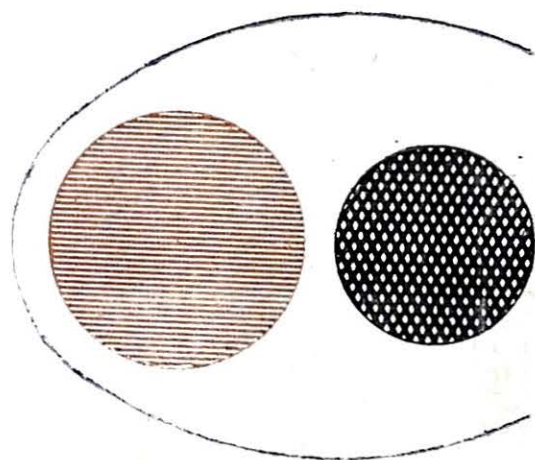


SRS ANALYTICAL SERIES
NO. 1, 1971



INFANT MORTALITY

IN INDIA



VITAL STATISTICS DIVISION

OFFICE OF THE REGISTRAR GENERAL, INDIA, MINISTRY OF HOME AFFAIRS, NEW DELHI

P R E F A C E

The increasing acuteness of the population problem in India has resulted in a more insistent demand that methods be devised and used which give a quick and reliable measure of the birth and death rates on a current and continuous basis. Scientific approaches to the problem in the collection of good demographic statistics are now receiving attention in many countries where the registration system is poor. The conventional vital registration system is limited in data content and it cannot satisfy many modern data needs for study of factors related to population change. Further in many of the developing countries, vital registration system requires many years to reach a satisfactory stage of accuracy and completeness. In order to measure the short-term change in the growth of population so essential for planning, the System of Sample Registration of Births and Deaths in India (SRS) was evolved. This System which was established in a few States in 1966, now extends to all parts of India.

The Sample Registration System has thus reached a stage of stability and maturity. The vast mass of data thrown up by the System now requires to be analysed and evaluated on a more intensive scale than hitherto. Evaluation of the data obtained through SRS serves to improve the working of the System. In this connection a Study Team has been set up with the primary object of studying the actual working of the System in the field and to suggest measures for bringing out improvement in the field operations. Also analytical studies based on SRS data are being undertaken. A comprehensive list of analytical and evaluation studies has been drawn up to evaluate the different aspects of the system and also to examine the structure and the design. As pointed out by Dr. Forrest E. Linder "this list of studies will be most useful as a check list of matters to be considered by other countries that may be considering the initiation of a dual-report sample vital statistics scheme". The deficiencies in this System arising mostly from variations in the accuracy of field work and in varying levels of rigour in supervision could be brought out in the studies listed. The studies have been categorised into:-

- i) Efficiency of the sample design
- ii) Performance of the Enumerators & Supervisors
- iii) Matching
- iv) Vital Rates
- v) Infant mortality
- vi) Population
- vii) Migration &

viii) Miscellaneous

These studies will be undertaken both by the Centre and by States.

3. The present study of infant mortality in India is the first of the Analytical Study Series and is aimed at providing estimates of infant mortality and its components. Estimates of still birth rate and peri-natal mortality by sex are also furnished. Infant mortality is a sensitive indicator of the socio-economic and health conditions prevailing in the country. It is hoped that this study would be useful in tackling the problem of high infant mortality in India.

4. Sample Registration System is a Centre-State venture and the progress registered so far would not have been possible without the active cooperation of the several implementing agencies in the States to whom my thanks are due. I am specially thankful to the Planning Commission which has taken considerable interest in the establishment and progress of the scheme. The compilation and analysis part of the study has been an onerous responsibility of the Sample Registration Unit of the Vital Statistical Division of this Department. I wish to record my appreciation of the dedicated work put in by the staff of the Sample Registration Unit. This study was handled by Shri V.S. Swamy, Senior Research Officer and Shri Lal Krishna Asstt. Director of Census Operations (Technical) under the guidance of Shri V.K. Ramabhadran, Deputy Registrar-General, India (Vital Statistics).

2nd December, 1971
NEW DELHI
A. CHANDRA SEKHAR
Registrar-General, India.

(v)

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INFANT MORTALITY IN INDIA

INTRODUCTION

1.1 The last two decades have witnessed an alarming growth of population. The rapid growth of population resulting from a sharp decline in the mortality level has been engaging the attention of demographers and social scientists. The recent technological advancement in medical and public health and sanitation programme have contributed a sizable dimension to the reduction in mortality level in the country. In effecting reduction in mortality level, infant mortality has a key role to play. The infant mortality rate is defined as the number of deaths under one year of age per thousand live births during the calendar period or any stated period of time. This conventional infant mortality rate differs from the cohort analysis method wherein we have to follow a cohort of a thousand live born children through their first year of life and record the number of deaths among them during that period to arrive at the correct infant mortality rate. But since the procedure has been found difficult to follow due to administrative and other difficulties, the conventional infant mortality rate has been adopted. The computation of true infant mortality rate would require the deaths be tabulated by the year of occurrence, age at death and by the year of birth of the deceased.

1.2 The infant mortality rate is often considered as an index reflecting the state of public health and hygiene, environmental sanitation, cultural, socio-economic development and above all the people's attitude towards dignity and value of human life itself in any community or a country. 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 remain higher than in all later years before old age. The persistence of relatively high mortality in infancy is due, in part, to the intractability of endogenous causes of death. Infancy is subject to great risks from infections and respiratory diseases which may be attributed to the influence of the household environment and parental care, conditions which are dependent on family levels of living, education and general medical and health services.

1.3 Mortality during the first year of life can be broken up into two main phases, each with a distinctive etiology, namely, neo-natal mortality, occurring within the first four weeks and post-natal mortality,

occurring within the remainder of the first year after birth. If the data collected are sufficiently refined, further distinctions can be made with reference to further sub-periods. The neo-natal mortality rate serves as an approximate index of that component of infant mortality which is attributable to endogenous factors, while the post-natal rate serves as an index of exogenous infant mortality. Infant mortality in the later months of the first year is more amenable to environmental and medical controls than the mortality occurring shortly after birth. The endogenous causes¹ responsible for the neo-natal deaths include genetic factors inherent in the cellular growth of the organism, birth injuries and conditions arising from the hazards of delivery while exogenous causes relate to infectious and parasitic diseases, digestive diseases arising from unhealthy feeding and respiratory diseases.

1.4 A measure of the pregnancy wastage is often indicated by still birth rate. This is defined as the ratio of still births to total live births plus still births, multiplied by thousand. The bulk of births in rural areas is domiciliary in nature. Further there is no medical attention of any description in a large proportion of such cases. There is thus every likelihood of still births being mis-classified as infant deaths or vice-versa. To overcome this handicap the concept of peri-natal mortality is advantageous. This is defined as the ratio of the sum total of still births and infant deaths occurring within seven days of birth to the total live births plus still births multiplied by the factor thousand. In India, the services of antenatal clinics are by and large absent. There is a growing need to set up antenatal clinic with the object of increasing the proportion of normal deliveries, of lowering maternal morbidity and mortality rates and lastly of reducing the incidence of premature births, still births, peri-natal and neo-natal deaths.

1.5 Infant mortality rate is of special interest because infant deaths account for a major share of all losses of life, especially in countries where conditions of health are poor. The prevention of avoidable infant deaths is the main responsibility of the health authorities and infant mortality rate furnishes a measure of the degree of success of their efforts.

2.0 SOURCES OF DATA:

2.1 The infant mortality and its components are derived from the Sample Registration System (SRS). The Sample Registration System is a miniature registration system in a random sample of villages or segment of villages or urban blocks based on the idea that with an adequate machinery for recording of births and deaths as they occur in the sample units and with proper supervision at all levels, it should be possible to obtain reliable estimates of vital rates at State and national level. The SRS has been collecting in respect of every birth event the data relating to sex, age at death and other related demographic particulars of the mother who gave birth to a child. Figures as obtained from SRS on infant mortality are available for a majority of States in rural areas for the period 1958 and 1969 whereas for urban areas data are available only for a few States since the scheme was implemented in different phases in urban areas. The official registration data on infant deaths have been used to get a reasonable dimension of the trend in infant mortality. The causes of infant deaths are also included from the civil registration and Model Registration data. The National Sample Survey² (NSS) has also collected and tabulated data on infant deaths. The figures on infant mortality and its components as given in the 14th and 19th Rounds have been used for comparison purposes.

3.0 INFANT MORTALITY, 1900-1950

3.1 The following Table gives the course of infant mortality in India from 1900 onwards based on registration data.

Table 1: Infant mortality rates³ for registration areas in India.

Period	Rate per thousand
1900-1905	215 (five year average)
1906-1910	228
1911-1915	204
1916-1920	219
1921-1925	174
1926-1930	178
1931-1935	174
1936-1940	161
1941-1945	161
1946-1950	134

The limitation of the registration data are well known. It has been the practice that Indian vital statistics are collected in many cases at second or even third-hand and may have no stronger bias than the recollections of an illiterate chowkidar. There has been no uniform procedure in collecting vital statistics all over India. Further there are numerous omissions in the reporting of events. Some of the deficiencies in the collection of infant mortality data are (i) inadequate coverage (ii) omission of infant deaths and births (iii) defective age reporting which affects the calculation of the number of infants under one year. Analysing the trend during the last fifty years it is observed that there has been considerable reduction in the infant mortality rate. During the beginning of the century infant mortality rate has been abnormally high. Famines, pestilence and diseases had been ravaging the country frequently in the earlier decades of the country. The spectacular decline in general mortality level in recent times is mainly due to the sharp decline in the infant mortality which contributes nearly 25 percent of total mortality.

3.2 The above downward trend of infant mortality rate is corroborated by the figures given by Census Actuary in their Actuarial Reports.⁴ The following Table gives mortality rates from 1881 onwards during the intercensal periods.

Table 2: Infant mortality rate, 1881-1961

Decade	Infant mortality	
	Male	Female
1872-1881	284.1	242.6
1881-1891	272.6	239.9
1891-1901	285.4	258.8
1901-1911	290.0	284.6
1911-1921	N.A	N.A
1921-1931	248.7	232.3
1931-1941	N.A	N.A
1941-1951	190.0	175.0
1951-1961	153.2	138.3

It is observed that infant mortality rates have been fluctuating at a high level till 1911 and only after 1941 the rate has dropped below 200 level. The great plague epidemic in the decade 1911-21 had claimed a heavy toll.

Malaria now is practically extinct and cholera and smallpox are contained wherever detected. The tremendous advancement in medical science and improvement in the sanitary and public health conditions have brought down the infant mortality. While the general mortality level during the last half a century has declined by about 50 per cent, the infant mortality rate has dropped by only 30 per cent (table 2). This gap may be explained by the fact that while the general mortality has responded to the community health measures such as control of infections and parasitic diseases, the reduction in infant mortality is linked with the availability of medical facilities to expectant mothers in rural areas in the antenatal period and the extent of institutionalisation of births.

4.0 INFANT MORTALITY AND ITS COMPONENTS, RURAL, 1968 & 1969.

4.1 The Table below summarises the infant mortality rate by pooling all the States for which data are available for the periods 1968 & 1969. Infant mortality rates are generally presented in at least two parts namely (i) deaths in the first month or sub-divisions of the first month of life per 1000 live births (neonatal mortality rate) and (ii) deaths in the remaining first year of life per 1000 live births (post-natal mortality rate).

Table 3: Infant mortality rates by age from SRS and NSS (Rural)

Source	Year/ Period	Infant mortality rate				Total
		Below 7 days	7 days to 28 days	29 days to 6 months	7 months to 1 year	
1	2	3	4	5	6	7
SRS	1968*(Rural)	43.3	30.7	39.0	23.8	136.8
SRS	1969**(Rural)	42.7	32.1	42.7	22.4	139.9
NSS	July 1958-(Ru- 14th June 1959 al)	N.A	N.A	N.A	N.A	145.9
		<u>0-3 weeks</u>		<u>3-51 weeks</u>		
	Round		63	51		114
NSS	July 1964-(Ru- 19th June 1965 al)					
	Round					

* Excludes Bihar, Haryana, Himachal Pradesh, Madhya Pradesh, Nagaland, Orissa, Tamil Nadu, West Bengal & Union Territories.

** Excludes Bihar, Himachal Pradesh, Madhya Pradesh, Nagaland, Orissa, West Bengal & Union Territories.

It is observed from above that the infant mortality rate as shown by NSS is on the lower side as compared to SRS. It is quite likely that the rates would have been affected by recall lapse since NSS is adopting a longer reference period for recording vital events. The neo-natal infant death rates as obtained in SRS for 1968 & 1969 are respectively 74 and 75 per 1000 live births. The post-natal infant mortality rates account for 63 & 65 per 1000 live births for the periods 1968 & 1969 respectively. The distinction between neo-natal and later infant deaths is based on the fact that they are in great part attributable to different causes. It is further observed that neo-natal mortality exceeds post-natal mortality. Thus about 55% of infant deaths occur to infants below one month (neo-natal mortality) and the rest is distributed to other age groups below one year. The risk of dying is greatest during the first week of life and then decreases thereafter.

4.2 The infant mortality by age at death and by sex by pooling all the States for which data are available for the years 1968 & 1969 is shown in the accompanying Table:

Table 4: Infant mortality & its components by sex, Rural

Period	Sex	Age of infants			
		< 7 days	7-28 days	29 days- 6 months	7-12 months
1968*	M	46.0	33.4	35.7	20.9
	F	40.4	27.9	42.5	26.9
1969**	M	44.4	29.4	38.1	20.4
	F	41.0	34.9	47.7	24.5

* Excludes Bihar, Haryana, Himachal Pradesh, Madhya Pradesh, Nagaland, Orissa, Tamil Nadu, West Bengal and Union Territories.

** Excludes Bihar, Himachal Pradesh, Madhya Pradesh, Nagaland, Orissa, West Bengal & Union Territories.

It is observed that the risk of dying is more in the case of male infants than female infants during the period of one week after birth. In the case of infants surviving after one month, male infants have greater chances of survival than female infants. It is observed that among males, neo-natal mortality is considerably larger in

magnitude than post-natal mortality. Among female infants, the magnitude of neo-natal mortality remains of the same order as post-natal mortality.

4.3 The Table below furnishes the peri-natal mortality rate and still birth rate by sex for the years 1968 and 1969. Peri-natal mortality is defined as the ratio of infant deaths below one week after birth plus still births to total live births plus still births, multiplied by 1000. In some cases still births and infant deaths soon after birth are misclassified mainly due to ignorance and want of proper medical facilities. There is also every likelihood of mishandling the cases of delivery by inexperienced women folk resulting in infant deaths soon after birth in rural areas where most of the births are domiciliary in nature. Such cases are likely to be misclassified as still births. The concept of peri-natal mortality is applicable only to advanced countries where over 95 per cent of births and an equally large proportion of deaths take place in institutions and hospitals. The cause of death among peri-natal deaths cannot easily be ascertained in any developing countries due to lack of medical facilities available in the ante-natal period of the mothers and non-institutionalisation of births and deaths. The International Classification of Diseases Unit of the W.H.O. had invited suggestions on the lay reporting of peri-natal morbidity and mortality. Keeping in view, the low medical density in several developing nations, it was suggested⁶ that the following axis of classification of causes of peri-natal morbidity and mortality would be suitable:

- (i) Mother's morbidity
- (ii) Deficiencies in foetal development
- (iii) Circumstances prevailing during the act of birth
- (iv) External causes affecting the new born.

Table 5 Peri-natal mortality and still birth rate by sex, Rural 1968 and 1969

Period	Sex	Peri-natal mortality	Still birth rate
1968*	M	69.9	25.1
	F	59.9	20.3
	T	65.1	22.8
1969**	M	67.8	24.5
	F	59.5	19.4
	T	63.8	22.1

* Excludes Bihar, Earyana, Himachal Pradesh, Madhya Pradesh Nagaland, Orissa, Tamil Nadu, West Bengal and Union Territories.

** Excludes Bihar, Himachal Pradesh, Madhya Pradesh, Nagaland, Orissa, West Bengal and Union Territories.

It is observed that still birth rate in the case of males is greater than female still birth rate. Thus the chances of still births among males are more than among females. The same trend is also found in peri-natal mortality. Under peri-natal mortality, males have less chances of survival than females.

5.0 DIFFERENTIALS BY STATES AND SEX, RURAL, 1968 AND 1969.

5.1 If the infant mortality rates (Rural) are shown on a map of India, it will be seen that there are regional variations. Infant mortality by age at death of the infants by States are shown in Table 12. The lowest infant mortality is recorded for Kerala followed by Haryana and Punjab where the rates based on the average of 1968 & 1969 figures are below 100. The remaining southern States comprising Andhra Pradesh, Tamil Nadu, Mysore together with Maharashtra in the west, Jammu & Kashmir in the north form another band where infant mortality ranges from 100 to 120. Assam in the east has recorded a rate of 138. There is a yet another belt running across the country comprising Rajasthan, Gujarat and Uttar Pradesh where the infant mortality rate exceeds 140. The highest infant mortality is recorded in Uttar Pradesh. The States for which figures are available can be grouped as under:-

<u>Range</u>	<u>States</u>
Below 30	Kerala, Haryana
30 - 100	Punjab
100- 120	Andhra Pradesh, Tamil Nadu, Mysore, Maharashtra, Jammu & Kashmir
120- 140	Assam
140+	Gujarat, Rajasthan, Uttar Pradesh

It can be seen that in most of the States the risk of infants dying during the first week after birth is greatest and thereafter decreases. Haryana has recorded the least infant death rate during the first week after birth followed by Kerala. It appears that the infant mortality rate during the period less than one week for Haryana is under-reported. Rajasthan has registered the highest infant mortality during the period less than one week after birth. There are marked

regional variations in the neo-natal mortality rates. Taking the average figures for both the years 1968 & 1969, the neo-natal mortality ranges from 36 in the southern State Kerala to 96 in the northern State Uttar Pradesh. There are also wide geographical variations in the post-natal mortality rate. Kerala has recorded the lowest figure (by taking the average of both the years 1968 & 1969) of 26 followed by Haryana. The highest figure is recorded in Rajasthan. In all the States excepting Rajasthan, the post-natal mortality rate is lower than neo-natal mortality rate. Rajasthan has registered an abnormal figure of 62.1 as infant death rate during the interval one month to six months for 1969. The general mortality rate in Rajasthan for the period 1969 is also high reaching a level of 24 per 1000 population.

5.2 Infant mortality by age of the infant at death and by sex is shown in Table 13 for different States. In majority of States, female infants have better chances of survival during the one week period after birth than male infants. For infants surviving after one month, males have greater chances of survival than females in many States. Sex differentials among neo-natal deaths are pronounced in the case of Uttar Pradesh in 1968 and in Assam in 1969. Regarding post-natal deaths pronounced sex differentials are found in Uttar Pradesh for both the years 1968 and 1969.

5.3 It would be interesting to study the geographical variation in still birth rates. Table 14 shows the Statewise still birth rates. It ranges from 9.7 in Haryana to 48.0 in Jammu & Kashmir in 1969. Still birth rate is highest in Assam in 1968 followed by Jammu & Kashmir. It appears that the still birth rate reported in Haryana. The States can be grouped according to the level of still birth rate based on the average for the years 1968 & 1969 as under:

<u>Range</u>	<u>States</u>
Below 15	Haryana
15 - 20	Maharashtra, Punjab Rajasthan
20 - 25	Kerala, Mysore, Tamil Nadu, Gujarat and Uttar Pradesh
25 - 30	Andhra Pradesh
30+	Jammu & Kashmir, Assam

It can be seen that the southern States form one belt where the still birth rate ranges from 20 to 30.

5.4 The still birth rates by sex and by States exhibit sex preferential pattern favouring females. Still birth rate for males is consistently higher than those for females. The same picture emerges in many of the States for the period 1968. Pronounced sex differentials are found in Assam for both the years 1968 & 1969.

5.5 Percent of still births by type of medical attention received at birth in the rural areas for the periods 1968 and 1969 for a majority of States is shown in Table 15. It can be observed that in all the States a major proportion of still births are attended by untrained practitioners and inexperienced women folk of the villages. It is seen that in Kerala about 30 percent of still births takes place in institutions and slightly over 20 percent of still births is attended by qualified medical personnel in 1968. In 1969, over 30 per cent of still births has taken place in institutions and about 15 percent of still births is attended by trained doctors. Tamil Nadu has also recorded over 45 percent of still births occurring in institutions and attended by trained practitioners in 1969. In the remaining States very few still births take place in institutions or are attended by trained doctors and nurses. Still birth rates by plurality of births are given in Table 16 for the rural areas for a majority of States for the periods 1968 and 1969. It is observed that still birth rate by single birth is highest in Jammu & Kashmir in both the years 1968 & 1969. The lowest figure is recorded in Haryana. As pointed out earlier, perhaps still births are under-reported in Haryana. Assam has recorded a figure of 37.5 in 1968 and 41.1 in 1969. High still birth rates are recorded in all States among twin births in 1968 and 1969. The highest figure is recorded in Jammu & Kashmir in 1969 and in Andhra Pradesh where the still birth rate among twins has registered 140.8 in 1968. Multiple births (triplets and above) are very uncommon and only in Gujarat in 1969 such cases are reported where the still birth rate in this category is abnormally high. Similar high rate is also recorded in Rajasthan in 1968. It is observed that as compared to single births, still birth rates are high among twin births.

5.6 Table 14 gives the peri-natal mortality by State and by sex. The lowest rate of 25.0 is recorded for Haryana. Possibly this may be due to under reporting of still births. The peri-natal mortality ranges from 25.0 in Haryana to 81.1 in Jammu & Kashmir for 1969. The peri-natal mortality in Assam for 1968 is 89.9 which is the highest recorded. Jammu & Kashmir takes the second

position in 1968. The States can be grouped according to the level of peri-natal mortality on the basis of the average for 1968 & 1969 as given.

<u>Range</u>	<u>States</u>
Below 40	Karyana
40 - 60	Kerala, Maharashtra, Punjab, Mysore
60 - 80	Andhra Pradesh, Gujarat, Tamil Nadu, Uttar Pradesh
80+	Jammu & Kashmir, Assam

It can be observed from the Table 14 that in most of the States the peri-natal mortality for males exceeds that of females. The States for which pronounced sex differentials are observed comprise Assam in the east, Uttar Pradesh in the north, Kerala in the south and Rajasthan in the north west for both the years 1968 & 1969.

5.7 State-wise percent distribution of infant deaths to total deaths by age of infants at death is shown in Table 17 for the years 1968 and 1969. In most of the States, infant death is one out of every four deaths. In the case of Gujarat, Uttar Pradesh and Rajasthan where the infant mortality rates are high one infant death takes place out of three deaths. Table 18 presents the per cent distribution of infant deaths by age at death for the different States. In most of the States about one third of the total infant deaths pertains to the age group below one week. It is further seen that in all States (with the solitary exception of Rajasthan in 1969) over 50 per cent of infant deaths comprises neo-natal mortality. Thus infant deaths below one month old constitute a sizable dimension.

6.0 CAUSES OF INFANT DEATHS (RURAL)

6.1 Data on cause of death in selected rural areas is collected through Model Registration Scheme. The basic unit of investigation is the Headquarters village of a Primary Health Centre (PHC). Only those PHC villages are selected which have a medical officer-in-charge and para-medical personnel for investigation. The following Table gives the per cent distribution of infant deaths (below one year) by cause of death and by sex for the years 1966-68.

Table 6: Percent infant deaths by cause of death and by sex, 1966-68.

Cause of death	Percent infant deaths					
	1966		1967		1968	
	M	F	M	F	M	F
1. Violence or injury	0.7	0.4	0.6	0.3	0.3	0.4
2. Child birth complicated pregnancy	-	-	-	-	-	-
3. Diarrhoea	9.9	13.5	9.3	9.1	8.7	9.9
4. Swellings	1.2	0.6	1.1	1.2	0.8	0.8
5. Fevers	13.5	15.3	14.2	16.3	11.6	12.5
6. Cough	25.5	23.6	22.0	20.5	19.6	20.4
7. Other infant deaths	40.9	40.0	46.3	45.8	50.0	48.4
8. Other clear symptoms	6.1	1.3	5.8	5.4	8.0	6.5
9. Others	2.2	1.8	1.7	1.4	1.0	1.1
Total	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

It is observed that the major cause of death of infants pertains to birth injuries, prematurity, infection of the new born and diseases peculiar to infancy. The second major cause of death relates to broncho pneumonia and pneumonia.

7.0 INFANT MORTALITY, URBAN 1969.

7.1 In regard to social and environmental factors related to mortality, special mention may be made of the rural-urban differentials which are quite marked in India. While the rural death rate in India is 19.1 per 1000 population in 1969 as per SRS data, the urban death rate is 11.5 only. The infant mortality is also of a smaller dimension in urban areas as compared to rural areas. This is mainly due to the ready availability of advances in medicine, public health, sanitation and hospital facilities in urban areas. The Sample Registration System (SRS) in urban areas was initiated in almost all States only from the later half of 1969 and as such estimates are available only for a few States. The following Table presents infant mortality by sex.

Table 7: Infant mortality by age at death and by sex, urban, 1969.

State	Age of the infants at death									
	Less than 7 days		7-28 days		1-6 months		7-12 months		All ages	
	M	F	M	F	M	F	M	F	M	F
Assam	59.8	19.1	20.7	9.3	36.6	47.1	13.6	16.9	110.7	92.4
Jammu & Kashmir	29.6	12.4	6.5	16.1	37.5	9.7	5.4	3.3	79.1	40.5
Mysore	23.4	20.0	14.1	7.6	15.3	16.8	7.4	10.1	60.1	54.4
Punjab	27.9	14.8	8.2	18.1	18.4	36.0	15.8	17.8	70.3	86.7
Rajasthan	30.3	24.3	17.1	13.0	32.4	33.0	17.2	13.9	97.0	84.2
Uttar Pradesh	42.8	30.3	29.3	26.0	30.4	30.2	16.7	13.5	110.2	99.7

It is observed that there are pronounced sex differentials among infants dying before one month after birth, favouring females. In States like Mysore, Punjab, Rajasthan and Uttar Pradesh sex differentials among infants dying during the post-natal period are reduced considerably. It is observed that during the post-natal period, female infant mortality in Jammu & Kashmir is considerably low. There appears to be under-reporting of female infants in the age groups 1-6 months and 5-12 months in Jammu & Kashmir. It is seen from above that there are regional variation in the urban infant mortality rate. Infant mortality is highest in Uttar Pradesh, followed by Assam and Rajasthan.

7.2 The components of infant mortality, peri-natal mortality and still birth rate by sex are given in the accompanying table for a few States.

As pointed out earlier, in the neo-natal period, the chances of survival of females are more than males. Pronounced sex differentials among neo-natal deaths are found in Assam and Uttar Pradesh. Post-natal mortality varies from 24.6 in Mysore to 57.2 in Assam. Assam has recorded a still birth rate of 17.3. The lowest is recorded in Jammu & Kashmir followed by Punjab. Peri-natal mortality varies from 48.2 in Uttar Pradesh to 25.8 in Jammu & Kashmir. It is observed that in urban areas still birth rate among females is more than males while the reverse is the case in rural areas. The distribution of peri-natal mortality by sex indicates that in most of the States the chances of survival of males are less than females.

Table 8: Components of infant mortality, peri-natal mortality and still birth rate, Urban, 1969.

State	Sex	Still birth rate	Peri-natal mortality	Neo-natal mortality	Post-natal mortality	Infant mortality
1	2	3	4	5	6	7
Assam	T	17.3	46.1	44.2	57.2	101.4
	M	13.2	52.5	60.5	50.2	110.7
	F	21.2	39.9	28.4	64.0	92.4
Jammu & Kashmir	T	4.4	25.8	32.5	28.3	60.8
	M	3.0	32.5	36.1	43.0	79.1
	F	5.9	18.2	28.5	12.0	40.5
Mysore	T	13.5	35.0	32.8	24.6	57.4
	M	10.7	33.9	37.5	22.6	60.1
	F	16.6	36.3	27.6	26.8	54.4
Punjab	T	7.1	28.7	34.6	43.3	77.9
	M	6.9	34.6	36.1	34.2	70.3
	F	7.3	22.1	32.9	53.8	86.7
Rajasthan	T	10.3	37.5	43.0	48.6	91.6
	M	9.6	39.6	47.4	49.6	97.0
	F	11.2	35.2	37.3	46.9	84.2
Uttar Pradesh	T	11.8	48.2	64.6	45.5	110.1
	M	11.2	53.4	72.1	47.1	119.2
	F	12.6	42.2	56.0	43.7	99.7

7.3 The Table below gives the percent distribution of infant deaths by age at death of infants for 1969.

Table 9: Percent infant deaths by age group, Urban, 1969.

State	Per cent of infants deaths by age				
	Total	0-7 days	7-28 days	1-6 months	7-12 months
Assam	100.0	28.9	14.7	41.3	15.1
Jammu & Kashmir	100.0	35.3	18.1	39.3	7.3
Mysore	100.0	37.9	19.2	27.8	15.1
Punjab	100.0	28.0	16.5	34.1	21.4
Rajasthan	100.0	30.2	16.7	35.9	17.2
Uttar Pradesh	100.0	33.4	25.2	27.6	13.8

In Punjab over one-fourth of the total infant deaths takes place in the age group below seven days while in Jammu & Kashmir slightly over one-third of the total infant deaths pertains to the age group below seven days. An equally large proportion of infant deaths takes place in the age group (1-6) months. Among neo-natal deaths, over 50 per cent of infant deaths takes place in Jammu & Kashmir, Mysore and Uttar Pradesh. Per cent of infant deaths to total deaths by age group is shown in the accompanying Table.

Table 10: Percent of infant deaths to total deaths, Urban, 1969.

State	Percent of infant deaths to total deaths					
	Total deaths	All ages	Less than 7 days	7-28 days	1-6 months	7-12 months
Assam	100.0	29.8	8.6	4.4	12.3	4.5
Jammu & Kashmir	100.0	23.8	8.4	4.3	9.4	1.7
Mysore	100.0	17.5	6.6	3.4	4.9	2.6
Punjab	100.0	22.4	6.3	3.7	7.6	4.8
Rajasthan	100.0	23.4	7.1	3.9	8.4	4.0
Uttar Pradesh	100.0	26.9	9.0	6.8	7.4	3.7

It can be seen that about one infant death takes place out of every five deaths in Mysore. In the case of other States one infant death takes place out of every four deaths. It is further observed that a good proportion of infant deaths to total deaths takes place in the age groups below one week and (1-6) months.

8.0 CAUSES OF INFANT DEATHS (URBAN)

8.1 The study of infant mortality by cause of death has its limitations due to the inadequacy of the available statistics. Further the usefulness of the statistics collected is limited by difficulties due to their quality and also comparability in time and space. In the first place the declaration of the cause of death duly certified by a qualified person is more accurate and precise. But this requirement is not met. The persons responsible for the registration of deaths are

also responsible for the registration of the causes of deaths. The quality of the statistics thus depends on the availability of medical personnel. Efforts are underway in some States to make a beginning by introducing medical certification of the cause of death in the international form in hospitals.

8.2 The percent distribution of infant deaths by selected causes according to medically certified cause for Bombay and Madras for 1966 is given in the Tables 19 & 20. It is observed from Table 19 that the major cause of infant deaths below one month (neo-natal mortality) is diseases 'peculiar to early infancy and immaturity unqualified.' About 8 percent of the total neo-natal deaths in accounted for birth injuries, post-natal asphyxia and atelectasis. Among post natal deaths, the major cause of death is pneumonia which accounts for about 38 percent of all post-natal infant deaths. The second dominant cause of death is gastritis, duodenitis, enteritis and colitis, except diarrhoea of the new born. Diseases of the early infancy and immaturity forms about 15 percent of the total post-natal deaths. Table 20 presents per cent distribution of infant deaths by selected causes for Madras for 1966. Among neo-natal deaths, the major cause of death is infantile debility and malnutrition including pre-mature births which accounts for about 65 percent of the total neo-natal deaths. Another cause of death is the diseases of the respiratory system. In the case of post-natal deaths the major cause of death is the disease of the respiratory system followed by diarrhoea and dysentery.

9.0 INFANT MORTALITY IN SELECTED COUNTRIES

9.1 There are global variations in the infant mortality rates. In large measure, differentials in the infant mortality rates among the various countries of the world reflect the differing social and economic conditions found in these countries. The following table gives some idea of the variations existing in the different parts of the world.

Table 11: Infant mortality rate in selected countries.

Country	Infant mortality (per 1000 live births)	Crude death rate (per 1000 popu- lation)
A. Infant mortality below 50:		
Japan (1968)	15	6.8
Switzerland (1968)	16	9.3
United Kingdom (1968)	19	11.9
France (1968)	20	11.0
United States of America (1968)	21	9.7
U.S.S.R. (1968)	26	7.7
Ceylon (1967)	48	7.5
B. Infant mortality 50-99:		
Mexico (1968)	64	9.6
Burma (1967)	67	N.A
Indonesia (1967)	87	9.2
Chile (1967)	92	9.5
C. Infant mortality 100+:		
U.A.R. (1967)	116	15.8
India (1968) Rural	137	16.8
(1969) Rural	140	19.1
Sierra Leone (1967) Rural	142	17.2
Urban	160	17.8

It can be observed that most of the advanced countries have brought down the infant mortality level below 50. In developing countries, the rates remain considerably high above 100. The greatest progress in advanced countries has been achieved in reducing mortality after the first month of life which is closely related to economic and social conditions. Reduction in neo-natal and peri-natal mortality which are affected more directly by biological factors can be controlled to some extent by setting up antenatal clinics and institutionalisation of births.

10.0 SUMMARY

10.1 Infant mortality in India (rural) is estimated at 137 per 1000 live births in 1968 and in 1969 the estimated figure is 140 per 1000 live births. Thus in India the infant mortality is still high. Infant mortality by sex indicates sex selectivity in favour of females in a majority of States. As regards the components of infant mortality, neo-natal deaths in rural areas share over 50 per cent of the total infant deaths. Among neo-natal deaths, female infants have better chances of survival than male infants. In the case of post-natal deaths, the differences in the two sexes are reversed as compared to neo-natal deaths. Among males neo-natal mortality is considerably larger than post-natal mortality. Among females, the magnitude of neo-natal mortality remains of the same order as post-natal mortality. The distinction between neo-natal and post-natal deaths has been made due to the differences in the causes of death. The neo-natal deaths are attributable to endogenous factors consisting of (i) genetic factors inherent in the growth of the organism or damage during gestation (ii) birth injuries and conditions arising from hazards of delivery. Post-natal deaths are attributable to exogenous factors like infectious diseases, respiratory diseases, digestive diseases and causes depending on the extent of infant care and neglect. It has been observed in rural areas that the major cause responsible for a large proportion of neo-natal deaths is diseases peculiar to early infancy and immaturity unqualified. Among post-natal deaths the major cause is pneumonia followed by diseases of the respiratory diseases. Peri-natal mortality in 1968 is 70 as against 68 in 1969. Peri-natal mortality by sex indicates that males have less chances of survival than females. The still birth rate (which is often considered as a measure of pregnancy wastage) is 22.8 in 1968 as against 22.1 in 1969. There are sex differentials in still birth rate favouring females in rural areas.

10.2 Infant mortality for urban areas for 1969 is also presented for few States for which data is available. The infant mortality in urban areas ranges from 57 in Mysore to 110 in Uttar Pradesh. The infant mortality in urban areas is of a smaller dimension as compared to rural areas. This is mainly due to the ready availability of advances in medicine, public health sanitation and hospital facilities in urban areas. There are pronounced sex differentials among infants dying before one month after birth, favouring females. Thus in urban areas, among neo-natal deaths, the chances of survival of females are more than males. Assam has recorded a still

birth rate of 17.3 which is the highest. The lowest figure is recorded in Jammu & Kashmir. It is observed that still birth rate among females is more than males. Peri-natal mortality by sex indicates that in most of the States the chances of survival of males are less than females. The major cause of infant deaths occurring below one month according to medically certified causes for Bombay, 1966 is diseases peculiar to early infancy and immaturity unqualified. Among post-natal deaths, the major cause of death is pneumonia which accounts for about 38 percent of all post-natal deaths. The distribution of infant deaths by selected causes for Madras, 1966 shows that among neo-natal deaths the major cause of death is infantile debility and mal-nutrition including premature births which account for about 65 percent of the total neo-natal deaths. Another cause is the diseases of the respiratory system. In the case of post-natal deaths, the major cause of death is the diseases of the respiratory system followed by diarrhoea and dysentery. Much of the success in reducing infant mortality to a level consistent with that of the advanced countries depends on creating social changes by way of institutionalisation of births and by providing increased facilities by way of hospitals, additional trained doctors and nurses through an integrated health, maternal and child welfare programmes.

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Table 12: Estimates of infant mortality by age of the infants at death and by States, SRS, Rural, 1968 & 1969.

Sl. No.	State	Year	Estimated Infant death rate				
			Infant death rate	0-7 days	7-28 days	29 days - 7 months to 1 year	
1.	Andhra Pradesh	1968	109.0	43.4	20.2	31.2	14.2
		1969	126.9	49.7	23.8	39.9	15.5
2.	Assam	1968	146.3	52.3	34.9	44.4	14.7
		1969	129.5	37.8	32.9	46.5	12.3
3.	Gujarat	1968	128.5	46.0	23.2	38.6	20.7
		1969	165.2	49.6	33.6	52.8	29.2
4.	Haryana	1968	N.A	N.A	N.A	N.A	N.A
		1969	79.7	15.4	25.3	29.2	9.8
5.	Jammu & Kashmir	1968	127.1	46.5	33.8	38.2	8.6
		1969	102.9	34.8	31.5	25.3	11.3
6.	Kerala	1968	66.0	23.3	14.5	20.5	7.7
		1969	56.8	20.5	12.8	15.4	8.1
7.	Maharashtra	1968*	95.5	41.0	16.5	25.5	12.5
		1969*	106.9	35.2	21.9	32.1	17.7
8.	Mysore	1968	96.3	36.5	23.9	24.6	11.3
		1969	109.6	40.2	21.2	33.4	14.8
9.	Punjab	1968	100.7	36.6	23.4	21.0	19.7
		1969	97.6	32.6	16.7	26.9	21.4
10.	Rajasthan	1968	156.5	53.9	26.0	47.3	23.3
		1969	168.8	45.6	28.1	62.1	33.0
11.	Tamil Nadu	1968	N.A	N.A	N.A	N.A	N.A
		1969*	112.5	43.8	23.2	32.6	12.9
12.	Uttar Pradesh	1968	177.4	44.6	46.0	51.0	37.8
		1969	178.7	48.2	47.8	51.4	31.3
Pooled Estimates		1968	136.8	43.3	30.7	39.0	23.8
		1969	139.9	42.7	32.1	42.7	22.4

* Enumerators events only

Table 13: Estimates of infant mortality by age of the infants at death, by sex & by States, SRS, Rural, 1968 & 1969.

Sl. No.	State	Year	Infant mortality rate by age and sex							
			/ 7 days		' 7 days - ' 28 days		' 29 days - ' 6 months		' 7 Months to ' 1 Year	
			M	F	M	F	M	F	M	F
1. Andhra Pradesh	1968	46.2	40.7	22.4	17.8	30.2	32.2	18.2	10.0	
	1969	49.6	49.8	24.6	22.9	40.9	38.9	16.6	14.4	
2. Assam	1968	54.7	49.7	37.0	32.7	44.7	44.0	15.5	13.8	
	1969	46.6	28.8	37.3	28.5	54.1	38.9	16.2	8.2	
3. Gujarat	1968	51.4	40.2	25.3	20.9	37.3	39.9	18.7	23.0	
	1969	46.1	53.3	32.7	34.6	50.5	55.1	23.9	34.8	
4. Haryana	1968	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	
	1969	18.6	11.9	29.1	20.9	21.6	37.7	13.6	5.6	
5. Jammu & Kashmir	1968	44.8	48.3	37.3	30.0	38.9	37.5	4.2	13.4	
	1969	37.1	32.1	29.9	33.4	26.9	23.5	12.4	9.9	
6. Kerala	1968	28.3	18.0	15.0	14.0	21.8	19.1	6.9	8.6	
	1969	23.9	17.0	17.0	8.3	15.3	15.5	8.6	7.7	
7. Maharashtra	1968*	38.0	44.5	15.5	17.6	23.3	28.1	11.4	13.7	
	1969*	31.4	39.4	21.7	22.0	29.8	34.7	18.1	17.3	
8. Mysore	1968	37.4	35.5	26.2	21.4	24.6	24.5	10.7	12.0	
	1969	41.6	38.8	23.5	18.7	34.5	32.1	14.9	14.8	
9. Punjab	1968	40.3	32.7	24.1	22.7	18.8	23.4	14.1	25.6	
	1969	27.2	38.6	16.8	16.4	27.8	25.8	9.1	35.1	
10. Rajasthan	1968	55.8	51.7	25.1	27.1	40.6	54.8	24.0	35.2	
	1969	49.6	41.0	27.3	29.1	62.6	61.4	28.1	38.7	
11. Tamil Nadu	1968	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	
	1969*	47.5	40.0	26.7	19.7	24.8	40.5	16.0	9.6	
12. Uttar Pradesh	1968	48.8	40.1	51.7	39.8	44.9	57.7	31.2	45.0	
	1969	51.3	44.7	37.1	59.6	39.2	64.8	26.3	36.8	
Pooled Estimates	1968	46.0	40.4	33.4	27.9	35.7	42.5	20.9	26.9	
	1969	44.4	41.0	29.4	34.9	38.1	47.7	20.4	24.5	

* Enumerators events only

Table 14(a): Estimates of still birth rate, peri-natal mortality, neo-natal mortality, post-natal mortality, & infant mortality by sex & by States, SRS, Rural, 1968.

Sl. No.	State	Sex	Still birth rate	Perinatal rate	Neonatal rate	Post-natal rate	Infant mortality rate
1.	Andhra Pradesh	T	30.8	73.0	63.6	45.4	109.0
		M	35.4	80.0	68.6	48.4	117.0
		F	26.0	65.6	58.5	42.2	100.7
2.	Assam	T	39.7	89.9	87.2	59.1	146.3
		M	46.2	98.4	91.7	60.2	151.9
		F	32.7	80.8	82.4	57.8	140.2
3.	Gujarat	T	23.1	68.1	69.2	59.3	128.5
		M	24.4	74.5	76.7	56.9	132.7
		F	21.7	61.0	61.1	62.2	124.0
4.	Jammu & Kashmir	T	37.5	82.2	80.3	46.8	127.1
		M	37.6	80.7	82.1	43.1	125.2
		F	37.3	83.8	78.3	50.9	129.2
5.	Kerala	T	22.4	45.2	37.3	28.2	66.0
		M	24.3	52.0	43.3	28.7	72.0
		F	20.3	37.9	32.3	27.7	59.7
6.	Maharashtra*	T	15.3	55.7	57.5	38.0	95.5
		M	18.2	55.5	53.5	34.7	88.2
		F	12.0	56.0	62.1	41.8	103.9
7.	Mysore	T	21.3	57.0	60.4	35.9	96.3
		M	19.1	55.8	63.6	35.3	98.9
		F	23.7	58.3	56.9	36.5	93.4
8.	Punjab	T	21.6	57.4	60.0	40.7	100.7
		M	20.4	59.8	64.4	32.9	97.3
		F	22.9	54.8	55.4	49.0	104.4
9.	Rajasthan	T	16.3	69.3	79.9	76.6	156.5
		M	19.3	74.1	80.9	64.6	145.5
		F	12.8	63.9	78.8	90.0	168.8
10.	Uttar Pradesh	T	21.2	64.9	90.6	88.8	179.4
		M	23.3	71.0	100.5	76.1	176.6
		F	18.8	58.2	79.9	102.7	182.6
Pooled Estimates		T	22.8	65.1	74.0	62.8	136.8
		M	25.1	69.9	79.4	56.6	136.0
		F	20.3	59.9	68.3	69.4	137.7

* Enumerators events only

Table 14(b): Estimates of still birth rate, peri-natal mortality, neo-natal mortality, post-natal mortality, & infant mortality by sex & by States, SRS, Rural, 1969.

Sl. No.	State	Sex	Estimated 'still bir- 'th rate	Peri- natal 'rate	Neo- natal 'rate	Post- natal 'rate	Infant 'mortality 'rate
1. Andhra Pradesh		T	26.5	74.9	73.5	55.4	128.9
		M	29.6	77.7	74.2	57.5	131.7
		F	23.3	72.0	72.7	53.3	126.0
2. Assam		T	42.2	78.4	70.7	58.8	129.5
		M	49.5	93.8	83.9	70.3	154.2
		F	34.7	62.5	57.3	47.1	104.4
3. Gujarat		T	18.6	67.3	83.2	82.0	165.2
		M	21.5	66.6	78.8	74.4	153.2
		F	15.6	68.0	87.9	89.9	177.8
4. Haryana		T	9.7	25.0	40.7	39.0	79.7
		M	9.8	28.2	47.7	35.2	82.9
		F	9.7	21.4	32.8	43.3	76.1
5. Jammu & Kashmir		T	48.0	81.1	66.3	36.6	102.9
		M	52.1	87.3	67.0	39.3	106.3
		F	43.0	73.7	65.5	33.4	98.9
6. Kerala		T	22.9	43.0	33.3	23.5	56.8
		M	23.0	46.3	40.9	23.9	64.8
		F	22.9	39.5	25.3	23.2	48.5
7. Maharashtra*		T	18.6	53.1	57.1	49.8	106.9
		M	19.2	49.9	53.1	47.9	101.0
		F	17.9	56.6	61.4	52.0	113.4
8. Mysore		T	22.3	61.7	61.4	48.2	109.6
		M	25.8	66.3	65.1	49.4	114.5
		F	18.6	56.7	57.5	46.9	104.4
9. Punjab		T	18.4	50.4	49.3	48.3	97.6
		M	21.5	48.2	44.0	36.9	80.9
		F	14.8	52.8	55.0	60.9	115.9
10. Rajasthan		T	14.3	59.3	73.7	95.1	168.8
		M	15.7	64.6	76.9	90.7	167.6
		F	12.7	53.2	70.1	100.1	170.2
11. Tamil Nadu*		T	22.2	65.0	67.0	45.5	112.5
		M	24.9	71.2	74.2	40.8	115.0
		F	19.4	58.6	59.7	50.1	109.8
12. Uttar Pradesh		T	21.3	68.5	96.0	82.7	178.7
		M	24.0	74.0	88.4	65.5	153.9
		F	18.4	62.4	104.3	101.6	205.9
Pooled Estimates		T	22.1	63.8	74.8	65.1	139.9
		M	24.5	67.8	73.8	58.5	132.3
		F	19.4	59.5	75.9	72.2	148.1

* Enumerators events only

Table 15: Percent distribution of still births by type of medical attention at birth by States, SRS, Rural, 1968 & 1969 (Unweighted).

Sl. No.	States	Year	Type of medical attention at Birth				
			Total	Institu- tional	Trained Practi- oner	Untrai- ned Pra- ctioner	Others
1.	Andhra Pradesh	1968	100.0	15.6	11.7	50.6	22.1
		1969	100.0	12.0	14.8	53.7	19.5
2.	Assam	1968	100.0	15.2	12.7	33.9	38.2
		1969	100.0	13.1	6.0	33.3	47.6
3.	Gujarat	1968	100.0	11.0	5.5	45.0	38.5
		1969	100.0	6.4	14.9	39.0	39.7
4.	Haryana	1968	N.A	N.A	N.A	N.A	N.A
		1969	100.0	6.7	16.7	76.6	0.0
5.	Jammu & Kashmir	1968	100.0	3.9	5.2	81.8	9.1
		1969	100.0	10.5	1.1	84.2	4.2
6.	Kerala	1968	100.0	27.9	21.1	38.5	12.5
		1969	100.0	32.7	14.4	38.6	14.3
7.	Maharashtra	1968*	100.0	8.3	16.7	9.4	65.6
		1969*	100.0	16.1	4.4	27.7	51.8
8.	Mysore	1968	100.0	10.3	17.1	18.8	53.8
		1969	100.0	8.3	15.3	22.5	53.4
9.	Punjab	1968	100.0	11.0	-	85.9	3.1
		1969	100.0	3.7	1.8	92.7	1.8
10.	Rajasthan	1968	100.0	4.5	6.4	73.6	15.5
		1969	100.0	10.6	9.6	75.5	4.3
11.	Tamil Nadu	1968	N.A	N.A	N.A	N.A	N.A
		1969*	100.0	18.2	28.4	22.2	31.2
12.	Uttar Pradesh	1968	100.0	1.9	16.0	76.4	5.7
		1969	100.0	0.0	12.2	84.1	3.8
Pooled Estimates		1968	100.0	13.0	12.3	47.6	27.1
		1969	100.0	13.6	12.9	47.1	26.4

* Enumerators events only

Table 16: Still birth rate by type of delivery by States, SRS, Rural, 1968-1969 (Unweighted).

Sl. No.	States	Year	Still birth rate by type of delivery		
			Single delivery	Twin delivery	Multiple delivery
1.	Andhra Pradesh	1968	26.3	140.8	0.0
		1969	24.5	181.8	0.0
2.	Assam	1968	37.5	137.5	0.0
		1969	41.1	130.4	0.0
3.	Gujarat	1968	22.2	88.2	0.0
		1969	18.0	48.8	1000.0
4.	Haryana	1968	N.A	N.A	N.A
		1969	9.2	71.4	0.0
5.	Jammu & Kashmir	1968	40.2	78.9	0.0
		1969	48.2	189.2	0.0
6.	Kerala	1968	22.0	42.8	0.0
		1969	22.5	47.1	0.0
7.	Maharashtra	1968*	15.6	21.7	0.0
		1969*	18.7	29.7	0.0
8.	Mysore	1968	20.0	85.1	0.0
		1969	22.4	64.1	0.0
9.	Punjab	1968	21.2	50.0	0.0
		1969	18.4	50.0	0.0
10.	Rajasthan	1968	15.3	48.4	1000.0
		1969	14.3	20.8	0.0
11.	Tamil Nadu	1968	N.A	N.A	N.A
		1969*	21.8	56.0	0.0
12.	Uttar Pradesh	1968	20.4	64.1	0.0
		1969	20.4	26.3	0.0
	Pooled Estimates	1968	22.5	76.2	500.0
		1969	21.8	69.8	250.0

* Enumerators events only.

Table 17: Percent distribution of estimated infant deaths to total estimated deaths by age of the infants at death and by States, SRS, Rural, 1968 & 1969.

Sl. No.	State	Year	Total deaths	Percentage of infant deaths to total deaths				
				Total / 7 days	7-28 days	29 days to 6 months	7 months to 1 year	
1. Andhra Pradesh	1968	100.0	25.0	10.0	4.6	7.2	3.2	
	1969	100.0	26.3	10.1	4.9	8.1	3.2	
2. Assam	1968	100.0	30.8	11.0	7.4	9.3	3.1	
	1969	100.0	28.8	8.4	7.3	10.4	2.7	
3. Gujarat	1968	100.0	29.3	10.5	5.3	8.8	4.7	
	1969	100.0	30.4	9.1	6.2	9.7	5.4	
4. Haryana	1968	100.0	N.A	N.A	N.A	N.A	N.A	
	1969	100.0	26.7	5.2	8.4	9.8	3.3	
5. Jammu & Kashmir	1968	100.0	29.9	10.9	8.0	9.0	2.0	
	1969	100.0	27.4	9.3	8.4	6.7	3.0	
6. Kerala	1968	100.0	22.0	7.8	4.8	6.8	2.6	
	1969	100.0	19.7	7.1	4.4	5.4	2.8	
7. Maharashtra	1968*	100.0	23.8	10.2	4.1	6.4	3.1	
	1969*	100.0	21.8	7.2	4.5	6.5	3.6	
8. Mysore	1968	100.0	23.5	8.9	5.8	6.0	2.8	
	1969	100.0	23.5	8.6	4.5	7.2	3.2	
9. Punjab	1968	100.0	26.3	9.6	6.1	5.5	5.1	
	1969	100.0	26.2	8.8	4.5	7.2	5.7	
10. Rajasthan	1968	100.0	37.8	13.0	6.3	11.4	7.1	
	1969	100.0	29.8	8.0	5.0	11.0	5.8	
11. Tamil Nadu	1968	100.0	N.A	N.A	N.A	N.A	N.A	
	1969*	100.0	20.3	7.9	5.9	4.2	2.3	
12. Uttar Pradesh	1968	100.0	33.5	8.3	8.6	9.5	7.1	
	1969	100.0	31.3	8.4	8.4	9.0	5.5	
Pooled Estimates	1968	100.0	30.0	9.5	6.7	8.6	5.2	
	1969	100.0	27.5	8.4	6.3	8.4	4.4	

* Enumerators events only

Table 18: Percent distribution of estimated infant deaths by age at death of the infants by States, SRS, Rural, 1968 & 1969.

Sl. No.	States	Year	'All Infant' deaths	Per cent			
				'/ 7 days'	'7-28 days'	'29 days to 6 months'	'7 months to 1 year'
1. Andhra Pradesh	1968	100.0	39.9	18.5	28.6	13.0	
	1969	100.0	38.6	18.4	31.0	12.0	
2. Assam	1968	100.0	35.8	23.9	30.3	10.0	
	1969	100.0	29.2	25.4	35.9	9.5	
3. Gujarat	1968	100.0	35.8	18.0	30.0	16.2	
	1969	100.0	30.0	20.3	32.0	17.7	
4. Haryana	1968	N.A.	N.A.	N.A.	N.A.	N.A.	
	1969	100.0	19.3	31.7	36.6	12.4	
5. Jammu & Kashmir	1968	100.0	36.5	26.6	30.1	6.8	
	1969	100.0	33.8	30.6	24.6	11.0	
6. Kerala	1968	100.0	35.3	22.0	31.1	11.6	
	1969	100.0	36.1	22.5	27.1	14.3	
7. Maharashtra	1968*	100.0	43.0	17.3	26.7	13.0	
	1969*	100.0	32.9	20.5	30.0	16.6	
8. Mysore	1968	100.0	37.9	24.9	25.5	11.7	
	1969	100.0	36.7	19.3	30.4	13.6	
9. Punjab	1968	100.0	36.3	23.3	20.9	19.5	
	1969	100.0	33.5	17.1	27.5	21.9	
10. Rajasthan	1968	100.0	34.4	16.7	30.2	18.7	
	1969	100.0	27.0	16.6	36.8	19.6	
11. Tamil Nadu	1968	N.A.	N.A.	N.A.	N.A.	N.A.	
	1969*	100.0	39.0	20.7	28.9	11.4	
12. Uttar Pradesh	1968	100.0	24.9	25.6	28.4	21.1	
	1969	100.0	26.9	26.8	28.8	17.5	
Pooled Estimates	1968	100.0	31.6	22.5	28.5	17.4	
	1969	100.0	30.6	22.9	30.5	16.0	

* Enumerators events only.

Table 19: Percent distribution of infant deaths according to certified cause of death and by sex, Madras, 1966.

Cause of death	Under 4 weeks		4 weeks & over		Total	
	Num- 'ber	'Percen- 'tage	Num- 'ber	'Percen- 'tage	Num- 'ber	'Percen- 'tage
Dysentery	32	1.0	474	10.5	506	6.5
Diarrhoea	58	1.7	529	11.7	587	7.5
Infantile debility and malnutrition including premature birth etc.	2155	64.9	237	5.3	2392	30.5
Diseases of the respiratory system	421	12.7	1611	35.7	2032	25.9
Other causes	656	19.7	1662	36.8	2318	29.6
Total infantile deaths	3322	100.0	4513	100.0	7835	100.0

Table 20: Percent distribution of infant deaths according to certified cause of death & by sex, Bombay, 1966.

Cause of death	Under 4 weeks		4 weeks and over		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
All other diseases classified as infective and parasitic	293	4.1	61	1.1	354	2.8
Pneumonia	419	5.9	2114	37.8	2533	20.0
Gastritis, duodenitis, enteritis and colitis, except diarrhoea of the newborn	130	1.8	1261	22.5	1391	11.0
Congenital malformations	85	1.2	23	0.4	108	0.9
Birth injuries, post-natal asphyxia and atelectasis.	562	8.0	16	0.3	578	4.6
Diarrhoea of newborn	239	3.4	26	0.5	265	2.1
Other infections of the newborn	400	5.7	21	0.4	421	3.3
Other diseases peculiar to early infancy, and immaturity unqualified.	4396	62.2	813	14.5	5209	41.1
Others	542	7.7	1259	22.5	1801	14.2
Grand Total	7066	100.0	5594	100.0	12660	100.0

Table 21: Infant mortality by sex & by States, NSS,
14th Round, July 1958 - June 1959, Rural.

State	Male	Female	Combined
1. Rajasthan	123.12	103.67	113.76
2. Punjab, Delhi and Himachal Pradesh	118.14	127.35	122.72
3. Jammu & Kashmir	113.98	75.20	94.84
4. Uttar Pradesh	225.68	208.46	217.07
5. Madhya Pradesh	169.96	156.10	163.05
6. Bihar	169.85	151.75	161.08
7. Orissa	152.75	155.13	153.88
8. West Bengal	77.46	89.15	83.02
9. Assam, Manipur and Tripura	109.16	85.06	96.85
10. Andhra Pradesh	120.88	101.54	111.38
11. Madras	139.18	98.47	118.50
12. Kerala	82.71	95.08	88.86
13. Maharashtra	142.41	125.90	134.59
14. Mysore	112.69	92.73	102.98
15. Gujarat	135.63	131.57	133.66
16. All India (Rural)	153.22	138.26	145.86

Table 22: Infant mortality, neo-natal mortality, post-natal mortality by sex and by States, NSS, 19th Round, July 1964 - June 1965, Rural.

State	Neo-natal mortality			Post-natal mortality			Infant mortality		
	Male	Female	Combined	Male	Female	Combined	Male	Female	Combined
1. Andhra Pradesh	71.20	59.28	65.41	50.56	34.02	42.55	121.76	93.28	107.96
2. Assam	43.96	46.56	45.25	37.36	35.48	36.42	81.32	82.04	81.67
3. Bihar	82.09	68.83	73.07	42.54	49.43	45.95	124.63	113.31	119.02
4. Gujarat	56.25	34.01	45.60	40.62	34.01	37.46	96.87	68.02	83.06
5. Jammu & Kashmir	230.26	212.93	222.22	10.74	22.81	21.16	250.00	235.74	243.38
6. Kerala	38.80	19.71	29.33	29.98	44.80	37.33	68.75	64.51	66.67
7. Madhya Pradesh	34.30	31.54	32.98	29.16	14.84	22.28	63.46	46.38	55.26
8. Madras	57.80	48.39	53.21	57.10	71.85	64.29	114.90	120.24	117.50
9. Maharashtra	67.38	54.45	61.18	25.73	23.90	24.85	93.11	78.35	86.03
10. Mysore	38.17	32.07	35.27	42.75	41.35	42.08	80.92	73.42	77.53
11. Orissa	109.01	100.00	104.50	21.80	4.35	13.06	130.81	104.35	117.56
12. Punjab	57.65	47.72	52.79	35.79	39.42	37.56	93.44	87.14	90.35
13. Rajasthan	62.19	49.05	55.92	39.80	19.07	29.91	101.99	68.12	85.83
14. Uttar Pradesh	57.78	51.05	54.69	50.00	85.08	66.10	107.78	136.13	120.79
15. West Bengal	77.97	65.60	72.07	82.82	94.55	88.42	160.79	163.15	160.42
16. All-India	49.69	44.90	47.27	34.78	32.77	33.76	84.47	77.67	81.03
17. All-India	68.98	57.64	63.49	49.63	52.49	51.01	118.61	110.13	114.50

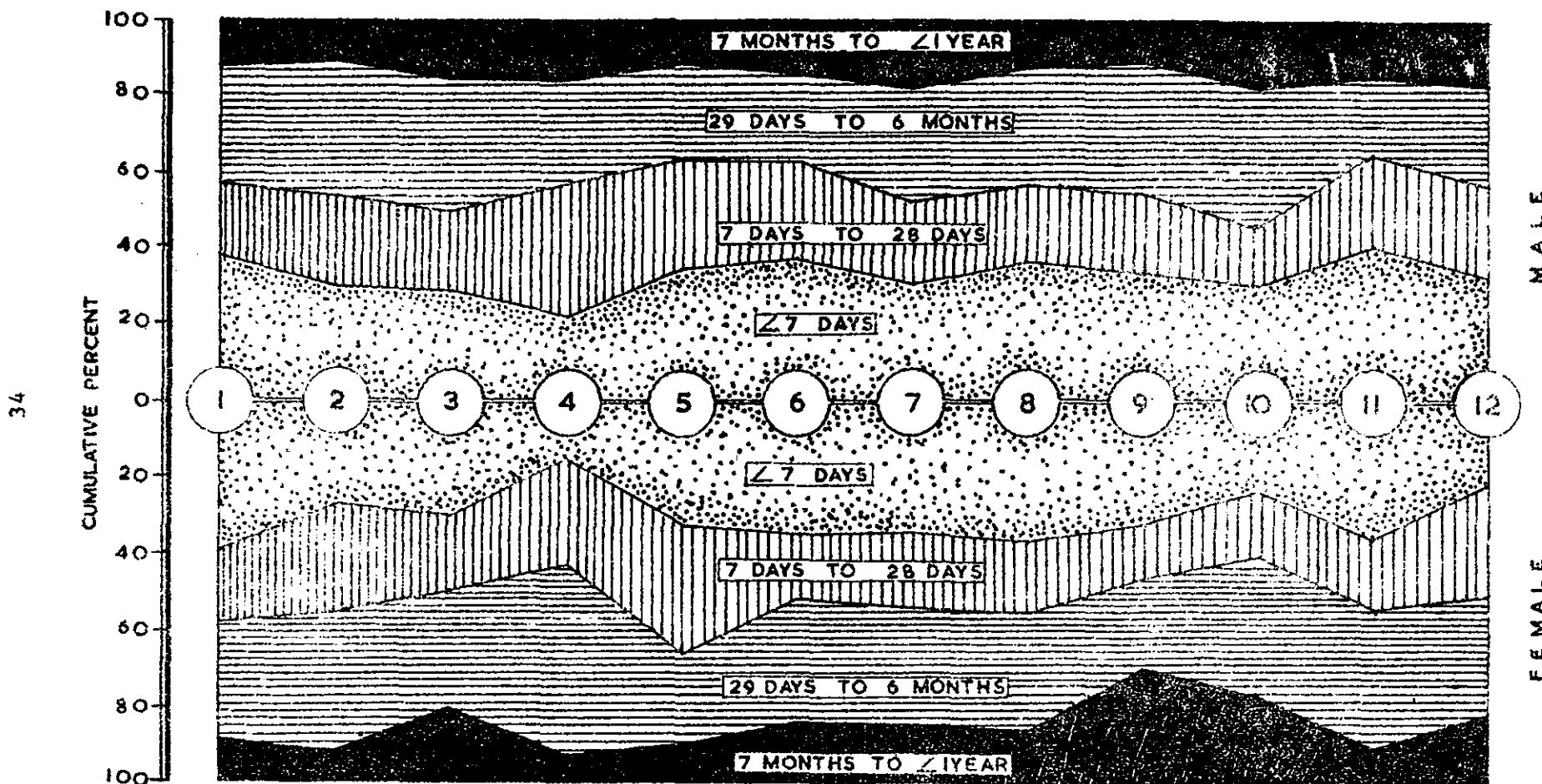
Table 23: Infant mortality, neo-natal mortality, post-natal mortality by sex & by States, NSS, 19th Round, July 1964 - June, 1965, Urban.

State	'Neo-natal mortality			'Post-natal mortality			'Infant mortality		
	'Male	'Fema- 'le	'Com- 'bined	'Male	'Fema- 'le	'Com- 'bined	'Male	'Fem- 'ale	'Com- 'bined
1.Andhra Pradesh	48.10	32.17	40.36	18.99	33.51	26.04	67.09	65.68	66.40
2.Assam	53.80	14.81	31.90	44.30	12.35	26.35	98.10	27.16	58.25
3.Bihar	58.92	47.54	53.44	47.46	28.17	38.17	106.38	75.71	91.61
4.Gujarat	29.27	10.34	20.08	41.46	31.01	36.38	70.73	41.35	56.46
5.Haryana	80.29	29.13	58.33	43.80		25.00	124.09	29.13	83.33
6.Jammu & Kashmir	11.49	24.69	17.86	30.65	12.35	21.83	42.14	37.04	39.69
7.Kerala	25.79	12.35	19.32	5.73	49.38	26.75	31.52	61.73	46.07
8.Madhya Pradesh	49.70	29.06	39.50	34.32	31.48	32.91	84.02	60.54	72.41
9.Madras	54.74	36.72	45.98	30.71	32.49	31.57	85.45	69.21	77.55
10.Maharashtra	43.24	32.88	38.43	25.89	23.64	24.85	69.13	56.52	63.28
11.Mysore	67.37	38.55	53.49	40.00	27.21	33.84	107.37	65.76	87.33
12.Orissa	26.57	40.58	32.94	24.15	37.68	30.30	50.72	78.26	63.24
13.Punjab	64.29	11.19	38.32	46.43	41.04	43.80	110.72	52.23	82.12
14.Rajasthan	72.60	43.48	58.33	36.30	69.94	52.78	108.90	113.42	111.11
15.Uttar Pradesh	81.26	60.11	70.86	53.55	61.07	57.25	134.81	121.18	128.11
16.West Bengal	34.60	30.58	32.63	39.79	25.18	32.63	74.39	55.76	65.26
17.All-India	53.08	35.40	44.56	35.65	35.07	35.37	88.73	70.47	79.93

*

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CHART I
CUMULATIVE PERCENT OF INFANT DEATHS BY AGE & SEX IN THE DIFFERENT STATES FOR 1969 (RURAL)



1. ANDHRA PRADESH 2. ASSAM 3. GUJRAT 4. HARYANA 5. JAMMU & KASHMIR 6. KERALA
 7. MAHARASHTRA 8. MYSORE 9. PUNJAB 10. RAJASTHAN 11. TAMILNADU 12. UTTAR PRADESH