A REPORT ON NEO NATAL AND POST NEO NATAL MORTALITY IN MATLAB VACCINE TRIAL AREA IN BANGLADESH

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Introduction

This report is an attempt to estimate the differentials of neonatal and post-neonatal mortality in a rural area of Bangladesh. The major objective of this study is to look at the demographic and socio-economic differentials of neonatal and post-neonatal mortality of Bangladesh in some detail.

The literature on neonatal and post-neonatal mortality reveals that the main causes of neonatal deaths in developed countries are immaturity, congenital defects and birth injuries, and for post-neonatal deaths, infection is the main cause. For developing countries, the list of major causes of neonatal deaths includes the neonatal infection and, for post-neonatal deaths, it includes malnutrition as well as infections. It is also documented in developed countries that 'biological factors' such as mother's age, parity, etc., are more related to neonatal mortality than 'social factors' such as father's occupation, social class, life style for family, etc., while the reverse is true for post-neonatal mortality. However, the experience of developed countries which have gone through the demographic transition may not hold true for developing countries today. With respect to age, both neonatal and post-neonatal deaths occur most frequently when the mother is very young, gradually fall to a minimum at ages 25-30 years, and rise again slowly and then more rapidly as the mother approaches the end of childbearing age. With respect to birth order, the lowest neonatal and post-neonatal mortality rates are observed for the second birth and the rates do not change significantly up to the fifth, after which they rise sharply. Infants born after short intervals have a higher risk of death than those born after long intervals. Also, the previous child mortality experience of mothers has a great impact on the neonatal and post-neonatal mortality of their subsequent births.

Many studies have shown that social and economic characteristics are important in determining levels of infant

mortality. A United Nations study indicates that many different measures of social and economic development can be used to demonstrate contrasts between the high and low infant mortality countries.

Infant mortality differentials based on individual data are generally available by social class (measured in terms of occupation of the father) or income groups. Such findings usually show that infant mortality decreases with an increase in social class or income. For example, since 1911 British data have shown an inverse relationship between social class and infant mortality. A similar relationship has also been noticed in parts of the United States for limited time periods. However, it is not known whether social class has an identical relationship with neonatal as well as post-neonatal mortality.

Up to now, studies of infant mortality, even in the developed countries, have not included variables other than demographic or occasionally as SES variable; they have been primarily descriptive. It is expected that this study, where a cohort of 20,000 births were registered in a rural area of Bangladesh and followed for one year and then matched with mother and the family, suggest additional avenues of research about the relative influence of various demographic and social factors on neonatal and post-neonatal mortality. As assessment of the magnitude of neonatal and post-neonatal mortality will provide a better indication of the state of development in the area of maternal and child health and the relationships between socio-demographic variables and infant deaths will help to identify the high risk segment of the population. This information will help in making inferences concerning the target population of future health programs of Bangladesh.

Methods

a) Analysis plans

The neonatal mortality is divided into two parts - one, early neonatal mortality where the main causes are expected to be related to the biological factors of the mother, and second, late neonatal mortality where one of the main causes is neonatal infection which is likely to be related to social factors in addition to biological factors. The post-neonatal mortality is generally caused by infections and malnutrition

which are most likely related to social factors. As the causes of infant deaths are not ascertained in this population and the analysis by cause of death is not possible, the breakdown of infant deaths by age may reflect distinct patterns when their differentials are studied. The measure of early neonatal mortality used here is q1 which is the probability of dying in the first week of life (0 to 6 days). The late neonatal mortality, q2, is the probability of dying between the 7th day of life and the 28th day of life, provided the infant survives the 6th day. The q3, which is the measure of post-neonatal mortality, is the probability of dying between the 29th day of life and the 364th day of life, conditioned that the infant survives the 28th day. As this is a cohort study, the value of q1, q2, and q3 is calculated in the following manner.

Let n be the number of births and n1, n2, and n3 the number of deaths occurring in the early neonatal, late neonatal and post-neonatal period respectively, among these births, then

$$q1 = \frac{n1}{n}, \quad q2 = \frac{n2}{n-n1}, \quad q3 = \frac{n3}{n-n1-n2}$$

The q1, q2, and q3 are to be estimated for the study population as a whole and for various subgroups of the population. In Bangladesh, there are no separate estimates of q1, q2, and q3. The only estimates so far available are for the infant mortality rate. The infant mortality rate 'IMR' = $\frac{n1 + n2 + n3}{n} = 1-\Pi\,(1-qi)$ where $\Pi i\,(1-qi)$ is the probability of surviving of a child in early neonatal, late neonatal and post-neonatal period.

Field

The census was taken in March and April of 1966 by four teams, each consisting of two trained field workers. The workers went from house to house collecting the basic information from each family on a simple form. For this study, a family was defined as a hearth unit, i.e. a group which eats together. There were commonly several patrilineally-related families living around a single courtyard in a bari

(generally a cluster of houses).

Families were identified by the name of the family head and the location. The family members were listed by name, age and sex. Efforts were made to obtain reasonably accurate ages by beginning with the age of the youngest child in the family and then asking the ages of the older children and of the parents and other members. The census workers made an effort to correct any obvious discrepancies in the ages reported by the informants. No effort was made, however, to verify the reported ages by such means as dating of historical events.

At the completion of this census, census books were made up in triplicate from the family census sheets arranged in geographical order. Every individual was assigned the village census number and an individual serial number within the village. One copy of the census book was returned to the field worker who used it to issue individual family census cards to every family. At this time any discrepancies which were noted by the field workers were reported to the central office and corrected.

Surveillance for births and deaths is maintained by several levels of workers. A local female resident of each village visits each household daily and inquires about births and deaths. A male field assistant supervises from 3 to 5 of these lady field workers. These men, with the equivalent of a high school education (matriculates), visit each family an average of once weekly and register all births, deaths, and migrations on standard forms. Supervision of this phase of the work is maintained by Sanitary Inspectors who visit each household approximately twice a month to check on the completeness of birth and death registration. In turn, these workers are supervised by the Field Surveillance Supervisor and his deputy who are responsible for the coordination of the field work. After the completion of four years registration of births, deaths, and migrations, another Census was taken in June-July 1970 in the same population where socio-economic information was collected for every family and individuals who were not available in the 1966 Census.

Quality of Data

Because of the intensive and regular house-to-house surveillance and close supervision of the field staff, the data on events that can be directly verified, such as births, deaths, and migration, are highly reliable. However, based on memory, the data on age, pregnancy history, etc. are subject to error. No attempt is made to smooth the data.

Results

There were a total of 19,534 births which occurred between May 1966 to April 1970, as seen in Table 1; among them, 2,329 deaths occurred in the first year of life and scattered over the period May 1966 to April 1971. Among them 1,934 infant deaths could be matched with their birth reports. Seventeen percent failure of matching may be due to wrong record of identification number, coding and punching errors, both in birth registration reports and in death registration reports. When classified by age at death, the percent matched in early neonatal deaths is 91 percent; it comes down to 83 percent for the late neonatal deaths, and 77 percent for post-neonatal deaths.

Two estimates of the probability of dying in early neonatal, late neonatal, and post-neonatal period and first year of life are calculated, first taking all cases, and then only matched cases, as given in Table 2. Taking all cases, infant mortality rate of the Matlab area was found to be 119 per 1000 births. The probabilities of dying in the early neonatal period, the late neonatal period and the post-neonatal period was found to be .039, .036, and .050, respectively.

Just over 60 percent of the infant deaths occurred in the neonatal period (combined early neonatal and late neonatal). This seemed to be different from the expected pattern. It has frequently been stated that in countries where the infant mortality rate is below 50, between one-half and two-thirds of infant deaths occur during the first month of life, whereas in countries where the rate exceeds 100 the proportion is around 35%. In the developing countries... deaths are spaced more evenly over the entire first year of life with only 20% or so occurring in the first month. Environmental and

infectious causes loom larger than congenital or birth related factors and gastric and respiratory ailments account for about two-thirds of all infant deaths. The present results suggest that the general proposition that 'moderate' or 'low' proportions of neonatal deaths characterize the total infant mortality rate in a 'less developed area', should be re-examined. This does not rule out the possibility, however, that the present findings may reflect an atypical distribution of neonatal and post-neonatal deaths for a high-infant mortality area.

The rate estimated here may not be true for the whole of Bangladesh because of 1) low geographical coverage, 2) a blanket protection from the diarrheal disease by the Cholera Laboratory, 3) the cholera vaccine program and its intensive surveillance may have an impact on the health consciousness of the people of the area.

The matched cases will only be used when looking at the differentials in early neonatal, late neonatal, and post-neonatal deaths. Since this will give an under-estimate, multiplying factors (all cases/matched cases), 1.10, 1.22, and 1.32 (Table 2), may be used for q1, q2, and q3, respectively, to get the actual estimate, assuming that unmatched cases are randomly distributed within each period of infancy. However, in this report q's are not corrected for unmatched cases.

Here the probability of dying in the early neonatal period, late neonatal period and post-neonatal period is termed as q1, q2, and q3 and these symbols are used throughout the rest of the paper instead of writing out the respective full phrases. The infant mortality rate is termed as IMR.

Age and Parity of Mother

Since the demographic variables age and parity are strongly correlated, it is better to look at the independent effect of each of the two variables.

In Table 3, q1, q2, and q3 are calculated by age of mother and parity. In zero parity there are only two age groups large enough to calculate the probabilities. One is up to 19 and the other 20-24. Values of q1, q2, and q3 in these two groups are almost equal (.054,.054), (.035, .036) and

(.046, .046). In parity 1-2, 3-4, 5-6 and 7+, q's seem to have no distinct pattern by age. Thus, when parity is controlled, it may be concluded that age has little effect on the qs, otherwise IMR by age reflects fallacial U-shaped pattern. When looking at the parities controlling for age, the IMR has either U-shaped or truncated U-shaped pattern in every age group.

Parity and Living Children

Parity and living children together tells the child mortality experienced by mother. Table 4 gives the estimates of q1, q2, and q3 by parity and number of living children. All the qis and the IMR are lower for women who have a higher number of surviving children, throughout all parity groups. Thus, women with parity 7+ with 7+ living children have smaller qs in earlier parities and are selected as successful child-bearers. If the group 'all the children living' is considered (in zero parity no question of living child), it is found that parity has no effect on q1 and q2. However, q3 in parity 7+, with all children living, have higher value than other parities with all children living. In 'all children living' group, only very large families put some pressure of infant health only in post-neonatal period. It appears low child mortality experiences in combination with high parity does reduce q1, q2 and q3.

Sex of the Birth

Table 5 gives the estimates of q1, and q2, and q3 by sex of the child and parity. q1 and q2 are always higher for males than females. The value q3 is lower for males than females in all parities except parity 7+. It can also be observed that the magnitude of excess mortality of females in post-neonatal period over males decreases as parity increases. This may indicate that in parents having large families, extra care for male children is minimized.

Age Difference Between Father and Mother

In the rural society of Bangladesh the husband's age is almost invariably higher than the wife's age, with husbands being on the average 10 years older than their wives. The

estimates of q1, q2 and q3 are given in Table 6 by age differences of the parents, controlling parity. The pattern of q1 by age difference of the parents showed an interesting pattern. The q1 is lower when the age difference between parents is lower (10 years or less) as compared to when difference in ages is higher (11 years and above).

This is true for all the parities, with the overall value of q1 for lower age differences being .031 and for higher age difference is .037. The maximum differences in q1 are reflected in the two extreme parity groups. The q2 showed no distinct pattern when looked at by age difference between father and mother. Values of q3, except in zero parity also showed little difference by age difference of parents. In zero parity q3 for the lower age difference of parents is .057 and for higher age difference is .031. The possible explanation for the differentials in q1 may be biological or social; however it needs further investigation.

Birth Interval

Birth interval is defined as time (in months) elapsed from one live birth to another live birth of a mother irrespective of an intervening fetal loss, if any. As mentioned before, during the period 1966-1970 as many as 19,534 births were considered. For mothers who had two or more live births during this time period, birth intervals were calculated by subtracting date of birth of the earlier one from the later one. The maximum birth interval will be 48 months because of the time limitation of the study. Altogether 5,002 birth intervals could be calculated among 19,534 births.

The birth intervals are classified into two groups, one short (26 month or less), another long (27 months and over). Table 7 gives the values of mortality rates for the second birth by birth interval and parity of mother. Overall q1, q2, and q3 are higher for shorter birth intervals. This is most striking for q3 which in every parity group shows a rate for the short interval that is double that of the higher birth interval group. For q1 and q2 the differences between short and long birth intervals are smaller than that of q3. It would appear that the pressure of a short birth interval is very high in post-neonatal period.

Socio-economic Variables

In any society the infant mortality under existing levels of social and economic development, including public health and medical facilities, may vary between different social and economic strata. These variations may be reflections of differentials in the parents' understanding and practice in child care. However, in a society where physical and social environment is relatively homogenous, with access to medical and health facilities limited and practically nil, one may ask, do socio-economic differences that exist within this society affect the infant mortality ? This will be examined here by relating different SES variables to early neonatal, late neonatal and post-neonatal mortality.

Religion, occupation and education of father, tillable land possessed by family will be considered for analysis. It has been seen previously that parity is the most important characteristic of those examined which affects neonatal and post-neonatal mortality, and the distribution of parity by SES may differ from one group to another group; consequently all the remaining analysis is done here by controlling parity.

Religion

There are two religions in this population, Muslim and Hindu. Muslims constitute over 80 percent of the population. Table 8 gives the values of q1, q2, and q3 by religion controlled for parity. The values of q1 among Hindus are higher than in Muslims. This is true for all parity groups. The difference is small in low parities and increases rapidly with high parity. The difference between Muslims and Hindus in respect to value of q2 is not consistent. Again, in all the parities except parity group 1-2, the values of q3 are much higher in Hindus than in Muslims. IMR reflected the same pattern as observed for q1. A possible explanation may be in the differences between cultural patterns of child delivery in the two religions. For example, when a Hindu pregnant woman feels the labor pain, a separate lying-in-room for the expectant mother is prepared. This may be a separate shed near the main room or in the corner of the veranda. The mother and baby will stay isolated there for 20 days. No one but a few female relatives can visit the mother during this

period. Among the Muslims, delivery generally occurs in the main room and everybody can take care of the baby and the mother.

Education of Father

Education of the father is grouped into three categories; those who have no formal education; those who had only one to six years of schooling, and those who had 7 years or more of schooling. Table 9 gives the estimates of q1, q2, and q3 by the education level of the father and parity. Except in the 7+ parity groups, the IMR for all other parities is slightly higher in the lower education groups than in the higher education groups.

Looking at the values of q1, q2, and q3, no distinct pattern is observed except in the group 7+ parity where values of q1, q2 and q3 of highest education group are higher than the lower education group. This raises,among others, the question whether the births in this group (parity 7+) occurring to the families where the father has the highest education, are undesirable and little care is provided for them. This needs further investigation and is beyond the scope of this report. Overall (all parities together) the values of q1, q2 and q3, differ little when looked at by the education of the father.

Occupation of Father

Table 10 presents the estimate of q1, q2, and q3 by occupation and parity. Overall, IMR, q1, q2, and q3 are the same in the farmer as in farm labor. This pattern is largely retained when the rates are further analysed by parity except in zero parity group. In zero parity group, the farmer has higher values of q1, and q2 than the farm labor group - .062 vs. .035 and .047 vs. .026; however, the value of q3 in the farmer group is half that of the farm labor group - .027 vs. .057.

Land Possessed

Land possessed is defined as how much land the family has from which it gets yields. The unit used here is an acre.

The five categories are 1) no land, 1) .01-.49; 3) .50-.99; 4) 1.00-1.99 and 5) 2.00 +.

Table 11 presents the estimates of q1, q2, and q3 by parity and land possessed by the family. Overall, q1, q2, q3 and IMR is higher in .50-.99 group when looked at by parity. In zero parity the same group has highest values for q1, q3, and IMR. In 1-6 parity groups there exists no distinct patterns of q1, q2 or q3 by land possessed. Again, in parity 7+ the group .50-.99 have maximum value of q1, q2, q3 and IMR. This is one of the unexpected patterns of infant mortality found in this population which needs more investigation.

SUMMARY AND CONCLUSIONS

Summary

The proportion of neonatal deaths to post-neonatal deaths population is found unexpectedly higher than what is believed to be true for developing countries. It is also observed that when controlled for parity, age showed no effect on either neonatal or post-neonatal deaths, while parity showed a distinct U-shaped pattern for early neonatal deaths as well as post-neonatal deaths. Child mortality experience of women is directly related to the neonatal and post-neonatal deaths of their subsequent births.

Male births have a higher risk of death in the neonatal period, while the female births have a higher risk of death in the post-neonatal period. The higher the difference between age of parents, the higher the risk of their child dying in the neonatal period.

The shorter the birth interval, the higher the infant deaths, especially post-neonatal deaths. If the previous birth dies in infancy, both neonatal and post-neonatal deaths occur to the next birth with almost double probability compared to cases where the preceding child survives at least one year.

Neonatal and post-neonatal mortality is higher with Hindus than with Muslims. This may be because of the difference

in cultural patterns with regard to child care and delivery systems between these two religions. When the population is homogenous with respect to health facilities and physical as well as social environment, the socio-economic status, such as education, occupation, and land holding have little effect on neonatal and post-neonatal mortality.

Conclusions

This is a unique study of its kind for a developing country where the analysis is done by matching deaths with births and births with mothers and families from registration and census data.

The estimate of infant mortality rate of 119 per 1000 live births should be cautiously used as a national estimate because of its limited geographical coverage and impact of the Cholera Research Program in that area.

When infant deaths are broken down into early neonatal, late neonatal, and post-neonatal deaths, a more distinct individual pattern is shown when their differentials are studied, explaining more about some of the possible causal factors.

Variations of the three types of infant mortality is found quite large between different sub-groups of population, and it needs a careful planning of child care to attain an accelerated reduction in mortality of infants. As a tentative suggestion in allocating scarce resources for infant care, attention should probably first be concentrated (1) on first born baby, (2) on births where mother already experienced high child mortality. Moreover, birth interval should be increased. Female children should be given care equal to that given to the male child in the post neonatal period. The cultural prescribed pattern of practices relating to the child delivery among Hindus should be studied with the view to attempting to reduce infant mortality by adjustments.

Unless such measures are taken, any family planning program which deals with the group of women with higher parity and higher number of living children-groups where it

is found that risk of dying in any period of infancy is lower-may tend to raise the overall infant mortality of the population.

Where environment is homogenous, medical facilities are extremely limited, studies of differences of mortality of infants with respect to socio-economic status should focus on child-care related practices and beliefs prevailing in various segments of the society in addition to customary analysis of socio-economic indicators such as education, occupation and income.

Table 1

Distribution of Matched and All Death Cases by Different Period of Infancy of Cholera Research Laboratory Data

Age at death	No. of Cases	No. of Cases Matched	Percent Matched
0- 6 days	760	691	90.9
7-28 days	667	550	82.5
29-364 days	902	693	76.8
All infant	2,329	1,934	83.0

1. Number of births having valid and unique identification = 19,534.
2. Number of infant deaths having valid and unique identification = 2,329.
3. Number of infant deaths can be matched with their births = 1,934.

Table 2

Estimate of Probability of Dying in Early, Late, and Post-neonatal Period of All and Matched Cases

	Probability of Dying				
	Early Neonatal 0-6 days	Late Neonatal 7-28 days	Post-neonatal 29-364 days	Infant Mortality Rate	No. of Births
	q_1	q_2	q_3	IMR	n
All cases	.03891	.03554	.04983	.11926	19534
Matched cases only	.03537	.02919	.03788	.09901	19534
(All cases)* / (Matched cases)	1.10	1.22	1.32	1.20	

* Multiplying factor.

Table 3

Probability of Dying in Early Neonatal, Late Neonatal and Post-neonatal Period by Parity and Age of the Mother

Parity	Age	Probability of Dying: Early Neonatal 0-6 days	Late Neonatal 7-28 days	Post neonatal 29-364 days	Infant Mortality Rate	No. of Births
		q_1	q_2	q_3	IMR	n
0	-19	.05356	.03479	.04626	.12875	2,035
	20-24	.05364	.03644	.04603	.13027	522
	25-29	*	*	*	(.1250)	(80)
	30-34	*	*	*	*	(19)
	35+	*	*	*	*	(7)
1-2	-19	.03338	.02855	.03829	.09692	1,558
	20-24	.03277	.02675	.02381	.08106	2,899
	25-29	.03350	.02685	.03563	.09297	925
	30-34	*	*	*	(.1217)	(174)
	35+	*	*	*	*	(63)
3-4	-19	*	*	*	(.0692)	(130)
	20-24	.02949	.02521	.02984	.08218	1,594
	25-29	.02724	.02945	.03433	.08830	2,129
	30-34	.02370	.02731	.03120	.08000	675
	35+	*	*	*	(.1117)	(170)
5-6	-19	*	*	*	*	(13)
	20-24	.03837	.04433	.02872	.10791	417
	25-29	.02925	.02180	.04128	.08960	1,607
	30-34	.02285	.03327	.03255	.08612	1,138
	35+	.04228	.02649	.03401	.09947	473
7+	-19	-	-	-	-	-
	20-24	*	*	*	(.18085)	(94)
	25-29	.04902	.02062	.05790	.12255	612
	30-34	.03044	.03049	.04625	.10348	1,150
	35+	.04817	.03441	.05870	.13487	1,038

Table 4

Probability of dying in early neo-natal, late neo-natal and post neo-natal period by parity and living children

Parity	Living Children	Probability of Dying: Early Neo-natal 0-6 days	Late Neo-natal 7-28 days	Post-Neonatal 29-364 days	Infant Mortality Rate	Number of Births
		q_1	q_2	q_3	IMR	n
0	0	.05368	.03570	.04648	.12988	2,664
1-2	0	.04718	.03834	.04983	.12938	657
	1-2	.03124	.02663	.02800	.08343	4962
3-4	0	*	*	*	(.16279)	(43)
	1-2	.3309	.02958	.03885	.09815	1783
	3-4	.02507	.02396	.02856	.07625	2872
5-6	0	*	*	*	*	(19)
	1-2	.04298	.03892	.04984	.12607	349
	3-4	.02788	.02820	.03552	.08885	2116
	5-6	.02981	.02722	.03339	.08773	1174
7+	0	-	-	-	-	-
	1-2	*	*	*	(.22989)	(87)
	3-4	.04920	.04056	.07289	.15433	752
	5-6	.03980	.02562	.04795	.10926	1382
	7+	.02972	.02450	.04396	.09510	673

Table 5

Probability of Dying in Early Neonatal, Late Neonatal and Post-neonatal Period by Parity of Mother and Sex of Child

Parity of Mother	Sex of Child	Probability of Dying: Early Neonatal 0-6 days	Late Neonatal 7-28 days	Post-neonatal 29-364 days	Infant Mortality Rate	No. of Births
		q_1	q_2	q_3	IMR	n
0	M	.06232	.03864	.03939	.13406	1,380
	F	.04453	.03271	.05410	.12578	1,280
1-2	M	.03837	.03235	.02563	.09333	2,893
	F	.02752	.02340	.03555	.08404	2,725
3-4	M	.02902	.03378	.03272	.09352	2,378
	F	.02720	.01953	.03350	.07815	2,316
5-6	M	.03171	.02993	.03376	.09340	1,829
	F	.02922	.02782	.03855	.09361	1,814
7+	M	.05078	.03352	.06199	.13947	1,477
	F	.03114	.02703	.04805	.10262	1,413

Sex ratio at birth = 104

Table 6

Probability of Dying in Early Neonatal, Late Neonatal and Post-neonatal Period by Parity and Age Difference of Parents

Parity	Difference of Age Between Father & Mother	Probability of Dying: Early Neonatal 0-6 days q_1	Late Neonatal 7-28 days q_2	Post-neonatal 29-364 days q_3	Infant Mortality Rate IMR	No. of Births n
0	10 yrs. or less	.04561	.03676	.05725	.13333	855
	11 yrs. & over	.06799	.03915	.03148	.13267	603
1-2	10 yrs. or less	.03085	.02753	.02742	.08336	2,399
	11 yrs. & above	.03277	.03146	.30610	.091867	1,709
3-4	10 yrs. or less	.02467	.02891	.02764	.079053	1,986
	11 yrs. & above	.02861	.02331	.02952	.095352	1,678
5-6	10 yrs. or less	.02876	.02961	.03691	.92308	1,495
	11 yrs. & above	.03262	.02891	.02764	.08655	1,502
7+	10 yrs. or less	.03685	.02500	.05388	.11225	1,167
	11 yrs. & above	.04627	.02916	.05960	.12906	1,232
All Parities	10 yrs. or less	.03138	.02900	.03633	.09365	7,902
	11 yrs. & above	.03748	.02917	.03516	.09840	6,697

Table 7

Probability of Dying in Early Neonatal, Late Neonatal and Post-neonatal Period by Parity and Birth Interval

Parity	Birth Interval	Probability of Dying: Early Neonatal 0-6 days q_1	Late Neonatal 7-28 days q_2	Post-neonatal 29-364 days q_3	Infant Mortality Rate IMR	No. of Births n
1-2	26 months or less	.03956	.03475	.03067	.10136	809
	27 months & above	.03269	.02753	.01544	.07385	826
3-4	26 months or less	.03298	.04806	.04072	.11694	667
	27 months & above	.03606	.02446	.01917	.07767	721
5-6	26 months or less	.04024	.03983	.03493	.11066	497
	27 months & above	.02967	.04676	.01698	.09075	573
7+	26 months or less	.04357	.04121	.06109	.14000	482
	27 months & above	.03704	.03125	.03226	.09732	432
All	26 months or less	.03870	.04068	.04019	.11487	2,455
	27 months & above	.03370	.03163	.01968	.08268	2,551

PROCEEDINGS OF THE 9TH MEETING OF THE SCIENTIFIC REVIEW AND TECHNICAL ADVISORY COMMITTEE OF THE CHOLERA RESEARCH LABORATORY

(a)

and

REPORTS OF THE COLLABORATIVE STUDIES BETWEEN CENTER FOR MEDICAL RESEARCH AND CHOLERA RESEARCH LABORATORY

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