

GENDER DISPARITY IN HEALTH STATUS IN INDIA- AN INTER STATE ANALYSIS

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Health is an important human right. Health deprivation has serious consequences for any section of society, more so for females. Government policies are focusing on improving health status of women and meeting their special requirements of reproductive and maternal health care. Despite concerted efforts in this direction, it is a fact that there is gender disparity in various indicators of health. Worst form of gender disparity is reflected in what is commonly called 'Missing Women'. In general the gender disparity in health care is manifested in high IMR, high death rate of female children in 0-5 age group, adverse sex ratio especially child sex ratio, high Maternal Mortality Rate and high Adolescent Fertility Rate. This paper attempts to measure gender disparity in health status by developing composite indices for states and India as a whole at various points of time. Gender Health Disparity Index (GHDI) has been constructed at four points of time i.e. 1981 to 2011 census years respectively. GHDI is based on four indicators of health i.e. sex ratio, child sex ratio, infant mortality rate and under five mortality rates of males and females. The Gender Inequality Index(Health) has been developed by adapting the methodology of GII in UNDP Human Development Report, 2010 and 2011 report. In addition to four indicators used in GHDI, the GII(Health) includes two more indicators of women health, i.e. Maternal Mortality Rate and Adolescent Fertility Rate. Due to lack of interstate comparable data, Gender Inequality Index GII (Health) has been constructed only for the census years 2001 and 2011.

Keywords: Health, Gender inequality, IMR, MMR, Sex Ratio, Child Sex Ratio.

INTRODUCTION

Health of a human being depends upon a large number of inter-related factors like economic conditions, social beliefs, cultural factors etc. Besides, health is also determined by inter-generational factors i.e. genes. Apart from these, environmental factors also have a strong bearing on human health (Ahmad, 2010). While discussing seven faces of gender disparity Amartya Sen (2001) also highlighted the inequality affecting women health such as natality inequality and mortality inequality. Klasen and Wink (2003) point out that the female children are in worse conditions in rural areas specially the later born girls and the condition is worse for second girl child where first child is also a girl in family. Female children are always neglected, whether it is healthcare, hospitalization or even feeding. They further point out that 88 million women are 'missing' in China, India, Pakistan, Bangladesh and West Asia in comparison to Amartya Sen's (1990 and 1992) estimates of over 100 million 'missing women' in Asia. As per World Development Report (2012) number of 'missing women' are estimated to be over two million annually. Thus health empowerment of women is required for economic productivity and development.

Health of woman in India is associated to the status of women in society (Velkoff and Adlakha, 1998). In 1946, the broad health policy document was prepared in India. This was Bhore Committee Report, which prepared a detailed plan of a National Health Service for the country (Duggal, 2001). The basic framework suggested by Bhore committee for primary health care, continues till date as the focal point of public health delivery. Further Mudaliar committee was set up in 1959 to assess

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the field of public health and disease control in the country. Expert committees such as Chaddha committee in 1963, Mukherjee committee in 1965, Jain committee in 1966, KartarSingh committee in 1970 and Shrivatsava committee in 1974 helped in development of public health system in India with their recommendations.

“The Alma Ata declaration” in 1978 led to the formation of first National Health Policy in 1983. Since then the strategy for health care development shifted from committees to policy based approach. There were basically three indicators namely demographical, epidemiological and infrastructural included under this policy. Improvement in the public health was broadly associated with the improvement in these indicators over the period of time. Since the 1983 health policy, many initiatives have been taken by Govt. of India including 73rd and 74th Constitutional Amendments devolving power to local institutions in 1992, the National Nutrition Policy in 1993, the National Policy on Indian System of Medicine and Homeopathy in 2002, introduction of simple health insurance schemes for the poor in 2003 and the inclusion of health in the Common Minimum Programme of Government in 2004. Government of India has implemented National Rural Health Mission (NRHM) in 2005 and put forward proposals to achieve universal health coverage (UHC) across the country in Twelfth Five Year Plan recommendations (GOI, 2011).

Second National Health Policy was introduced in 2002. As empowered women help in improving the overall health standard of the country, the National Health Policy-2002 aimed at facilitating and increasing access of women to basic health care and to meet the specific requirements of women in a more comprehensive manner. The policy commits the highest priority of the Central Government to the funding of the identified programmes relating to woman’s health. Also, the policy recognizes the need to review the staffing norms of the public health administration. Further, in the draft paper of National Health policy, 2015 the primary aim of the policy is to inform, clarify, strengthen and prioritise the role of the Government in shaping health systems in all its dimensions particularly reproductive, maternal, child and adolescent health through minimising all types of disparities (gender disparity or caste disparity) in health care access (MOHFW, 2014). Moreover, Health related targets set by the government of India in Twelfth Five Year Plan should positively emphasise on curbing violence, gender discrimination and under-nutrition of girls and women. In order to promote women’s health participation the government policies must be re-strategized to draw men into taking part in women’s health seeking behaviour (GOI, 2011).

DATABASE AND METHODOLOGY

The objective of this paper is to measure gender disparity in various indicators of women health and in the matters of life and survival in different states of India and changes therein during the period 1981 to 2011. The present study is based on secondary data. The data have been collected from various official and semi-official published reports as given below.

1. Sex Ratio- Primary Census Abstract (PCA), Ministry of Home Affairs, Office of the Registrar General, India.
2. Child Sex Ratio- Census of India, 2001 series- I, India: Primary Census Abstract: Table-A, Census of India, 1991; Series I-India, Part IV A-C series; Socio-Cultural Tables, vol.-I and Census of India, 1981, Series I-India, Part IV A-C series; Socio-Cultural Tables, (tables C-I to C-6)
3. AFR, IMR and U5MR- Sample Registration System (SRS) Bulletin, Registrar General of India, Ministry of Home Affairs, Govt. of India.

4. 1981 and 1991 data of IMR from Compendium of India's Fertility and Mortality Indicators 1971-97, Registrar General of India: 1999.
5. U5MR- Data for 2001 not available in SRS Statistical Report 2001. So in order to fill their gap, NFHS-3, 2005-06 State level reports has been compiled.
6. MMR-Mortality in India 2001-03: Trend, Causes and Risk Factors-2006, MMR 2010-12: A Presentation on Maternal Mortality Levels, December 2013, Office of the Registrar General of India.

According to the availability of data, the study has covered the period from 1981 onwards with some variations. Gender Health Disparity Index (GHDI) has been constructed at four points of time i.e. 1981 to 2011 census years respectively. Due to lack of interstate comparable data, Gender Inequality Index GII (Health) on health has been constructed only at two points of time.

Measures of Gender Disparity in Health

In order to calculate gender disparity in health two indices are used.

1. Gender Health Disparity Index (GHDI)
2. Gender Inequality Index (GII Health)

Gender Health Disparity Index (GHDI) is a ratio method based on four major health indicators. The variables included in Gender Health Disparity Index:

1. Infant mortality rate (IMR),
2. Under five year mortality rate (U5MR),
3. Sex ratio and
4. Child sex ratio.

In case of sex ratio and child sex ratio, GHDI stands for male to female ratio (females per 1000 males) while in case of other variables i.e., infant mortality rate and under five mortality rates, this index has been calculated as female to male ratio. Ratios are calculated to highlight female disadvantage where ever present. Higher the ratio, higher is female disadvantage or male advantage. The values of all these ratios are summed up and their average give the GHDI values for each state, which are then ranked in the descending order to know the relative position of each state in health status. Index has been calculated only for those states where all the indicators are available.

Gender Inequality Index - Health

Gender Inequality Index (GII Health) is used to measure the inequality in achievements between women and men in India. The GII Health compares the situation of the women with respect to men in terms of health in the country. In order to see the trends, the GII was calculated at two points of times i.e. 2001 and 2011. The Gender Inequality Index has been developed by adapting the methodology of GII in UNDP Human Development Report, 2010 and 2011 report. Methodology is same but we have calculated Gender Inequality Index (GII Health) for health by taking following variables:

1. The variables included in Gender inequality index (GII Health):
2. Maternal mortality rate (MMR),
3. Adolescent fertility rate (AFR),

4. Infant mortality rate (IMR),
5. Under five year mortality rate (U5MR),
6. Sex ratio and
7. Child sex ratio.

Method of Constructing Index

The index is being constructed in five steps :

Step 1: Constructing Indices

At the first stage aggregated indices of sex ratio, child sex ratio, maternal mortality rate, adolescent fertility rate, infant mortality rate and under five mortality rate was constructed for males and females separately. These were calculated by using the following formula:

$$\text{a) Sex Ratio Index (SR)} = \sqrt{\frac{SR}{1000} \times \frac{CSR}{1000}}$$

Where, SR is sex ratio and CSR indicates the child sex ratio.

$$\text{b) Reproductive Health Index (RPD)} = \sqrt{\frac{10}{MMR} \times \frac{1}{AFR}}$$

Where, MMR is maternal mortality rate, AFR is adolescent fertility rate.

$$\text{c) Infant Mortality Rate Index for Female (IMRF)} = \sqrt{\frac{1}{IMRF} \times \frac{1}{U5MRF}}$$

$$\text{d) Infant Mortality Rate Index for Male (IMRM)} = \sqrt{\frac{1}{IMRM} \times \frac{1}{U5MRM}}$$

Where, IMRF is infant mortality rate for female, IMRM is infant mortality rate for male, U5MRF is under five year mortality rate for female, U5MRM under five year mortality rate for male.

Step 2: Calculating the Geometric Mean of the Arithmetic Means for Each Indicator

At the second stage, gender equality was measured by calculating the mean of female and male indices calculated above. The detail is given below:

$$\text{Gender Equality in Sex Ratio (SRE)} = \frac{SR + 1}{2}$$

$$\text{Gender Equality in Reproductive Health (RPDE)} = \frac{RPD + 1}{2}$$

$$\text{Gender Equality in Infant Mortality Rate (IMRE)} = \frac{IMRF + IMRM}{2}$$

Male index is treated as unity where the value of male is not given. An aggregated gender index was constructed keeping in view the above indicators by using **geometric mean** and the formula given below:

$$\text{Geometric Mean } (GF, \bar{M}) = \sqrt[3]{SRE \times RPDE \times IMRE}$$

Step 3: Aggregating across dimensions within each gender group, using geometric means

On the basis of the gender wise indices calculating at step 1, aggregated indices across the various dimensions within each gender group were calculated by using geometric means, the aggregation formula of the overall index for women is:

$$GF = \sqrt[3]{SR \times RPD \times IMRF}$$

And, the aggregation formula of the overall index for men is:

$$GM = \sqrt[3]{1 \times 1 \times IMRM}$$

Step 4: Aggregating across genders, using a harmonic mean

The female and male indices are then aggregated using the harmonic mean to create the equally distributed gender inequality index by using following formula:

$$\text{HARM}(GF, GM) = \frac{(GF)^{-1} + (GM)^{-1}}{2}$$

Step 5: Calculating Gender Inequality Index (GII)

Finally, the Gender Inequality Index has been constructed by using the following equation:

$$\text{GII}_{\text{Health}} = 1 - \frac{\text{HARM}(GF, GM)}{GF, \bar{M}}$$

Where, GF, \bar{M} is mean gender equality index and HARM (GF, GM) is the gender inequality index calculated in the above analysis.

RESULT AND ANALYSIS

a) Gender Health Disparity Index (GHDI)

At national level, in relative terms GHDI has increased which indicates that gender gap in health status has increased over time (Table 1). As the index has been ranked in descending order at four points of time, the lowest GHDI has been found in Kerala (0.9202) in 1981 followed by West Bengal (0.9216), Mizoram (0.9430) and Andhra Pradesh (0.9494) showing low level of gender disparity in health status whereas highest GHDI has been calculated in Haryana (1.0959) in the same time period. The states of Uttar Pradesh (1.0929), Arunachal Pradesh (1.0591), Delhi (1.0584), Bihar (1.0584) and Punjab (1.0499) are revealing high level of gender disparity following Haryana. GHDI ranges from 0.9202 to 1.0959 during 1981.

In 1991, Goa (0.8857) has shown lowest GHDI followed by Manipur (0.9323), Himachal Pradesh (0.9619), Orissa (0.9781) and Karnataka (0.9821) whereas Bihar (1.1444) has been found to be the worst performing state in case of gender health status followed by Haryana (1.0978), Delhi (1.0970), Sikkim (1.0931), Rajasthan (1.0913) and Uttar Pradesh (1.0617). GHDI ranges from 0.8857 to 1.1444 during 1991.

Table 1: Gender Health Disparity Indices for States and India

States	1981		1991		2001		2011		% Change in 2011 over 1981	% Change in 2001 over 1981
	GHDI	Rank	GHDI	Rank	GHDI	Rank	GHDI	Rank		
Andhra-Pradesh	0.9494	22	0.9865	17	0.9849	19	1.0960	10	15.44	-
Arunachal-Pradesh	1.0591	3	1.0303	11	0.9587	23	N/A	-	-	-9.48
Assam	N/A	-	N/A	-	1.0939	8	1.0500	20	-	-
Bihar	1.0584	5	1.1444	1	1.1630	2	1.0727	16	1.35	-
Chhattisgarh	N/A	-	N/A	-	1.01981	16	1.1143	7	-	-
Delhi	1.0584	4	1.0970	3	1.0464	15	1.1880	3	12.25	
Goa	1.0221	10	0.8857	22	1.1516	4	N/A	-	-	12.67
Gujarat	1.0295	8	1.0443	8	1.0844	10	1.0989	9	6.74	-
Haryana	1.0959	1	1.0978	2	1.1587	3	1.2005	1	9.55	-
Himachal-Pradesh	0.9507	21	0.9619	20	0.9063	27	1.0888	11	14.53	-
Jammu & Kashmir	1.0114	11	N/A	-	1.0043	18	1.0785	14	6.63	-
Jharkhand	N/A		N/A	-	1.1454	5	1.1771	4	-	-
Karnataka	0.9734	16	0.9821	18	0.9812	21	1.0557	18	8.46	-
Kerala	0.9202	25	0.9917	16	0.8433	28	1.0781	15	17.16	-
Madhya Pradesh	1.0034	12	1.0565	7	1.0803	12	1.0993	8	9.55	-
Maharashtra	0.9771	15	1.0390	9	1.0511	14	1.0719	17	9.69	-
Manipur	1.0222	9	0.9323	21	1.0827	11	N/A	-	-	5.92
Meghalaya	0.9818	13	1.0317	10	0.9314	26	N/A	-	-	-5.14
Mizoram	0.9430	23	N/A	-	0.9666	22	N/A	-	-	2.50
Nagaland	0.9642	18	N/A	-	N/A	-	N/A	-	-	-
Orissa	0.9715	17	0.9781	19	0.9813	20	1.0509	19	8.17	-
Punjab	1.0499	6	1.0123	14	1.2519	1	1.1952	2	13.84	-
Rajasthan	1.0453	7	1.0913	5	1.0926	9	1.1333	5	8.41	-
Sikkim	0.9816	14	1.0931	4	1.0148	17	N/A		-	3.39
Tamil Nadu	0.9627	20	1.0188	12	1.1017	7	1.0825	12	12.44	-
Tripura	0.9628	19	0.9927	15	0.9319	25	N/A	-	-	-3.21
Uttar Pradesh	1.0929	2	1.0617	6	1.1163	6	1.1226	6	2.71	-
Uttarakhand	N/A	-	N/A	-	1.0548	13	N/A	-	-	-
West Bengal	0.9216	24	1.0154	13	0.9451	24	1.0799	13	17.17	-
India	1.01615		1.0586		1.0873		1.0952		7.79	

Source: Author's calculation

N/A- Not available

Higher the value of the index, higher is the disparity.

Refer appendix tables 1-4

In 2001, Kerala (0.8433) has shown the lowest GHDI indicating lowest gender disparity in health. Kerala is followed by the states such as Himachal Pradesh (0.9063), Meghalaya (0.9314), Tripura (0.9319), West Bengal (0.9451) and Arunachal Pradesh (0.9587) indicating low level of gender disparity in health. At the same time period, Punjab has shown highest GHDI. This is probably due to comparatively lower sex ratio and child sex ratio. Punjab (1.2519) is followed by the states like Bihar (1.1630), Haryana (1.1587), Goa (1.1516), Jharkhand (1.1454) and UttarPradesh (1.1163) revealing high level of gender disparity in health. The value of GHDI ranges from 0.8433 to 1.2519 during 2001.

In 2011, data for Under- Five mortality rate (U5MR) was not available for the states of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttarakhand. So GHDI index has been calculated for limited states only. Assam (1.0500) has shown lowest GHDI followed by Orissa (1.0509), Karnataka (1.0557), Maharashtra (1.0719) and Bihar (1.0727). For the same time period, highest GHDI has been found in Haryana (1.2005) followed by Punjab (1.1952), Delhi (1.1880), Jharkhand (1.1771), Rajasthan (1.1333) and UttarPradesh (1.1226). GHDI ranges from 1.0500 to 1.2005. In 2011, none of the state GHDI is less than one, indicating that in each of the state, girls are in a disadvantageous position in terms of health status of males and females.

In India, during the period 1981 to 2011, percentage change in GHDI has been recorded to be 7.79 percent indicating that gender disparity in health has increased during the study period. The states which have shown a considerably high change during the period 2011 over 1981 in term of GHDI are West Bengal, Kerala, Andhra Pradesh, Himachal Pradesh, Punjab and Tamil Nadu whereas Bihar, Uttar Pradesh, Gujarat and Jammu and Kashmir have shown lower growth in comparison to national level. However, the states of Orissa, Rajasthan, Madhya Pradesh, Maharashtra, Karnataka and Haryana have shown moderate growth in gender disparity. As mentioned above, data for under five mortality rate (U5MR) was not available for some states in 2011 so percentage change for those particular states has been calculated for the period 2001 over 1981 which shows that in Goa Manipur, Mizoram and Sikkim gender disparity has increased while it has declined in the Arunachal Pradesh, Delhi, Meghalaya and Tripura during the study period.

b) Gender Inequality Index (GII Health)

The state-wise GII (Health) in terms of women health has been calculated and presented in Table 2. At national level, the GII (Health) declined from 0.4376 to 0.3660 during the year 2001 to 2011. This revealed that the women health with respect to above said parameters has improved during the last decade. In 2001, MadhyaPradesh (0.4859) has shown the highest rank in GII (Health) which indicates the highest gender inequality in health status. Assam (0.4818) is on second position in term of gender inequality in health followed by Rajasthan (0.4757), Bihar (0.4662) and UttarPradesh (0.4590). However, Kerala (0.28823) has shown lowest GII (Health) followed by Punjab (0.33367), Tamil Nadu (0.34985), Gujarat (0.3508) and Maharashtra (0.3763). The value of GII (Health) ranges from 0.2882 to 0.4859.

The GII (Health) for Assam state came to be 0.4352 during the year 2011. This means the gender inequality in terms of women health is highest in this state which is followed by Rajasthan (0.4013), UttarPradesh (0.3937), MadhyaPradesh (0.3036) and Bihar (0.3845). Among all the states, the women inequality is least in Kerala state as the value of GII (Health) is relatively low (0.2563) in this state. The states like Tamil Nadu (0.2773), Punjab (0.2829), Maharashtra (0.3036), Haryana (0.3170) and Gujarat (0.3170) are also showing relatively low level of gender inequality. The GII (Health) for other states during the year 2011 ranges from 0.2563 to 0.4013.

The decadal percentage change of 2011 over 2001 shows that, GII (Health) has significantly declined in all the states. GII (Health) has recorded negative percentage change to the tune of -16.36 in India. The states which have shown decadal percentage change higher than the national level are Andhra Pradesh, Tamil Nadu, Madhya Pradesh, Maharashtra, Haryana and Bihar.

Graphically, Figure (i) representing GII (Health) for different states is lower in the study period 2011 as compared to the 2001. Moreover, the gender inequality with respect to health among women has declined in all the states during the last decade. This has become possible due to the better access of medical facilities especially to the vulnerable section of the society in the last couple of decades.

Table 2: State-wise Gender Inequality Index in Health, India

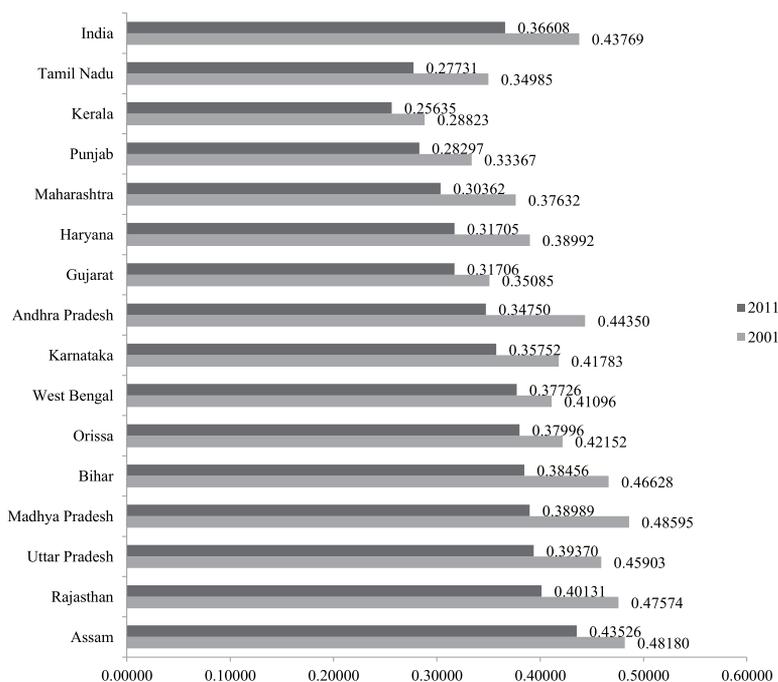
States	2001	Rank	2011	Rank	% change in 2011 over 2001
Assam	0.4818	2	0.4352	1	-9.66
Rajasthan	0.4757	3	0.4013	2	-15.65
UttarPradesh	0.4590	5	0.3937	3	-14.23
MadhyaPradesh	0.4859	1	0.3898	4	-19.77
Bihar	0.4662	4	0.3845	5	-17.53
Orissa	0.4215	7	0.3799	6	-9.86
West Bengal	0.4109	9	0.3772	7	-8.20
Karnataka	0.4178	8	0.3575	8	-14.44
AndhraPradesh	0.4435	6	0.3475	9	-21.65
Gujarat	0.3508	12	0.3170	10	-9.63
Haryana	0.3899	10	0.3170	11	-18.69
Maharashtra	0.3763	11	0.3036	12	-19.32
Punjab	0.3336	14	0.2829	13	-15.20
Tamil Nadu	0.3498	13	0.2773	14	-20.74
Kerala	0.2882	15	0.2563	15	-11.06
India	0.4376	-	0.3660	-	-16.36

Source: Author's calculation

N/A- Not available"

Higher the value of the index, higher is the inequality.

Refer appendix table-1-6

Figure (i): State-wise Gender Inequality Index in Health, India

Source: Author's Calculation

CONCLUSIONS

Gender Health Disparity Index (GHDI), which is based on four important health indicators, has increased during 1981 to 2011 for India as a whole as well as for most of the states. The main contributory factor is deterioration in sex ratio and child sex ratio over time. The rise in GHDI over time is a clear reflection of deep rooted gender bias in Indian society. GHDI has declined over time only in case of north eastern states. In 2011, Assam has lowest GHDI followed by Orissa, Karnataka, Maharashtra and Bihar due to fall in IMR and U5MR (low gender gap in IMR and U5MR) and improvement in sex ratio. For the same time period, highest GHDI has been found in Haryana followed by Punjab, Delhi, Jharkhand, Rajasthan, and Uttar Pradesh due to very low sex ratio and child sex ratio. In 2011, none of the states has GHDI less than one indicating girls' disadvantageous position in terms of health status.

However, Gender Inequality Index (GII Health) has declined in 2011 in comparison with 2001 due to improvement in women health indicators during this period. Trends seem to be different in case of Gender Inequality Index (GII Health) because results relate to more recent period and are based on six indicators of women health, many of which have improved during the period covered. Among all the states, the women inequality is least in Kerala state as the value of GII (Health) is relatively low in this state. The states like Tamil Nadu, Punjab, Maharashtra, Haryana and Gujarat are also showing relatively low level of gender inequality following Kerala. During 2011, GII (Health) for Assam has been found to be highest followed by Rajasthan, Uttar Pradesh, Madhya Pradesh, and Bihar.

Policy Implications

- Low sex ratio and child sex ratio is “silent emergency”. There is an urgent need for stopping supply of the technology, which will reduce the demand – for determining the sex of the foetus and aborting if it is female.
- The programs like Nanhichhaan in Punjab, LadliLuxmiYojana in MadhyaPradesh, Bhagyashree Scheme in Maharashtra. Similar schemes need to be expanded to all over India to increase child sex ratio because female foeticide is the root cause of low child sex ratio.
- Efforts both at Govt. level and community level are required for reducing Maternal Mortality Rate (MMR) and special efforts should be made to provide special health care facilities to older and high parity women and also to the women who are socio-economically disadvantaged. Government needs to expand basic midwifery services and primary health care to thousands of pregnant women
- General economic growth (resulting in higher living standards), improved infrastructure, and greater child immunization coverage are essential in lowering infant and under-five mortality rates in the country. Government can reduce the mortality rates by addressing the combined need for education, nutrition, and access to basic maternal and infant health services. A policy focus has to be made to aid those children who are at extreme risk for infant and childhood mortality especially in rural, poor and migrant populations.
- Basic public health system cannot be neglected rather it must be strengthened. All people cannot afford private health system so public healthcare system should be made cheaper and accessible so that even the weaker section of society can avail the health facilities so as to reduce MMR, IMR and U5MR.
- There is a need to strengthen institutional, legal and regulatory framework and to bring more transparency and efficiency in decision making so that any discrepancies regarding effective implementation of policies for health care of people can be made possible.
- The need of the hour is to educate the weaker sections of the society about the prevailing health facilities of the government so that they can avail benefit of various health programs at the minimal cost.
- Free of cost health insurance should be provided to females and children at least up to the age of five years belonging to BPL (Below Poverty Line) families so that risk of reproductive health and child mortality can be reduced.

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APPENDICES**Appendix -1: State-wise Sex Ratio, India**

States	1981	1991	2001	2011	% Change in 1991 over 1981	% Change in 2001 over 1991	% Change in 2011 over 2001	% Change in 2011 over 1981
Andhra Pradesh	975	972	978	993	-0.31	0.62	1.53	1.85
Arunachal Pradesh	862	859	893	938	-0.35	3.96	5.04	8.82
Assam	N/A	923	935	958	N/A	1.30	2.46	N/A
Bihar	946	911	919	918	-3.70	0.88	-0.11	-2.96
Chhattisgarh	N/A	N/A	989	991	N/A	N/A	0.20	N/A
Delhi	808	827	821	868	2.35	-0.73	5.72	7.43
Goa	981	967	961	973	-1.43	-0.62	1.25	-0.82
Gujarat	942	934	920	919	-0.85	-1.50	-0.11	-2.44
Haryana	870	865	861	879	-0.57	-0.46	2.09	1.03
Himachal Pradesh	973	976	968	972	0.31	-0.82	0.41	-0.10
Jammu & Kashmir	892	N/A	892	889	N/A	N/A	-0.34	-0.34
Jharkhand	N/A	N/A	941	949	N/A	N/A	0.85	N/A
Karnataka	963	960	965	973	-0.31	0.52	0.83	1.04
Kerala	1032	1036	1059	1084	0.39	2.22	2.36	5.04
Madhya Pradesh	941	931	919	931	-1.06	-1.29	1.31	-1.06
Maharashtra	937	934	922	929	-0.32	-1.28	0.76	-0.85
Manipur	971	958	978	992	-1.34	2.09	1.43	2.16
Meghalaya	954	955	972	989	0.10	1.78	1.75	3.67
Mizoram	919	921	935	976	0.22	1.52	4.39	6.20
Nagaland	863	886	900	931	2.67	1.58	3.44	7.88
Orissa	981	971	972	979	-1.02	0.10	0.72	-0.20
Punjab	879	882	876	895	0.34	-0.68	2.17	1.82
Rajasthan	919	910	921	928	-0.98	1.21	0.76	0.98
Sikkim	835	878	875	890	5.15	-0.34	1.71	6.59
Tamil Nadu	977	974	987	996	-0.31	1.33	0.91	1.94
Tripura	946	945	948	960	-0.11	0.32	1.27	1.48
Uttar Pradesh	885	879	898	912	-0.68	2.16	1.56	3.05
Uttarakhand	N/A	N/A	962	963	N/A	N/A	0.10	N/A
West Bengal	911	917	934	950	0.66	1.85	1.71	4.28
India	933	927	933	943	-0.64	0.64	1.07	1.07
CV	5.78	5.07	5.11	4.78	-	-	-	-

Source: India PCA Ministry of Home Affairs, Office of the Registrar General, India

Appendix - 2: State-Wise Sex Ratio of Child Population (Age Group 0-6), India

States	1981	1991	2001	2011	% Change in 1991 over 1981	% Change in 2001 over 1991	% Change in 2011 over 2001	% Change in 2011 over 1981
Andhra Pradesh	992	975	961	943	-1.71	-1.44	-1.87	-4.94
Arunachal Pradesh	997	982	964	960	-1.50	-1.83	-0.41	-3.71
Assam	N/A	975	965	957	N/A	-1.03	-0.83	N/A
Bihar	981	953	942	933	-2.85	-1.15	-0.96	-4.89
Chhattisgarh	N/A	N/A	975	964	N/A	N/A	-1.13	N/A
Delhi	926	915	868	867	-1.19	-5.14	-0.12	-6.37
Goa	965	964	938	920	-0.10	-2.70	-1.92	-4.66
Gujarat	947	928	883	886	-2.01	-4.85	0.34	-6.44
Haryana	902	879	819	830	-2.55	-6.83	1.34	-7.98
Himachal Pradesh	971	951	896	906	-2.06	-5.78	1.12	-6.69
Jammu & Kashmir	964	N/A	941	859	N/A	N/A	-8.71	-10.89
Jharkhand	N/A	N/A	965	943	N/A	N/A	-2.28	N/A
Karnataka	975	960	946	943	-1.54	-1.46	-0.32	-3.28
Kerala	970	958	960	960	-1.24	0.21	0.00	-1.03
Madhya Pradesh	977	941	932	912	-3.68	-0.96	-2.15	-6.65
Maharashtra	956	946	913	883	-1.05	-3.49	-3.29	-7.64
Manipur	986	974	957	934	-1.22	-1.75	-2.40	-5.27
Meghalaya	991	986	973	970	-0.50	-1.32	-0.31	-2.12
Mizoram	986	969	964	972	-1.72	-0.52	0.83	-1.42
Nagaland	988	993	964	944	0.51	-2.92	-2.07	-4.45
Orissa	995	967	953	934	-2.81	-1.45	-1.99	-6.13
Punjab	908	875	798	846	-3.63	-8.80	6.02	-6.83
Rajasthan	954	916	909	883	-3.98	-0.76	-2.86	-7.44
Sikkim	978	965	963	944	-1.33	-0.21	-1.97	-3.48
Tamil Nadu	967	948	942	946	-1.96	-0.63	0.42	-2.17
Tripura	972	967	966	953	-0.51	-0.10	-1.35	-1.95
Uttar Pradesh	935	927	916	899	-0.86	-1.19	-1.86	-3.85
Uttarakhand	N/A	N/A	908	886	N/A	N/A	-2.42	N/A
West Bengal	981	967	960	950	-1.43	-0.72	-1.04	-3.16
India	962	945	927	914	-1.77	-1.90	-1.40	-4.99
CV	2.66	3.11	4.76	4.27	-	-	-	-

Sources: Census of India, 2011, Office of the Registrar General, India.

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Appendix- 3: State-Wise Infant Mortality Rate by Sex, India

States	1981		1991	
	Total		Total	
	Male	Female	Male	Female
Andhra Pradesh	100	82	76	70
Arunachal Pradesh	111	126	65.7	63.1
Assam	N/A	N/A	88	74
Bihar	95	94	68	71
Chhattisgarh	N/A	N/A	N/A	N/A
Delhi	108	92	39.1	46.7
Goa	87	93	27.2	14.3
Gujarat	120	110	70	67
Haryana	132	119	69	67
Himachal Pradesh	160	126	80.8	67.3
Jammu & Kashmir	115	99	N/A	N/A
Jharkhand	N/A	N/A	N/A	N/A
Karnataka	87	74	82	72
Kerala	61	48	17	16
MadhyaPradesh	158	140	116	119
Maharashtra	131	106	60	59
Manipur	31	33	28.6	14.2
Meghalaya	81	76	54.7	59.4
Mizoram	94	70	N/A	N/A
Nagaland	76	58	N/A	N/A
Orissa	172	153	114	116
Punjab	138	114	55	51
Rajasthan	146	135	77	80
Sikkim	135	118	45.4	57.5
Tamil Nadu	114	93	60	54
Tripura	143	116	59	53
UttarPradesh	131	128	95	100
Uttarakhand	N/A	N/A	N/A	N/A
West Bengal	103	57	72	69
India	122	108	81	80

Source: Source 1: Sample Registration System (SRS) Bulletin, Registrar General of India, Ministry of Home Affairs, Govt. of India.

Source 2: 1981 and 1991 data from Compendium of India's Fertility and Mortality Indicators 1971-97, Registrar General of India: 1999.

Note : Infant Mortality Rate (IMR) is defined as number of death by age 1 per 1000 live births.

Cont: State Wise Infant Mortality Rate by Sex and, India

States	2001		2011	
	Total		Total	
	Male	Female	Male	Female
AndhraPradesh	65	68	40	46
ArunachalPradesh	35	31	33	31
Assam	69	80	55	56
Bihar	57	68	44	45
Chhattisgarh	72	78	47	50
Delhi	27	23	25	31
Goa	11	17	7	14
Gujarat	61	60	39	42
Haryana	63	70	41	48
HimachalPradesh	48	36	36	39
Jammu & Kashmir	43	36	40	41
Jharkhand	37	54	36	43
Karnataka	59	58	34	35
Kerala	14	9	11	13
MadhyaPradesh	83	89	57	62
Maharashtra	43	48	24	25
Manipur	8	12	8	15
Meghalaya	52	50	52	52
Mizoram	20	16	31	37
Nagaland	N.A.	N.A.	15	26
Orissa	90	93	55	58
Punjab	43	63	28	33
Rajasthan	78	82	50	53
Sikkim	30	29	23	30
Tamil Nadu	45	54	21	23
Tripura	39	31	29	29
UttarPradesh	82	84	55	59
Uttarakhand	40	40	34	38
West Bengal	53	49	30	34
India	64	68	43	46

Source : **Source 1:** Sample Registration System (SRS) Bulletin, Registrar General of India, Ministry of Home Affairs, Govt. of India.

Source 2 : 1981 and 1991 data from Compendium of India's Fertility and Mortality Indicators 1971-97, Registrar General of India: 1999.

Note : Infant Mortality Rate (IMR) is defined as number of death by age 1 per 1000 live births.

Appendix- 4: State-wise Under Five Mortality Rate (Per '000) by Sex, India

States/UTs	1981			1991		
	Total			Total		
	Total	Male	Female	Total	Male	Female
Andhra Pradesh	139	143	135	67	68	66
Arunachal Pradesh	220	227	213	139	140	137
Assam	N/A	N/A	N/A	116	118	115
Bihar	141	131	153	89	75	104
Chhattisgarh	N/A	N/A	N/A	N/A	N/A	N/A
Delhi	96	93	99	70	74	66
Goa	81	83	80	72	74	70
Gujarat	124	119	129	101	97	104
Haryana	138	125	153	73	71	80
Himachal Pradesh	139	142	136	95	98	92
Jammu & Kashmir	115	114	117	N/A	N/A	N/A
Jharkhand	N/A	N/A	N/A	N/A	N/A	N/A
Karnataka	142	143	140	90	91	88
Kerala	80	85	76	60	60	61
Madhya Pradesh	197	193	201	147	142	151
Maharashtra	145	146	144	91	89	93
Manipur	51	51	50	39	37	43
Meghalaya	142	147	137	98	99	97
Mizoram	103	107	99	68	72	65
Nagaland	100	104	96	67	67	68
Orissa	179	181	176	133	154	128
Punjab	111	104	118	92	97	82
Rajasthan	176	166	186	110	103	117
Sikkim	159	173	144	85	87	81
Tamil Nadu	132	134	131	67	64	70
Tripura	150	153	146	101	102	100
Uttar Pradesh	190	174	208	134	135	132
Uttarakhand	N/A	N/A	N/A	N/A	N/A	N/A
West Bengal	124	123	125	94	94	92
India	152	147	157	94	91	101

Under Five Mortality Rate is defined as number of death by age 5 per 1000 live births.

Source: Sample Registration System (various years), Office of the Registrar General, India.

Cont:State-wise and Sex-Wise Under Five Mortality Rate (Per '000) by Sex , India

States/UTs	2001#			2011		
	Total			Total		
	Total	Male	Female	Total	Male	Female
Andhra Pradesh	63.2	85.6	71.1	45	42	49
Arunachal Pradesh	87.7	109.1	86.4	N/A	N/A	N/A
Assam	85	90.3	100.3	78	75	82
Bihar	84.8	82.7	108.3	59	56	62
Chhattisgarh	90.3	107.7	103.3	57	49	66
Delhi	46.7	47.2	45.5	32	29	35
Goa	20.3	32.9	31.4	N/A	N/A	N/A
Gujarat	60.9	72.7	82.5	52	49	54
Haryana	52.3	55.2	63	51	45	58
Himachal Pradesh	41.5	49.3	35.8	46	43	49
Jammu & Kashmir	51.2	53.9	53.7	45	45	45
Jharkhand	93	111.1	113.7	54	45	63
Karnataka	54.7	71.4	60.6	40	38	42
Kerala	16.3	22.3	16.6	13	12	14
Madhya Pradesh	94.2	103.6	112.7	77	72	82
Maharashtra	46.7	55.8	50.7	28	27	28
Manipur	41.9	56.7	43.3	N/A	N/A	N/A
Meghalaya	70.5	86.2	61	N/A	N/A	N/A
Mizoram	52.9	49.5	47.5	N/A	N/A	N/A
Nagaland	64.7	74.8	65	N/A	N/A	N/A
Orissa	90.6	103.7	84.4	72	70	74
Punjab	52	51.3	58.9	38	33	43
Rajasthan	85.4	87.7	99.4	64	57	72
Sikkim	40.1	44.1	40.2	N/A	N/A	N/A
Tamil Nadu	35.5	42.3	47.9	25	23	27
Tripura	59.2	79.5	67	N/A	N/A	N/A
Uttar Pradesh	96.4	100.9	124.7	73	67	81
Uttarakhand	56.8	67.6	72.9	N/A	N/A	N/A
West Bengal	59.6	74.9	55.7	38	37	40
India	74.3	69.7	79.2	55	51	59

Under Five Mortality Rate is defined as number of death by age 5 per 1000 live births.

Source: Sample Registration System (various years), Office of the Registrar General, India.

Note 1:*= Rural- Urban Data for 1991 is not Available

Note 2:#= Data for 2001 not available in SRS Statistical Report 2001. So in order to fill the gap, NFHS-3, 2005-06 State level reports has been compiled

Appendix- 5: State-wise Adolescent Fertility Rate (15-19 Years) in India

States	2001	2011
Andhra Pradesh	95.7	38.8
Assam	56.3	45.8
Bihar	53.5	33
Chhattisgarh	N/A	39.8
Delhi	9.3	9.2
Gujarat	26.4	23.4
Haryana	42.4	17
Himachal Pradesh	12.5	12.3
Jammu & Kashmir	10.4	5.7
Jharkhand	N/A	37.8
Karnataka	57.1	35.8
Kerala	24.5	20.3
Madhya Pradesh	79	32.5
Maharashtra	44.9	28.6
Orissa	38.4	29.8
Punjab	16.2	10.4
Rajasthan	56.8	32.7
Tamil Nadu	32.6	19.4
Uttar Pradesh	37.1	26.1
West Bengal	64.3	55.4
India	48.9	30.7
CV	57.12	47.13

Source: Registrar General, India and SRS Bulletin (Various Issues)

Appendix 6: State-wise Maternal Mortality Ratio (Per 100000 live births)

States		2001-03	2010-12
Andhra Pradesh	195	110	
Assam	490	328	
Bihar/Jharkhand@	371	219	
Gujarat	172	122	
Haryana	162	146	
Karnataka	228	144	
Kerala	110	66	
Madhya Pradesh/ Chhattisgarh@	379	230	
Maharashtra	149	87	

States		2001-03	2010-12
Orissa	358	235	
Punjab	178	155	
Rajasthan	445	255	
Tamil Nadu	134	90	
Uttar Pradesh/Uttarakhand@	517	292	
West Bengal	194	117	
India	301	178	
CV	51.17	46.70	

Note: Maternal Mortality Ratio (per 100000 live births)

NA: Not available.

@: For 2001-03, figure is for undivided state.

Source: Maternal Mortality in India 2001-03: Trend, Causes and Risk Factors-2006, MMR 2010-12: A Presentation on Maternal Mortality Levels, December 2013, Office of the Registrar General of India.