Chapter VI

Causes of Death in rural Assam

6.1 General Introduction

Unswerving information at various levels such as global and regional levels on deaths by cause is an indispensable input to planning, administration and evaluating the performance of the death segment in developing countries. The figures of deaths by cause persuade the manner in which resources are allocated to various service programmers and research activities. A precise measurement of current death proportion by cause in different regions also forms the baseline against which new health programmers must be evaluated. Exclusive of a realistic baseline, it is not possible to assess what has worked and what has failed. Over and above, dependable information on deaths by cause is an important key to the assessment of the cost-effectiveness of new technologies for disease control and health promotion. The epidemiological transition, where the cause of death structure shifts profoundly from infectious to chronic disease, is under way in most middle-income countries and among the richer communities in low-income countries. Estimating the cause-of-death pattern for certain
periods will provide a quantification of the extent to which this pattern has changed.

6.2 Review of literature

Although statistics on deaths by cause are mandatory for objective planning and evaluation of the health sector, the available data sets are probably inadequate. A decade ago, claims concerning child and adult mortality by disease-specific programmers at the world health organization and by individual disease expert exceeded the total deaths in group by two to threefold. Through the efforts of the World Bank and WHO, more consistent estimates of mortality, by cause, under age 5 have been developed although these still remain uncertain. Further, no conceivable or consistent estimates for death over age 5 exist despite their increasing importance in the context of the epidemiological transition. The rationale of the present psychotherapy is to even out these gaps in vital information.

Efforts to estimate cause-specific mortality are not new. The fundamental problem is that dependable vital registration data, with the cause of death coded by physician, are available for only a small number of mostly developed countries. Data on cause-specific mortality need to be based on other approaches for virtually all of the populations
of sub-Saharan Africa, most of Asia the Middle East and North Africa. Indirect techniques to do this were first developed by Preston to model the relationship between total mortality and mortality by cause for broad groups of causes, based on an analysis of historical vital registration data for the develop and a few developing countries. The objective of this chapter is to create a data base for the Northeastern states particularly for the states of Assam, which may provide a direction for determining the exact cases of deaths.

The objective of this chapter is to analysis the causes of deaths for Assam by age group for possible number of years. The source of data is the survey of causes of deaths. If the data on age specific death rates are taken into consideration it is seen that about 20 percent of the deaths are occurred in the age group less than 1. Death rates decreases after the age 5 and than after age 55 it starts going up. Data on percentage distribution of deaths for India and Assam may be seen as given below. From the Table 6.1, it is clear that 21 percent of deaths occur in the age group <1 in India and shows a declining trend from 1998 to 2002. In Assam the same is 21.2 percent, but does not show any declining trend. However, there seems to be some improvement in the age of child age 1-4 in Assam. In the upper age groups, the
percentage of deaths are lower in case of Assam than India implying the fact that people in the upper ages in Assam is less than the all-India average.

From the age specific death rates, it is clear that the status of children in Assam is not very good in comparison to all-India. At all-India level, ASDR for infant is gradually coming down. It has come from 74.7 percent in 1998 to 70.5 percent in 2002 showing a decline of about 5 points in five year. In case of Assam, it has increased from 79.9 in 1998 to 80.5 in 2002. This shows that proportion of infant deaths in Assam is much higher than all-India average. For the age group 0-4 also, the death rate is higher by 5 point in Assam. In most of the age group the death rates are higher in Assam than all-India. It is therefore necessary to know cause specific mortality to reduce the death rates in Assam.

The graph given below depicts a comparative picture of death rates of India and Assam. It shows that apart from lower and upper age groups, death rates in the middle ages are also higher implying the unwarranted heath condition in Assam.
The data on mortality by cause will reveal the burden of diseases in that particular age group. Let us therefore discuss causes of deaths of this age group for India and Assam.
6.3 Overall mortality by Cause

Before we dig into the data on cause of death, let state about the source of data to be used in the discussion. In this chapter data that will be used has been collected through a scheme of Office of the Registrar General, India. The name of the scheme is Survey of Causes of Deaths—(Rural). ‘Survey of Causes of Death’ in rural areas was being conducted continuously in sample villages of selected Primary Health Centres (PHCs). Data collection is done using the Technique of 'lay diagnosis reporting (Post Death Verbal Autopsy)' employing paramedical personnel of primary health centres for the fieldwork. It bridges an important gap in statistics on causes of death for rural areas. During 1998, 2,059 PHC villages were covered under the survey where 40,351 deaths were reported for which causes of death were identified. The presentation and analysis of major causes of death have been attempted according to the International Classification of Diseases (ICD 10th Revision).

The Office of the Registrar General, India initiated in the 1960s a scheme called 'Model Registration Scheme' (MRS) pursuant to the recommendations made in the 'Conference on improvement of Vital
Statistics' held in 1961. The Model Registration Scheme was renamed in 1982 as "Survey of Causes of Death (Rural) (SCD)".

During 1998 the survey under the scheme was conducted in 2,059 selected PHCs spread over 23 States and 3 Union territories. However, from the State of Jammu & Kashmir, no returns of causes of death were received during the year. In respect of Andhra Pradesh, Bihar and West Bengal, the returns were received only for 135, 69 and 16 units out of 200, 130 and 100 respectively. The details of 1602 responding PHCs during 1998, out of 2059 selected are given in table 6.3.

It can be seen that around 44,000 deaths were canvassed for ascertaining causes of death covering 1602 Primary Health Centers. Most of the major states were covered under the scheme though state wise details for some states are not published due to inadequate number of deaths. None of the Northern eastern states find their place in the report due to meager size of sample deaths. The number of deaths covered under the scheme for the NE states are given below.

It can be seen from the table that even for the state of Assam, the number of reported deaths from 49 PHCs is only 591 in 1998. With this number of deaths, estimates under various causes' specific mortality
may provide ambiguous results. That may be the reason that results of all the states are not being presented the report. However, along with the results of India, Assam results would also be presented in this chapter. As the objectives of this chapter are to make an acceptable data base for the state of Assam, all effort has been made to arrange a supporting results for the state of Assam.

Based on the data collected through the survey, the causes of death are classified into various major cause groups as per ICD-10 classification. The number of deaths by major cause-groups according to International Classification of Diseases (ICD) for the last five years has been provided in table 6.5.

The data given in table 6.6 reveals that during the five years period i.e. 1994-98 the cause group 'symptoms, signs and abnormal clinical findings not elsewhere mentioned' claims maximum lives. This cause is not basically a cause, but an unclassified group. So it is seen that about one-fourth of the total deaths occurs, where doctors can not find the cause of deaths. In other words, one-fourth of total deaths occur without proper medical treatment. Out of identifiable causes, one can find that in the rural areas of the country the highest number of deaths is due to the cause group 'diseases of the respiratory system'
This cause group mainly includes deaths due to Influenza, Pneumonia, Bronchitis and Asthma. It claims about one-sixth of the total deaths in all these years. The 2nd identifiable cause of death in rural India after the biggest killer disease is 'infectious and parasitic diseases'. This includes deaths due to Cholera, Typhoid & Paratyphoid, Dysentery, Diarrhea and Gastroenteritis of presumed infectious origin, TB of lungs, Leprosy, Tetanus, Rabies etc. Out of around 40000 thousand deaths, this cause group claims about 5000 deaths. The 3rd in descending order of deaths claimed by major cause group was 'a condition originating in the perinatal period' in the initial years, but from 1995, the 3rd killer disease was 'diseases of circulatory system'. The cause group 'conditions originating in the perinatal period' includes diseases of prematurity, Birth Injury, Respiratory infection of new born, Diarrhoea of new born (Digestive system disorders of new born). It basically relates to infant deaths. So, about ten percent of the total deaths occur due to this cause and that too of infant only. In the later years from 1995 onward the 3rd position is occupied by 'diseases of circulatory system' and this includes mainly Heart Attack (Ischaemic Heart Disease), Congestive and other heart diseases etc. The data reveal that even in the rural areas, the heart diseases are increasing day by day subject to correct recording of
the causes by the doctors. At the national level, other responsible major cause groups in order are with venomous animal contact, inflammatory diseases of central nervous system, viral infection, neoplasm, and diseases of the blood and blood forming organs. It may be mentioned here that Neoplasm which includes Cancer of various parts of the body claims sizable number of deaths in the rural area of the country. Another important disease is ‘pregnancy childbirth and puerperium’. This cause group claims on an average of one-tenth of the total deaths in the country from the women of age group 15-49.

Data of the major cause group for the years are given in terms of percentages in the following statement. It is observed from the data that the unclassified cause group ‘symptoms, signs and abnormal clinical findings not elsewhere mentioned’ claims highest percentage of deaths in 1994. However, it is important to note that the percentage of deaths under unclassified has come down from 24.30 percent to 18.41 in 1998. It’s a good sign that percentage of deaths is reducing in the unclassified categories. The cause group that claims highest percentage of deaths is ‘diseases of the respiratory system’. This group claims 15.10 percent of total deaths in 1994 and increased upto 17.17 percent in 1998. Data
reveals that diseases of Influenza, Pneumonia, Bronchitis and Asthma are increasing day by day. The data further reveals that sizable percentages of deaths occur due to cancer and that is about 5 percent of total deaths. Deaths due to child disease that is 'conditions originating in the perinatal period' occupy the second position in comparison to total deaths. Pregnancy related deaths also claims about one percent of the total deaths.

The status of rural areas of Assam can be seen from the table 6.7. During 1996, the data collected from the Primary Health Centres (PHCs) of Assam was based on conventional list. The list includes 10 classified categories as given in the statement. It should be mentioned here that the coverage was also not complete. However, a diluted assessment can be made, though it can not be fair assessment. It is required to mention that probable causes of all the deaths mentioned below are counterchecked by the Doctors of PHCs. A look on the data indicates that out of 122 deaths, 69 male and 53 female, 30 deaths are identified as deaths due to 'coughs (disorders of respiratory system)' which is the highest among all ten causes. Male deaths are more than female. However, in terms of percentages, female death under this cause is highest (26.4%). The 2nd rank goes to 'digestive disorders'. This
group claims 19 deaths (15.6%). It is important to note that out of 53 female deaths, 6 deaths pertain to 'childbirth and pregnancy' i.e. maternal deaths, which constitutes 11.3 percent of the female total deaths. Another important area is of child death. Here the significant area point that can be noted is death of 16 infant deaths out of 122, which constitutes 13.1 percent of total deaths.

Based on the data given in table 6.7, though some important comment could be given, sufficient analysis could not be made. The data collected for the years 1997 and 1998 gives somewhat better picture, which can be seen from the following statement. The data is based on International Classification of Diseases. The data reveals an important fact that in contrast to all-India status, where the highest number of deaths occurs due to unclassified cause with more than 18 percent of total deaths, the status of Assam is better than this. In the state, deaths due to unclassified categories is much less and not the highest number. Deaths due to unclassified cause in the state are around 12 percent. The strongest killer disease in the state, which claims the highest number of deaths, is 'diseases of the respiratory system'. Though the data for the year 1996 is not enough to comment, it confirmed that the dreaded killer disease in the state is the same. The
core diseases under this cause are Influenza, Pneumonia, Bronchitis and Asthma. It kills one fifth of total deaths in Assam. Within this group, the highest number of deaths occurs for the disease 'Bronchitis and Asthma'. If it is compared with the all India status, it may be seen that the same diseases claims the highest number of deaths after unclassified deaths.

The second major cause responsible for deaths in the state of rural Assam is 'infectious and parasitic diseases'. Out of 591 deaths this disease claims 111 deaths in 1998, of which 59 male deaths and 52 female deaths. This includes deaths due to Cholera, Typhoid & Paratyphoid, Dysentery, Diarrhea and Gastroenteritis of presumed infectious origin, TB of lungs, Leprosy, Tetanus, Rabies etc.. If detail data is seen, it is observed that 'T B OF lungs' is the disease which needs to be checked, as it claims highest number of deaths within this major group. The third major cause group responsible for deaths is the unclassified group i.e. 'symptoms, signs and abnormal clinical findings not elsewhere mentioned' followed by 'diseases of circulatory system'. This group claims around one-tenth of total deaths in Assam. The main specific cause relates to this group is 'heart attack'. The major cause 'neoplasm' is also a significant cause for the state of Assam. It
ranks fifth in descending order of major causes of deaths. The specific cause pertaining to this cause is 'cancer'. The major cause group which relates to the deaths of children viz. ‘conditions originating in the perinatal period’ claims 21 deaths in 1997 and 40 deaths in 1998, whereas the major group ‘pregnancy childbirth and puerperium’ which pertains to deaths of women of age group 15-49 claims sizable number of deaths. During the period 1997-98, 11 deaths out of 482 deaths occur due to this cause.

The percentage distribution of deaths by major cause-group for rural Assam is given in table 6.9. The highest percentage of deaths occurs in rural Assam for the cause group diseases of the respiratory system, followed by infectious and parasitic diseases. The third cause group is symptoms, signs and abnormal clinical findings not elsewhere mentioned. This is an unclassified cause group. The third cause group is basically the diseases of circulatory system. It may be mentioned that the specific cause “cancer” claims around 7 percent of total deaths in Assam. Deaths due to child deaths claims 5.6 percent and maternal deaths are of the order of 2.3 percent.
6.4 Top Ten Killer Diseases of rural India

The ten top killer diseases by specific cause-groups have indicated that 'Bronchitis & Asthma' is the top killer in rural India, which accounted for 14.8 per cent of the reported deaths during 1998 as against 13.7 per cent during 1997. It is interesting to note that top ten causes of deaths have remained the same over the years 1995-98 while ranks have changed at some places due to slight increase/decrease of per cent deaths over the years. It is alarming that in rural areas 'Suicide' is among the top ten killers during 1997 and 1998 occupying IX position. Among these top ten killers, 'Bronchitis & Asthma' 14.8 per cent, 'Heart attack' 10.5 per cent, 'T.B. of lungs' 5.8 per cent, 'Paralysis of cerebral appoplexy' 5.4 per cent and 'Prematurity' 5.2 per cent are the top 5 killers during 1998 followed by 'Cancer' 5.0 per cent, 'Anaemia' 3.9 per cent, 'Pneumonia' 3.8 per cent, 'Suicide' 3.2 per cent and 'Vehicular accidents' 2.6 per cent. Data on Percentage distribution of specific causes to the total deaths for rural India is given in table 6.10.

The status of Top Ten killer diseases in Assam can be seen in table 6.11. Top ten diseases consists of around two-third of total deaths during 1996. The specific disease 'Bronchitis & Asthma' claims the highest percentage of deaths in Assam. The same cause claims the
highest percentage of deaths in all-India. The estimate in all-India is based on about 3500 number of deaths, whereas the estimate of Assam is based on only 22 deaths. But ranking remains the same. It is also expected that percentage of deaths (18.0%) would be close to the reality. The data also reveals that males are more prone to the disease than the female. The second cause responsible for deaths in Assam is the ‘heart attack’. It claimed about 6.6 percent of total deaths. The third to sixth ranks with equal number/percentages of deaths are occupied by ‘dysentery’, ‘peptic ulcer’, ‘cancer’ and ‘respiratory infections of new born’. The seventh to ninth ranks are secured by the diseases ‘malaria’, ‘influenza’ and ‘pneumonia’. The tenth killer disease is ‘typhoid’.

It is important to note that during the year 1997, the first two dreaded diseases which claims the highest and the second highest number/percentages of deaths are ‘bronchitis & asthma’ and ‘heart attack’, while the third highest percentage of deaths are claimed by ‘cancer’. The percentages of deaths pertaining to these causes are 11, 9.7 and 7.7 respectively. The fourth dreaded disease during 1997 was ‘paralysis of cerebral apoplexy’ with 5.1 percent. The fifth, sixth, seventh and eighth rank are secured by ‘peptic or gestric ulcer’, ‘t b of lungs’, ‘anaemia’ and ‘typhoid & paratyphoid’ with 4.9, 4.5, 3.9 and 3.6
percent respectively. The ninth and tenth diseases are respectively ‘influenza’ and ‘pneumonia’ with 3.6 and 3.4 percent respectively.

Table 6.12 provides data on Top Ten Specific Causes of Death, Assam, 1997.

Table 6.13 provides data on Top Ten Specific Causes of Death, Assam, 1998. In 1998 also the highest number of deaths are claimed by the disease ‘bronchitis & asthma’ with slight change in percentage of deaths (14.2 percent). In this year the disease ‘diarrhoea & gastroenteritis’ which did not find a place within the tenth rank came to the second rank with 9.6 percent of deaths. The specific cause ‘heart attack’ that claimed the second dreaded killer disease in 1996 and 1997 has come to the third position with 7.6 percent of deaths. ‘t b of lungs’ claimed 5.2 percent of deaths and ranked fourth. This cause was the seventh killer disease in 1997. Malaria was in fifth, which did not figure in 1997, but occupied seventh position in 1996. anaemia ranked sixth in 1998, which occupied seventh in 1997, but did not figured within the tenth rank in 1996. The disease ‘congestive and other heart diseases’ ranked seventh claiming 3.4 percent of deaths in 1998. The diseases ‘influenza’, ‘peptic or gastric ulcer’ and ‘typhoid & paratyphoid’ ranked eighth, ninth and tenth, which figured in previous years also.
From the above discussion, it is very clear that the above mentioned diseases are the common diseases in Assam, which needs to be minimized to increase the longevity of human life in Assam.

6.5 Mortality by Cause, sex and age for India and Assam

The percentage distribution of deaths by age and sex has been presented in table 6.14 for major cause-groups for the year 1998. It is seen that the percentage of deaths due to Infectious and parasitic diseases in the age-groups 45-59 and 60 & over are significantly higher than other age-groups for both sexes. Deaths due to viral infection have mostly affected both the sexes in the children of all ages, age group 45-59 and older age groups of 60 & over while deaths due to Neoplasm have affected both males and females in the age group of 35-44 to 60 & over. Diseases of Blood and Blood forming organs have affected lower age-groups i.e. below one year, 1-4 years, and also above the age-groups of 45-49 for both the sexes. The Metabolic diseases have affected both male and female in the older age groups of 45-59 and above. Both in the case of male & female deaths, over three-fifth of deaths have occurred in the age group 35 years & above due to the cause-group Mental and Behavioral disorders.
Inflammatory diseases of Central Nervous System have mostly affected both the sexes in the age group of 60 & over. Similar trend has been observed in the deaths due to Diseases of Circulatory System. Over three-fourth of total reported deaths in the category of Diseases of Respiratory system have affected infants and old age persons of both sexes. Deaths due to Diseases of Digestive System have been reported in higher age groups of 25 years and over for both the sexes. Diseases of Genitourinary System have affected the age groups 45-59 and above for both males and females. Deaths due to "Pregnancy, Childbirth and puerperium" relate to the females in the reproductive age group 15-49. 80.0 per cent of deaths have been reported in the age group 15-34. The deaths due to "Conditions originating in the perinatal period" and "Congenital malformations deformations and abnormalities" are related to infants of ages below one year. Maximum deaths in the age group of 60 & over for both male and female are reported under the category of symptoms, signs and abnormal clinical findings not elsewhere mentioned. Injuries, Poisoning and Other Consequences of External Causes have affected both for males and females, mostly the age groups of 15-24 and above. Over three-fifth of total deaths due to External causes of Mortality have
affected both males and females in the age-groups of 15-60 and over 60 years. Deaths due to Other External Causes of Accidental Injuries have affected the age group 45-59 and over 60 to a great extent. More than three-fourth of the deaths due to Venomous Animal Contact (X) have occurred between the age-groups of 15-59 years and above for both males and females.

The table 6.15 provides the data on the age and cause specific mortality by sex for the period 1997-98. Total deaths for the year 1997 is 507 and for 1998, it is 591. If data for each years is to be distributed by sex and age, there will be many cell without any value. That’s the reason that two years data are clubbed together so that one can arrive at some valid decision on age-sex cause specific mortality. From the table given below, it is seen that out of 1098 deaths, 151 deaths pertains to age 0-4, 422 deaths occur in the age group 5-59 and 525 deaths belong to age 60+. Another high light of the data is that about 400 deaths pertain to the Causes with codes ‘A’ and ‘J’. Further the proportion of deaths of a female is less than a male. This is true in almost all the age groups. In the age group 0-1, the most prevalent causes of death are conditions originating in the perinatal period, infectious and parasitic diseases and congenital malformations,
deformations and abnormalities. In the group 5-59, the most prevalent cause of death are infectious and parasitic diseases, diseases of the respiratory system and neoplasm; whereas in the age group 60+, the important causes are diseases of the respiratory system, diseases of circulatory system, infectious and parasitic diseases, diseases of the digestive system and neoplasm.

The Percentage distribution of deaths for major cause-groups for selected age groups for male for the state of Assam for the period 1997-98 has been presented in table 6.16. It can be seen from the following statement that each cause of death has different effect on different age group. Percentage of deaths due to major cause 'infectious and parasitic diseases' is 32 percent (maximum) in the age group 60+, followed by 17.5 percent in the age group 45-59, 12.6 percent in age 5-14, then 11.7 in the age 35-44, 9.71 percent in 1-4 and 7.77 percent in 0-1 age group. 'viral infection' has significant effect on age group 15-24, 35-44 and 45-59. It claims 34.8, 17.4 and 21.7 percent respectively. ‘NEOPLASM’ kills people mostly of age group 45-59 and 60+ with 37.8 and 44.4 percent respectively. ‘diseases of the blood and blood forming organs’ kills people mostly of the age group 60+, 45-59 and 5-14 with 64.7, 23.5 and 11.8 percent respectively.
'Metabolic diseases' are responsible for deaths for the people of the age group 60+ and 45-59 with 77.8 and 22.2 percent of deaths respectively. 'Mental and behavioural disorders' mostly kills people of higher age group that is 60+. The cause of death 'Inflammatory diseases of central nervous system' is responsible for deaths in age group 1-4 and above with highest effect on the age group 60+ with 52.6 percent. 'Diseases of circulatory system' kills people of all ages except age <1 with highest percentage of deaths in the age group 60+ with 59.2 percent, followed by 19.7 percent deaths in the age group 44-59. 'Diseases of the respiratory system' is responsible for deaths in all ages with maximum percentage of deaths in the age group 60+ with 64.8 percent of deaths followed by 13.0 percent in the age group 44-59.

'Diseases of the digestive system' kills people of all ages with highest percentage of deaths in the age group 60+ with 55.3 percent followed by its preceding age group 44-59 with 18.4 percent. 'Diseases of genitourinary system' kills people in the age group 15-24, 35-44, 45-59 and 60+ with highest in 60+ with 68.4 percent. 'Conditions originating in the perinatal period' is the disease for the children of age group <1 and that is why, 100 percent deaths occur in this age group. Same is the
case with the cause group ‘congenital malformations, deformations and abnormalities’. ‘Symptoms, signs and abnormal clinical finding not elsewhere mention’ is an unclassified cause of death, which includes old age disease i.e. senility also. Deaths due to this cause are found in all ages with maximum in the age group 60+ with 75.6 percent deaths. Among the remaining four causes, the cause group ‘with venomous animal contact’ is an important cause as it claims a sizable number of deaths. It is irrelevant to mention the age group for this cause, as it may happen in any age group.

The Percentage distribution of deaths for major cause-groups for selected age groups for female for the state of Assam for the period 1997-98 has been presented in the table 6.17. It can be seen from the following statement that each cause of death has different effect on different age group. Percentage of deaths due to major cause ‘infectious and parasitic diseases’ is 25.6 percent (maximum) in the age group 60+ followed by 17.1 percent in the age group 5-14, 15.9 percent in age 35-44, then 11.0 in the age 1-4 and 45-59. ‘viral infection’ has significant effect on age group 5-14 and 25-34. It claims 34.5 and 15.7 percent respectively. ‘neoplasm’ kills people mostly of age group 35-44, 45-59 and 60+ with 15.2, 42.4 and 36.4 percent respectively. ‘diseases of the
blood and blood forming organs' kills people mostly of all age group. However, the maximum effect is on the age group 60+ with 37.5 percent.

'Metabolic diseases' are responsible for deaths for the people of the age group 15-24, 45-59 and 60+ with 33.3 each on this age group. 'mental and behavioural disorders' mostly kills people of higher age group that is 35-44. The cause of death 'inflammatory diseases of central nervous system' is responsible for deaths in all age group, but maximum in the age group 60+ with 62.1 percent. 'Diseases of circulatory system' kills people of all ages except age <1 with highest percentage of deaths in the age group 60+ with 73.6 percent. 'diseases of the respiratory system' is responsible for deaths in all ages with maximum percentage of deaths in the age group 60+ with 56.7 percent of deaths followed by 14.4 percent in the age group 44-59.

'Diseases of the digestive system' kills people of all ages with highest percentage of deaths in the age group 60+ with 65.4 percent followed by its preceding age group 44-59 with 19.2 percent. 'diseases of genitourinary system' kills people in the age group 1-4, 15-24, 45-59 and 60+ with highest in 45-59 with 40.0 percent. 'conditions originating in the perinatal period' is the disease for the children of age group<1 and
that is why, 100 percent deaths occur in this age group. Same is the case with the cause group ‘congenital malformations, deformations and abnormalities’. ‘symptoms, signs and abnormal clinical finding not elsewhere mention’ is an unclassified cause of death, which includes old age disease i.e. senility also. Deaths due to this cause are found in all ages with maximum in the age group 60+ with 78.2 percent deaths. Among the remaining four causes, the cause group ‘with venomous animal contact’ is an important cause as it claims a sizable number of deaths. It is irrelevant to mention the age group for this cause, as it may happen in any age group.

6.6 Mortality by Cause for Infant

It has been attempted to find cause specific mortality for infant deaths. Here it may be mentioned that the data pertaining to infant is not sufficient to make a confirm comment particularly for Assam. For India it may not be much stringent to comment, but for Assam, it may be difficult to provide sufficient backing for the result. However, an attempt is made to guess the prevailing diseases for infants in Assam.

Infant mortality is often considered as an index of the State of public health and hygiene, environmental sanitation, cultural and socio-economic development. Important gains have been made in reducing
mortality in infancy and early childhood, but even in most advanced countries, the risk of death immediately after birth and in subsequent months remains higher than in all-later years before the onset of young age. Infancy is subject to great risks from infectious and respiratory diseases especially in rural environment without adequate medical care.

Percentage distribution of infant deaths by major cause-groups for the period 1997-98 for all-India has been presented in the table 6.18. It may be seen from the Statement that 62.5 per cent of infant deaths in 1998 occurred due to major cause group "Conditions originating in the perinatal period" followed by "Diseases of the respiratory system" which accounted 15.5 per cent. Deaths due to "Infectious and parasitic diseases" accounted 4.8 per cent of total infant deaths. The major cause-groups like "Congenital malformations, deformation & abnormalities", "Diseases of the blood and blood forming organs" and "Viral infection" accounted for around 2.5 to 3.5 per cent of total infant deaths while the deaths due to other cause groups like "Inflammatory diseases of central nervous systems", "Diseases of circulatory system", "Symptoms, signs and abnormal clinical findings not elsewhere mentioned" and "With venomous animal contact" contributed around 1 to
2 per cent. Infant deaths due to each of the remaining major causes contributed below 1 per cent.

The percentage distribution for infant deaths by major causes for the period 1997-98 for the state of Assam is presented in table 6.19. It can be observed that data are available in some of the major causes only. Out of 104 deaths, 59 deaths are reported for male and 45 for female and these deaths are caused mainly due to 'conditions originating in the perinatal period', in which 61 deaths had been reported. 14 deaths have been reported under 'infectious and parasitic diseases', 11 deaths under 'diseases of the respiratory system', 6 each to 'congenital malformations, deformations and abnormalities' and 'symptoms, signs and abnormal clinical finding not elsewhere mention'. As per the available data, it is observed that 58.7 percent of deaths occur due to 'conditions originating in the perinatal period' followed by 13.5 percent deaths due 'infectious and parasitic diseases'. 10.6 percent deaths occur due 'diseases of the respiratory system' and 5.8 percent each due to the major causes 'congenital malformations, deformations and abnormalities and 'symptoms, signs and abnormal clinical finding not elsewhere mention'. It is observed that in all the causes, percentage of male deaths is more than female.
"Prematurity" dominated in the year 1997 and 1998 among the top ten killer diseases of infants accounting 29.9 percent in 1997 and 34.4 per cent deaths in 1998 of the total reported 69.9 in 1997 and 73.7 per cent deaths in 1998 due to ten specific cause-groups as shown in table 6.20. 'Pneumonia' was the second top killer disease in both 1997 and 1998 with 14.5 and 13.5 percent respectively. "Respiratory infection of new born" emerged as the third top killer among infants with 11 and 11.5 respectively in 1997 and 1998. In respect of "Congenital Malformation" which ranked fourth at national level, has shown the percentage of deaths as 3.1 and 3.5 percent in 1997 and 1998 respectively. 'Anaemia' ranked as fifth at national level with 2.9 and 3.3 percent in these two years. 'Diarrhoea of new born' which ranked as sixth major killer at national level killed people of the order of 2.9 and 2.4 percent in 1997 and 1998 respectively. Other top killers of infants at the national level are 'Birth injury', 'Tetanus neonatorum', 'Diarrhoea & Gastroenteritis' and 'Convulsions' which accounted for 2.0, 1.3, 1.1 and 0.9 per cent deaths respectively.
Table 6.21 provides data on Top Ten Killer Diseases of Infant for Assam for the period 1997-98, out of total deaths of 104 occurred during the period 1997-98, top ten diseases took toll of 87 deaths consisting of 83.7 percent of total deaths. Male deaths were more than the female deaths. The classification of these deaths among top ten probable causes depicts that 'respiratory infection of new born' ranked first killer disease with 15.3 male and 20.0 percent female with total 18.3 percent deaths. The causes 'prematurity' and 'diarrhoea of new born' secured 2nd and 3rd position with equal number of deaths indicating 13.5 percent deaths in both the cases. 'birth injury' occupied the fourth position with 10.6 percent deaths. 'congenital malformation' has been ranked fifth with equal number of deaths for male and female with total 5.8 percent. 'influenza', 'pneumonia' and 'jaundice' are ranked sixth, seventh and eighth rank with equal number of deaths in each cases indicating a percentage of 4.8 percent. 'typhoid & paratyphoid' and 'diarrhoea & gastroenteritis' ranked ninth and tenth with equal number of deaths in each cases with 3.8 percent.

Though the number of deaths for the state of Assam is meager, the top ten diseases for infant for the state with all-India are more or less the same. Therefore one can loosely make an assessment of the
important diseases in the state for infant based on the data given on table 6.21.

6.7 Maternal Mortality & Female deaths by causes

Maternal Mortality is also an indicator of health status is a state. To estimate maternal mortality is very difficult as it requires a huge amount of sample for any direct estimate. An attempt has been made to provide some guess for its estimate using the data of the present survey. The data given below presents data on female deaths, specifically restricted to the reproductive age group (15-44). The percentage of female deaths in the reproductive age group according to major cause-groups as per International Classification of Diseases for the years 1997 and 1998 along with the corresponding percentages are presented in table 6.22.

It may be noted from the table 6.22 that major cause of female deaths in the reproductive age-groups in rural areas is due to major cause group 'With venomous animal contact' which accounts for 19.6 per cent of total female deaths during 1998 as compared to 18.0 per cent during 1997. This is followed by 14.6 per cent of deaths due to 'Infectious and parasitic diseases' and 11.1 per cent of deaths accounted for 'Diseases of circulatory system'. Deaths due to 'pregnancy, child birth and puerperium' accounted for 8.5 per cent of
total female deaths. Deaths due to other major cause-groups like 'Injuries', 'Poisoning' & other consequences of external causes', 'Neoplasm', 'Symptoms, signs and abnormal clinical findings not elsewhere mentioned', and 'Diseases of the respiratory system' account between 5 to 8 per cent of total female deaths.

The table 6.23 provides distribution of deaths for major cause groups for female age group 15-44 for the state of Assam, 1997-98. As the data for the single is very small, two year data has been clubbed, even then, the size is only 99 deaths. The distribution of deaths by major causes corresponds to only a few major cause groups. The highest number of toll is being taken by the cause group 'infectious and parasitic diseases' cornering 23.2 percent of total deaths. The second rank pertains to cause group 'diseases of the respiratory system' with 15.2 percent of deaths. The third rank pertains to 'pregnancy childbirth and puerperium' which represents maternal deaths. This important cause corners 11.1 percent of deaths. The fourth rank for female deaths pertains to 'neoplasm' which took 7.1 percent of deaths. Fifth rank goes to 'injuries poisoning & other consequences of external causes' with 6.1 percent of deaths. Sixth
rank is occupied by 'with venomous animal contact' with 5.1 percent of deaths. Other causes are insignificant.

Top ten killer diseases of females in the reproductive age groups by specific causes of death at national level for the years 1997 & 1998 has been compiled and presented in Statement given below. Top ten specific causes of female deaths account for 55.8 percent in the year 1997 and 54.4 per cent deaths in 1998 at all India level.

Top ten killer diseases of females in reproductive age-groups (15-44) have highlighted very useful and vital information of female deaths. Table 6.24 provides data on percentage of ten top killer diseases of females in reproductive age-group (15-44), India for 1997-98. During 1997 and 1998, deaths due to Suicide in females under reproductive age group has been reported as top killer in India. T.B. of lungs is the second top killer at the national level. Burns is the third top killer while Cancer at the fourth position. Heart Attack stands fifth and Anaemia is sixth top killer diseases. Bronchitis & Asthma, Acute abdomen, Drowning and Vehicular accident have affected less than 4 per cent of female deaths at all India level.
The table 6.25 presents percentages of Top Ten killer diseases of female in the reproductive age group 15-44 for the state of Assam for the period 1997-98. It has been observed that out of total 99 deaths, Top Ten covers 67 deaths constituting 67.7 percent of total deaths. Amongst the Top Ten diseases, 'diarrhoea & gastroenteritis' ranked first with 10.1 percent of deaths. The second rank is captured by the disease 'influenza' with 9.1 percent of deaths. 't b of lungs' tool toll of 8.1 percent of deaths. The probable causes viz. 'cancer' and 'anaemia' claimed the same number of deaths with 7.1 percent of deaths each. 'heart attack' and 'bronchitis & asthma' claimed again the same number of deaths with 6.1 percent each. 'anaemia of pregnancy' and 'burns' was responsible for deaths for 5.1 percent of cases, whereas 'typhoid & paratyphoid' was responsible for 4 percent of deaths.

### 6.8 Old Age Deaths (60 Years & over)

Causes of deaths for the age group 60 years & over has been compiled according to major-cause groups as per ICD classification and the percentage of deaths with respect to the total number of reported deaths by the major cause groups in this age-group has been presented in table 6.26.
'Symptoms, signs and abnormal clinical findings not elsewhere mentioned' that includes deaths due to senility is the major killer for the age-group 60 years & over in 1998 and 32.8 per cent of deaths due to this cause-group has been reported. This is followed by the major cause-group 'Diseases of the respiratory system' which accounted 22.4 per cent of the total old age deaths. 'Diseases of the circulatory system' accounted for 14.4 per cent of total deaths while 'Inflammatory diseases of central nervous systems' are responsible for 7.5 per cent deaths. The deaths due to 'Infectious and parasitic diseases', 'Neoplasm', 'Diseases of the blood and blood forming organs' and 'With venomous animal contact' are in the range of 2 to 7 per cent. Other major cause-groups accounted less than 2 per cent of total old age deaths.

The percentage of female deaths in the case of major cause-group 'Symptoms, signs and abnormal clinical findings not elsewhere mentioned' are higher than male deaths in this age-group while a reverse trend is seen in the case of major cause group 'Diseases of the respiratory system', 'Diseases of circulatory system' and 'Infectious and Parasitic diseases'. As regards other major cause-groups, sex-wise differential is not very much significant.
Table 6.27 presents the data of old age 60+ classified by major cause of deaths for the state of Assam during the period 1997-98. The data reveals that amongst the nineteen major causes excluding the medically certified deaths, the maximum number of deaths of old age people has been owned by the cause group ‘diseases of the respiratory system’, which claimed 23.0 percent of deaths followed by ‘symptoms, signs and abnormal clinical finding not elsewhere mention’ with 20.0 percent of deaths. The third group responsible for deaths of old people is ‘diseases of circulatory system’, which claimed 15.4 percent of deaths in Assam. The fourth rank is occupied by the cause group ‘infectious and parasitic diseases’ with 10.3 percent of deaths. ‘diseases of the digestive system’ ranked fifth in order claiming 7.2 percent of total deaths. ‘neoplasm’ claimed 6.1 percent of total deaths. The remaining causes claimed less than 5 percent of total deaths.

Out of 525 total deaths of old people during 1997-98 in Assam sample, female deaths are 223 about 80 deaths less than male. However, the ranking of deaths for women among the various cause group are more or less the same.
Top ten killer diseases of old age (age group 60+)

* Causes pertaining to top ten killer diseases of old age by specific cause for all-India for the last two years has been presented in table 6.28. It has indicated the trend among top ten killers in this age-group. Bronchitis & Asthma is the major killer occupied 1st position, which accounted 29.6 per cent deaths in 1998 as against 28.0 per cent in 1997. It is evident from the Statement that Bronchitis & Asthma, Anaemia, Acute abdomen, Uremia and whooping cough with ranks 1st, 6th, 8th, 9th and 10th respectively showing an increasing trend i.e. 29.6, 4.5, 1.9, 1.6 and 1.4 in the year 1998 respectively. The position occupied in ranks 2nd, 3rd, 4th, 5th and 7th are in decreasing trend in the year 1998 in comparison to the year 1997.

The table 6.29 presents data on the percentage distribution of Top Ten killer diseases of old age population (age 60+) of Assam during the period 1997-98. The data reveals that 'bronchitis & asthma' is responsible for maximum number/percentage of deaths of 60+ population 20.8 percent deaths. The cause group 'heart attack' is the second cause group, which took a toll of 10.7 of total deaths of old people in Assam. 'cancer' is the disease, which is the third rank holder
that took a toll of 6.1 percent death. The fourth rank is secured by the specific cause 'paralysis of cerebral apoplexy' with 5.1 percent of deaths. 'T B of Lungs' occupied the fifth rank with 5.0 percent deaths. 'congestive and other heart diseases', 'peptic or gestic ulcer', 'anaemia', 'diarrhoea & gastroenteritis' and 'cirrhosis & chronic lever diseases' occupied the sixth, seventh, eighth, ninth and tenth positions respectively with less than 5 percent of deaths.

Tables pertaining to the chapter VI are presented at Annexure V.