

## MORTALITY PROFILE IN A PRIVATE MEDICAL COLLEGE HOSPITAL IN NORTH ANDHRA PRADESH - A 5 YEARS RETROSPECTIVE STUDY

Mahitha Joshna K<sup>1</sup>, Koneti Kailash Rao<sup>2</sup>, C Tej Kumar<sup>3</sup>, Venkata Suresh Anga<sup>4</sup>, N Hanumanth<sup>5</sup>

Received : 14/09/2023  
Received in revised form : 08/10/2023  
Accepted : 20/10/2023

Keywords:  
Mortality, Medical Records, Public health.

Corresponding Author:  
**Dr. Venkata Suresh Anga,**  
Email: doctorsuresh2013@gmail.com

DOI: 10.47009/jamp.2023.5.5.306

Source of Support: Nil,  
Conflict of Interest: None declared

Int J Acad Med Pharm  
2023; 5 (5); 1556-1561



<sup>1</sup>M.B.B.S Student, GVP Institute of Health Care & Medical Technology, Visakhapatnam, India.  
<sup>2</sup>Associate Professor, Department of Community Medicine, GVP Institute of Health Care & Medical Technology, Visakhapatnam, India.  
<sup>3</sup>Associate Professor, Department of Community Medicine, Guntur Medical college, Guntur, India.  
<sup>4</sup>Associate Professor, Department of Community Medicine, GVP Institute of Health Care & Medical Technology, Visakhapatnam, India.  
<sup>5</sup>Lecturer in Statistics, Department of Community Medicine, GVP Institute of Health Care & Medical Technology, Visakhapatnam, India.

### Abstract

**Background:** Mortality statistics, life expectancy at birth, and life expectancy at various ages are key indicators of population health that allow for comparisons between countries for the purpose of planning, intervention programmes, allocating resources, and suggesting priorities. Life expectancy at birth is also an important indicator of population health. **Materials and Methods:** Medical records of all deaths which occurred in between November 2017 to October 2022 (5 years), were reviewed. All the details like age, sex, residence, socioeconomic status, appropriate admission details, duration of hospital stay, referral, cause of death etc., were collected. **Result:** Total number admissions in 5 years study period were 81,164 and total number of deaths that occurred during the study period were 244. Mortality rate was 3.1 per 1000 admissions and it was very low when compared to other studies. Among the total deaths (244), majority of deaths observed were above 55 years old patients and male deaths were more than female deaths. The peak in mortality during the study period was occurred during COVID-19 pandemic period. Apart from COVID-19 disease, Cancer was the second most common cause of death followed by other Chronic diseases. Among the cancers, Lung cancer was the most common cause of death followed by Carcinoma Breast and Carcinoma Stomach. **Conclusion:** Most common causes of death in tertiary care hospital were Non-Communicable diseases and Chronic diseases followed by Communicable diseases. Apart from COVID-19, cancer was the main leading cause of overall mortality.

## INTRODUCTION

Thanatology is a branch of science which deals with death study. The Death is a series of events, and it is complete opposite of health. The pattern of mortality is a key indicator of consequent health scenario attempts to estimate cause of loss of healthy life. According to WHO, death is said to be sudden, unexpected when a person not known to have been suffering from any dangerous disease, injury after the onset of terminal illness. The magnitude of mortality and causes are different from country to country and ward to ward in a hospital. Majority of causes are preventable and avoidable. This study tried to analyze the deaths from different wards in a medical College hospital. The Medical Records Department (MRD) has a system of compilation for keeping the

records of death, but getting the correct statistics from the records for review of health care planning is lacking in many medical institutes. Mortality statistics are particularly important to know about the health of the population. Mortality statistics and life expectancy at birth and life expectancy at various subsequent ages are important indicators of population health to make comparisons between nations for designing intervention programmes, for allocation of resources and indicating priorities.<sup>[1]</sup>

**In Death certificate, the causes of death are mentioned in three phases:**

**Immediate cause** - Disease present at terminal event.  
**Basic cause** - pathological process responsible for death.

**Contributory Cause** - Pathological/ complicating process involved in.

Causes of death are classified as a). Natural b). Unnatural c). Obscure

The frequency of disease or death is not static, and it is a dynamic event. The observed change reflects change in incidence and case fatality or both. Universally, most epidemiological studies begin with mortality data and it is relatively easy to obtain and reasonably accurate in many countries. Many countries have routine system for collection of mortality data and important causes of death.<sup>[1]</sup>

Epidemiological studies about mortality are used for explaining trends and differentials in overall mortality, indicating priorities of action and the assessment and monitoring of public health.<sup>[1]</sup>

Mortality data from hospitalized patients reflect the causes of major illnesses, case seeking behavior and the standard of care being provided by the health system. Results of vital events like mortality data constitutes most vital component of Health information system (HIS).<sup>[2]</sup>

Hospital based health records provide information regarding the causes of deaths, case fatality rates and age and sex distribution. These are of immense importance in planning health care services.<sup>[2]</sup>

When compared to developed countries, the pattern of diseases is vastly different in developing countries. In developing countries, most deaths result from infectious and parasitic diseases which are abetted by malnutrition.<sup>[2]</sup>

In India about 40% of deaths occur due to infectious, parasitic, and respiratory diseases, as compared to developed countries where it is only 8%. Even though infectious diseases are more common in developing countries, there is an increase in the frequency of new health problems such as coronary heart disease, hypertension, cancer, diabetes, and accidents. Indians are facing double burden of diseases.<sup>[2]</sup>

More specifically, epidemiology is concerned with the distribution of disease and death and with their determinants and consequences in population groups. The pattern of health and disease are integral components of population change. The knowledge about this pattern of health and disease and their determinants in population groups serves as a prediction of population change and a source of hypothesis that can be further assessed to collect, refine, and build population theory.<sup>[3]</sup>

A transition in disease burden is a shift from communicable to non-communicable causes of disease and injury. Transition remains a powerful framework for global and regional health policy debates.<sup>[4]</sup>

In 1971, Omran outlined the concept of the "epidemiological transition" to describe the changing pattern of causes of death that results from socio-demographic development. The epidemiological transition is an extension of the conception of the demographic transition.<sup>[4]</sup> In developed countries, an epidemiological transition is parallel to the demographic and technologic transitions. It is still underway in less developed societies.<sup>[2]</sup>

The epidemiological transition constitutes characteristic change occurs in the contributing causes of death, in addition to the demographic changes like fertility rates, mortality rates and age distribution of the population. The epidemiological transition includes both mortality and morbidity.<sup>[4]</sup>

India is undergoing a rapid epidemiological transition consequent to economic and social changes. As the mortality statistics reveal a lot about the health of the population, it is quite important to know the frequency of diseases and deaths which keeps changing over time. It is equally important to know whether that observed trend in mortality pattern is genuine or due to change in classification of diseases, changes in accuracy of diagnosis or allocation of priorities.<sup>[5]</sup>

A country needs a sound epidemiological information system to prioritize, plan and implement public health programmes. This information also provides the basis for patient care and helps the administration in managing day to day hospital affairs.<sup>[5]</sup>

Life expectancy of India in 2022 is 70.19 years. Life expectancy in India shows a continuous increasing trend from 63.9 years for males and 66.9 years for females in 20015 to 69.5 years in males and in 72.2 years in females in the year 2022.<sup>[6]</sup>

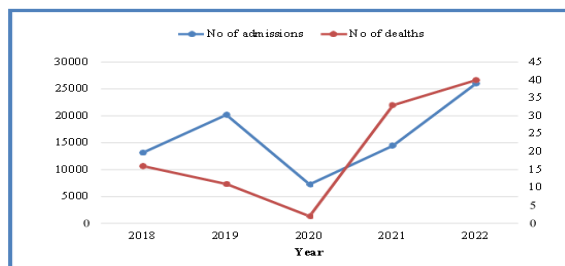
The Crude Death Rate(CDR)in India is around 7.3 per 1000 people since 2015. Only in the year 2020 it is increased by 1.49 percent due to COVID-19 complications. There were 10.23 million deaths in India in 2021(CDR 7.34 per thousand people), whereas the death rate of the world in 2021 is 7.64 per 1000 population. Death rates have been declined since 1950 due to better socio-economic status, and improved medical care. The death rate in India in 1950 was 28.16 and gradually declined to 7.38 in 2022. On the above background it is intended to study the subject with the following objectives. To find out the determinants of deaths in patients admitted in last five years and to know the common causes of death in a tertiary care hospital.

## MATERIALS AND METHODS

Medical records of all deaths which occurred in between November 2017 to October 2022 (5years), were reviewed. All the details like age, sex, residence, socioeconomic status, appropriate admission details, duration of hospital stay, referral, cause of death etc., were collected from MRD section of Hospital. The data collected has been fed into MS EXCEL Software and analyzed in SPSS version 25. The results were expressed in percentages.

## RESULTS

**Figure 1: Year wise admissions and deaths occurred during the study period (2018 to 2022)**



**Table 1: Age wise distribution of deaths that occurred during study period (2018– 2022)**

Age in years	Frequency	Percentage (%)
15-25	02	0.8
25-35	12	4.9
35-45	39	16.0
45-55	41	16.8
55-65	80	32.8
65-75	51	20.9
75-85	15	6.1
85-95	04	1.6
Total	244	100.0

**Table 2: Gender wise distribution of deaths in the study period (2018– 2022)**

Sex	Frequency	Percentage (%)
Female	91	37.3
Male	153	62.7
Total	244	100.0

**Table 3: Distribution of deaths according to their admission in different wards**

Department Admitted	Frequency	Per cent
Casualty	5	2.0
Chest and TB	16	6.6
General medicine	209	85.7
General surgery	5	2.0
ICU	6	2.5
Orthopedics	3	1.2
Total	244	100.0

Majority (85.7%) of deaths were occurred in General medicine wards. Deaths that occurred in Chest and TB ward were 6.6% and remaining deaths were occurred in all other wards.

**Table 4: Disease wise Distribution of deaths during the study period (2018-2022)**

Other significant conditions contributing to deaths (Part-II of Death certificate)	No. of deaths	Percentage (%)
Br. Asthma	3	1.2
CVA (Cerebrovascular Accidents)	9	3.7
HD (Heart Diseases)	3	1.2
DM (Diabetes Mellitus related)	71	29.1
HTN (Hypertension related)	92	37.7
ALCOHOLISM Related deaths	31	12.7
SMOKING Related deaths	37	15.2

Maximum number of deaths were associated with Hypertension (37.7%) followed by Diabetes (29.1%), then Smoking (15.2%), and Alcoholism (12.7%).

**Table 5: Year wise admissions and deaths during the study period (2018-2022)**

Year	No. of Admissions	No. of deaths due to all causes except COVID-19	No. of COVID-19 deaths	Total no. of deaths
2018	13174	16	-	16
2019	20210	11	-	11
2020	7255	2	15	17
2021	14469	33	127	160
2022	26056	40	-	40
Total	81164	102	142	244

Total number admissions in 5 years study period were 81,164. Maximum number of admissions were seen in the year 2022 followed by the year 2019. Maximum number of deaths were seen in the year 2021 followed by 2020. COVID –19 related deaths were observed in the year 2020 and 2021(142, 58%) and deaths due to other causes in the study period were 102 (42%).

**Table 6: System wise deaths during the study period (2018-2022).**

Underlying cause from	Number of deaths	Percentage (%)
Cardiovascular system	10	4.1
Respiratory system	21	8.7
Central Nervous system	6	2.4
GI system and Hepato-biliary system	7	2.9
Renal diseases	14	5.8
Blood disorders	1	0.4
Traumatic causes	3	1.2
Cancers	28	11.5
Diabetes – complications	2	0.8
HIV/AIDS	1	0.4
Communicable diseases	8	3.2
COVID-19	142	58.2
Poisoning	1	0.4
Total	244	100.0%

Majority (58.2%) of deaths were occurred due to COVID-19 disease. Apart from that in remaining deaths, maximum deaths were due to Cancers (11.5%) followed by Respiratory diseases (8.7%), then 5.8% deaths were due to Renal diseases, 4.1% deaths were due to Cardio Vascular diseases, 3.2 % deaths were due to Communicable diseases, 2.9% deaths were due to GI system and Hepato- biliary diseases, 2.4% deaths were due to CNS disorders, 1.2% deaths were due to traumatic causes, 0.8% deaths were due to Diabetic complications, 0.4% deaths were due to Blood disorders, 0.4% deaths were due to HIV/AIDS and 0.4% deaths were due to Poisoning.

**Table 7: Distribution of deaths that occurred due to different types of Cancers (n=28)**

Type of cancer	No. of deaths	Percentage (%)
Carcinoma Breast	4	14.2
Carcinoma cervix	2	7.1
Carcinoma Ovary	1	3.6
Carcinoma Lung	6	21.5
Oral Carcinoma	1	3.6
Carcinoma Pharynx	2	7.1
Carcinoma stomach	3	10.8
Carcinoma Rectum	2	7.1
Hepatocellular Carcinoma	2	7.1
Carcinoma Gallbladder	2	7.1
Glioblastoma	1	3.6
Carcinoma Thyroid	1	3.6
Sarcoma	1	3.6
Total	28	100.0

Cancer was the major (11.5%) cause of deaths in this study. Among them, Carcinoma Lung was major contributor for deaths, followed by Carcinoma Breast and Carcinoma Stomach. Other cancers were Carcinoma Rectum, Liver, Gallbladder, Pharynx, cervix, Ovary, Thyroid, Oral cavity, Glioblastoma and Sarcoma.

## DISCUSSION

Total number admissions in 5 years study period were 81,164. Maximum number of admissions were seen in the year 2022 (i.e. 26,056) followed by the year 2019 (i.e. 20,210). Total number of deaths that occurred during the study period were 244 and the Mortality rate was 3.1 per 1000 admissions. Maximum number of deaths were seen in the year 2021 (i.e. 160) followed by 2022 (i.e. 40) and this was during COVID –19 pandemic (142 deaths) and deaths due to other than COVID-19 disease in the study period were 102.

Among the total deaths (244), maximum number of deaths observed were above the age of 55 years o. No deaths were reported among children. Ashwathy A et al,<sup>[7]</sup> Holambe V. M. et al,<sup>[8]</sup> Chinmay Nandi et al,<sup>[5]</sup>

Jeeveswararao Bagadi et al,<sup>[9]</sup> Murtuja et al,<sup>[10]</sup> Neeraj Khare et al,<sup>[11]</sup> studies also reported that maximum deaths were occurred among >50 years old individuals.

Among the total observed deaths, maximum number of deaths were occurred among males (62.7%) than females (37.3%). Similar results were seen in many studies Viz. C.Deepak et al,<sup>[12]</sup> Neeraj Khare et al,<sup>[11]</sup> Kauser MM et al,<sup>[10]</sup> Jeeveswararao Bagadi et al,<sup>[9]</sup> Holambe V. M. et al,<sup>[8]</sup> Meenal Kulkarni et al,<sup>[13]</sup> Gowri Shankar et al,<sup>[14]</sup> Ashwathy A et al,<sup>[7]</sup> Lata Godale et al,<sup>[1]</sup> Saha R et al.<sup>[15]</sup> This difference was due to males were more exposed to smoking, alcohol, Road Traffic accidents etc.,

Maximum (85.7%) deaths were occurred in General medicine ward. Deaths that occurred in Chest and TB ward were 6.6% and remaining deaths were occurred in all other wards. Similar observations were reported in studies by C.Deepak et al,<sup>[12]</sup> Neeraj Khare et al,<sup>[11]</sup> Kauser MM et al,<sup>[10]</sup> Gowri Shankar et al,<sup>[14]</sup> Jeeveswararao Bagadi et al.<sup>[9]</sup> More admissions more serious diseases were treated in General medicine ward.

Maximum number of deaths were associated with Hypertension (37.7%) followed by Diabetes (29.1%),

then Smoking (15.2%), and Alcoholism (12.7%). These are all major risk factors for cardiovascular diseases and all Chronic and Non-Communicable diseases.

The line diagram showing year wise admissions had increasing trend from 2018 to 2019 and decreasing in 2020 and again increasing in 2021 and 2022. The line diagram showing year wise deaths and it is increasing from 2018 to 2021 and decreasing in 2022. In 2021 the rise in peak is due to COVID-19 disease [Figure 1]. Neeraj Khare et al,<sup>[11]</sup> study showed continuous increasing trend during the study period from 2008 to 2011.

Majority (58.2%) of deaths were occurred due to COVID-19 pandemic. Apart from that in remaining deaths, maximum deaths were due to Cancers (11.5%). Ashwathy A et al,<sup>[7]</sup> reported cancers account for 12.7%, C.Deepak et al,<sup>[12]</sup> showed cancers only 3.11%, according to Neeraj Khare et al,<sup>[11]</sup> it was 2.4%. followed by Respiratory diseases (8.7%) and it was 12.4% according to Ashwathy A et al,<sup>[7]</sup> 4.3% according to C.Deepak et al,<sup>[12]</sup> then 5.8% deaths were due to Renal diseases (This was almost similar to the observations by C.Deepak et al.<sup>[12]</sup>

Nearly 4.1% deaths were due to Cardio Vascular diseases {C.Deepak et al,<sup>[12]</sup> reported deaths due to Cardio Vascular causes were 17.89%, according to Neeraj Khare et al,<sup>[11]</sup> it was 14.63%, Gowri Shankar et al,<sup>[14]</sup> 13.44%, Ashwathy A et al,<sup>[7]</sup> – 39.6% }. 3.2% deaths were due to Communicable diseases, 2.9% deaths were due to GI system and Hepato-biliary diseases, 2.4% deaths were due to CNS disorders ( it was 11.3% according to C.Deepak et al,<sup>[12]</sup> 1.2% deaths were due to traumatic causes (according to C.Deepak et al it was 13.3%), 0.8% deaths were due to Diabetic complications, 0.4% deaths were due to Blood disorders (This was equal as per C.Deepak et al) , 0.4% deaths were due to HIV/AIDS and 0.4% deaths were due to Poisoning { according to C.Deepak et al it was 1.75% }

In this study maximum deaths were due to Non-Communicable diseases and Chronic diseases compared to Communicable diseases and it was also observed in studies like C.Deepak et al,<sup>[12]</sup> Neeraj Khare et al,<sup>[11]</sup> Murtuja et al,<sup>[10]</sup> Jeeveswararao Bagadi et al,<sup>[9]</sup> Meenal Kulkarni et al,<sup>[13]</sup> Gowri Shankar et al,<sup>[14]</sup> Ashwathy A et al.<sup>[7]</sup>

Cancer was the major (11.5%) cause of deaths in this study. Among them, Carcinoma Lung (21.5%) was major contribution followed by Carcinoma Breast (14.2%) and Carcinoma Stomach (10.8%). Other cancers were Carcinoma Rectum (7.1%), Liver (7.1%), Gallbladder (7.1%), Pharynx (7.1%), cervix (7.1%), Ovary (3.6%), Thyroid (3.6%), Oral cavity (3.6%), Glioblastoma (3.6%) and Sarcoma (3.6%).

## CONCLUSION

Even though individual hospital data may not represent National Health statistics, they provide useful indicators for the health of the community.

Causes of Mortality are multifactorial. Most common causes of death in tertiary care hospital were Non-Communicable diseases and Chronic diseases followed by Communicable diseases. Apart from COVID-19; cancer was the main leading cause of overall mortality. It is necessary to take a forward step to educate the medical fraternity and the people about the prevalence of different diseases causing mortality and preventive strategies for Communicable and Non-Communicable diseases. Reorientation of the Health Care delivery system and allocation of resources is required to implement evidence-based strategies and the new challenges in Health Programmes. This study will also be helpful to know various causes of mortality in this hospital and it would also be helpful for health managers to monitor mortality in various departments and plan for new interventions to decrease mortality.

## Recommendations

1. Since the death records or mortality data give lot of information resources can be utilized optimally by careful health planning. Budget allocation can be channelized to priority areas.
2. Proper data collection and documentation is most essential for all deaths.
3. Time to time doctors should be trained to ascertain proper cause of death according to ICD-11 classification.
4. Periodical auditing on deaths must be conducted in medical institutions to explore the preventable causes of premature deaths and to improve quality of medical care.

## REFERENCES

1. Godale L, Mulaje S. Mortality Trend and Pattern in Tertiary Care Hospital of Solapur in Maharashtra Indian Journal of Community Medicine. 2013; 38(1): 49-52
2. Omran AR. The Epidemiologic Transition: A Theory of the Epidemiology of Population Change. The Milbank Quarterly. 2005;83(4): 731-57.
3. Park K. Park's textbook of preventive and social medicine. 26th ed. 1167 Prem Nagar, Jabalpur, 482001 (M.P.), India: M/s Banarsidas Bhanot Publishers; p. 42 & 52.
4. Last JM, Rosenau M. Public health and preventive medicine. 11th ed. Appleton Century Crofts: New York; 1980. p. 18-21.
5. Nandi C, Mitra K, Bhaumik D, Paul SP. An observational study on pattern of mortalities as per ICD-10 classification system in a tertiary care hospital in India Asian Journal of Medical Sciences. 2021; 12(10): 69-73.
6. World Bank Data. World Bank Data portal; World Development Indicators; World Development Report; International Debt Statistics; Global Consumption Database.
7. Ashwathy A, Pramodkumar GN, Undi M, Prathvimraj BU, Bakkannavar SM, Roopa AN et al. Study of mortality trends & pattern in a tertiary care hospital in Kerala, South India. J Indian Acad Forensic Med. 2021 Oct-Dec; 43(4): 340-344
8. Holambe VM, Thakur N. Mortality Pattern in Hospitalized Patients in a Tertiary Care Centre of Latur. JKIMSU. 2014; 3(2): 111-115
9. Bagadi J, Pothireddy S, Mohanthy SK. Analysis of Hospital Deaths at Tertiary Care Teaching Hospital. Indian Journal of Forensic Medicine & Toxicology. 2020; 14(2):8-12
10. Kausar MM, Kinnera S, Korrapolu J. Study of Mortality Pattern in Adults at a Tertiary Care Teaching Hospital in South India. RRJMHS. 2014;3(4):145-149

11. Khare N, Gupta G, Gupta SK, Khare S. Mortality trend in a tertiary care hospital of Bhopal, Madhya Pradesh. *National Journal of Community Medicine*. 2016; 7(1): 64-67
12. Deepak C, Kishore RK, Babu M. Mortality trends in a tertiary care hospital in Mysore. *International Journal of Health & Allied Sciences*. 2018; 7(2).
13. Kulkarni M, Nayse J. Trend and pattern of mortality among patients admitted in a tertiary care hospital *The Journal of Community Health Management*, October- December 2016;3(4):199-202
14. Shankar G, Kalburgi EB. Mortality pattern in a tertiary care teaching hospital in North Karnataka, India. *Int J Community Med Public Health*. 2019 Aug;6(8):3280-3283
15. Saha R, Nath A, Sharma N, Badhan SK, Ingle GK. Changing profile of disease contributing to mortality in a resettlement colony of Delhi. *The National Medical Journal of India*. 2007; 20(3): 125-7