

## A retrospective study of mortality in a tertiary care teaching hospital in Bagalkot, Karnataka, India

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### Abstract

**Introduction:** Cause of death statistics from hospitals are considered along with mortality data from other sources to constitute the essential statistics on the health of a population. Mortality data is used to periodically review health priorities, set research agendas and monitor progress towards national and global health and development goals. There has been an increase in the frequency of new health problems like coronary heart disease, hypertension, cancer, diabetes and accidents. The emerging picture is a mixture of the old and modern diseases. Hence, this study was done to know the socio demographic profile and pattern of causes of death in a Tertiary Care Teaching Hospital in Bagalkot, Karnataka, India.

**Materials and Method:** The case reports of all deaths for the 5 year period i.e. 2012 to 2016 from the Medical Records Department were analyzed to study the socio demographic profile and the pattern of causes of death. The deaths were classified according to ICD 10<sup>th</sup> revision.

**Results:** In all the 5 years, male deaths were more than female deaths. Almost three- fourths of deaths were in males and females from rural areas. Non communicable diseases contributed to 62.88% to 72.75% of the deaths during the 5 year study duration.

**Conclusion:** The present study indicates that Bagalkot district is going through an epidemiological transition from communicable to non communicable diseases and there is a need for health awareness in the community about changing lifestyles and its harmful effects on health.

**Keywords:** Mortality, Tertiary care hospital, communicable disease, Non communicable disease

### Introduction

Most of the epidemiological studies begin with mortality data around the world. Many countries have routine systems for collecting such data. Each year, information on deaths is analyzed and the resulting tabulations are made available by each Government.<sup>(1)</sup>

Mortality is an index of the severity of a disease from both clinical and public health standpoints.<sup>(2)</sup> An important use of mortality data is to compare two or more studies or one study in different time periods. Such studies may differ in regard to many characteristics that affect mortality of which age distribution is the most important as it is the single most important predictor of mortality.<sup>(2)</sup>

Public health planning should be based on reliable and timely data on the leading causes of death. Most deaths whose cause is certified according to the International classification of diseases and related health problems occur in hospitals. Cause of death statistics from hospitals are considered along with mortality data from other sources to constitute the essential statistics on the health of a population. Mortality data is used to periodically review health priorities, set research agendas and monitor progress towards national and global health and development goals.<sup>(3)</sup>

The causes of death in developing countries is very different from those in developed countries.<sup>(4)</sup> In India, most deaths result from infectious and parasitic diseases, abetted by malnutrition. On the other hand, there has been an increase in the frequency of new

health problems like coronary heart disease, hypertension, cancer, diabetes and accidents. The emerging picture is a mixture of the old and modern diseases.<sup>(1)</sup>

Mortality data from hospitalized patients reflect the causes of major illness and care seeking behavior of the community.<sup>(5)</sup> It is an important aspect of health information system.

Hence, this study was done to know the socio demographic profile and pattern of causes of death in a Tertiary Care Teaching Hospital in Bagalkot, Karnataka, India.

### Materials and Method

A 5-year retrospective study was done of all deaths in Hangal Sri Kumareswar Hospital and Medical Research Center attached to S.Nijalingappa Medical College, Navanagar, Bagalkot, Karnataka. After Ethical Clearance and Institutional Review Board, the case reports of all deaths for the 5 year period i.e. 2012 to 2016 from the Medical Records Department were analyzed to study the socio demographic profile and the pattern of causes of death. The deaths were classified according to ICD 10<sup>th</sup> revision. Data regarding age, sex, place of residence, date of death and cause of death was recorded and analyzed using percentages and chi square test.

### Results

During the 5 year period from 2012 to 2016, there was a total of 2056 deaths registered in the Medical

Records Department of Hangal Sri Kumareswar Hospital and Medical Research Center of S.N. Medical College, Navanagar, Bagalkot, Karnataka, India. In all the 5 years, male deaths were more than female deaths.

(Table 1) In this study, almost three- fourths of deaths were noted in males and females from rural areas and was statistically significant. (Table 2)

**Table 1: Sex distribution of mortality**

Year	Males	%	Females	%	Total	%
2012	268	57.51	198	42.49	466	22.66
2013	206	58.03	149	41.97	355	17.27
2014	268	63.21	156	36.79	424	20.62
2015	267	61.66	166	38.34	433	21.06
2016	218	57.67	160	43.33	378	18.38
Total	1227	59.68	829	40.32	2056	100

chi square= 4.847  
p = 0.303

**Table 2: Proportional mortality rate according to age**

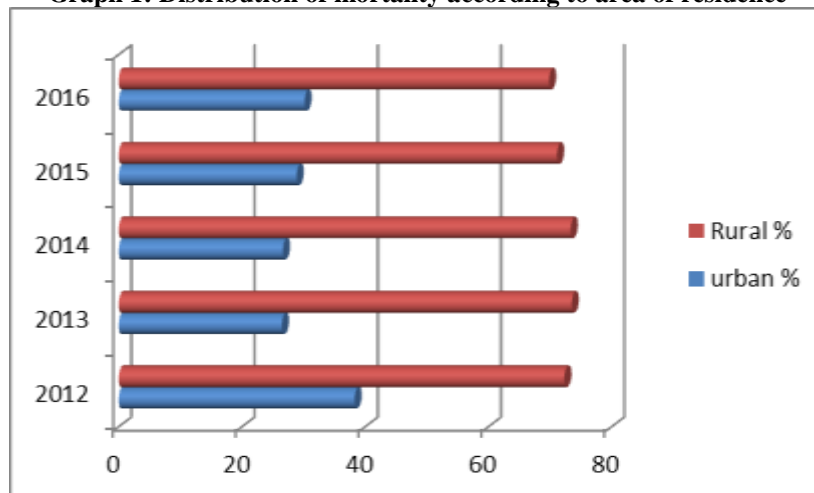
Age	2012	2013	2014	2015	2016
<_7 days	22.96	30.69	21.7	15.94	11.38
8-28 days	14.81	2.54	1.42	1.39	0.53
29 days-1 year	7.29	5.35	2.83	3.23	2.38
1-5 years	6.01	2.25	2.59	3	1.06
6-10 years	0.86	0.85	1.42	1.85	0.53
11-19 years	4.29	3.09	3.77	3.23	4.23
20-40 years	14.81	21.99	21.7	21.48	22.22
41-60 years	13.09	15.21	19.81	22.17	26.45
61-80 years	13.73	13.24	22.17	23.32	26.19
>-81 years	2.15	4.79	2.59	4.39	5.03

**Table 3: Age and Sex distribution of mortality**

Proportional mortality rate	2016		2015		2014		2013		2012	
	Male %	Female%	Male %	Female%	Male %	Female%	Male %	Female%	Male %	Female%
<_7 days	10.55	12.5	18.35	12.05	22.01	21.15	33.98	26.17	22.01	24.24
8-28 days	0.46	0.62	1.87	0.6	1.86	0.64	3.4	1.34	15.67	13.64
29 days-1 year	2.75	1.87	1.5	6.02	3.36	1.92	4.85	6.04	7.46	7.07
1-5 years	1.38	0.62	3.74	1.81	2.24	3.21	3.4	0.67	6.72	5.05
6-10 years	0.46	0.62	1.5	2.41	1.12	1.92	0.48	1.34	0.37	1.51
11-19 years	3.21	5.62	3.37	3.01	2.98	5.13	1.94	4.7	2.98	6.06
20-40 years	17.89	28.12	16.1	30.12	19.03	26.28	16.5	29.53	13.43	16.67
41-60 years	33.03	17.5	24.34	18.67	21.64	16.67	17.96	11.41	15.67	9.59
61-80 years	26.15	26.25	25.47	19.88	23.13	20.51	13.59	12.75	13.43	14.14
>-81 years	4.13	6.25	3.74	5.42	2.61	2.56	3.88	6.04	0.22	2.02

Maximum number of deaths in the year 2012 and 2013 were observed in the early neonatal period. In the years, 2014 and 2015, majority of deaths were observed between 61 to 80 years of age. (Table 3)

It was noted that during 2013 to 2016, maximum number of female deaths were between 20 to 40 years of age. (Graph 1)

**Graph 1: Distribution of mortality according to area of residence**

Chi square=10.48  
p= 0.033

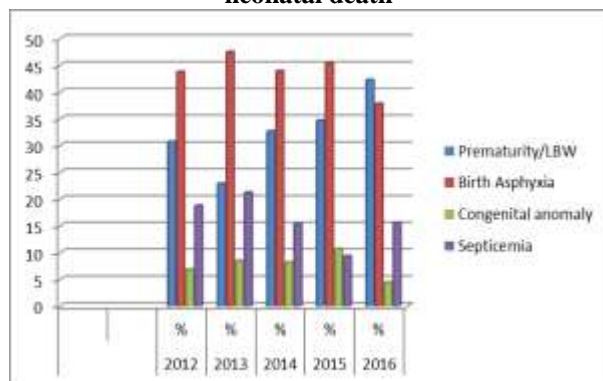
Non communicable diseases contributed to 62.88% to 72.75% of the deaths during the 5 year study duration. The proportion of deaths due to communicable diseases ranged from 27.25% to 37.12%. (Table 4)

**Table 4: Distribution according to the causes of death**

Causes of Death	2012		2013		2014		2015		2016	
	Count	%	Count	%	Count	%	Count	%	Count	%
<b>Communicable Diseases</b>	466		355		424		433		378	
Infectious & parasitic diseases	63	13.52	40	11.27	73	17.22	63	14.55	50	13.23
Inflammatory diseases of CNS	12	2.57	10	2.82	9	2.12	16	3.69	26	6.88
Respiratory Tract infections	27	5.79	14	3.94	11	2.59	20	4.62	21	5.56
Infections of skin & subcutaneous tissue	5	1.07	0	0	7	1.65	4	0.92	14	3.7
Infections specific to perinatal period	66	14.16	39	10.98	25	5.9	15	3.46	18	4.76
Total	173	37.12	103	29.01	125	29.48	118	27.25	129	34.13
<b>Non Communicable Diseases</b>										
Neoplasms	6	1.29	3	0.84	2	0.47	10	2.31	10	2.65
Cardiovascular diseases	53	11.37	75	21.13	90	21.23	92	21.25	71	18.78
Conditions in perinatal period	107	22.96	72	20.28	65	15.33	53	12.24	26	6.88
Digestive system	22	4.72	14	3.94	15	3.54	19	4.39	23	6.08
Congenital malformation	13	2.79	10	2.82	8	1.89	22	5.08	7	1.85
Respiratory System	16	3.43	16	4.51	30	7.07	19	4.39	17	4.5
Genito urinary system	7	1.5	9	2.53	8	1.89	14	3.23	10	2.65
Pregnancy, childbirth and puerperium	5	1.07	5	1.41	9	2.12	6	1.38	5	1.32
Diabetes	9	1.93	13	3.66	17	4.01	21	4.85	25	6.61
Burn injury	26	5.58	18	5.07	33	7.78	30	6.93	27	7.14
Road traffic accident	16	3.43	4	1.13	6	1.42	11	2.54	17	4.5
Organo phosphorous poisoning	11	2.36	10	2.82	8	1.89	15	3.46	8	2.12
Snake bite /scorpion sting/Bee sting/bull gore injury	2	0.43	3	0.84	8	1.89	3	0.69	3	0.79
Total	293	62.88	252	70.99	299	70.52	315	72.75	249	65.87

It was observed that cardiovascular deaths were maximum during 2013 to 2016. Alcoholic liver disease was responsible for 3% to 6.08% of all deaths in the 5 year study period. Regarding neonatal deaths; maximum number of deaths (44.33%) was due to birth asphyxia followed by low birth weight due to prematurity (30.86%) (Graph 2)

Tuberculosis contributed to 2.15% to 6.88% and HIV was responsible for 1.50% to 4.16% of the deaths in the study period.

**Graph 2: Distribution according to the causes of neonatal death**

## Discussion

In the present 5 year study male deaths were more than female deaths and this finding is similar to other studies.<sup>(4,5,6,7)</sup>

Mortality was the highest in the early neonatal period only in 2012 and 2013 whereas in a similar study, for all the 5 years, mortality was highest in the early neonatal period.<sup>(4)</sup> This finding could be attributed to the skilled Perinatal care in our tertiary care hospital over the 5 year study period. Our finding is similar to another study done in Punjab.<sup>(8)</sup>

This study revealed that during 2013 to 2016, majority of females who died in the hospital were between 20 to 40 years of age and the most common cause was burn injury which contributed to 32.86% of all deaths in that age group followed by septicemia (9.39%), severe anemia (7.51%), Retroviral disease (5.63%) and organ phosphorous poisoning (5.16%). The range of burn injury deaths for the 5 year period was 25% to 39.39%. Stringent measures are required to prevent burn injuries in the most productive age group of women.

Pregnancy, childbirth and puerperal causes lead to 10.33% of deaths in the 20 to 40 year age group. Post partum hemorrhage contributed to 50% of deaths followed by eclampsia (22.73%), and amniotic fluid embolism (9.09%). Puerperal sepsis, prolonged labor, post abortion shock and ante partum hemorrhage contributed each to 4.55% of deaths. Similar findings were reported in a study done in Srinagar<sup>(9)</sup> whereas in studies done in Odisha and Andaman and Nicobar group of islands, hypertensive disorders of pregnancy was the most common cause of maternal mortality.<sup>(10,11)</sup> These findings indicate the need for outreach services in the rural and urban community to identify high risk ante natal mothers.

Majority of the deaths in males between 20-40 years of age was due to alcoholic liver disease (15.27%) followed by septicemia (11.33%), Road traffic accidents (10.84%), cardiovascular diseases (10.34%) and organophosphorous poisoning (9.85%). Burn injuries and retroviral disease was responsible for

8.87% of the deaths. Tuberculosis contributed to 3.45% deaths. In contrast, in a study done in Nigeria, the leading causes of death in males aged 15 and older was retroviral disease contributing to 29% of the deaths followed by 12% due to road traffic accidents, and 7% due to hypertension.<sup>(12)</sup> This is the most productive age group and measures are needed for behavior change communication regarding alcohol, burn injuries, Road traffic accidents and organophosphorous poisoning.

Birth asphyxia was responsible for 44.33% of neonatal deaths in the study period followed by prematurity contributing to 30.86% of deaths, septicemia to 16.99% and congenital anomalies to 7.8%. This could be attributed to the fact that this hospital is a referral hospital for the neighboring 4 districts for neonatal resuscitation under the Karnataka Government Balasanjeevani Scheme for the vulnerable population. Similar findings are reported in the study done in Solapur where prematurity caused 42.4% to 51.8% of the deaths.<sup>(4)</sup>

Overall, non-communicable diseases contributed to two-thirds of all deaths during the 5 year period and the leading cause was cardiovascular diseases between 2013 to 2016 (21.33% to 18.78%). This finding is very similar to developed countries like United States of America and Europe.<sup>(1)</sup> In contrast, in a study done in North East Ethiopia, HIV/AIDS was the common cause of mortality contributing to 14.89% of deaths followed by pneumonia (9.9%), septicemia (7.6%) and intestinal obstruction (7.0%).<sup>(6)</sup> In a study done in Bhopal, Madhya Pradesh, India, the leading cause of death was septicemia (24%) followed by heart disease (14.63%) and pulmonary tuberculosis (10.31%).<sup>(5)</sup>

## Conclusion

The present study indicates that Bagalkot district is going through an epidemiological transition from communicable to non communicable diseases and there is a need for health awareness in the community about changing lifestyles and its harmful effects on health. Regarding prevention of non communicable deaths due to cardio vascular diseases, screening programmes should be implemented in the rural and urban communities from the second decade of life itself and early intervention through diet and exercise and stress reduction should be done. Age limit of consuming alcohol should be increased. Accidents and burn injuries are also a cause for concern and safer fuel should be used at home. Adequately trained personnel for Reproductive and child health services are needed in the community to prevent maternal and neonatal deaths. About communicable diseases, environmental issues like water supply and sanitation have to be given high priority to decrease the number of preventable deaths. Early diagnosis and treatment of Tuberculosis and HIV is essential to decrease the burden of deaths due to these causes.

## Recommendation

Emergency care and life support training is the need of the hour to medical officers in rural areas so that they can identify and stabilize the critically ill and injured before transfer to a tertiary care hospital to save lives in the golden hour and to decrease the proportion of deaths in the younger age groups.

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