

S
T
U
D
I
E
S

No. 15-08

Child Survival
in Gujarat

Aalok Ranjan

'Shyam' Institute

This page is intentionally left blank

CHILD SURVIVAL
IN
GUJARAT

INTRODUCTION

Children, along with women, constitute the most vulnerable group of the population. Children are particularly vulnerable to the deprivation of their basic needs that secure their survival, contribute to their growth and development and ensure their protection. Children are not full social and economic agents and hence they cannot secure resources necessary for their survival, growth and development until they reach a certain age. Similarly, children have no or very limited freedom to make decisions related to their own welfare and benefit. Within the household, they are dependent upon elder members of the household including their parents in meeting out their basic needs. Moreover, for the fulfilment of their basic needs they have to rely to a significant extent upon the production of goods and services by public authorities, especially in areas of education and health. These and many other dependencies of children get manifested typically in the poor social and economic settings. Poverty, at the early stages of life, has enduring consequences on those who survive into adulthood. It condemns them to recurrent poverty spells and a life full of hardship and misery.

Another reason behind increased attention to the well-being of children is the United Nations Convention on the Rights of the Child which lays down principles of non-discrimination in the best interests of the child along with common standards for various rights of children. It takes into account different cultural, social, economic and political realities in which children live. (United Nations, 1989). By ratifying the Convention in 1992, India has committed herself to protecting and advancing children's rights; to developing and undertaking all actions and policies in the light of the best interests of children; and to hold herself accountable for this commitment before the international community. Children rights include right to survival, right to development, right to protection and right to participation.

The above considerations constitute the background for the present report which focusses on an analysis of the current status of child survival in Gujarat, one of the states of India. Child survival is the first and the most important domain of child well-being as articulated in the United Nations Convention on the Rights of the Child as well as in the National Policy for Children 2013 (Government of India, 2013). The available

evidence suggests that child survival situation in Gujarat is only marginally better than the child survival situation at the national level and there is ample scope for improving child survival probability in the state.

The analysis is based on the data available from different sources including the Sample Registration System (SRS) and the Rapid Survey of Children (RSoC) 2013-14. The Sample Registration System is the national system of producing annual estimates of key demographic indicators including indicators related to child mortality for India as a whole and for its selected states. The Rapid Survey of Children 2013-14, on the other hand was commissioned by the Government of India, Ministry of Women and Child Development with support from the United Nations Children Fund (UNICEF) across 29 states of the country towards strengthening the data system on children and women (Government of India, 2015). The key objective of RSoC 2013-14 was to assess the situation of children and women in the country and in its constituent states with special emphasis on access and utilisation of services under the Integrated Child Development Services (ICDS) Scheme.

The present report is divided into four sections including this introduction. The next section of the report analyses child survival situation in Gujarat in terms of the probability of survival. The third section analyses coverage of child survival services in the state as revealed through RSoC 2013-14 while the last section puts forward a set of recommendations for accelerated improvement in child survival in the State.

CHILD SURVIVAL IN GUJARAT

Child survival is traditionally measured in terms of infant and under-five mortality rates including neonatal mortality. The infant mortality rate reflects the probability of death or, equivalently, probability of survival in the first year of life. Similarly, the under-five mortality rate reflects the survival experience of children aged below five years. These indicators, however, provide no information about the survival experience of children aged at least five years and, therefore, are incomplete measures for any analysis and discussion of child survival. A child, according to both National Policy for children 2013 and United Nations Convention for the Rights of the Child, is a person - female or male - who

has not yet reached her of his eighteenth birthday. Obviously, any analysis of child survival should cover the entire childhood period - from birth to less than 18 years of age.

The abridged life tables prepared by the Registrar General and Census Commissioner of India on the basis of age-specific death rates estimated from the data available through SRS provide an opportunity to analyse the survival experience of the children of Gujarat and compare the experience of the state with other states of the country. These life tables are available separately by residence and gender which also permit analysing gender and residence inequality in child survival. These life tables, however, provide the probability of death or the probability of survival for the conventional quinquennials age groups 0, 1-4, 5-9, 10-14, 15-19, etc. and not for the childhood period. As such, the abridged life tables based on SRS have been expanded into un-abridged or single-year life tables through the application of UNABR schedule of the MORTPAK software package (United Nations, 2013) to obtain single-year probability of death or probability of survival. These single-year probabilities of death or probabilities of survival have been used in the present report to analyse the survival experience of children in Gujarat.

The latest abridged life tables available through SRS refer to the period 2009-2013 or around the year 2011. Based on these life tables, the probability of survival of a new born up to 18 years of age in Gujarat and India is given in table 1 by residence and by gender. The table suggests that the survival experience of children in Gujarat is very similar to the survival experience of children in the country as a whole, although there are some subtle differences. In Gujarat, out of every 1000 new born, 933 are expected to survive to their 18 birth day on the basis of the current mortality experience prevailing in the state. In India, on the other hand, this number is 932 which shows that there little difference in the survival experience of children in Gujarat as compared to India.

Across different states of India for which abridged life tables are available through SRS, Gujarat ranks quite low in terms of survival up to age 18 years. There are 11 states - Andhra Pradesh, Bihar, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra Punjab, Tamil Nadu and West Bengal - where child survival experience is better than that in Gujarat. This leaves only five states - Assam, Madhya

Pradesh, Odisha, Rajasthan and Uttar Pradesh - where the child survival experience is poorer than that in Gujarat (Figure 1).

The distribution of childhood deaths by age in Gujarat is also very similar to that in India as may be seen from Figure 2. Very close to 70 per cent of the childhood deaths in Gujarat are confined to the first year of life; another 17 per cent occur in the 1-5 years of life while remaining 14 per cent deaths occur in 5-18 years of life. By comparison, more than 80 per cent of the childhood deaths in Andhra Pradesh occur in the first year of life while only 5 per cent deaths occur in 1-5 years of life. The remaining 14 per cent childhood deaths in the state occur in 5-18 years of life.

Around 73 per cent of the total infant deaths in Gujarat are confined to the neonatal period. This proportion is fourth highest in the country next to Punjab, Jammu & Kashmir and Himachal Pradesh and higher than the national average of 70 per cent. By contrast, in Kerala, only 58 per cent of the infant deaths are confined to the neonatal period. This proportion is only 55 per cent in Assam. Assam and Kerala are the only two states in the country where less than 60 per cent of the infant deaths are confined to the neonatal period according to the estimates available through SRS.

Table 1 also reveals gender and rural-urban difference in child survival probability in the state. The gender difference in child survival probability is however not large and most of the difference appears to have confined to the first three years of life as may be seen from the Kaplan-Meier curves presented in figure 4. After the third year of life the gender difference in the survival probability in the state appears to have remained unchanged throughout the remaining childhood period.

Unlike gender difference in the child survival probability, rural-urban difference in the child survival probability in the state is quite substantial. The child survival probability in the urban areas of the state is found to be substantially higher than the child survival probability in the rural areas of the state throughout the childhood period (Figure 5). Moreover, the rural-urban difference in the survival probability appears to increase with age so that the difference is the widest at the end of the childhood period, although the increase in the difference is not very substantial.

Table 1 also reveals that the male child survival probability is always higher than the female child survival probability during the childhood period in the state and in its rural and urban areas. Out of every 1000 male new born, 65 are expected to die during the childhood period. This number is 70 for female new born. Table 1 also informs that the gender difference in child survival probability in the rural areas of the state is almost marginal but very marked in the urban areas of the state where out of every 1000 male new born only 40 are expected to die during the childhood period but this number is 50 for female new born. Similarly, rural-urban difference in the male child survival probability during the childhood period is wider than the rural-urban difference in the female child survival probability. The reason appears to be the observation that the female child survival probability in the urban areas of the state is relatively quite low.

Recent estimates of the probability of survival during the childhood period by social class are not available. Similarly, recent estimates of the probability of survival during the childhood period are also not available for the districts of the state. Gujarat is one of those states of India where registration of deaths under the Birth and Death Registration Act is almost complete. However, there has never been any attempt to estimate child survival probability from the civil registration data to generate estimates of the probability of survival during the childhood period at state and district level.

District level estimates of the probability of survival during the first year of life and during the first five years of life are derived from the 2001 population census data using the indirect methods of demographic estimation (Rajan et al, 2008). These estimates indicate that the probability of survival during the first five years of life varies widely across the districts of the state. These estimates also suggest that gender and rural-urban difference in child survival probability is quite pervasive in the state.

DETERMINANTS OF CHILD SURVIVAL

A child death is a complex process. It is the ultimate consequence of a cumulative series of biological insults (Mosley and Chen, 1984). Determinants or factors influencing of child survival can broadly be categorised into two groups: 1) social, economic and cultural factors; and

2) medical factors. Mosley and Chen (1984) have developed a conceptual framework of child survival by combining the two set of factors. This framework argues that all social, economic and cultural factors of child survival operate through a limited set of proximate determinants that directly influence risk of disease and outcome of disease processes. They identified 14 proximate determinants of child mortality grouped into five categories (Table 2). The list of proximate determinants of child mortality or, equivalently, child survival is intended to be exhaustive. It is argued that child health or child mortality will change if, and only if, one of the determinants will change. The framework developed by Mosley and Chen (1984) can not only assess the overall health impact of alternative development strategies, but also more sharply define which among a number of specific factors amenable to change by health policymakers are of greatest consequence for child survival.

The Mosley and Chen conceptual model of child survival can be used to analyse the determinants of child mortality in Gujarat by following at least two types of statistical modelling strategies. The first statistical modelling strategy may explore the link between social, economic and cultural factors and proximate determinants of child survival. The second strategy, on the other hand, involves modelling the probability of child survival or the probability of child death with both social, economic and cultural variables and proximate determinants of child mortality. Both approaches of analysing the determinants of child survival have their own strengths and weaknesses (Hill, 2003). The first statistical modelling strategy can provide useful insights for health sector professionals about how to improve the health care delivery system to promote and sustain child survival, but provides no direct indication of the potential gain in terms of the improvement in child survival probability or reduction in child mortality. The second statistical modelling strategy can provide important indication of the proximate pathways through which social, economic and cultural variables operate to influence child survival, but may be affected by the bias resulting from the variables omitted from the model, since it is difficult to measure proximate determinants exhaustively. Moreover, since the proximate determinants of child survival, by definition, explain all the variation in the child survival probability, the influence of all background variables - social, economic, cultural - are bound to be not significantly different from zero at least theoretically (Bollen et al, 2001).

In practice, however, this may not be the case because either the proximate determinants are not measured exhaustively or are not measured accurately. In any case, the remaining effect of any social, economic or cultural variable is hard to interpret once the proximate determinants are controlled in the statistical model.

Another problem with analysing the determinants of child survival is that proximate determinants of child mortality are different in different ages of the childhood period. Some idea about the difference in the proximate determinants of child survival or child mortality can be made by analysing the main causes of death during different sub-periods of the childhood period. Unfortunately such data are not available in the state. However, data pertaining to the causes of death are not available for Gujarat. At the national level, data about causes death are made available by the Registrar General and Census Commissioner of India. These data relate to deaths reported under the sample registration system and the cause of death is ascertained through the application of verbal autopsy method. At the state level, these data are available in two groups - EAG states and Assam and for all other states. Gujarat is included in the second group.

The three main causes of death during first year of life; during 1-5 years of life; and during 5-15 years of life in other group of states which includes Gujarat also are given in table along with the proportion of total deaths attributed to the cause. The main cause of death during infancy is prematurity and low birth weight which along accounts for almost 35 per cent of the total deaths during the first year of life. The second most important cause of death in this age group is pneumonia while the third main cause of death is birth asphyxia and birth trauma. In children aged 1-5 years, on the other hand, the main cause of death is unintentional injuries followed by pneumonia. Unintentional injuries are also the most important cause of death in children aged 5-15 years.

However, data related to the causes of death during the childhood period are not available for Gujarat. Three main causes of death in the three sub-periods of the childhood period are given in table 3 along with the proportion of total child death attributed to the cause of death. It is very much evident from the table that priorities of survival during different ages of the childhood period are essentially different. During infancy, the

main factor influencing the survival probability is prematurity and low birth weight. Both these factors are essentially related to the health and nutritional status of women. However, in children aged at least one year, major factor influencing the child survival probability is pneumonia and diarrhoea. Obviously, the strategy adopted for promoting child survival during the first year of life is going to be different from the strategy for promoting survival beyond the first year of life.

A major challenge to modelling the determinants of child survival is the availability of the necessary data on social, economic and cultural variables and data related to proximate determinants of child survival as identified in table 2. In India, there is no system to regularly collect data related to proximate determinants of child survival and to analyse how different proximate determinants are influenced by a host of social, economic and cultural variables.

The Rapid Survey of Children (RSoC) commissioned by the Government of India, Ministry of Women and Child Development during 2013-14 with technical and financial support from UNICEF provides estimates of selected social, economic and cultural variables and proximate determinants of child survival for India and for constituent states that can be used to explore determinants of child survival on the basis of inter-state variation in the child survival probability and inter-state variation in a selected set of indicators that has an impact on child survival probability. Based on the data available through RSoC 2013-14, the explanatory variables selected for analysing the determinants of child survival are given in table 4. On the other hand, the dependent variables used in the analysis included:

1. Probability of survival during the first year of life - PS(0-1)
2. Probability of survival during 1-4 years of life - PS(1-5)
3. Probability of survival during first five years of life - PS(0-5)
4. Probability of survival during 5-9 years of life - PS(5-10)
5. Probability of survival during 10-14 years of life - PS(10-15)
6. Probability of survival during 15-17 years of life - PS(15-18)
7. Probability of survival during the childhood period - PS(0-18)

Results of the modelling exercise are presented in table 5. For the purpose of modelling, the logit transformation of survival probabilities has

been used as the dependent variable. The ordinary least square regression procedure with forward stepwise method of entering the explanatory variables in the model was used for modelling.

Results of the analysis are presented in table 5. When the entire childhood period (0-18 years) is taken into consideration, the probability of survival is found to be statistically significantly associated with: 1) proportion of children aged 0-59 years not low height for age (NSTU); 2) proportion of women who received full antenatal care during their last pregnancy (FANC); and 3) proportion of households not defecating in the open (NODF). Inter-state variation in these three variables is found to be accounting for more than two-third of the inter-state variation in the probability of survival of a new born through the childhood period (0-18 years). Moreover, the direction of the regression coefficients has also been found to be in the expected direction. Table 5 suggests that reducing the prevalence of stunting among children, improving full antenatal care of pregnant women along with the elimination of the practice of open defecation can contribute significantly towards improving the probability of survival of a new born through the childhood period. This means that a three dimensional approach is required to improve child survival in Gujarat. The first dimension of this approach should focus on addressing under nutrition among children with particular emphasis on reducing the prevalence of stunting. The second dimension should focus on women with particular emphasis on comprehensive care of women during the period of pregnancy. Finally, the third dimension of improving child survival should focus the household with particular emphasis on preventing open defecation. The three dimensions of child survival revealed through the present analysis are related to three categories of the proximate determinates of child survival presented in table 2. Care during the antenatal period reflects the role of maternal factors in child survival. Similarly, the practice of open defecation reflects the effect of environmental contamination while the prevalence of stunting reflects the importance of nutrition in promoting child survival in contemporary social, economic and cultural settings. The role of the other two categories of proximate determinants could not be ascertained simply because indicators reflecting these categories of proximate determinants are not available through RSoC 2013-14 and, therefore, could not be incorporated in the statistical modelling exercise attempted here.

Table 5 also identifies main determinants of survival probability during the first year PS(0-1) of life; during 1-4 years of life PS(1-5); during the first five years PS(0-5) of life; during 5-9 years PS(5-10) of life; during 10-14 years PS(10-15) of life and during 15-17 years PS(15-18) of life. During the first five years of life, during the first five years of life and during 10-14 years of life, the statistically significant determinants of the probability of survival are the same as the statistically significant main determinants of the probability of survival during the entire childhood PS(0-18) period. However, main determinants of survival during 1-4 years of life are: 1) prevalence of stunting; and 2) proportion of children aged 12-23 months of age fully immunised. The prevalence of stunting is also statistically significant factor in influencing the survival probability during 5-9 years of life along with the practice of open defecation. On the other hand, the practice of open defecation is found to be a statistically significant factor in deciding the survival probability in children aged 15-17 years.

Results of the statistical modelling exercise presented in table 5 can be used to discuss the child survival scenario in Gujarat. The child survival probability in the state as obtained on the basis of SRS based life tables and as predicated on the basis of the statistical model described above are presented in table 6 separately for rural and urban population. For the entire childhood period, the survival probability as obtained through SRS is found to be lower than the survival probability predicted by the statistical model in both rural and urban populations of the state. This implies that at the prevailing level of the full antenatal care to pregnant women, the prevalence of stunting and the practice of open defecation, the child survival probability in the state is lower than that predicted by the statistical model. One reason may be the fact that child survival probability in the state is influenced by factors that have not been included in the statistical model simply because the necessary data are not available from RSoC 2013-14 or from any other source. As discussed earlier, the variables included in the statistical model are limited to three of the five categories of proximate determinants of child survival (Table 2). This observation is also supported by the fact that the statistical model presented in table 5 explains only about 75 per cent of the total variation in the probability of survival during the childhood period. Remaining variation in the child survival probability is may be attributed to those

variables which could not be included in the statistical model because estimates of these variables are not available from RSoC 2013-14 for different states of the country.

Table 6 reveals an interesting pattern of age-specific probability of survival. It may be seen from the table that the observed probability of survival during the first five years of life is less than the probability of survival predicted by the statistical model presented in table 5 in both rural and urban populations. On the other hand, the observed probability of survival in children at least 5 years old is either equal to or greater than the probability of survival predicted by the statistical model. Obviously, there is scope for improving the probability of survival in the first five years of life in the state. It is also obvious from table 5 and table 6 that the state will have to go beyond the traditional approach of focussing on antenatal care, improvement in the nutritional status, especially, stunting and preventing open defecation to accelerate improvements in the probability of survival during the first five years of life. The present analysis recognises the importance of these factors in improving child survival probability. At the same time, the analysis also points out to the effect of other factors that have not been included in the statistical model.

CONCLUSIONS

Main conclusions of the present analysis may be summarised as under:

1. The probability of survival during childhood in Gujarat is almost the same as the probability of survival during childhood in India.
2. With the state, rural-urban difference in childhood survival probability is quite sharp and this difference appears to increase with age.
3. The survival probability of male children during childhood is higher than the survival probability of female children. The gender difference in the child survival probability in the rural areas is only marginal but very substantial in the urban population of the state.
4. Main determinants of the probability of survival during childhood are: a) antenatal care to pregnant women; b) prevalence of stunting; and c) practice of open defecation. These three factors

influence, statistically significantly, the probability of survival in the first year of life which, ultimately, determines the survival probability during the entire childhood period.

5. Immunisation status of children plays a statistically significant role in deciding the probability of survival during 1-4 years of life only. The role of immunisation in influencing survival probability in children aged at least 5 years appears, at best, to be limited.
6. The prevailing probability of survival in the first five years of life in Gujarat is less than the survival probability predicted by the statistical model based on inter-state variation in the survival probability and inter-district variation in full antenatal care to pregnant women, prevalence of stunting and practice of open defecation. This means that there are state specific factors that need to be taken into consideration for charting any strategy for accelerated improvement in the probability of survival during the first five years of life. At present, very little is known about these state specific factors. In any case, an understanding of state specific determinants of child survival appears to be important for accelerating the improvement in child survival probability in the state.
8. The analysis presented here is based primarily on inter-state variation in child survival probability and inter-state variation in selected determinants of child survival. In order to have a better understanding of the determinants of child survival, state-specific analysis needs to be carried out. there is, however, little impetus in this direction.
9. Securing survival of all new born through the childhood requires that every new born is followed throughout the childhood period, a recommendation put forward by India First Health Survey and Development Committee (Government of India, 1946). Gujarat may take the lead in establishing such a system.

References

- Bollen KA, Glanville JL, Stecklov G (2001) Socioeconomic status and class in studies of fertility and health in developing countries. *Annual Review of Sociology* 27:153-85.
- Government of India (1946) Report of the First Health Survey and Development Committee. New Delhi, Director of Publications.
- Government of India (2013) National Policy for Children 2013. New Delhi, Ministry of Women and Child Development.
- Government of India (2015) Rapid Survey of Children 2013-14. New Delhi, Ministry of Women and Child Development.
- Government of India (2015a) Report on Medical Certification of Cause of Death. New Delhi, Registrar General and Census Commissioner.
- Hill K (2003) Frameworks for studying the determinants of child survival. *Bulletin of World Health Organization* 81(2):138-139
- Mosley WH, Chen LC (1984) An analytic framework for the study of child survival in developing countries. *Population and Development Review* 10:25-45.
- Rajan SI, Nair PM, Sheela KL, Jagatdeb L, Mishra NR (2008) Infant and Child Mortality in India: District Level Estimates. New Delhi, Population Foundation of India.
- United nations (1989) United Nations Convention for the Rights of the Child. New York, United Nations.
- United Nations (2013) MORTPAK for Windows. Version 4.3. New York, United Nations.

Table 1
The probability of survival of a new born up to 18 years of age in
Gujarat and India, 2011

| Residence | Gender | Probability of survival up to 18 years of age in | |
|-----------|--------|---|-------|
| | | Gujarat | India |
| Combined | All | 0.933 | 0.932 |
| | Male | 0.935 | 0.935 |
| | Female | 0.930 | 0.928 |
| Rural | All | 0.920 | 0.924 |
| | Male | 0.921 | 0.928 |
| | Female | 0.920 | 0.920 |
| Urban | All | 0.955 | 0.957 |
| | Male | 0.960 | 0.959 |
| | Female | 0.940 | 0.956 |

Source: Author calculations

Table 2
Proximate determinants of child survival

| Categories | Factors |
|--------------------------------|--|
| 1. Maternal factors | 1. Age 2. Parity 3. Birth interval |
| 2. Environmental contamination | 4. Air 5. Food/water/fingers 6. Skin/soil/inanimate objects 7. Insects, vectors |
| 3. Nutrition | 8. Calories 9. Proteins 10. Micronutrients |
| 4. Injury | 11. Accidental 12. Intentional |
| 5. Personal illness control | 13. Personal preventive measures 14. Medical treatment |

Source: Mosley and Chen (1984)

Table 3
Three main causes of death in children

| | | Age | | | |
|-------------------------------------|------|--|------|--|------|
| < 1 year | | 1-5 years | | 5-15 years | |
| 1. Prematurity and low birth weight | 34.7 | 1. Unintentional injuries other than motor accidents | 20.5 | 1. Unintentional injuries | 20.2 |
| 2. Pneumonia | 14.5 | 2. Pneumonia | 16.5 | 2. Other infectious and parasitic diseases | 10.5 |
| 3. Birth asphyxia and birth trauma | 11.8 | 3. Diarrhoeal diseases | | 3. Diarrhoeal diseases | 8.6 |

Source: Government of India (2015a)

Table 4

Explanatory variables used in analysing determinants of child survival

| | | |
|----|------|--|
| 1 | FANC | Proportion of women who received full antenatal care during their last pregnancy |
| 2 | NBCU | Proportion of new born who received first check-up within 24 hours of delivery/discharge from hospital |
| 3 | NLBW | Proportion of new born having birth weight at least 2.5 Kg |
| 4 | CFIM | Proportion of children 12-23 months of age fully immunised |
| 5 | BFOH | Proportion of new born initiated breastfeeding within one hour of birth |
| 6 | NSTU | Proportion of children 0-59 months of age not low height for age |
| 7 | NWST | Proportion of children 0-59 months of age not low weight for height |
| 8 | APSE | Proportion of children aged 3-6 years attending pre-school education |
| 9 | GNEM | Proportion of girls 10-19 years of age not ever-married |
| 10 | NODF | Proportion of households not defecating in the open |

Table 5
Effect of selected explanatory variables on the probability of survival during childhood and during different sub-periods of the childhood period

| Explanatory variables | B | | t | p | R ² |
|-----------------------------|--------|-------|--------|-------|----------------|
| Dependent variable PS(0-1) | | | | | |
| NSTU | 1.564 | 0.259 | 1.631 | 0.113 | 0.674 |
| FANC | 1.672 | 0.440 | 3.345 | 0.002 | |
| NODF | 0.544 | 0.307 | 2.370 | 0.024 | |
| Constant | 1.542 | | 3.147 | 0.004 | |
| Dependent variable PS(1-5) | | | | | |
| NSTU | 6.095 | 0.583 | 4.043 | 0.000 | 0.667 |
| CFIM | 2.343 | 0.302 | 2.088 | 0.045 | |
| Constant | -0.489 | | -0.706 | 0.486 | |
| Dependent variable PS(0-5) | | | | | |
| NSTU | 2.208 | 0.338 | 2.311 | 0.028 | 0.724 |
| FANC | 1.652 | 0.402 | 3.315 | 0.002 | |
| NODF | 0.562 | 0.292 | 2.455 | 0.020 | |
| Constant | 0.934 | | 1.913 | 0.065 | |
| Dependent variable PS(5-10) | | | | | |
| NSTU | 4.412 | 0.590 | 5.288 | 0.000 | 0.756 |
| NODF | 0.826 | 0.376 | 3.367 | 0.000 | |
| Constant | 2.445 | | 5.307 | 0.002 | |

| Explanatory variables | B | | t | p | R ² |
|------------------------------|--------|--------|--------|-------|----------------|
| Dependent variable PS(10-15) | | | | | |
| NODF | 0.432 | 0.259 | 1.770 | 0.087 | 0.680 |
| FANC | 1.659 | 0.466 | 3.013 | 0.005 | |
| BFOH | -0.997 | -0.386 | -2.740 | 0.010 | |
| NSTU | 2.138 | 0.378 | 2.318 | 0.028 | |
| Constant | 6.829 | | 9.331 | 0.000 | |
| Dependent variable PS(15-18) | | | | | |
| NODF | 0.828 | 0.657 | 4.936 | 0.000 | 0.415 |
| Constant | 5.365 | | 43.975 | 0.000 | |
| Dependent variable PS(0-18) | | | | | |
| NSTU | 2.116 | 0.339 | 2.410 | 0.022 | 0.746 |
| FANC | 1.507 | 0.383 | 3.292 | 0.003 | |
| NODF | 0.600 | 0.326 | 2.854 | 0.008 | |
| Constant | 0.811 | | 1.807 | 0.081 | |

Source: Author calculations

Table 6
Actual and predicted probabilities of child survival in Gujarat

| Survival probability during | Rural | | Urban | |
|--------------------------------|----------|-----------|----------|-----------|
| | Observed | Predicted | Observed | Predicted |
| 0-18 years | 0.920 | 0.926 | 0.955 | 0.961 |
| 0-1 year | 0.945 | 0.951 | 0.970 | 0.973 |
| 1-4 years | 0.986 | 0.984 | 0.992 | 0.992 |
| 0-5 years | 0.932 | 0.938 | 0.962 | 0.968 |
| 5-10 years | 0.995 | 0.994 | 0.998 | 0.997 |
| 10-15 years | 0.996 | 0.996 | 0.998 | 0.998 |
| 15-18 years | 0.997 | 0.997 | 0.998 | 0.998 |

Source: Author calculations

Figure 1
Probability of survival up to 18 years of age in states

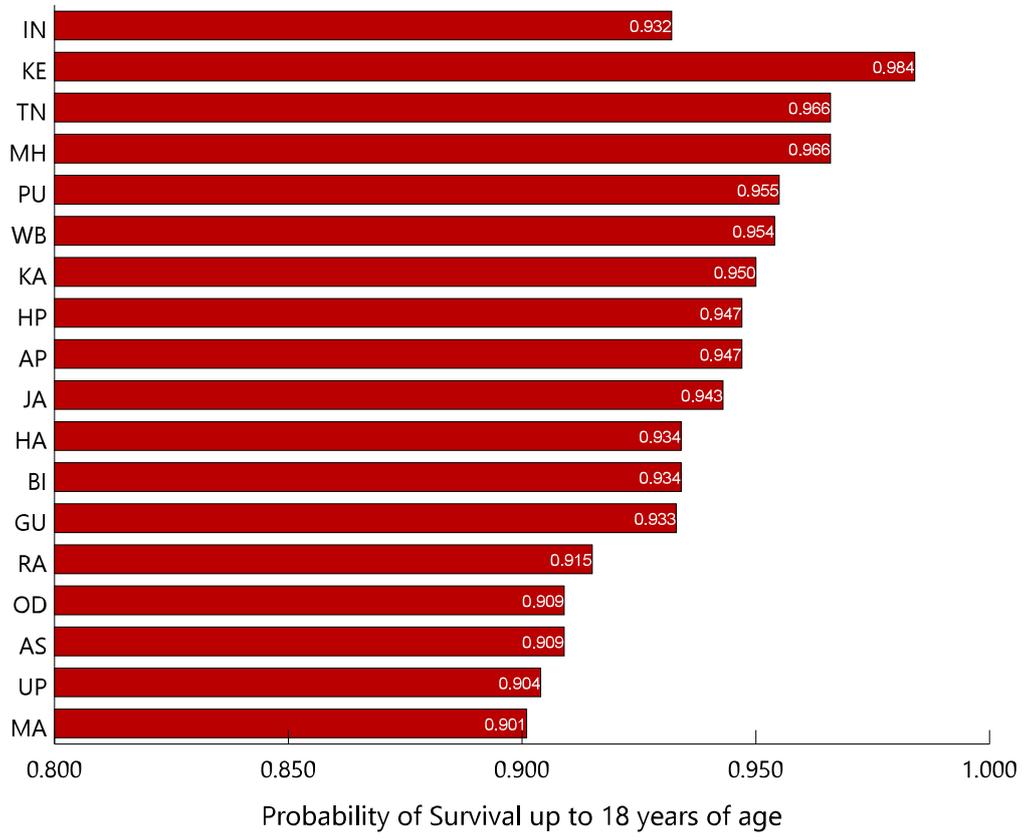


Figure 2
Probability of survival up to 18 years of age in states

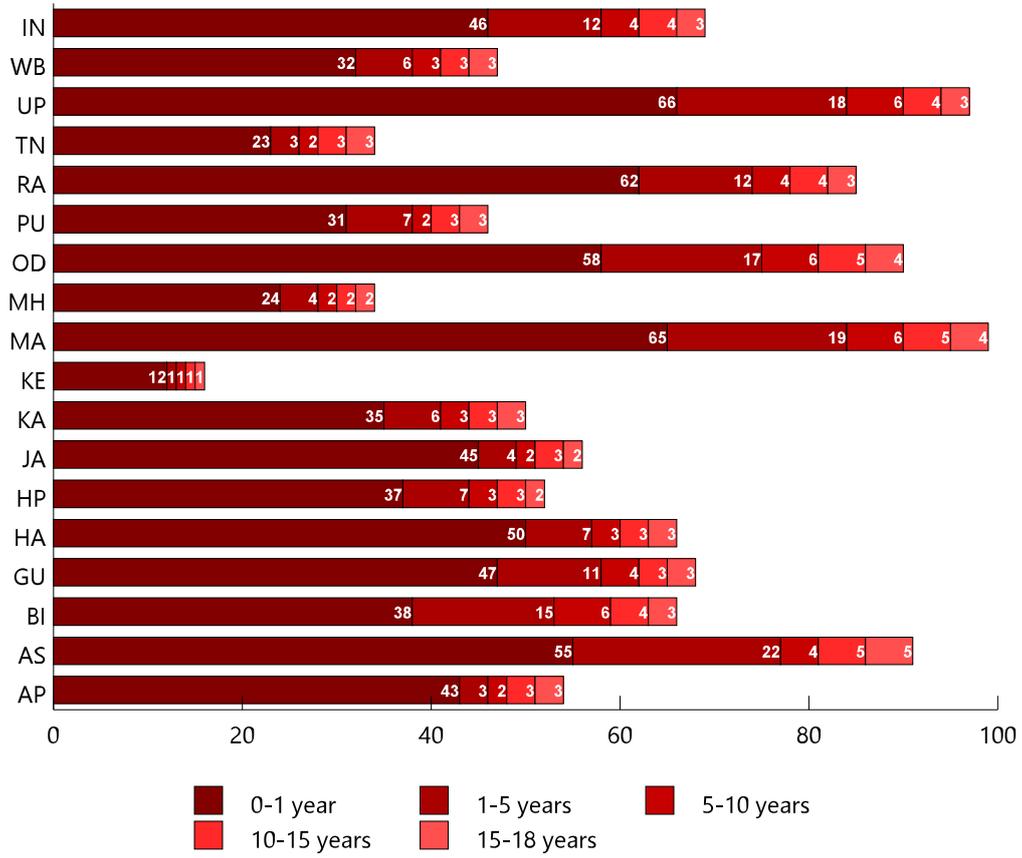


Figure 3
Distribution of infant deaths in India and states

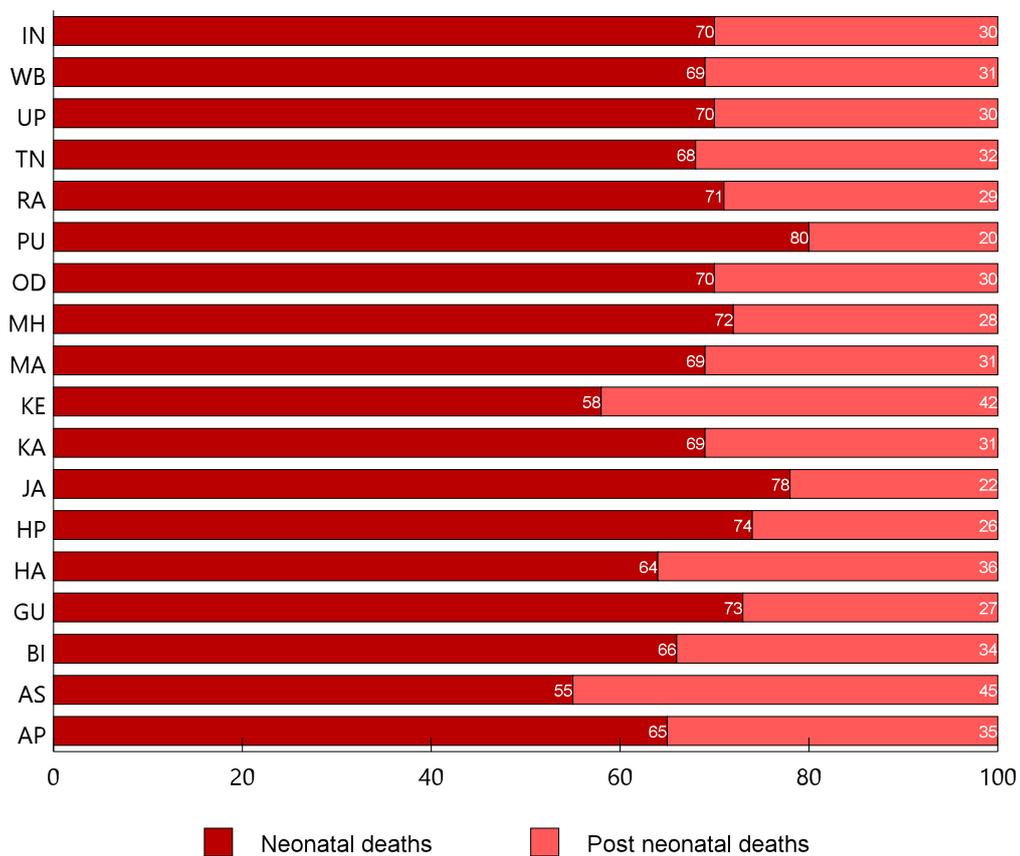


Figure 4
Gender difference in child survival probability in Gujarat

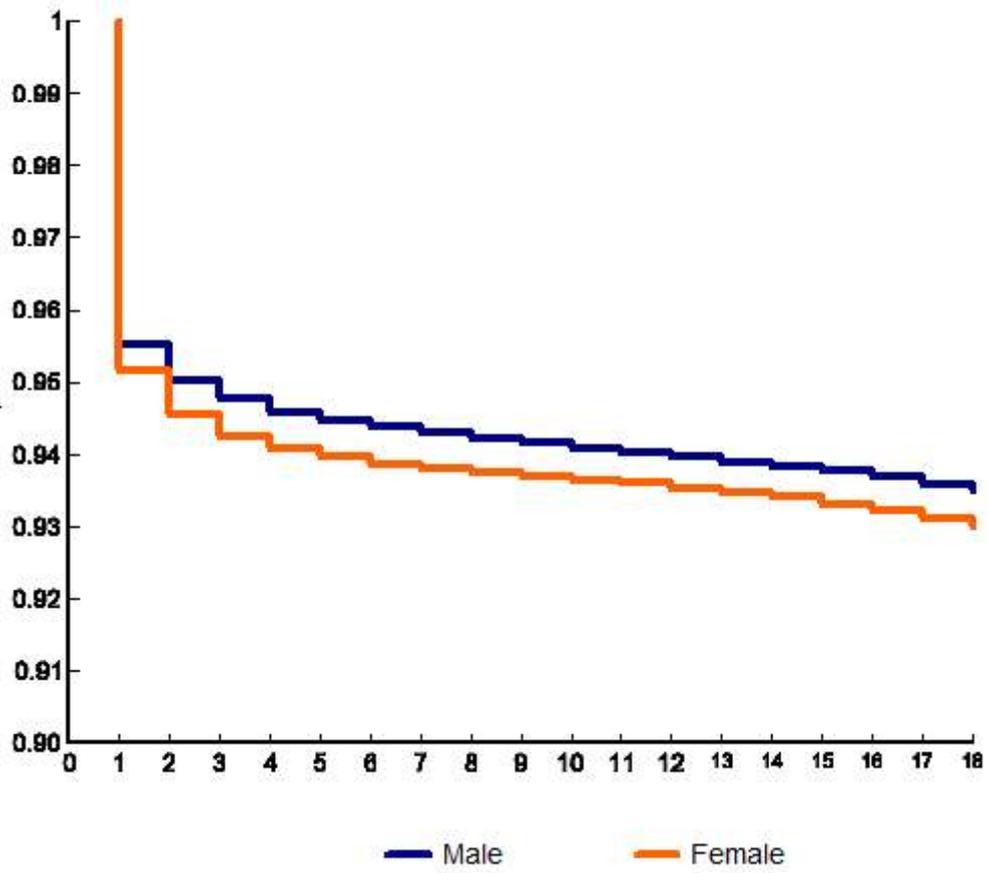


Figure 5
Rural-Urban difference in child survival probability in Gujarat

