

# A Retrospective Study on Cause of Death at Janakpur Zonal Hospital, Nepal

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## ABSTRACT

Death Certificate is the most frequently issued certificate by a government employed medical officer. Medical certification of causes of death is a popular method of presenting mortality statistics and is a useful means for illustrating the relative burden of cause of specific mortality. Therefore, this study was carried out to design the leading cause of death other than the disease and natural death at Janakpur Zonal Hospital, Nepal. A retrospective study was carried out on 290 cases of death due to various reasons which was collected from the Janakpur Zonal Hospital in collaboration with Janaki Medical College Teaching Hospital, Janakpur, Nepal in 2015 AD. A total of 290 death cases, 13, 6, 17, 22, 41 and 1% death cases were due to drowning, current, hanging, road traffic accident, poisoning and thundering, respectively. The highest number of death cases were found as male than female of 20 to 39 years age group of 37.24% followed by below 19 years with 27.93% and found to be statistically insignificant ( $p=0.328$ ). The highest number of death cases was reported in January to March as 30%. The highest number of death was observed in male (55.93%) than female (44.06%) due to poisoning and was found to be statistically significant ( $p=0.001$ ). Most of the death cases were found due to poisoning followed by Road traffic accident (RTA). Community based awareness programs and strict rules regarding sale of pesticide will help to prevent the instances of poisoning. Strict implementation of traffic rules and regulations are important measures to avoid RTA.

**Key words:** Hanging, Medical certification, Poisoning, Road traffic accident (RTA).

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## INTRODUCTION

Birth and death are the two most important events in the life of any individual as the person's existence starts at the moment of birth and ceases at the moment of death. A person has legal existence between the recorded timings of birth and death. Apart from this legal importance, recording of births and deaths creates vital basic data about a population group (Kotabagi et al., 2004). Prompt and accurate certification of death is essential as it provides legal evidence of the fact, manner and causes of death, thus enabling the death to be formally registered, the family can then make arrangements for disposal of the body (Srivastava et al., 2009).

Death certification provides the raw data from which all mortality statistics are derived and these are vital for

public health surveillance for resource allocation in the National Health Service and for a wide range of research, ultimately for improving the health of the population. An important feature is the reported underlying cause of death determined by the certifying physician and defined as "the disease or injury that initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence that produced the fatal injury" (WHO, 1992; Physician's Manual, 2000).

The cause of death is designed to elicit the opinion of the medical certifier whereas the death certificate represents a medical opinion that might vary among individual physicians. A properly completed cause of death provides an etiologic explanation of the order, type and association of events resulting in death. Correct

knowledge of the cause of death is essential as future course of action is different if the death is other than natural or cause of death is not known/doubtful (Simpson, 1979; Bernard, 1991). Wrong diagnosis or incorrect filling up of the certificate will result in gross error in mortality statistics, thus directly affecting formulation of National Health Policy. In addition, the certified cause of death is subjected to legal scrutiny in medico-legal deaths.

The official health statistics of Nepal show that during the last four decades, the health indicators have improved to a great extent. However, there is lack of information on cause of death in the medical/health literature encompassing a total scenario in developing countries like Nepal. Data on the mortality pattern in Nepal in absolute terms are almost non-available. It was not possible to get any information regarding the cause of deaths other than specific diseases leading to mortality. Although very few literatures are found relating to diseases but there is scanty information regarding the cause of death other than the diseases and natural death. Such type of mortality pattern from different aspects has probably not been carried out so far and also there is no functioning system of collecting information on the cause of death. Therefore, the objective of this study was designed to carry out the leading cause of death other than the disease and natural death at Janakpur Zonal Hospital which will explore the causes of death in Nepalese context and will be a helpful means in reducing the mortality rate.

## **MATERIALS AND METHODS**

### **Study Design**

This retrospective hospital based study was carried out at Janakpur Zonal Hospital in collaboration with Janaki Medical College Teaching Hospital located in Dhanusha District, Janakpur, Nepal in 2015 AD. Forensic experts of the Janakpur Zonal Hospital guided the medical officers in conducting the medico-legal cases as there is a legal provision that only the government medical officers are allowed to perform medico-legal works. A total of 290 confirmed death cases were enrolled in this study.

### **Ethical Consideration**

The study was approved by Institutional Review Board and Hospital Committee of Janaki Medical College Teaching Hospital, Janakpur, Nepal. Informed consent before interview from health professionals of emergency unit and forensic unit of Zonal Hospital, Janakpur was taken by explaining the objective of the study. Strict confidentiality was also maintained for the information and documents collected through coding of questionnaire anonymously.

## **Data Collection and Processing**

Information regarding the name, age, address, way of committing suicide and place of death were taken from the inquest reports, hospital records, and post-mortem records of Janakpur Zonal hospital. The data collection was performed by the members of this research group and was cross checked by one another for any missed information.

### **Acceptance Criteria**

Medically certified confirmed cases of unnatural death were included in this study.

### **Rejection Criteria**

Natural death and death due to disease registered in record book and those data where cause of death was not registered in the record were excluded.

### **Reliability and Validity**

Frequent supervision and cross checklist of the filled form were performed to maximize the reliability and validity of the study.

### **Statistical Analysis**

The data obtained from secondary sources were edited reviewing the completeness, consistency and accuracy of the data; it was coded and entered into computer using SPSS 17.0 version. The Chi-square test was used to test for the association of the various factors. The  $p$ -value  $\leq 0.05$  was considered statistically significant.

## **RESULTS**

### **Age and Gender Wise Distribution of Death Cases**

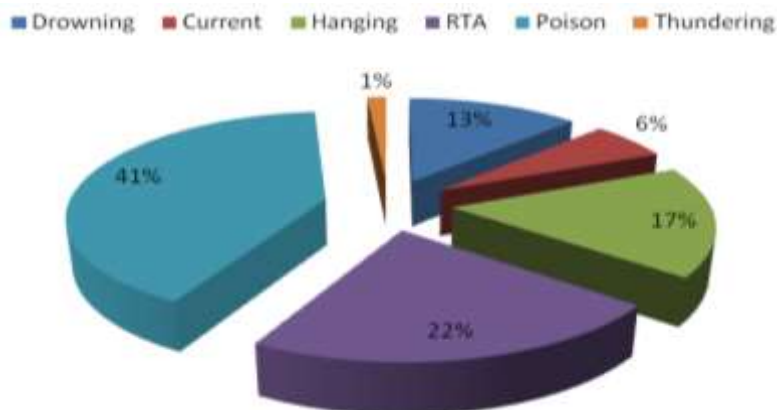
A total of 290 death cases were reported in Zonal hospital of Janakpur, of which 158 were male and 132 were female. The highest number of death cases were found as male than female of 20 to 39 years age group of 37.24% followed by below 19 years with 27.93% and found to be statistically insignificant ( $p=0.328$ ). The results are shown in Table 1.

### **Pattern of Total Deceased Cases**

Of total, 13, 6, 17, 22, 41 and 1% death cases were due to drowning, current, hanging, road traffic accident, poisoning and thundering, respectively. Most of the death cases were found due to poisoning. The results are as shown in Figure 1.

**Table 1.** Pattern of age and gender wise distribution of total death cases.

Age Group (yrs.)	Male No. (%)	Female No. (%)	Total (%)	p-value
0-19	40 (25.31)	41 (3.10)	81 (27.93)	0.328
20-39	59 (37.34)	49 (37.12)	108 (37.24)	
40-59	30 (18.98)	32 (24.24)	62 (21.37)	
60-79	26 (16.45)	10 (7.57)	36 (12.41)	
Greater than or equal to 80	03 (1.89)	00 (00)	03 (1.03)	
Total	158	132	290	



**Figure 1.** Frequency distribution of total death cases.

**Table 2.** Frequency distribution of total death cases due to various reasons.

Death Cases	Male (%)	Female (%)	Total (%)
Drowning	26 (16.45)	11 (8.33)	37(12.75)
Current	12 (7.59)	05 (3.78)	17(5.86)
Hanging	17 (10.75)	32(24.24)	49(16.89)
RTA	34 (21.51)	31(23.48)	65(22.41)
Poison	66 (41.77)	52(39.39)	118(40.68)
Thundering	3 (1.89)	01 (0.75)	04(1.37%)
Total	158	132	290

**Table 3.** Incidence of total death cases according to month wise.

Months	Drowning (%)	Current (%)	Hanging (%)	RTA (%)	Poison (%)	Thundering (%)	Total (%)
Jan –Mar	5 (13.5)	6 (35.29)	10 (20.40)	21 (32.30)	45 (38.13)	00(00)	87(30)
Apr-Jun	10 (27.02)	1 (5.88)	13 (26.53)	15 (23.07)	38 (32.20)	1(25)	78(26.89)
July-Sep	15 (40.54)	9 (52.94)	20 (40.81)	14 (21.53)	22 (18.64)	3(75)	83(28.62)
Oct-Dec	7 (18.91)	1 (5.88)	6 (12.24)	15 (23.07)	13 (11.01)	00(00)	42(14.48)
Total	37	17	49	65	118	04	290

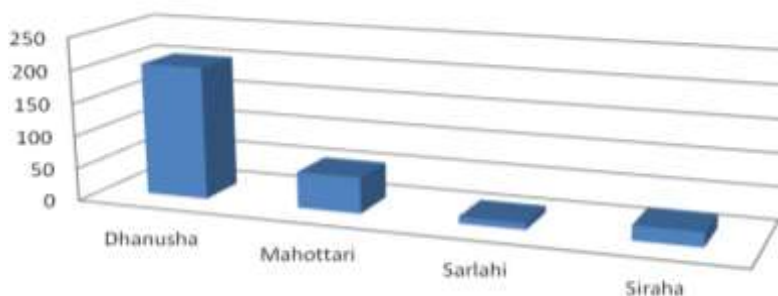
**Gender Wise Distribution of Death Cases Due to Various Reasons**

Most of the death cases were due to poisoning 118 (40.68%) of which 66 (41.77%) were male and 52 (39.39%) were female followed by road traffic accident 65 (22.41%) of which 34 (21.51%) were male and 31 (22.41%) were female. The results are shown in Table 2.

**Month wise Distribution of Death Cases**

The highest number of death cases were reported in January to March (30%) followed by July to September (28.62%) due to poisoning. The results are shown in Table 3.

**District wise distribution of Death Cases**



**Figure 2.** Pattern of total death cases according to district wise.

**Table 4.** Association of total death due to poisoning in relationship with gender.

Gender	Due to poison	Not due to poison	Total	p-value
Male	66 (55.93)	92 (53.48)	158	0.001
Female	52 (44.06)	80 (46.51)	132	
Total	118	172	290	

The highest number of death cases was reported in Dhanusha district 203 (70%) followed by Mahottari district 55 (19%). The results are shown in Figure 2.

#### Relationship between Deaths Due to Poisoning with Gender

The highest number of death was observed in male (55.93%) than female (44.06%) due to poisoning. The association between gender and death due to poisoning was found to be statistically significant ( $p=0.001$ ). The results are shown in Table 4.

#### DISCUSSION

The debate surrounding the medical and legal definition of death is driven by a need to preserve medical resources and procure organs rather than by an honest scientific and philosophical inquiry about the meaning of life and death (Dolinak, 2005). Death either it is natural or unnatural, is a harsh reality of life. The unnatural and suspected deaths are subjected to medico-legal investigation. Meticulous examination of the scene of death, exploration of the history and the behavior of the deceased approximating the time of death and thorough autopsy are the cornerstones in the diagnosis of the cause of death (Subedi et al., 2015). Proper death certification begins with a fundamental understanding of the cause and manner of death (Srivastava et al., 2009). This study highlights that the highest number of death cases were observed in male than in female of 20 to 39 years age group of 37.24% followed by below 19 years with 27.93% and found to be statistically insignificant

( $p=0.328$ ). The present study reflects, a total of 290 death cases in which 13, 6, 17, 22, 41 and 1% death cases were due to drowning, current, hanging, road traffic accident, poisoning and thundering, respectively. Similar type of study conducted by Prasad and Prasad in (2003) at the Bharatpur hospital, Chitwan, Nepal, total of 229 autopsy cases was included in the study, of which 153 were males and 66 females. Of total cases, 110 (47), 47 (20), 39 (17), 16 (7), 8 (4), 5(3) and 4 (2%) death cases were due to RTA, hanging, poisoning, drowning, fire arm injury, animal bite and burns, respectively. This finding is not almost concurred with the present study (Prasad and Prasad, 2003).

Rapid development in science and technology and rapid growth in agriculture and industrial sector has led to increase in the incidence of poisoning, taking away a lot of precious human life. The chemical substances developed to protect the agriculture products from rodents and pests to save the human beings from starvation, are themselves becoming a threat for the human life. Trends of poisoning had been constantly changing throughout the world with advent of new agents leading cause of death from injuries in developed and developing countries, as reported by the Centers for Disease Control and Prevention and National Center for Health Statistics (Haloi et al., 2013). Nepal is an agricultural country and the farmers keep the agricultural poisons at their home and these could also be purchased easily available from the market (Subedi et al., 2015). The present study revealed most of the people died due to poisoning 118 (40.68%) of which 66 (41.77%) were male and 52 (39.39%) were female. Similar findings were also obtained in the study conducted by Das et al. (2017) at Government Zonal Hospital, Janakpur in collaboration

with Janaki Medical College Teaching Hospital, Janakpur, Nepal (Das et al., 2017). Maskey et al. (2012) reported 90 (56.2%) were males while 70 (43.8%) were females (Maskey et al., 2012) which is in accord with this study. But in the study conducted by Khadka and Ale in (2005) found female death slightly more than male due to poisoning which is not in accordance with this study (Khadka and Ale, 2005). This may be due to family conflict, job problems, associated psychiatric illness, poverty, stress and love affairs. Nowadays, most of the youths with emotional instability in affairs establish physical relations. But, the fake promises arises flirts and exploitation which leads to frustration and unusual stress dictating the more death cases. Poisoning are also found common in older age which may be due to the patrism property. An important factor of fatality in treatable poisoning cases is lack of toxicological units and analytical facilities which deprives of proper diagnosis. As well in many cases, due to non-availability of proper transportation facilities, the cases cannot be brought in time to the hospital for treatment may be the another cause of poisoning death.

Road traffic accidents are one of the foremost causes of morbidity and mortality worldwide, accounting for over one million deaths per year (WHO, 1995). Road traffic accidents are defined as a collision involving at least one vehicle in motion on a public or private road that results in at least one person being injured or killed (WHO, 2004). They also have a huge impact on disability-adjusted life years (DALYs).

This study highlights road traffic accident was second most death cases reported in Zonal hospital of Janakpur of which 34 (21.51%) were male and 65 (22.41%) were female which may be due to the effect of rapid population growth, animals on road, narrow roads, negligency in traffic rules, mis-management of municipal transportation, industrialisation and an increase in road vehicles. Multiple factors like poor visibility, monsoons, road conditions, absence of sign boards, poor road engineering and peak hours play a part, are involved in road traffic accidents. Prasad and Prasad in 2003 reported 110 (47%) cases died due to RTA (Prasad and Prasad, 2003). Speed thrills but kills. Inadverant drivers, especially young guys on motorbike are the important vulnerable groups to cause and suffer from R.T.A. Traffic overload is the major contributing factor for RTA. Some people violate the traffic rules and regulations and ultimately get involved in RTA. Hilly, tortuous and serpentine road is another factor for RTA.

Suicide is a major socio-economic and public health issue worldwide. People usually attempt suicide to block unbearable emotional pain, which is caused by a wide variety of problems. Hanging is one of the 10 leading causes of death in the world accounting more than a million deaths annually (Mohanty et al., 2007). Hanging is a common mode of committing suicide among suicidal deaths (Lowy et al., 1990; Trivedi et al., 2005) which is a

personal tragedy or murdered plan that prematurely takes the life of an individual and has a continuing ripple effect, dramatically affecting the lives of families, friends and communities. Every year, more than 800,000 people die by suicide one person every 40 sec (WHO, 2004). The death occurs within few minutes of hanging (Gorden et al., 1998).

This study revealed hanging was the third common cause of death at Janakpur Zonal hospital as 17% which is almost in accord with the study conducted by Prasad and Prasad in (2003), 20% hanging death cases and is the 1<sup>st</sup> common death reported in Bharatpur hospital, Bharatpur district, Chitwan, Nepal (Prasad and Prasad, 2003). With increasing disparity between the poor and the rich and due to high ambitions, these victims fall short of their expectations and who then adopts to commit suicide by hanging. The high incidence of suicidal hangings among young adults, especially females imposes a huge socioeconomic burden on our society. Marital unhappiness, problems associated with organic illnesses and dowry harassment are the main causative factors for suicidal hangings in females. This study also observed the highest number of death cases due to hanging in old ages. Since aged people are in distress with mounting pressures of life, break down to end their life and invariably it is seen that the easier route which is readily available to them is death by hanging.

This study found the highest number of death cases were reported in January to March (30%) followed by July to September (28.62%) due to poisoning. Haloi et al. (2013) conducted a similar type of study in the district of Kamrup, Assam also reported the highest cases (44.79%) of poisoning took place in summer which is in accordance with this study. This may be due to active agricultural activities in these months when pesticide and insecticide are extensively used. The present study depicts the highest number of death cases reported from Dhanusha district 203 (70%) followed by Mahottari 55 (19%) which may be due to dense population and the medical facility from government sector is also located in Dhanusha district. The highest number of death was observed in male (55.93%) than female (44.06%) due to poisoning and was found to be statistically significant ( $p=0.001$ ). The males lead a more stressful life than female due to family and job responsibilities, social burdens and others pressure during the lifetime. This is in accordance with the study conducted by Haloi et al. (2013).

## CONCLUSION

The present study concludes that poisoning, RTA and hanging were the major cause of death among all medico-legal death cases. Among gender, male poisoning cases are increasing. Younger age group was more vulnerable for poisoning. Measures to improve the

socioeconomic conditions through reforms in the field of education, health, employment and more economic as well as scientific support to cultivators are expected to decrease the incidence of poisoning. Proper education of common people, cultivators about storage, handling, uses of pesticide and insecticide is expected to reduce incidence of poisoning. The existing laws in relation to toxic substances should be incorporated to erase the loopholes for their production, distribution, sale, storage and application. Public awareness about seriousness of poisoning is expected to reduce death due to poisoning. Government should provide toxicological diagnostic and therapeutic assistance to doctors and also should develop criteria or develop an act on equality of speed on road for different vehicles such as helmet use, preventing drinking and driving, speed control, safety belts, trauma care, road engineering, use of signages and child safety seats. Family members, friends, teachers, healthcare professionals especially psychiatrists may have to play a major role in primary and secondary prevention of suicidal hangings.

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