

# Study of pattern of unnatural deaths at southern Marathwada region Maharashtra

Mahadev E Bansude<sup>1</sup>, M M Nomani<sup>2\*</sup>, C R Dode<sup>3</sup>, Rahul B Umbare<sup>4</sup>

<sup>1</sup>Associate Professor, <sup>3</sup>Professor & HOD, <sup>4</sup>Assistant Professor, Vilasrao Deshmukh Government Medical College, Latur, Maharashtra, INDIA.

<sup>2</sup>Medical Officer, Georai Dist. Beed, Maharashtra, INDIA.

Email: [mohammad6288@gmail.com](mailto:mohammad6288@gmail.com)

## Abstract

**Background:** Death is a tragedy in whatever form, at whatever time and in whatever way it comes. Death may be natural (resulting from disease) or unnatural by deliberate action of other (homicide), intentionally self-inflicted (suicide) or as a result of an environmental influence (accident). Pattern of unnatural deaths reflects prevailing social setup and mental health status of a region, and law and order situation in a particular area of jurisdiction. Police investigation records provide a valuable source of information on events leading to the death of an individual, analysis of these records along with the post-mortem analysis may help us in understanding the casual pathway, to elucidate potential areas of intervention in socio-political system to investigate and develop preventive measures. To know the magnitude and changing pattern of unnatural deaths in southern region of Marathwada of Maharashtra state, we have conducted an autopsy based prospective analytic study of 1401 cases of unnatural deaths. All data related to age, sex, marital status, religion and cause of death with manner were recorded with detailed autopsy examination and subsequently the cases were analysed on various parameters to find the trends and other significant features of pattern of unnatural deaths. Out of 1401 unnatural deaths studied, 892(63.67%) were male and 509 (36.33%) were female. 87.26% were Hindu and 12.74% were Muslim. Married deceased were 892(63.67%). Majority of causes of death were due to trauma i.e. head injury and multiple injuries 432 (32.84%), burns 325 (23.20%) and poisoning 274(19.56%) and death due to violent asphyxia were 224(15.99%).

## \*Address for Correspondence:

Dr M.M. Nomani, Medical Officer, Dist. Beed, Maharashtra, INDIA.

Email: [mohammad6288@gmail.com](mailto:mohammad6288@gmail.com)

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## INTRODUCTION

Death is a tragedy in whatever form, at whatever time and in whatever way it comes. Death may be natural (resulting from disease) or unnatural by deliberate action of other (homicide), intentionally self-inflicted (suicide) or as a result of an environmental influence (accident). If death is caused as a result of any terminal illness in the hospital or bedroom in peace and solace, everybody accepts it considering as a wish of God and mourns for the departed

soul. On the contrary, if death, results as a consequence of violence, may it be self-suffered by the deliberate act or negligence of others or as a corollary of an accident or misadventure, society displays resentment, cry for punishment to the responsible(s) and demand for future prevention from such incidents to happen. State apparatus, entrusted for receiving such information and investigations, instantly take cognizance of the happening and take appropriate actions accordingly. Such cases fall under the category of unnatural deaths. Unnatural deaths due to different cause of death have a serious psychological and social impact on the family and community.<sup>1</sup> Death is unnatural, when caused prematurely due to physical injury, accident, poison and other means of violence.<sup>2</sup> Unnatural deaths includes death due to intentional injury such as homicide or suicide and death due to unintentional injury in accidental manner.<sup>3</sup> According to figures given by NCRB, in 2014 the suicide rate in India is 10.6/1 lakh population, and rate of accidental death is 36.3/1 lakh population, while in 2014- 33981 cases of murders were reported. India being a poor Introduction country with high

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unemployment and illiteracy rate, crime rate though disproportionate, still contributes its bit towards unnatural deaths. Crime rate in a community is directly linked with the rate of poverty and illiteracy.<sup>4</sup> Present study has been carried out regarding the various epidemiological, demographical and medicolegal aspects of unnatural deaths in Latur district population. The study has been undertaken to know relations of un-natural deaths with factors like sex of person, marital status, place of occurrence, motive and more ailments. Endeavour to establish various causative factors, pattern and distribution of un natural deaths and thereby to plan successful measures against it.

## MATERIALS AND METHODS

A prospective, cross-sectional, autopsy based study was conducted at Vilasrao Deshmukh Government Medical College and Hospital, Latur in Marathwada region of Maharashtra. It was conducted from October- 2015 to September-2017. Ethical clearance for the present study was obtained from the institutional ethical committee. Information regarding the death is acquired from hospital papers such as death summary, investigation reports, Inquest (Panchnama) papers and other relevant documents. All cases of unnatural deaths brought to mortuary at Tertiary care center, Cases subjected for autopsy with alleged history of natural death but which Later Turn out as unnatural based on the autopsy findings circumstantial evidence and investigation by the police, such cases are included in the study. Natural deaths, bodies in advanced state of decomposition or where there is ambiguous history, or obscure / negative autopsy and exhumation cases are excluded from the study. Data was statistically analysed with the help SPSS20 software, windows -7, (Microsoft word and Microsoft Excel).

## RESULTS AND OBSERVATIONS

Total 1725 Medico legal autopsies were conducted during two year of study period. Out of which 1401 (81.22%) cases were of unnatural deaths (Table- 1). The most common age vulnerable to unnatural death is 21-to-30 years 425(30.31%) and from the age of 21 years to 40 years, unnatural deaths comprise approximately 52.62% of the total unnatural deaths (Table -2). Total 892(63.67%) males and 36.33% females died due to unnatural causes during the study period. Burn is the most common cause of unnatural death among females that is 256(18.27%). However the less common cause of female unnatural death is Mechanical injuries (spine injury, Haemorrhage, Injury to vitals). In male counterpart the most common cause of male unnatural death is Head injury 260 (18.55%) followed by Poisoning 205 (14.63%). However Burn is less common cause of male unnatural deaths, that is

69(4.92%). It is quite lucid that the Asphyxia and Mechanical injury deaths are more common in male than that of the females (Table-3). It is observed that unnatural deaths are more common 892 (63.67%) in married peoples living with family, However significant number 357 (25.48%) of unmarried peoples died due to unnatural causes (Table-4). It reveals that unnatural deaths are common in house working peoples alone. However Farmers, Daily wage worker, Students, Unemployed jointly comprise 580(41.42%) of the unnatural deaths (Table-5).

It shows that unnatural death is most common in less educated (Primary, 407, 29.05%). However significant number (376, 26.83%) of people with education of SSC, died due to unnatural deaths (Table-6). It is observed that fatal incidences of unnatural deaths occurred in very less percentage 207 (14.78%) in the morning hours, whereas maximum number of fatal incidences 514(36.68%) occurred in evening and night time between 06:00pm to 11.59pm (Table-7). It reveals that maximum number of incidences have occurred in summer season (from February to May) that is 536 (38.26%), whereas it is less in rainy season (from June to September) that is 407 (29.05%), although there it is not huge 129 (09.21%) difference (Table-8). The incidence is highest in month of March 146(10.42%) and April 150(10.71%). Incidence is lowest in month of September 89(6.35%) with drop of 57 (4.07%) compared to March (Table-9). This study it reveals that, in most of the cases survival period is from 1to 3 days 241(17.2%), 3 to 7 days 244 (17.43%) with total of 485(34.63%). However in significant number of cases 271(19.34%) the death was sudden, without any agonal period (Table-10). It is observed that maximum numbers of victims were treated prior to death in Govt. hospitals 561(40.04%). Whereas significant numbers of cases 272(19.42%) of the cases wasn't received any treatment prior to death (Table-11). It is observation in this study that in majority of cases 502(35.83%) of Accidental deaths dying declaration was not obtained, and in total 885 (63.24%) cases dying declaration was not obtained (Table-12).

It is observed in this study that, accidents 522 (37.26%) are the most manner of death in males whereas accidents 231(16.49%) and suicides 245(17.49%) are the common manners of death in females. It is also observed that victim of homicides are commonly females 16 (1.14%) as compared to males 13 (0.93%). Most of the cases of suicide victims belongs to Hindu religion (with population percentage of 79.8%) the incidence is 486 (86.32%) so it is not of much significance, whereas in Muslims (with population percentage of 14.23%) (Table-13). It shows that, most of the homicides taken place with underlying cause related to illicit relations of accused or victim

10(72%). Accused were multiple 20 (1.43%) in most of the cases of homicide. And in present study, in homicides related to property dispute the accused were almost always multiple 06(00.42%) (Table-14). present study that in cases of Road Traffic accidents the most common vehicle involved is two wheeler, 191 (46%), followed by four wheeler, 143(34.46%). However significant number of pedestrian died 29 (6.99%) in Road Traffic Accidents (Table-16). In present study total no of 41(2.93%) out of 1401 deaths were due to animal attack. Among these, snake bite cases 39(2.78%) is the commonest cause of death due to animal attack (Table-17). There are very few 5(0.29%) cases of deaths during treatment. 2 cases related to adverse drug reaction diagnosed clinically as Steven Johnson's syndrome, and 2 cases of haemorrhage following surgery (Table-18). It reveals that deaths due to burns was 66(4.71%) while 259 (18.49%) deaths were due to complication of burns such as septicaemia. Similarly 69(4.93%) deaths were directly due to poisoning and 260(18.55%) deaths were due to complication of poisoning such as septicaemia or multi organ failure. Exactly opposite to this is, in head injury 205(14.63%) peoples died directly due to head injury and 106(7.57%) victims died due to after effects or complication of head injury, similarly 217(15.49%) victims died with cause of death asphyxia and only 7(0.5%) survived for some period and died due to complications during recovery (Table-19).

## DISCUSSION

The present study, total 1401(81.22%) cases out of 1725 post-mortems were clearly of un-natural deaths (Table-01). This finding is nearly same to the study of Anjanamma T C *et al.* 9 and Kumar Awdhesh *et al.* 7 in their study they observed 87.00% and 88.13% respectively. In this study, the most common age group vulnerable to unnatural death is 21-to-30 years i.e. 425 (30.31%). From the age of 11 years to 40 years, unnatural deaths comprise approximately 68% of the total unnatural deaths (Table-02). There is decline in the incidence of unnatural death thereafter. This finding is very much similar to the findings of Anjanamma *et al.* 9 in their study they observed that the most vulnerable group for unnatural death was 21-40 years of age, in this age they observed around 73% deaths of all unnatural deaths. In the study of Awdhesh kumar *et al.* 7 they observed around 62% of unnatural deaths in the age group from 11 to 40 years. It is observed in this study that the more males are dying due to unnatural causes. 892(63.67%) males died due to unnatural causes during the study period (Table-04). Only 36.33% females have died due to unnatural causes, which is nearly half of the male counterpart. This finding is similar to the findings of Rathod S N and Bharatwaj R S<sup>8</sup>, Kumar Awdhesh<sup>6</sup> male (68.6%) female (31.4%), Anjanamma T C *et al.* 9 found

male (64.4%) and female (35.6%), this finding is due to males exposed much more to the environment and more physically active lifestyle than the females. Male accepts more difficult tasks and may involve in violent acts. According to census 2011 Hindu population is 79.8%, Unnatural deaths are more common 1184(84.51%) in Hindus. However it is less common in Muslims in relation to population (14.23%); and the incidence are 118 (8.42%). This finding is nearly similar to the findings of Awdhesh K *et al.* 7 Hindu (84.9%) Muslim (2.9%), and Rathod S N and Bharatwaj R S, al<sup>8</sup> Incidences of unnatural deaths occurred in very less percentage 207 (14.78%) in the morning hours, whereas maximum number of fatal incidences 514(36.68%) occurred in evening and night time between 06:00pm to 11.59pm (Table-7). This finding is of much importance because it shows that the maximum suicides, homicides and accidents occurred between 06:00pm to 11:59pm. Patel J Dhaval<sup>10</sup> also observed similar result of more fatalities in same time period. The maximum number of incidences have occurred in summer season (from February to May) that is 536 (38.26%), whereas it is less in rainy season (from June to September) that is 407 (29.05%), although there it is not huge 129 (09.21%) difference. This finding is similar to the finding of, Kumar Awdhesh<sup>6</sup> in his study the incidence of unnatural death was 39.14%, and Yousufani G M, Memon MU<sup>5</sup> Accidents 522 (37.26%) are the most common manner of death in males whereas accidents 231(16.49%) and suicides 245(17.49%) are the common manners of death in females. It is also observed that victim of homicides are commonly females 16 (1.14%) as compared to males 13 (0.93%). This finding is also nearly similar to the observations in the study of Yousufani G M, Memon MU<sup>5</sup>, Rathod S N, Bharatwaj R S<sup>8</sup> Most of the cases of suicide victims belongs to Hindu religion (with population percentage of 79.8%) the incidence is 486 (86.32%) so it is not of much significance (Table-13), whereas in Muslims (with population percentage of 14.23%) the incidence is 32 (5.68%) suicide is not common manner of death which is a significant finding. Same observations were found in the study of Jha S *et al.* 17, Baruah A M, Chaliha R<sup>16</sup>, Santhosh. C.S, Bande Nawaz<sup>15</sup>, Pradhan A *et al.* 13, and Pankaj Prajapati *et al.* 14.

Most of the homicides taken place with underlying cause related to illicit relations of accused or victim 10(72%) . Accused were multiple 20 (1.43%) in most of the cases of homicide. And in present study (Table-14), in homicides related to property dispute the accused were almost always multiple 06(00.42%). These findings are quite different from the findings of Dhaval J Patel<sup>10</sup>, which observe that revenge is the most common motive for homicide. When homicidal cases analysed (Table-15) on the basis of methods employed in homicide, it reveals that most

common method of homicide is physical assault by sharp or blunt weapon 12(0.86%), this finding is similar to findings in the study of Sachidananda Mohanty *et al.*<sup>11</sup> and Jhaveri Shailesh *et al.*<sup>12</sup>. Homicide by strangulation is more common when female is victim 4(0.29%). Female 16(1.16%) is the more vulnerable sex for homicide than males 13(0.91%). Road Traffic Accident accounts for 415(29.62%) cases which are very higher than second common cause that is Burn and Scalds 161 (11.49%), with the difference nearly of triple. This finding is quite similar to the Yousufani G M, Memon MU<sup>5</sup>, Rathod S N, Bharatwaj R S<sup>8</sup>,Kumar Awdhesh<sup>6</sup> Though snake bite is very common in our region but fatality due to snake bite is rare as compared to other causes of unnatural deaths. In present study total no of 41(2.93%) out of 1401 deaths were due to animal attack. Among these snake bite cases 39 (2.78%) is the commonest cause of death due to animal attack (Table-19). This observation is similar to the observation of Rao CP, Shivappa P, Mothi V R <sup>20</sup> in their study snake bite cases were 2.29% of the total cases of unnatural deaths. In the study conducted by Farooque Jamebaseer M.*et al.* <sup>21</sup> they observe that snake bite incidence is 2.13% of the total medico-legal autopsy cases.

### CONCLUSION

Unnatural deaths are commonly found in male than in females. Most common age group vulnerable to unnatural deaths is 21-30 years. Trauma (Head injury and multiple

injuries) is the most common cause of death. Frequency of unnatural deaths is quietly common in summer season than other seasons. Accidental deaths more common than suicide followed by homicide. Common method of homicide is by physical assault with sharp or blunt weapon. Most of alleged homicidal deaths were took place with underlying cause of illicit relations of victim of accused. Females are more vulnerable for homicide.

### Recommendations

Unnatural deaths are known to claim a substantial number of lives especially in developing country like India. The most effective prevention strategies are those in which the environment in which people work, live, and play should be changed, through technology or public policy. Education has a role to play in prevention as well, especially when it is paired with technology and legislation. What is needed to employ effective strategies is a well-informed public and legislative leadership. Preventive measures should be adopted promptly wherever possible to avoid all unnatural deaths. If not preventable, prompt and immediate care should be provided in order to save the life of the victim. Ensure adequate access to mental health services through mental health parity legislation is another prevention tactic. Establishment of working relationships with other prevention programs, such as alcohol- and drug-abuse treatment programs. Drive a safe and with good conditioned vehicles and strictly follow the traffic rules.

**Table 1:** Burden of natural and unnatural deaths (n = 1725)

Sr. No	Distribution	Count	Percentage (%)
01	Un-Natural Deaths	1401	81.22
02	Natural Deaths	262	15.19
03	Decomposed / Unknown	41	02.38
04	Uncertain	21	01.21
<b>Total</b>		<b>1725</b>	<b>100</b>

**Table: 2:** Age wise distribution of victims of Unnatural Deaths (n= 1401)

Age in years	Count	Percentage (%)
00-10	37	02.64
11-20	215	15.35
21-30	425	30.31
31-40	313	22.31
41-50	159	11.35
51-60	115	08.21
61-70	97	06.92
71-80	34	02.43
Above 80	06	00.48
<b>Total</b>	<b>1401</b>	<b>100</b>

**Table3:** Cause of death and distribution of Un-natural deaths in eitherSex. (n=1401)

Sex Causes of death	Males	Females	Total
	Cases and %	Cases and %	Cases and %
Burn	69 (04.92)	256 (18.27)	325 (23.20)
Head Injury	260 (18.55)	51 (03.65)	311 (22.20)
Poisoning	205 (14.63)	69 (04.93)	274 (19.56)
Asphyxia	150 (10.71)	74 (05.28)	224 (15.99)
Multiple Injuries	103 (07.36)	18 (01.28)	121 (08.64)
Electrocution	17 (01.21)	29 (02.07)	46 (03.28)
Animal Attack	27 (01.93)	14 (01.00)	41 (02.93)
Injury to vital organ	20 (01.42)	05 (00.36)	25 (01.78)
Injury and Haemorrhage	18 (01.28)	03 (00.22)	21 (01.50)
Spine Injury	04 (00.29)	01 (00.07)	05 (00.36)
Other	07 (00.50)	01 (00.07)	08 (00.56)
<b>Total</b>	<b>880 (62.81)</b>	<b>524 (37.19)</b>	<b>1401 (100%)</b>

**Table 4:** Marital Status wise distribution of Un-Natural Deaths (n = 1401)

Sr.No.	Status	Count	Percentage (%)
1	Married	892	63.67
2	Unmarried	357	25.48
3	Widow	89	06.35
4	Married but Living Separate	38	02.71
5	Divorced	12	00.86
6	Heirless	13	00.93
	<b>Total</b>	<b>1401</b>	<b>100</b>

**Table 5:** Un-natural deaths victims among various professions and workers (n=1401)

Work/ Profession	Cases	Percentage
House working	266	18.98
Dependents / Minors	214	15.27
Medical/Paramedical	10	00.71
Farmer	169	12.06
Daily wage workers	165	11.80
Students	138	09.85
Educated and Unemployed	108	07.71
Business and Professionals	96	06.85
Driver	61	04.35
Attendant and Class IV	43	03.07
Industrial workers	29	02.07
Other	68	04.85
<b>Total</b>	<b>1401</b>	<b>100</b>

**Table 6:** Un-natural deaths in relation to education of victim (n = 1401)

Education of victim	Cases	Percentage
Primary	407	29.05
SSC completed	376	26.83
Illiterate	216	15.41
HSC completed	215	15.36
Graduate	96	06.85
Secondary	51	03.64
Under-6Yrs of age	24	01.72
Post-Graduate	16	01.14
<b>Total</b>	<b>1401</b>	<b>100</b>

**Table 7:** Diurnal Variations of Un-natural Fatal Incidence (n = 1401)

Time of Occurrence	No. of cases	Percentage
12:00night to 05:59am	207	14.78
06:00am to 11:59am	309	22.06
12:00noon to 05:59pm	371	26.48
06:00pm to 11:59pm	514	36.68
<b>Total</b>	<b>1401</b>	<b>100</b>

**Table 8:** Seasonal Variations of Un-natural Death incidences (n = 1401)

Season	Cases	Percentage
Summer	536	38.26
Winter	458	32.69
Rainy	407	29.05
<b>Total</b>	<b>1401</b>	<b>100</b>

**Table 9:** Month wise distribution of Un-natural deaths (n=1401)

Month	Cases	Percentage %
January	117	08.35
February	104	07.42
March	146	10.42
April	150	10.71
May	136	09.71
June	93	06.63
July	115	08.20
August	110	07.85
September	89	06.35
October	114	08.13
November	101	07.24
December	126	08.99
<b>Total</b>	<b>1401</b>	<b>100</b>

**Table 10:** Period of survival in Un-natural deaths (n = 1401)

Period of survival	Cases	Percentage %
Nil-	271	19.34
Within 01 hour	115	08.22
01 to 6 hours	233	16.63
06 to 24 hours	176	12.56
01 day to 3 days	241	17.20
03 day to 7 days	244	17.43
7 days to 30 days	117	08.35
More than one month	04	00.27
<b>Total</b>	<b>1401</b>	<b>100</b>

**Table 11:** Utilization of govt. and private hospitals by victims

Treatment	Cases	Percentage
Treated in Govt. hospital	561	40.04
Treated in Private hospital	297	21.20
Not received any Treatment	272	19.42
Died on spot	271	19.34
Other	1401	100

**Table 12:** Un-natural deaths in which dying declaration (D/D) was notobtained (n=1401)

Unnatural Death	DD obtained (%)	DD not Obtained (%)	Total (%)
Suicide	231 (16.49)	332 (23.70)	563 (40.19)
Homicide	10 (00.71)	19 (01.36)	29 (02.07)
Accidents	251 (17.92)	502 (35.83)	753 (53.75)
Attacked by Animals	19 (01.36)	22 (01.57)	41 (02.93)
Died during Treatment	04 (00.29)	01 (00.07)	05 (00.36)
Other	00 (00.00)	10 (00.71)	10 (00.71)
<b>Total</b>	<b>515 (36.76)</b>	<b>886 (63.24)</b>	<b>1401 (100%)</b>

**Table 13:** Trends of suicide in various religions (n = 563)

Religion	Cases	Percentage
Hindu	486	86.32
Budhha	45	08.00
Muslim	32	5.68
Jain	00	00
Other	00	00
<b>Total</b>	<b>563</b>	<b>100</b>

**Table 14:** Cases of homicides with cause/reason and No. of accused(n=1401)

Causes of homicide	Single		Multiple		Total	
	Accuse (%)		Accused (%)		Cases (%)	
Illicit relations of accused or victim	05 (00.36)	05	05 (00.36)	05	10 (00.70)	10
Property	00 (00.00)	06	06 (00.42)	06	06 (00.42)	06
Spouse (End relation)	02 (00.14)	03	03 (00.21)	03	05 (00.35)	05
Dowry	00 (00.00)	04	04 (00.28)	04	04 (00.28)	04
Infanticide	02 (00.14)	01	01 (00.07)	01	03 (00.21)	03
Personal other	00 (00.00)	01	01 (00.07)	01	01 (00.07)	01
<b>Total</b>	<b>09 (00.64)</b>	<b>20</b>	<b>20 (01.43)</b>	<b>20</b>	<b>29 (02.07)</b>	<b>29</b>

**Table 15:** Showing Sex of Victims and Methods of Homicides (n = 1401)

Methods	Female	Male	Total (%)	
Strangulation	04	01	05	(00.36)
PhysicalAssault	Sharp	02	03	(00.36)
	Weapon	02	05	(00.50)
	Blunt	02	05	(00.50)
Poisoning	02	03	05	(00.36)
Burn	03	00	03	(00.21)
Other	03	01	04	(00.29)
<b>Total</b>	<b>16</b>	<b>13</b>	<b>29</b>	<b>(02.07)</b>

**Table 16:** Cases of RTAs involving different types of vehicles (n=415)

Vehicle	Cases	Percentage
Two Wheeler	191	46.02
Four Wheeler	143	34.46
Three Wheeler	47	11.33
Pedestrian	29	06.99
Other	05	01.20
<b>Total</b>	<b>415</b>	<b>100%</b>

**Table 17:** Incidence of deaths due to animal attack/bite (n=1401)

Animal Attack	Cases	Percentage
Snake bite	39	02.78
Bull horn	01	00.07
Boar attack	01	00.07
Other	00	00.00
<b>Total</b>	<b>41</b>	<b>02.93</b>

**Table: 18:** Incidence of deaths during Therapy and cure (n = 1401)

Deaths during therapy and cure	Govt. Hospital	Private Hospital	Total Cases
Death after giving Medicine	01	01	02 (00.14)
Haemorrhage following Surgery	01	01	02 (00.14)
Deaths during Anaesthesia	01	00	01 (00.07)
Other	00	00	00 (00.00)
<b>Total</b>	<b>03</b>	<b>02</b>	<b>05 (00.29)</b>

**Table: 19:** Deaths as Direct or as a Complication of fatal event (n = 1401)

Sex	Direct cause		As a complication		Total	
	No	%	No	%	No	%
Causes of death						
Burn	66	04.71	259	18.49	325	23.20
Head Injury	205	14.63	106	07.57	311	22.20
Poisoning	69	04.93	260	18.55	274	19.56
Asphyxia	217	15.49	07	00.50	224	15.99
Multiple Injuries	94	06.71	27	01.93	121	08.64
Electrocution	29	02.07	17	01.21	46	03.28
Animal Attack	14	01.00	27	01.93	41	02.93
Injury to vital organ	20	01.42	05	00.36	25	01.78
Injury and Haemorrhage	18	01.28	03	00.22	21	01.50
Spine Injury	04	00.29	01	00.07	05	00.36
Other	01	00.07	07	00.50	08	00.56
<b>Total</b>	<b>880</b>	<b>62.81</b>	<b>524</b>	<b>37.19</b>	<b>1401</b>	<b>100</b>

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