-11.

11. Silva, A., Silva, S., Fonseca, C., Cardoso, I., Ferrinho, R., Sousa, L., ... & Lopes, M. (2021). Indicators sensitive to rehabilitation nursing care: a functional and technological respiratory rehabilitation program for elderly people. In International Workshop on Gerontechnology (pp. 87–98). Springer, Cham.

12. Watson, A., & Wilkinson, T. M. (2021). Respiratory viral infections in the elderly. Therapeutic advances in respiratory disease, 15, 1753466621995050.

13. Watanabe, A., Fukuda, M., Suzuki, M., Kawaguchi, T., Habata, T., Akutsu, T., & Kanda, T.(2015). Factors decreasing caregiver burden to allow patients with cerebrovascular disease to continue in long-term home care. Journal of stroke and cerebrovascular diseases, 24(2), 424–430.

14. Brickman, A. M., Reitz, C., Luchsinger, J. A., Manly, J. J., Schupf, N., Muraskin, J., ... &Mayeux, R. (2010). Long-term blood pressure fluctuation and cerebrovascular disease in an elderly cohort. Archives of neurology, 67(5), 564-569.

15. Li, X., Wang, F., Li, R., & Tian, H. (2022). Quality Care Alleviates Behavioral Cognitive Impairment and Reduces Complications in Elderly Patients with Cardiovascular and Cerebrovascular Diseases. Journal of Healthcare Engineering, 2022.