Measurement Of Health Inequality In India By Computing Gini Coefficient

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ABSTRACT

Introduction: Health inequality refers to the difference in health status of two demographic groups that include both morbidity and mortality.

Objective: This study will measure the disparities in length of life across age, sex, over periods from 1970/71-2005 for India and some of its states, viz. Assam, Kerala, Maharashtra, Orissa, Punjab and Uttar Pradesh using Gini Coefficient. The correlation coefficient between inequality in the length of life and average length of life for all states and age groups is also computed.

Data and Methodology: The data is secondary provided by Sample Registration System (SRS), computed by office of the Registrar General of India and put with fitted arguments.

Results and Conclusion: The variation in the value of this measurement in the work established the amount of health disparities prevailing in this part of the world.

Key words: Correlation coefficient, Gini Coefficient, Health Inequality, length of life.

Introduction

Health inequality refers to the difference in health status of two demographic groups that include both morbidity and mortality. Mortality and age at death are the most reliable and important measures of health and morbidity related to medically defined diseases. (Sermet & Cambois, 2006). Gini coefficient is one such health inequality measure which assesses variation in length of life across people. The Health and Services administration of the United States (2004) define it as the population-specific differences in the presence of disease, health outcomes, or access to health care. (Goldberg et.al 2004). Gakidou et al. (2002), define health inequality to be "variations in health status across individuals in a population which allows us to perform cross- country comparisons and study the determinants of health inequality." (The World Health Report, 2000).

Over the last 50 years of the 20th century many countries including poor countries have made remarkable improvements in health status. (Evans et. al 2001). However India's performance in health is not encouraging over the years since there are gross inequalities within the country, which is viewed as a major public health concern. Though life expectancy at birth for the male population of India increases from 51 in 1970-75 to 62 in 2001-05, yet this improvement is not uniform throughout the country. The female statistics are 49 and 64 respectively i.e. outnumbering males in 2001-05 in life expectancy at birth. This can also be visualised from the interstate variation in life expectancy at birth from 71 in Kerala to 58 of Assam in 2001-05 among its male members. Its counterparts have 76 and 59 respectively. This interstate variation can be marked from all the socio-economic and demographic indicators viz. literacy rate, variation in the percentage of population below the poverty line, TFR, IMR, MMR etc. (National Family Health Survey 3, India: 2005-06). Thus the health inequality determinants are particularly crucial in a developing country like India where health policies and programs are attempting to rectify the communal discrepancies over the past decades. These rigid social disparities in India create hurdles for economic development and social opportunities. Hence the future development of the country will depend

on the pace of reduction of health inequalities within the communities by identifying the unequal health wise groups. The number of studies associated to health inequalities has steadily increased. These studies focused on differences in average health status across groups of people, across income groups, among social classes, among racial or ethnic groups, by educational attainment or occupation, across age, sex etc. (Gakidou et.al op.cit 2002). Lauridsen et.al (2011), Saikia et.al (2011) and many others work on health disparities prevailing among the people of India. This study will also humbly attempt to measure the health inequality of India by computing Gini coefficient for evaluating the distribution of health among different sectors. Gini coefficient is abbreviated as Go.

Objectives

With this backdrop it was imperative to study the disparities in length of life by means of Gini Coefficient across age (0-5, 15-40 and for all ages), sex, over periods from 1970/71-2005 for India and some of its states based on geographic location viz. Assam (North-east), Kerala (South), Maharashtra (West), Orissa (East), Punjab (North) and Uttar Pradesh (Central). Further these states are witnessing different stages of development as Maharashtra and Punjab are considered among the richest states whereas Assam and Orissa are among the poorest states. Though Punjab has the lowest infant mortality rate after Kerala the gender gap is more pronounced in Punjab. Uttar Pradesh is considered as the most populous state and Kerala holds its position as the educationally and socially developed state. Thus it will suffice one to observe the performance of better and worst states in the health inequality scenario. The aforesaid components of age will help in studying the overall variation in degrees of inequality in length of life at different ages. The justification of using the periods from 1970/71-75 to 2001-05 is the non availability of reliable data prior to these periods, since Sample Registration System is the only unique source of information providing representative and the most complete data on mortality in India. (National Population Commission, 2001). This work further studies the relation between inequality in the length of life and average length of life for all states and age groups.

Data and methodology

The data used for computing Gini coefficient was secondary provided by Sample Registration System (SRS). The office of the Registrar General of India started the process of sample registration of births and deaths in India in 1964-65 on a pilot basis and on a full scale from 1969-70. This scheme was based on dual record system in India. It provided unswerving estimates of birth rate, death rate and infant mortality rate for rural, urban and combined areas for India and for some of its states and union territories. An abridged life table had been constructed by the office of Registrar General of India for males and females from 1970 -75 to 2001-05 for India and some of its major states using SRS data. However life tables were constructed for 1971-75 instead of 1970-75 for the states Punjab and Kerala. In this study we utilized these life tables to calculate Gini coefficient.

The Gini coefficient was developed by the Italian statistician Corrado Gini and published in his 1912 paper "Variabilità e mutabilità" ("Variability and Mutability"). It is based on the Lorenz curve, a cumulative frequency curve that compares the empirical distribution of a variable with its uniform distribution represented by a diagonal line. The greater the area included between the Lorenz curve and the diagonal, the greater the inequality. A small value of Go indicates equality in income distribution and larger value specifies inequalities. In case of inter individual differences in length of life, it is equal to zero if all individuals die at the same age; and equal to one if all people die at age zero and one individual dies at an infinitely old age. (Shkolnikov, et.al ,2001). Though Gini coefficient reflects the level of inequality it is generally used for comparative purposes. Gini index has many different formulations and interesting interpretations. All of them are equivalent. (Anand, 1983). Hanada (1983) defined Gini coefficient as:

$$G_o = 1 - \{ \int_0^{\infty} [l(x)]^2 dx \} / \{ e(0) * [l(0)]^2 \} \quad ...(2.1)$$

Whereas
l(x) is the number of survivors at the beginning of the interval x.
l(0) is the size of the birth cohort.
e(0) is the life expectancy at birth.

This formula was used to compute Go for full range of ages. However for limited range of ages this formula can be rewritten as

$$G_{x/X} = 1 - \{ \int_x^{X} [l(t)]^2 dt \} / \{ e(x/X) * [l(x)]^2 \} \quad ...(2.2)$$

Where the temporary life expectancy is

$$e(x/X) = \{ \int_x^{X} [l(t)]\, dt \} / [l(x)] \quad \text{(Arriaga, 1984)}$$

$$\text{Or, } e(x/X) = T(x)/l(x) = \sum_n L_x / l(x).$$

(Namboodiri and Suchindran, 1987).

${}_nL_x$ is the number of person years lived by the l(x) persons during the interval (x, x+n).
T(x) is the total number of person years lived during the interval (x, x+n).

$$\text{Now } {}_nL_x = n \{ l_{x+n} + {}_na_x * {}_nd_x \}.$$

${}_nd_x$ denotes the number of deaths during (x,x+n).

${}_na_x$ is the fraction of years lived by those dying in the interval (x,x+n) on the average.

Chiang (1960a) observe that nax is more or less invariant with respect to sex, race, cause of death, geographic location, and other demographic variables. He further remarked that ${}_na_x$

computed for a population for each age group can be used for many populations. For calculating ${}_nL_x$ in our study a set of Chiang's estimates of ${}_na_x$ (Namboodiri and Suchindran, 1987, pg 26) was used. For the extremely old ages nax is taken as 0.5.

The integral part of equation 2.2 is given by

$$\sum_x \int_0^1 [l(x+t)]^2 dt = \sum_x [(l_{x+1})^2 + A_x \hat{} \{(l_x)^2 - (l_{x+1})^2\}] \ldots (2.3)$$

Where $A_x\hat{} = [1-2/3q_x + C_x(2- q_x - 6/5\, C_x)]/[2- q_x] \ldots (2.4)$

q_x is the mortality rate and

$C_x = {}_na_x - 0.5.$

Since for the first year of life l(x) falls more steeply, so the equation (2.4) will not be suitable for finding $A_o\hat{}$.

(Shkolnikov, op.cit, 320). Thus J. Borgois-Pichat (1951) formula

$$A_o\hat{} = a_o(1-q_o * (3+0.831a_o)/(2+q_o)) \ldots (2.5)$$

was used.

The last age group used in the mortality data as given by SRS was 70_+. Hence we apply mortality law

$$l(x) = C * a^{b^x}$$

to extrapolate survivors in a life table beyond the final age as discussed by Preston et.al (2001). Parameters C, a and b can be estimated from the last three values of the life table survival function, l(y), l(y+n) and l(y+2n).(Horiuchi and Coale,1982).

$$b = [\ln\{l(y+2n)/l(y+n)\}/\ln\{l(y+n)/l(y)\}]^{1/n}.$$

$$a = \exp[\ln\{l(y+n)/l(y)\}/\{b^y(b^n-1)\}]$$

$$C = l(y) * \exp(-b^y * \ln(a)).$$

$$\text{Thus } A_{70+}\hat{} = \{1/(l_{70})^2\}[\sum_{70}^{110} \{(l_{x+1})^2 + A_x\hat{}\{(l_x)^2 - (l_{x+1})^2\}\}] \ldots (2.6)$$

was defined to find a solution for open ended interval.

Finally Go was computed by using equation (2.2).

Results and Conclusions

From column (2) of Table 1 one it is observed that inequality in the length of life among male population of India decreased from 0.3019 in 1970-71 to 0.1673 in 2001-05. On the other hand its female population decrement was from 0.3323 to 0.1826 as portrayed in Table 2. However from the two tables one observed that Gini coefficient was higher among the female population as compared to the male population. The negative correlation coefficient between life expectancy at birth and Gini coefficient for India across periods was -0.74 for men and -1 for women as shown in Table 7. The correlation coefficient -0.74 among men indicated a firm negative linear relationship between the variables. The value -1 for females represented the perfect negative linear relationship as the two variables moved in opposite direction with the same amount. The value of correlation will depend on the mortality levels of the countries and periods. A higher value of correlation coefficient will reflect the divergence in the levels of mortality. (Shkolnikov, et.al, 2003). Column (3) of the same tables gave the computed Gini coefficient values for the male and female populace of Assam. A higher Go value was observed for Assam as compared to Go value of India for both male and female populace. The negative associations between the two indicators for the aforementioned periods for the male and female inhabitants were -1 and -1 respectively. The third state considered here was Kerala, where Go was represented by (4) column of the aforesaid tables. A smaller value of Gini coefficient was observed for both male and female population of Kerala as compared to other states including India. The variability in the length of life declined from 0.1860 in 1971-75 to 0.0918 in 2001-05 among males of Kerala. It could be deduced from column (4) that Go value for female populace for all ages reduced from 0.1742 in 1971-75 to 0.0478 in 2001-05. Thus among Kerala populace one observed that inequality in the age of death was small among females as compared to the male people. The correlation coefficients swung from -0.99 to -1 between male to female inhabitants of Kerala across the periods. Maharashtra, being a wealthy and developed state its Gini coefficient value ranged from 0.2687 to 0.1419 among male members and its female counterparts ranged from 0.2697 to 0.1216 across the aforesaid periods. Thus the inequality was higher as compared to its fellow state Kerala. The correlation was -0.99 both for males and females of Maharashtra. The next state Orissa, experienced highest Gini value as compared to all the states and India among its male members. In 1970-75 Gini coefficient for male populace was 0.3407 and it reduced to 0.2135 in 2001-05. A higher Gini value of 0.3525 was observed for women of Orissa in 1970-75 and lessened to 0.2187 in 2001-05. The correlation value ranged from -0.92 to -1 among males and females of Orissa. Gini coefficient for the male and female population of Punjab for the period 1971-75 were 0.2257 and 0.2509 which reduced to 0.1392 and 0.1307 in 2001-05 respectively. Though Punjab was an economically developed state of India a contrast higher value of Gini coefficient was visualized among the female population as compared to its male populace except for the periods 1986-90, 1991-95 and 1996-2000. This explained the gender inequality in the age at death. The negative association between life expectancy at birth and Gini coefficient for all ages across the periods were -0.99 and -1 among men and women of Punjab. From column (8) we inferred that Go value decreased from 0.3000 in 1970-75 to 0.2018 in 2001-05 among male inhabitants of Uttar Pradesh. However for female population the same column depicted that these values decreased from 0.3484 in 1970-75 to 0.2220 in 2001-05 for all ages. Thus one deduced that inequality in the age of death was more among female inhabitants of Uttar Pradesh in comparison to males of Uttar Pradesh The last entry of columns ((8) were 0.2018 and 0.2220 respectively for the period 2001-05 of male and female population of Uttar Pradesh, which was larger as compared to 0.1860 and 0.1742 for both male and female population of Kerala for the period 1971-75. Though Go value decreased across periods for male and female population of Uttar Pradesh a larger Go was observed for this populace as compared to other states including India and this leads to larger inequality in the length of life. The correlation coefficient between eo and Go among the male and female population of Uttar Pradesh were -0.92 and -0.91 respectively.

The inequality among individuals depends on many factors. One such factor was age, since some age groups would have more tendency of dying as compared to other age groups. Choudhury et.al. (2007) viewed that probability of an individual afflicted by various chronic diseases differed across ages. Ho et.al (2009) studied the characterization of international variation in mortality rates by age in 2005 in the United States and observed that death rates rank poorly between ages 40-75 among males and females of US. Further Caselli (2010) proved that mortality pattern by cause diverges as one moved from infant to adult age and from adult to old age. This incites one to obtain inequality in the length of life among age groups 0-5 and 15-40 for all states by computing Go.

Tables 3 and 4 measured the Gini coefficient across different periods, among different states, for both male and female populace irrespective of region for age group 0-5. A similar pattern of diminishing inequality in the length of life was observed across the periods. However all Go values of Tables 3 and 4 were smaller than Gini coefficient of Tables 1 and 2. The same trend of larger Go value for Orissa and Uttar Pradesh and smaller for Kerala, was seen. The same mode of smaller Go was perceived among males as compared to females for all states except Kerala. Further, the association regarding Gini coefficient and average length of life can be elucidated similarly as discussed earlier.

Tables 5 and 6 portrayed G_{15} values for age group 15-40 for population across all periods and for different states as discussed earlier. The G_{15} values for the male population of India decreased from 0.0349 in 1970-75 to 0.0183 in 2001-05. And for its females it was from 0.0502 in 1970-75 to 0.0261 in 2001-05. The correlation coefficient between inequality in the length of life and expectation of life at age 15 among male and female inhabitants of India were -0.94 and -0.99. Columns 3 of Tables 5 and 6 presented the G_{15} value for the male and female people of Assam. Gini coefficients for the male and female inhabitants of this place for the period 1971-75 were 0.0387 and 0.0727 reduced to 0.0324 and 0.0391 in 2001-05 respectively. The correlation between the two measurements of life is -0.86 and -0.97 among men and women of this place. A similar pattern of diminishing inequality was observed from column 4 across the periods among the populace of Kerala. The female inequality in the length of life diminished from 0.0211 to 0.0097, while for

males it decreased from 0.0232 to 0.0153 across the periods. The correlation coefficients varied from -0.90 to -0.93 between male to female inhabitants of Kerala across the periods. The arguments regarding smaller G_{15} value among the female members of Kerala as compared to its males would be same. The state Maharashtra experienced Gini value 0.0319 in 1970-75 whereas it reduced to 0.0242 in 2001-05 among the male members. A slightly higher Gini value was observed among the female members as depicted in Table 6. In this age group the state Orissa has larger Gini coefficient among all the states both for male and female population. The correlation coefficients are -0.72 and -0.09 among the male inhabitants of Maharashtra and Orissa respectively. The female counterparts had -0.26 and -0.98 correlation coefficients of the aforesaid states. The next state is Punjab, represented by the 7th column of the same table. The Gini coefficient value for the period 2001-05 among men and women of Punjab were 0.0266 and 0.0168 while G_{15} of 0.0283 and 0.0297 were observed for the period 1971-75. The same table indicated that Gini coefficient for all the periods except 1970-75 among males of Punjab was larger as compared to its female counterparts. Thus this showed the favourable change among the female populace of Punjab as less inequality in the length of life was observed. The correlation coefficients were 0.02 and -0.92 among male and female populace. A contrast positive correlation coefficient of 0.02 among males of Punjab might be due to the amount of change in G_{15} and e_{15} across the periods, which was not uniform. The correlation coefficient 0.02 indicated a very weak positive unstable linear relationship. Also the correlation would be weaker if life expectancy continued to increase while the decline in the inequality in the length of life had slowed down or stopped. Thus the correlation coefficient will be weaker if the comparable levels of mortality are selected. (Shkolnikov, et.al, 2003). The Gini coefficient values for the male and female inhabitants of Uttar Pradesh were 0.0289 and 0.0363 in 2001-05, which was larger as compared to 0.0232 and 0.0211 in 1971-75 of Kerala. Thus inequality in the length of life was more significant among the members of Uttar Pradesh. The association between expectation of life at age 15 and Gini coefficient among men and women of Uttar Pradesh across the periods were -0.91 and -0.86. The explanation regarding the value of this association would be same as above.

From the tables one might conclude that inequality in the length of life was more apparent among children of age group 0-5 as compared to its adult populace. Further a larger Gini value was observed for the female population of India and its states except for Kerala as compared to males. In all the tables we viewed that inequality is least in Kerala and Assam got a higher rank in disparity in length of life followed by Orissa, Uttar Pradesh, Maharashtra and Punjab in 2001-05. Similarly in other periods 1970/71-75 to 1996-2000 the states Uttar Pradesh, Assam and Orissa are considered as the most health inequality states according to their Gini figures. The inhabitants of India and its states also experience the same kind of variation in age specific mortality rate as observed in case of inequality in the length of life. Hence the notion presented by Shkolnikov, et.al. (2003) that inequality in the length of life is influenced by the difference in the age specific mortality rate is substantiated by the present study too. In India these variations in the age specific mortality rate is due to the epidemiological transition from the communicable diseases to AIDS. The infectious, chronic diseases and rise in injuries/ accidents accelerates these disparities among the people. The HIV prevalence rate is more prevalent among the male adults of age group 15-49. (National Family Health Survey 3, 2005-06). Further data from SRS depict that Crude Death Rate (CDR) of India has been declining from 14.9 in 1971 to 7.6 in 2005 in the last three decades. It has also been observed that the crude death rate is higher than the national average in Orissa (9.2), Assam (8.6) and Uttar Pradesh (8.5) whereas Kerala (6.8), Maharashtra (6.6) and Punjab (7) have lower CDR as compared to India. (SRS, 2007). An identical pattern has also been observed in case of maternal mortality rate. A higher value of maternal mortality rate is seen for the states Assam (390), Uttar Pradesh (359), and Orissa (258) i.e. above the national average of 212. (SRS, 2011). However the states Kerala (81), Maharashtra (104) and Punjab (172) have done better in maternal mortality indicators than India. A similar trend is noticed for neonatal, infant and under 5 mortality rates. ((National Family Health Survey 3, 2005-06). Bhat (1987) also observed that pace of mortality reduction is not uniform among the states of India. Hence in our study we observed a smaller value of Gini for the states whose infant mortality rate is lower. Thus the view of Shkolnikov, et.al. (2003) that reduction of infant mortality rates caused equalization of age at death is also observed in this study.

The foregoing discussion leads this study to the conclusion that in India, disparity in health was found according to geographical region, gender, age groups and among the periods. This was catalysed by the variation in assessing health services due to socio-economic, gender and geographical distance in a populous country like India. Thus health inequalities were marked from the start of life and continue into death. (Graham, 2004). These unfair and avoidable differences in health status could be bridged by accompanying growth with more equitable access to the benefits of development to cease the unacceptable threat to human well being and security. This kind of analysis might help in identifying the pace of improvement among the states, across time periods and to check the benefitting index of population from the existing social arrangement.

Different tables have been provided in this section following.

Tables

Table 1: Go for Male Population of All Ages

State / Periods	India	Assam	Kerala	Maharashtra	Orissa	Punjab	Uttar Pradesh
1970/71-75	0.3019	0.3318	0.1860	0.2687	0.3407	0.2257	0.3000
1976-80	0.2822	0.2749	0.1562	0.2430	0.3041	0.2029	0.3379
1981-85	0.1458	0.2737	0.1366	0.2003	0.2760	0.1781	0.3000
1986-90	0.2372	0.2553	0.1147	0.1759	0.2679	0.1673	0.2657
1991-95	0.2017	0.2389	0.0966	0.1740	0.2628	0.1604	0.2282
1996-2000	0.1873	0.2175	0.0913	0.1463	0.2235	0.1462	0.2075
2001-05	0.1673	0.2181	0.0918	0.1419	0.2135	0.1392	0.2018

Table 2: Go for Female Population of All Ages

State / Periods	India	Assam	Kerala	Maharashtra	Orissa	Punjab	Uttar Pradesh
1970/71-75	0.3323	0.3482	0.1742	0.2697	0.3525	0.2509	0.3484
1976-80	0.3057	0.2919	0.1299	0.2436	0.3293	0.2258	0.4143
1981-85	0.2649	0.2844	0.0942	0. 1956	0.2833	0.1871	0.3484
1986-90	0.2326	0.2630	0.0769	0.1667	0.2736	0.1513	0.3011
1991-95	0.2048	0.2468	0.0556	0.1611	0.2501	0.1448	0.2551
1996-2000	0.1875	0.2261	0.0497	0.1293	0.2242	0.1378	0.2357
2001-05	0.1826	0.2249	0.0478	0.1264	0.2187	0.1307	0.2220

Table 3: Go or Male Population Aged 0-5

State / Periods	India	Assam	Kerala	Maharashtra	Orissa	Punjab	Uttar Pradesh
1970/71-75	0.1604	0.1767	0.0753	0.1333	0.1754	0.1197	0.1691
1976-80	0.1485	0.1347	0.0588	0.1098	0.1614	0.1135	0.1948
1981-85	0.1262	0.1302	0.0436	0.0895	0.1514	0.0882	0.1691
1986-90	0.1052	0.1213	0.0294	0.0760	0.1487	0.0699	0.1410
1991-95	0.0933	0.1140	0.0196	0.0665	0.1249	0.0609	0.1113
1996-2000	0.0818	0.0903	0.0170	0.0527	0.1069	0.0551	0.0977
2001-05	0.0765	0.0943	0.019	0.0479	0.1003	0.0524	0.0959

Table 4: Go for Female Population Aged 0-5

State / Periods	India	Assam	Kerala	Maharashtra	Orissa	Punjab	Uttar Pradesh
1970/71-75	0.1765	0.1629	0.0756	0.1327	0.1811	0.1448	0.1972
1976-80	0.1637	0.1358	0.0548	0.1170	0.1738	0.1349	0.2449
1981-85	0.1346	0.1285	0.0364	0.0919	0.1516	0.0947	0.1972
1986-90	0.1129	0.1170	0.0277	0.0748	0.1424	0.0835	0.1603
1991-95	0.0974	0.1112	0.0154	0.0647	0.1296	0.0718	0.1279
1996-2000	0.0886	0.0931	0.0113	0.0550	0.1056	0.067	0.1162
2001-05	0.0893	0.0998	0.0127	0.0533	0.1048	0.0687	0.1102

Table 5: G_{15} for Male Population Aged 15-40

State / Periods	India	Assam	Kerala	Maharashtra	Orissa	Punjab	Uttar Pradesh
1970/71-75	0.0349	0.0387	0.0232	0.0319	0.0463	0.0283	0.0336
1976-80	0.0321	0.0376	0.0197	0.0301	0.0380	0.0267	0.0321
1981-85	0.0300	0.0342	0.0204	0.0356	0.2225	0.0291	0.0336
1986-90	0.0279	0.0311	0.0171	0.0288	0.0330	0.0331	0.0298
1991-95	0.0273	0.0299	0.0164	0.0207	0.0324	0.0364	0.0302
1996-2000	0.0271	0.0316	0.0153	0.0238	0.0354	0.0294	0.0291
2001-05	0.0183	0.0324	0.0153	0.0242	0.0305	0.0266	0.0289

Table 6: G_{15} for Female Population Aged 15-40

State / Periods	India	Assam	Kerala	Maharashtra	Orissa	Punjab	Uttar Pradesh
1970/71-75	0.0502	0.0727	0.0211	0.0372	0.0632	0.0297	0.0504
1976-80	0.0438	0.0548	0.0147	0. 0357	0.0542	0.0247	0.0559
1981-85	0.0381	0.0503	0.0150	0.0293	0.0408	0.0277	0.0504
1986-90	0.0354	0.0455	0.0112	0.0247	0.0463	0.0234	0.0435
1991-95	0.0331	0.0429	0.0104	0.0374	0.0345	0.0198	0.0400
1996-2000	0.0283	0.0443	0.0104	0.0220	0.0391	0.019	0.0364
2001-05	0.0261	0.0391	0.0097	0.0215	0.0340	0.0168	0.0363

Table 7: Correlation Coefficient between Gini Coefficient and Expectation of Life

Place	G_0e_0(m)	G_0e_0(f)	$G_{15}e_{15}$(f)	G_0e_0(m)(for all ages)	G_0e_0(f)(for all ages)
(1)	(2)	(3)	(4)	(5)	(6)
India	-1	-0.99	-0.99	-0.74	-1
Assam	-0.99	-0.99	-0.97	-1	-1
Kerala	-0.98	-1	-0.93	-0.99	-1
Maharashtra	-0.99	-1	-0.26	-0.99	-0.99
Orissa	-0.92	-0.98	-0.98	-0.92	-1
Punjab	-0.99	-0.98	-0.92	-0.99	-1
Uttar Pradesh	-0.92	-0.91	-0.86	-0.92	-0.91

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