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Title: Fertility Reduction: Does Poverty Matter?

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Fertility Reduction: Does Poverty Matter?

Abstract:

Using data from three rounds of National Family and Health Survey (NFHS) and a follow up study of NFHS 2, India, this paper tests the hypothesis that fertility level and preferences of the poor have been declining fast and the use of contraceptive is on rise in two economically disparate states, namely, Maharashtra and Orissa. The official cut-off points of poverty are applied to the wealth index in defining the poor.

Results indicate that, despite large differentials in reproductive and child health services and practice of early marriage of girls, the reduction in fertility and the use of contraception has been remarkable among the poor in both the states. The reduction of poverty and fertility are not concomitant in either of the states. This added to the debate that poverty is not necessarily a barrier to fertility reduction at least in parts of a large and heterogeneous country like India.

Key words: fertility, poor, non-poor, poverty, fertility and poverty, India

I. Background:

Fertility transition in developing countries in last two decades has renewed research interest on micro level linkages of poverty and fertility. The conventional Malthusian argument of diminishing return on agriculture and slow technological progress through the *distribution effect*[1] leading to the Malthusian Crises has been proved wrong in many developing countries. The Neo-Malthusian, while upholding the Malthusian view point, link the overpopulation with carrying capacity, advocated strict family planning and abortion for population control. Though the Neo-Malthusian argument that high fertility results in low saving, investment; and hence low economic growth is more logical than Malthus, it is not supported by empirical findings and is contested by researchers (National Research Council 1986*).* The socio-economic theories fail to explain the fertility decline in countries with a low level of development and high incidence of poverty. Alternatively, the diffusionist attributed the fertility change to the spread of ideas, values and technology (contraception) irrespective of socioeconomic status in the population (Casterline 2001). The diffusion process spreads from some individuals to others, through informal face-to-face interaction or through mass media (Rogers 1962, Brown 1981). The diffusionist propositions i.e., limited utility of socio-economic theories in explaining the fertility change, weaker relationship of fertility and development indicators and diffusion of new ideas leading to fertility change were widely accepted (Bryant John 2007).

There are numerous writings on poverty and fertility linkages; mainly drawn from cross sectional data that highlight the bi-directional and complex relationship of poverty and fertility at the macro and micro level. These writing are grouped into three, namely, i) macro level (household) effects of fertility change on poverty ii) micro-level effects of poverty on fertility iii) micro-

level effects of fertility on poverty (Amin et al 2007). While the macro level studies generally conclude that increases in absolute poverty are due to higher fertility (Eastwood and Lipton 1999), micro level studies establish that poor households tend to have larger families and that their children tend to have lower schooling and poor health (Lipton 1994; Krishnaji 1984; King 1987; Desai 1995). The micro level studies also explored the reverse causality i.e., the effect of fertility on economic well being. Studies also explored on contextual factors such as family planning programmes, the health services, social structure, institutional characteristics and the level of development in understanding the poverty and fertility relationship (Diamond, Newby and Varle 1999). It is commonly agreed that fertility and contraception are the most important factors for poverty reduction at the national and household levels (Merrick Thomas 2002).

While a number of research studies have been conducted on the negative relationship of fertility and poverty and adverse effect of higher fertility in poor health of mother and children, less attention has been paid on increasing contraceptive use and lower fertility preferences among the poor. This is probably because of our common notion that poor people tend to have more number of children due to perceived economic benefit and so poverty is the key explanatory variable explaining high fertility. But, the fertility decline in Thailand, Bangladesh, Nepal, parts of sub-Saharan Africa and Latin America, amid economic crises has added to the debate of population and poverty within the frame work of rational thinking (Lesthaeghe 1989; National Research Council 1993; Garner and Joseph 2002; Kabeer 2002; Eshety G and Ruth Mace 2008). Studies also found inverse-J-shaped relationship of poverty and fertility and the relationship of poverty and fertility is often negative within the poorest countries *(*Cosio- Zavala 1996*)*. Studies also found the postponement of marriage and timing of births through induced abortion and contraception due to economic lead to fertility change (Palloni *et al.,* 1997). These findings calls

for reconsidering the relationship between poverty and fertility decline in the frame work of rational thinking that promotes behavioural change in response to the prevailing ecology and economic stress. The fertility transition in some states of India has added to this debate.

II. Justification:

India is passing through economic and demographic transition. On the economic front, the country has achieved self-sufficiency in food production, sustained higher economic growth, and reduced the poverty ratio. The level of poverty has declined from 55% in 1973-74 to 22% in 2004-05 for the country (based on mixed recall period) but varies largely among the states (Planning Commission 2006). Studies have shown that with accelerated economic growth, regional disparities have widened in the 1990s (Joseph, 2004). The state of Orissa, Uttar Pradesh, Madhya Pradesh and Bihar accounts for more poor people than those in all the other states put together. On the demographic front, fertility transition in India started in the early 1970s and by 2007, 11 of the 29 states achieved the replacement level of fertility (IIPS and Macro International 2007). The total fertility rate (TFR), the summary measure of fertility, declined from 5.2 per woman in 1971 to 3.0 per woman in 2006 with large variations among the states. Fertility transition in the 1970s and 1980s were largely attributed to women's education, improvement in household economic condition, reduction in child mortality, reduction in child marriage, rising cost of child bearing and rearing, lower son preference and other socio-cultural factors (Caldwell *et al* 1982, Dreze and Murthy 2002). Fertility transition since the 1990s has been attributed largely to the diffusion process as significant reduction in fertility was among illiterate or less educated women (Bhat 2002; Arokiasamy 2009). While the diffusionist explained how the fertility transition takes place, they do not explain why it happens. We take another but related domain, that is, poverty, not necessarily absolute but relative, that probably induces poor and uneducated women

to limit their family size and bring about behavioral change. Because of the absence of the direct measure of poverty in NFHS, we rely on economic proxies, which reflect the relative poverty in the population. While Arokiasamy (2009) attributed the "quantity and quality" trade off of less educated women for better education and health of children, we believe that economic stress (crisis led fertility transition) cannot be negated.

This research has bearing with at least four of the recent writings. First, the findings of Dreze and Murty (2001) that found a negative but not significant relationship of poverty and fertility in the districts of India. We believe that the relationship has been stronger over the last two decades and can be best tested using the household level data. Second, the findings on poverty and fertility relationship from 25 countries of Sub-Saharan Africa (Schoumaker 2004). Using the DHS data, Schoumaker found that fertility changes within countries are independent from the changes in the distribution of the population by economic status. Third, the writings on poverty and reproductive health by Greene and Merrick (2007) that highlights the utility of longitudinal data or repeat surveys on understanding the poor reproductive health outcomes on well being and vice versa. We also believe that longitudinal data can provide better understanding of poverty and fertility at the micro level. Fourth, the findings from a longitudinal study in Albania, Ethiopia, Indonesia and Vietnam highlighting that poor households do not necessarily have a higher rate of fertility but those with higher fertility (measured with respect to number of children), tend to have a higher rate of entering into poverty and a lower rate of exiting poverty (Aassve *et al* 2005)

We have carried out the exercise in two disparate states of India namely, Maharashtra and Orissa. With large regional variations in the level of development and demographic parameters,

it is often puzzling to explain the factors associated with such variations in both the states. Though eradication of poverty, improvement in child survival and reduction of fertility were used as the developmental strategies of many developmental programme including the National Rural Health Mission (NRHM), we have limited understanding on the pathways of poverty and fertility transition in these states or in the country.

III. Objectives and Hypotheses:

The main objective of the paper is to understand the trends and change in the fertility behaviour among the poor and the non-poor in two disparate states of India, namely, Maharashtra and Orissa. We have used the cross-sectional data from three rounds of NFHS and data from a follow up study of NFHS 2, in rural Maharashtra. The specific objectives are i) to examine the change in proximate determinants, fertility levels and fertility preferences among the poor and non-poor; ii) to understand the role of poverty in fertility transition.

Based on these objectives, we hypothesize that i) despite huge poor-non poor gap in maternal and child health services, the fertility level and preferences among the poor are declining fast ii) the poor-non poor differentials in contraceptive use has narrowed down iii) the reduction in poverty has contributed little to the fertility transition in both the states.

We argue that poverty is not a barrier for fertility reduction and contraceptive use and the reduction of poverty has contributed little to the fertility reduction in both the states. Using the longitudinal data of rural Maharashtra, we have supplemented that contraceptive use among the poor was faster than that among the non-poor and there is no significant difference in fertility preferences among the poor and non-poor.

IV. Data and Methods:

Three rounds of NFHS in India, conducted during 1992-2006, and a follow up study of NFHS 2 conducted in the rural areas of the states of Maharashtra, Tamil Nadu, Bihar and Jharkhand in 2002-03 form the main data source of this paper. The NFHSs were large scale population based nationally representative surveys designed to provide reliable estimates on demographic and health parameters at the national and sub-national levels. In all the three rounds of surveys, a household schedule and a women schedule (a men schedule was also canvassed in NFHS 3) were canvassed in the sampled households. The household schedule collected information on economic proxies such as housing quality, household amenities, size of land holding and a set of consumer durables and the women schedule collected detailed information on demographic, health and nutrition and related parameters. There was considerable improvement in the coverage of topics, sample size and methodology in the subsequent rounds. For example, the number of variables covered under economic proxies had increased from 27 in NFHS 1 to 32 in NFHS 2 and 38 in NFHS 3. Most of the variables collected in NFHS 1 were covered in the subsequent rounds, except sofa and VCD/VCR. A number of additional issues such as family life education, risky sexual behaviour and estimates of HIV/AIDS were covered in the recent round of survey. Detailed descriptions of the survey design and the findings are available in the national report (IIPS and Macro International 2007).

The longitudinal data are of immense use in understanding the change in fertility and poverty. The follow-up study of NFHS 2 re-interviewed ever married women who were interviewed during the NFHS-2 (conducted in 1998-99) in Bihar, Jharkhand, Maharashtra and Tamil Nadu. The overall objective of the follow up study was to understand the role of the quality of family

planning services in contraceptive behaviour in rural India (IIPS and JHU 2005). The field work for the follow-up study was done during December 2002- June 2003. In addition to these data sources, data from the Census of India, Sample Registration System and poverty estimates of the Planning Commission, Government of India are used.

Given the regional inequality in the level of socio-economic development in India, we prefer to select two disparate states, Maharashtra and Orissa. These two states have higher proportion of population living below the poverty line and have experienced a substantial reduction of fertility in recent years. Some of the key indicators of these states are shown in Table 1. The state of Maharashtra is the second most populous state in the country with an estimated population of 109 million in 2009 and has recently achieved the below replacement level fertility (Office of the Registrar General and Census commissioner 2006). It is one of the economically progressive states of India with an estimated state domestic product per capita of Rs 41,331/- in 2007-08, at current prices (Ministry of Finance 2008). Among the major states of India, it ranks fourth in the human development index (Planning Commission 2002). However, in 2004-05, 25% of population in the state were living below the poverty line compared to 22% for the national level (Planning Commission 2006), based on mixed recall period estimates. On the other hand, Orissa with an estimated population of 40 million in 2009 is one of the backward states in the country. The state domestic product per-capita was Rs 23,403/- in 2007-08 compared to the national average of Rs 33,283/-. About two-fifths of the population in the state were living below the poverty line in 2004-05 and infant mortality remained high for a relatively longer period. Despite these, the fertility level in the state is low (TFR of 2.4 in 2005-06) compared to that in many other states of India under similar conditions.

The total number of households successfully interviewed in Maharashtra was 4063 in NFHS 1 (1992-93), 5830 in NFHS 2 (1998-99) and 8315 in NFHS 3 (2005-06). Similarly, the total number of women successfully interviewed were 4106 in 1992-93, 5391 in 1998-99 and 8315 in 2005-06. In Orissa, the total numbers of households successfully interviewed were 4602 during 1992-93, 4689 in 1998-99 and 3910 in 2005-06. Similarly, the total numbers of women successfully interviewed in the state were 4257 in 1992-93, 4425 in 1998-99 and 4540 in 2005-06. For convenience, the periods between 1992-93 and 1998-99 is referred to as 1992-98, between 1998-99 and 2005-06 as 1998-20005 and between 1992-93 and 2005-06 as 1992-2005. In the follow up study, a total of 1132 ever married women were successfully re-interviewed from a targeted sample of 1485 and the response rate was 76 percent.

The analyses are derived only for the state total without rural and urban segregation, owing to sample size constraints and state weight is used in the state level analyses. The Principal Component Analysis (PCA) is used in deriving the wealth indices separately for the rural and urban areas of the country, in each of the three periods. Based on the percentile of wealth index, the cut off point of the poor is fixed in accordance with the poverty estimates of the Planning Commission, Government of India, for the country, separately for rural and urban areas. The mean children ever born, child loss, ideal number of children, desire for additional child, marriage practices, contraceptive use, infant and child mortality of poor and non-poor are analysed for the period of 14 years. Decomposition analysis has been carried out to understand the role of poverty reduction in promoting fertility transition.

V. Results and Discussion

The results are presented in three sections, namely, deriving the poor, trends and change in proximate determinants of fertility, fertility levels and preferences among the poor and non-poor, and the poverty-fertility relationship.

Section I: Deriving the Poor

The NFHS like other DHS does not collect information on direct economic measure such as income or consumption in any of the rounds. While the household income are drawn from multiple sources, suffers from under reporting and is subject to seasonal fluctuation, the consumption expenditure schedules are relatively lengthy, suffer from recall lapse and need adjustment for household size, composition, and price level and involve higher cost **(**Montgomery M *et al* 2000**)**. On the other hand, economic proxies such as consumer durables, housing quality, household amenities and land holding size are easy to collect in field based surveys. These economic proxies are combined into a composite index, often referred to as wealth index or standard of living index and used to describe the economic differentials in health outcome, health care utilization and other demographic parameters. The wealth index is increasingly used to reflect the economic inequalities in health services and health outcome. The wealth index, as a proxy of consumption expenditure is a subject of intense debate and discussion, though its utility in predicting differentials in health outcome and health care utilisation has been established. A number of studies have demonstrated wealth index as a good proxy of economic status (Filmer and Pritchett 2001; Wagstaff and Watanabe 2003; Rutstein and Johnson 2004) while studies have also described the wealth index, as a weak predictor of

consumption expenditure and poor measure of inequality (Montgomery M *et al* 2000; Lindleow M 2006; Howe *et al.* 2008).

The NFHS 1 did not provide summary measure of economic status, at least in the report, while NFHS 2, for the first time, provided a composite index that is, the standard of living index (SLI) by assigning the arbitrary score to individual variables. For example, a score of four was assigned each to a car, tractor, flush toilet, five acres or more land and a *pucca* house. The total scores varied from 0-67, and scores ranging from 0-14 were categorized as low, 15-24 as medium and 25 and above as high SLI, and used in examining the economic differentials (IIPS and Macro International 2000). In NFHS 3, the wealth index was constructed using 33 variables and classified into quintiles. The index so constructed, classified three percent of the urban population in the lowest quintile (bottom 20 percent), compared to 28 percent in rural areas. On the other hand, the wealth index classified 77 percent of the urban population in the fourth and fifth quintiles (IIPS and Macro International 2007). The wealth index constructed in NFHS 3 has certain limitations. First, it did not take into account the rural-urban and inter-state variations in economic differentials, in a heterogeneous and large country like India (Misra and Dillip 2008). Second, it has provided estimates on five quintiles but policy makers often seek such estimates among poor and non-poor. Third, the magnitudes of health inequalities are sensitive to the choice of asset items included in the index (Howeling et al, 2003); which was not considered in the wealth index. On the other-hand, for all official purposes, the estimates of poverty and inequality in India and its states are derived by the Planning Commission, Government of India, from the consumption expenditure data collected by the National Sample Survey Organisation (NSSO) (a unit of the ministry of statistics and programme implementation, Government of India) on a quinquennial basis.

To overcome such difficulties, we have recomputed the wealth index separately for rural and urban areas for the country by using the PCA to facilitate the comparison of the two states. Secondly, the cut off point of the poor has been fixed at the poverty estimates by Planning Commission, Government of India for the periods that are close to that of NFHS rounds for the country. For example, the poverty estimates of 1993-94 were close to the time period of NFHS 1, 1999-2000 to NFHS 2 and that of 2004-05 to NFHS 3. The percentage of population living below poverty line in 1993-94 (based on mixed recall period) was 37 % in rural India and 33% in urban India (36% for combined). We have used the rural and urban cut off points from the respective wealth index to derive the poverty estimates. The estimated asset poor for the states, based on the national cut-off point is close to the planning commission's estimates for the states except for the period 2004-05 in the state of Maharashtra (table 2). For example, while 40% of Orissa's population were living below the poverty line in 2004-05 based on consumption expenditure data of NSSO, the asset poor based on the national cut-off point were estimated at 38%. The percentage of population shown as asset poor in the respective states is referred to as "poor" in further analyses.

The indicators used in the construction of wealth index may be grouped into three categories, namely, consumer durables, household amenities and housing quality and agriculture and related accessories. The variables were not uniformly available in all the three rounds and so the inclusion of variables in the construction of the wealth index was subject to availability and their significance. In general, the agricultural activities are less practised in urban areas and so the variables related to land and other agricultural accessories were not included in the construction of the wealth index in urban areas in any of the round. In case of rural, ownership of the house is

not included as more than 90% of the households own a house in rural areas. The factor score of the wealth index for the three periods are generated and shown in Appendix 1. The derived factor score serves as weight. In general, all the factor scores were in expected direction. The distribution of wealth indices were negatively skewed in rural areas and positively skewed in urban areas. Clumping, a situation, whereby a large proportion of households, have the same score is relatively lower, both in rural and urban areas. Similarly, truncation, a situation, where the score is distributed over a smaller range, appears to be minimal. Thus, the distribution of the wealth index suggests that the construction of wealth indices is reasonably good. Cronbach's alpha reliability value is more than 0.8 indicating that the correlation between the variables is high and the PCA is a suitable method of analysis.

Section II: Trends and Changes in Proximate Determinants of Fertility, Fertility Levels and Preferences among the Poor and Non-poor

Trends in Mean Children Ever Born (CEB) and Child Loss among the Poor and Non-poor:

We started the discussion by considering the mean children ever born (CEB), a cohort measure of fertility, that reflects the average number of children born to a woman during her life time. Though it reflects the cumulative fertility, it does not reflect the current fertility levels in the population. However, the mean CEB among women in the age group 40-44 or 45-49 reflects the completed family size and the end of the child bearing process. For younger women, the mean CEB may not be a suitable measure as they are still exposed to the child bearing process and are at various stages of family formation. Among other factors, the CEB is greatly affected by the marital duration and the survival status of the child.

In general, the mean CEB and mean child loss among the poor mothers is found to be higher than that of non-poor mothers cutting across the time, age group and the states (Table 3). Though many of the age groups had noticed a substantial decline in the mean CEB irrespective of their poverty status, the reduction in mean child loss was small among the poor. The poor-non poor ratio in mean child loss is computed to understand the differences in child death over the years and by age group. The closer the ratio to one, the lesser is the difference in child loss among the poor and non-poor. In general, the poor-non poor ratio in mean child loss had either remained similar or even increased except for the 15-19 age group in both the states. For example, in the age group 25-29 years, the ratio has increased from 2.00 to 2.09 in Maharashtra and from 1.27 to 1.74 in Orissa during 1992-93 and 2005-06. In fact, the increase in poor-non poor ratio of child loss was observed in all the five year age groups in Orissa and four of the seven age groups in Maharashtra. The only exception is the adolescent age group, probably because of sample size. The higher mean CEB among the poor in both the states may be attributed largely to the replacement effect where families replace death of one or more children with further births.

Trends and Change in Proximate Determinants of fertility:

Davis and Blake (1956) outlined a set of 11 'intermediate variables' through which the social, economic and cultural factors affect fertility. However, the four proximate determinants, namely, marriage, contraception, post partum amenorrhea and induced abortion explain 96% or more variation in fertility (Bongaarts 1982). We have examined the marriage practices, post partum amenorrhea, contraceptive use and additionally, breastfeeding practices among the poor and non-poor over a period of time. The duration and nature of breastfeeding practices (up to a certain period) are the major determinants of postpartum period (Habicht *et al* 1985; Huffman *et al*;

1987) and so the duration of breastfeeding is included in the analyses. The questions on abortion were not collected uniformly in the three rounds of NFHS and not used in the analyses.

With respect to marriage, early marriage of girls (marriage before the age of 18) is a significant contributor to fertility and has many adverse social, economic and health consequences. Accordingly, two indicators, namely the proportion of ever married women in the age group 20-24 marrying before the age of 18 (Legal age at marriage for girls in India) and the percentage of women never married in the child bearing age group (15-49) are computed for poor and non-poor in all the three period (Table 4). The finding reveals that majority of the ever married women aged 20-24 continued to marry below the legal age suggesting that the marriage practice has not changed much in both the states. More than two-thirds of recent marriages among the poor and about half among the non-poor were below the legal age in both of the states. However, among poor in Maharashtra, the proportion of never married women in childbearing age group had increased substantially compared to non poor. In case of Orissa, there is no significant change in proportion of never married women either among poor or non poor but remained at a higher level than that of Maharashtra.

The post partum amenorrhea and breast feeding practices has not changed over the years. For example, the mean postpartum amenorrhea was about 8 months for the poor and 7 months for the non-poor cutting across the states and time. On the other hand, there was significant increase the use of contraception, particularly limiting methods (largely female sterilisation) among both poor and the non-poor over the years. For example, in 2005-06, the use of sterilisation among the poor in Maharashtra was higher than that of non-poor (58% versus 52%). In case of Orissa too,

there was not much differences in the use of sterilisation among the poor and the non-poor (33% versus 35%). It may be mentioned that most of the women in India availed sterilisation services from public health centres at free of cost and incentive were given to couple to undergo sterilisation. On the other hand, the use of modern spacing methods, largely availed at private sources, was lower among the poor. The use of spacing method is linked to ability to pay and so is lower among the poor compared to non-poor in both the states.

Fertility Levels and Change:

The current fertility patterns are best measured by the age specific fertility rates (ASFRs) schedule and the Total Fertility Rate (TFR). Accordingly, the ASFR and TFR of the poor and the non-poor were computed from the births that occurred in the three years preceding the survey and shown in Table 5. The TFR among poor and non-poor had declined in both the states over time. In case of Maharashtra, the TFR among the poor had declined from 3.18 in 1992-93 to 2.5 in 2005-06 while it had declined from 2.72 to 2.03 among non-poor (almost equal reduction in TFR among the poor and the non-poor). The ASFR curve also reveals a similar pattern of child-bearings in all age groups among the poor and the non-poor (Figures 1a and 1 b) with a peak in the age group 20-24 years. The asset poor in Maharashtra (2005-06) formed just bottom 16% of the households in the state and fertility had substantially reduced even among them.

Fig 1 (a) : Age Specific Fertility Rate (ASFR) among the poor in Maharashtra, 1992-2006

Fig 1 (b) : Age Specific Fertility Rate (ASFR) among the non-poor in Maharashtra, 1992-2006

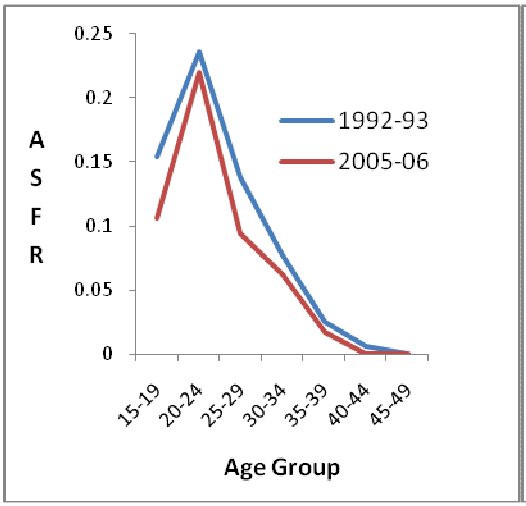


Fig 1 (c) : Age Specific Fertility Rate (ASFR) among the poor in Orissa, 1992-2006

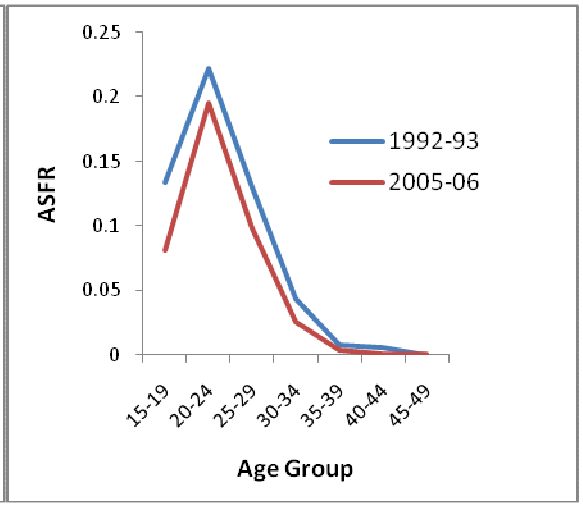
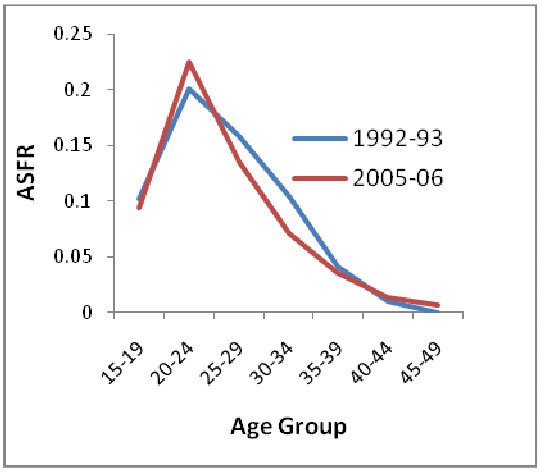
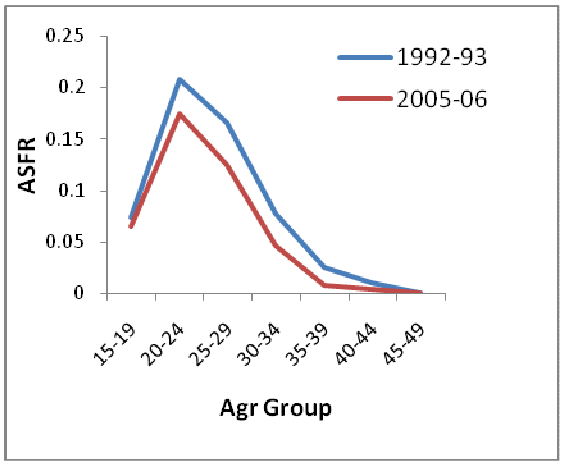


Fig 1 (d) : Age Specific Fertility Rate (ASFR) among the non- poor in Orissa, 1992-2006





In Orissa, the ASFR among the non-poor has declined for all age groups over the years. For the poor, there appears to be no change in the fertility level among younger age group but a reduction was noticed in later age (30 and above) group. In fact there was marginal increase in ASFR among poor in 20-24 age group but sharp reduction afterwards. The peak age of ASFR remains the same for both the poor and non-poor in both the states.

Fertility Preferences among the Poor and the Non-poor:

The ideal family size (IFS) and the desire for additional child (DAC) are two of the fertility preferences indicators collected in Demographic and Health Surveys and useful in explaining the fertility preferences of the population (Roy et al 2008). In Maharashtra, the mean IFS among the poor had declined from 2.80 in 1992-93 to 2.26 in 2005-06 while it had declined from 2.45 to 2.10 among the non-poor during the same period. The differentials in the mean IFS among the poor and the non-poor had narrowed down from 0.35 in 1992-93 to 0.16 in 2005-06 suggesting a substantial decline in fertility preferences among the poor in the state. In case of Orissa, the mean IFS had declined from 3.17 to 2.68 among poor and from 2.9 to 2.23 among the non-poor during the same period.

The desired for an additional child by the number of surviving children would better reflect the fertility preferences of the population. The response to the question on 'desire for additional child' includes a small proportion of the non-numeric responses such as "Up to God" and "Not Decided". However, we have tabulated the percentage of women with two or more surviving children who explicitly stated that they do not want any more children by selected characteristics and poverty status. The differences in desire for an additional child among the poor and the non-poor had narrowed down in Maharashtra and were small in Orissa. In both the states, the desire for an additional child with two or more surviving children had declined significantly among women cutting across the age, educational level, caste and religion during 1992-2006. The differences were large with respect to sex composition of living children. For example, the desire for an additional child with two surviving daughters had declined from 45% to 19% among the poor and 40% to 19% among the non-poor in Maharashtra and the patterns were similar in Orissa.

Health and Health Care utilisation among the Poor and the Non-poor:

A set of three maternal health care variables and four child health variables are computed for the poor and the non-poor over the three periods. Empirical studies amply demonstrated that health care utilisation and child survival are critical factors in the reduction of fertility. The maternal health variables considered in this paper are mother receiving three or more antenatal care for the last births in the three years preceding the survey, percentage of birth assisted by a health professional and percentage of currently married women with unmet need for contraception. The child health variables were percentage of children aged 12-23 months fully immunised, percentage of children under age three years who were severely underweight, infant mortality rate and child mortality rate for the poor and the non-poor. Each of the variables has considerable significance on reduction of fertility. The poor-non poor differences in maternal care utilisation remained large and in fact increased for both the states over the period. For example, the non poor-poor ratio in medical assistance at delivery had increased from 1.52 in 1992-93 to 1.73 in 2005-06 (Table 7). Though the patterns were similar in both the states, the coverage was lower in Orissa than Maharashtra. Similarly, the unmet need for contraception, particularly, the spacing method remained higher among poor than no poor in both the states. This partly explains the lower use of spacing method among the poor in both the states.

With respect to child health variables, the percentage of children who were severely underweight was about double among the poor compared to those among the non-poor in both the states. While the percentage of severely underweight children had either stagnated or declined among the non-poor, it had increased among the poor in both the states. The increase had been from 28% to 34% in Maharashtra and from 26% to 48% in Orissa, during 1992-2005. The infant mortality rate (IMR) and child mortality rate for the poor and the non-poor have been computed using children ever born and children surviving data. The UN MORTPACK 4 was used for

estimating the infant and child mortality. The estimated infant mortality among the poor was higher than that of the non-poor cutting across the states and time. In Maharashtra, the estimated IMR among the poor was 61 per 1000 live births compared to 47 among the non-poor in 2005-06. Similarly in Orissa, the estimated infant mortality among the poor was 93 compared to 77 per 1000 live births among the non-poor in 2005-06. Similar differences were also observed in child mortality

We hypothesise that the programme factors in motivating the contraceptive use would be similar to that of ante natal and natal care and child immunisation, at least in post ICPD 1994. Post ICPD, the Government of India had adopted target free approach and prioritise the antenatal, natal and postnatal services in the reproductive and child health programme. Since there were large differences in the utilisation of ante natal and natal services among the poor and the non-poor, we expect similar differences with respect to contraceptive use also. On the contrary, the differences in contraceptive use among the poor and the non-poor in both the sates were insignificant. Thus, the overemphasis of the family planning programme (only on sterilisation) and the rational thinking of the household amid economic stress may not be ruled out.

Section III: Poverty and Fertility Pathways

This section attempted to understand the role of changing economic status in fertility decline in both the states. A simple decomposition exercise is attempted. We have decomposed the TFR among the poor and the non-poor for two periods of time, namely, 1992-93 and 2005-06 for both the states. During this period, the percentage of asset poor had declined from 31% to 16% in Maharashtra (about 50%) and from 45% to 40% in Orissa (Table 8). The decline was noticeable in Maharashtra but not in Orissa. The decline in TFR due to decline in poverty (asset poor) was

9% in Maharashtra and 8% in Orissa. This tends to suggest that the reduction of poverty did not contribute to the reduction of fertility in a big way. It appears that the fertility reduction is independent of poverty reduction. These findings are consistent with the findings of 25 African countries that showed that fertility changes within countries are largely independent from changes in the economic status of population and poverty does not act as obstacle to fertility change in some of these countries. The proportion of fertility decline accounted by increase living standard varies from -2% in Cameroon to 26% in Ghana (Schoumaker 2004).

We further attempted to understand the contraceptive behaviour of a cohort of poor over a period of four years using the data from the longitudinal study for the state of rural Maharashtra. The longitudinal data would reflect the changing behaviour of the population. During the follow up study, women were asked *"Do you think that the economic condition of your household is better, worse, or the same as it was four year ago"*. The classification of poor and non-poor in 1998-99 (NFHS 2) by their perception of their economic status in 2002-03 is shown in Table 10. It was found that, among the poor in 1998-99, 80% perceived that their economic condition had either deteriorated or had remained the same as four years before compared to 61% among non-poor. Only, 9% among non-poor had stated that their condition had worsened over the last four years. For further analyses, those poor who perceived their economic condition remained same or deteriorated are considered as "remained poor" during 1998-2002. There is an advantage of such classification as the quantitative information are integrated with perceptions on their economic condition and these groups are definitely the chronic poor. Further, we attempted to understand the use of contraception during the inter-survey periods among the non-users in 1998-99. The difference in the use of any contraception among the poor and non-poor was 6.8 percent in 1998-99 (56.3% among poor and 63.1% among non-poor) and it reduced to 3 percent

in 2005-06 (Table 10). Among all non-users of contraception in 1998-99, the contraceptive use of any method among the poor was higher (58.2%) than that among the non-poor (55.6%) during the inter survey period. This indicates that poor are increasingly adopting contraception. This tends to support the hypothesis that poverty is not a barrier for contraceptive use and fertility reduction. It may be further mentioned that the use of the limiting method (both female and male sterilisation) was significantly higher among the poor than among the non-poor in Maharashtra in 2005-06 as well as among all new users in the inter-survey period.

Determinants of Contraceptive Use:

To understand the fertility reduction we have carried out a logistic regression analysis among non-users of contraception in rural Maharashtra in 1998-99. The dependent variable is the contraceptive use status in 2002-03 (1 for using and 0 for not using) and the independent variables are age of woman, educational level of the woman, caste, religion, sex composition of surviving children, home visit of health worker, any child loss and poverty status of the household (Table 11). The preference for a son is deeply rooted in India cutting across space and time. Accordingly, a variable such as no son but daughter and at least one son were computed and used in the analyses. Similarly, the home visit of the health worker, a programme variable, was combined to a composite variable that is, no visit, irregular visit and regular visit. Prior research suggests that the regular visit of a health worker is a significant determinant of service utilisation (Sinha et al 2006). Results revealed that, during the inter survey period, variables such as age, education, sex composition of living children and home visit of the health worker were significant predictor of contraceptive use. The poverty status of the household was not a

significant factor influencing contraceptive use. This further supports the hypothesis that there are no significant differences in contraceptive use among both the poor and non-poor.

Discussion:

As in many developing countries, fertility transition in Indian sates is a universal phenomenon; but marked with striking regional differences. The population theories or socio-economic theories have a limited explanation for fertility transition in many of these states. Prior to the 1990s, researchers attributed fertility change to women's education, change in economic condition, reduction of child marriage and rising cost of child care. Since the 1990s, the researchers had attributed the diffusion process accelerating the fertility transition in the country. However, the role of poverty in fertility reduction was least explored. The common notion is that higher fertility is the result of socio-economic backwardness and more specifically "poverty is a key explanatory variable of higher fertility". We have demonstrated that this not true, at least in economic sense and more particularly to poverty. While the district level analysis of Dreze and Murthy (2001) revealed a negative but an insignificant relationship of poverty and fertility, we believe that the relationship is getting stronger over the years and can best be tested by household data. Accordingly, we aimed at understanding the poverty and fertility relationship in two states of India.

We have selected two disparate states, at least in the economic sense, Maharashtra, an economically progressive state but one quarter of its population are living below poverty line and the state has reached the replacement level of fertility and Orissa with higher percentage of population living below poverty line and close to the replacement level of fertility. We have framed three hypotheses primarily to test the argument that poverty does not act as a barrier to

contraceptive use and reduction of fertility. Data from the three rounds of NFHS and the follow up study of NFHS 2 are used in the analyses. The demarcation of asset poor in NFHS is equivalent to national estimates of consumption poor and close to the time period of different rounds of NSSO.

Results revealed that the fertility level and fertility preferences had declined among the poor and non-poor in both the states. Reduction in the fertility level among the poor was more due to increase in contraception and less due to change in other proximate determinant including marriage practices. Though, the level of fertility is higher among the poor than among the non-poor, but this may be largely due to differences in maternal and child health care utilisation and infant and child mortality among the poor and non-poor. In fact, the non poor- poor gap in antenatal care, delivery care and child immunisation and infant and child mortality had increased while that of contraceptive use had declined in both the states. Though the fertility differences among the poor and the non-poor were noticeable, it was not so with respect to the contraceptive use. In fact, in 2005-06, the use of the modern limiting method was higher among the poor than the non-poor in Maharashtra and the differences were small in Orissa. The affordability to the spacing method probably restricts its use among the poor. The contraceptive behaviour of the poor and non-poor over a period of time suggests that among all non-users of contraception in rural Maharashtra in 1998-99, a higher proportion of the poor had accepted contraception compared to the non-poor. Further, the logistic regression controlling for other factors support the fact that there were no significant differences in contraceptive use among the poor and the non-poor in rural Maharashtra. The decomposition analysis showed that, the reduction of poverty though positive had contributed little to the reduction of fertility in both the states. The reduction

of fertility seems to be independent of the reduction of poverty in these two states. The study suggests that barriers other than poverty may be identified for reduction of fertility levels. Thus, we have validated the three hypotheses and the findings are similar to the fertility transition of other developing countries.

Conclusion:

From the above discussion, it may be concluded that poverty does not necessarily act as a barrier in the adoption of contraception and reduction of fertility in two disparate states of India. The poor are increasingly adopting contraception even with low maternal health care utilisation and higher infant and child mortality. Thus, the economic hardship leading to fertility reduction among the poor cannot be negated. Moreover, while the non poor- poor ratio in antenatal and natal care has increased, it has narrowed down for contraceptive use. The implication is to focus on antenatal care, natal care and child survival and on the contraceptive use of the poor so as to realise the goals of Millennium Declarations.

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Foot Note:
[1]*Distribution effect*: High fertility leads to increase in unskilled labour and decline in real wage rate.

Table 1: Socio-economic and demographic profile of Maharashtra, Orissa and India

INDICATOR	Maharashtra	Orissa	India
Population in million (1st March), 2009[a]	109	40	1160
Annual Natural Growth rate of population [b]	1.15	1.24	1.57
Infant Mortality Rate [b]	34	71	55
Total Fertility Rate [c]	2.11	2.37	2.68
Life expectancy at birth [d]	67.2	59.6	63.5
Maternal Mortality Ratio [e]	149	358	301
Female Literacy Rate [f]	67.0	50.5	53.6
Percent urban [f]	42.4	15.0	27.8
Religion composition [g]			
Hindus	80.37	94.35	80.46
Muslims	10.60	2.07	13.43
Others	9.03	3.58	6.11
Per capita Net National Product (NNP)/ State Domestic Product Percapita in 2007-08 in RS[h]	41331	23403	33283

[a] Office of the Registrar General and Census Commissioner, India, 2006; [b] Sample Registration System Bulletin (SRS), 43(1), October 2008, Office of the Registrar General, Government of India, New Delhi; [c] IIPS and Macro International (2007), National Family Health Survey 3, [d] Abridged Life Table 2002-07, Analytical Studies, Report No.3, Registrar General of India, New Delhi; [e] Special Survey of Deaths Maternal Mortality in India: 1997-2003, Trends, Causes and risk factor, Registrar General of India and the centre for global health research, university of Toronto, Canada
[f] Office of the Registrar General and Census Commissioner, India, 2004, Population Profiles [g] http://www.censusindia.gov.in/ [h] Economic Survey, 2008-09, Ministry of Finance, Govt of India, Oxford University Press

Table 2: Planning Commission estimates on percentage of population living below poverty line and the percentage of asset poor in Maharashtra, Orissa and India, 1992-06

Percentage	Maharashtra	Orissa	India
Pl commission estimates on poverty, 1993-94	37	49	36
Asset poor, 1992-93	31	45	36
Pl commission estimates on poverty, 1999-2000	25	47	26
Asset poor, 1998-99	27	44	26
Pl commission estimates on poverty, 2004-05	25	40	22
Asset poor, 2004-05	16	38	22

Poverty estimates of planning commission referred to the mixed recall period

Table 3: Mean children ever born and mean child loss among ever married women by poverty status in Maharashtra and Orissa, 1992-2006

Age Group/ State	1992-93				2005-06				Poor-non poor ratio in child loss	
	Poor		Non-poor		Poor		Non-poor			
	Mean CEB	Mean Child Loss	Mean CEB	Mean Child Loss	Mean CEB	Mean Child Loss	Mean CEB	Mean Child Loss	1992-93	2005-06
M	**A**	**H**	**A**	**R**	**A**	**S**	**H**	**T**	**R**	**A**
15-19	1.04	0.09	0.80	0.07	0.67	0.06	0.59	0.03	1.29	0.50
20-24	2.08	0.19	1.74	0.10	1.77	0.13	1.40	0.07	1.90	1.86
25-29	3.26	0.38	2.52	0.19	3.13	0.23	2.10	0.11	2.00	2.09
30-34	4.28	0.49	3.11	0.26	3.50	0.30	2.64	0.16	1.88	1.88
35-39	4.43	0.74	3.51	0.38	3.39	0.40	3.04	0.21	1.95	1.90
40-44	4.71	0.83	3.85	0.49	4.19	0.77	3.23	0.28	1.69	2.75
45-49	4.84	1.24	4.49	0.77	4.47	0.64	3.33	0.34	1.61	1.88
All	3.22	0.45	2.78	0.29	3.01	0.32	2.43	0.17	1.55	1.88
				O	**R**	**I**	**S**	**S**	**A**	
15-19	0.80	0.12	0.52	0.07	0.49	0.00	0.52	0.19	1.71	-
20-24	1.70	0.25	1.36	0.16	1.71	0.21	1.24	0.11	1.56	1.91
25-29	2.84	0.47	2.53	0.37	2.77	0.33	2.01	0.19	1.27	1.74
30-34	3.80	0.66	3.40	0.49	3.41	0.53	2.65	0.22	1.35	2.41
35-39	4.35	0.99	4.13	0.69	3.65	0.64	3.10	0.43	1.43	1.49
40-44	4.88	1.29	4.72	0.76	4.14	0.99	3.64	0.52	1.70	1.90
45-49	5.29	1.67	5.04	1.02	4.47	1.10	3.87	0.72	1.64	1.53
All	3.14	0.64	2.96	0.46	3.01	0.51	2.51	0.32	1.39	1.59

Table 4: Proximate Determinants of fertility among poor and non-poor in Maharashtra and Orissa, 1992-2006

Variables	Poor			Non-poor		
	1992-93	1998-99	2005-06	1992-93	1998-99	2005-06
	Maharashtra					
Percentage of ever married women age 20-24 marrying before 18 years of age	77.0	77.8	69.1	59.0	52.2	51.5
Percentage of never married women in 15-49 age group	10.3	12.3	16.9	20.0	21.5	22.1
Mean duration of breastfeeding (in months) for surviving child born in last three years	14.14	13.33	13.89	12.64	12.87	13.34
Mean duration of post partum amenorrhea (in months) for surviving child in last 3 years	8.27	7.90	7.13	7.01	6.17	5.92
Current use of contraception (any method) among currently married women or their husbands						
Percentage using spacing method	3.0	2.6	3.6	9.4	10.6	15.1
Percentage using limiting method	44.3	50.7	58.3	46.9	52.6	52.5
Percentage using any method	47.3	53.3	61.9	56.3	63.2	67.6
	Orissa					
Percentage of currently married women age 20-24 marrying before 18 years of age	74.2	69.3	72.2	52.0	46.3	45.3
Percentage of never married women in 15-49 age group	20.0	20.6	20.5	25.6	26.3	25.7
Mean duration of breastfeeding (in months) for surviving child born in last three years	14.96	14.62	15.27	14.25	14.42	15.29
Mean duration of post partum amenorrhea (in months) for surviving child in last 3 years	8.00	8.43	7.45	6.97	7.15	6.23
Current use of contraception (any method) among currently married women or their husbands						
Percentage using spacing method	2.4	7.5	10.6	6.3	13.6	19.3
Percentage using limiting method	32.7	34.7	32.6	30.7	36.2	35.0
Percentage using any method	35.1	42.2	43.3	37.1	49.8	54.3

Table 5: Estimated ASFR and TFR of poor and non-poor in Maharashtra and Orissa, 1992-2006

			Maharashtra			
			Poor		**Non-poor**	
Age Group	1992-93	1998-99	2005-06	1992-93	1998-99	2005-06
15-19	0.154	0.131	0.106	0.134	0.128	0.081
20-24	0.236	0.237	0.22	0.222	0.219	0.195
25-29	0.138	0.121	0.094	0.13	0.101	0.098
30-34	0.077	0.031	0.062	0.044	0.035	0.026
35-39	0.025	0.023	0.017	0.008	0.009	0.004
40-44	0.006	0	0	0.006	0	0.001
45-49		0	0	0	0	0.001
TFR	3.18	2.71	2.50	2.72	2.46	2.03
			Orissa			
			Poor		**Non-poor**	
Age Group	1992-93	1998-99	2005-06	1992-93	1998-99	2005-06
15-19	0.102	0.089	0.094	0.074	0.072	0.065
20-24	0.201	0.169	0.225	0.208	0.177	0.175
25-29	0.158	0.15	0.136	0.166	0.129	0.125
30-34	0.105	0.086	0.071	0.077	0.059	0.046
35-39	0.041	0.033	0.036	0.025	0.017	0.008
40-44	0.01	0.006	0.014	0.01	0.007	0.004
45-49	0	0	0.007	0	0.002	0
TFR	3.08	2.66	2.92	2.80	2.31	2.11

Table 6: Percentage of currently married women not desiring for an additional child with two surviving children (1992-2006) and mean ideal family size in 2005 -06 among poor and non poor by selected characteristics

Background characteristics	Maharashtra						Orissa					
	Desired for additional child with 2 surviving children				Ideal family size		Desired for additional child with 2 surviving children				Ideal family size	
	Poor		Non-poor		Poor	Non poor	Poor		non-poor		Poor	Non poor
	1992-93	2005-06	1992-93	2005-06	2005-06	2005-06	1992-93	2005-06	1992-93	2005-06	2005-06	2005-06
Age												
Less than or equal to 30	18.3	6.0	15.3	5.4	2.10	1.97	21.1	17.2	14.6	14.2	2.5	2.05
30 and above	3.8	2.8	0.9	1.1	2.3	2.17	5.0	4.2	3.1	0.5	2.76	2.36
Years of schooling												
Up to five years	11.1	4.3	6.0	1.3	2.26	2.24	11.5	7.8	6.4	2.7	2.71	2.48
More than five years	4.7	0.0	4.4	2.7	2.08	1.99	10.3	4.0	5.2	1.8	2.09	1.91
Sex composition												
No son	45.0	19.2	40.3	19.4	2.06	1.89	55.9	35.1	45.8	27.3	2.35	2.01
At least one son	8.1	3.0	3.8	1.0	2.26	2.15	8.1	5.7	4.2	0.7	2.79	2.31
Caste												
Scheduled caste/tribe	14.9	3.7	6.0	2.4	2.21	2.13	15.9	9.6	8.8	3.5	2.80	2.47
Others	9.1	3.8	5.4	1.7	2.23	2.08	8.9	4.4	5.4	1.8	2.43	2.13
Religion												
Hindus	8.6	4.3	4.9	1.2	2.18	2.04	11.3	8.0	5.9	2.4	2.66	2.23
Muslims	19.0	6.1	10.8	5.1	2.71	2.46	22.2	0.0	0.0	0.0	2.15	2.50
Others	10.1	0.0	1.7	3.1	2.04	2.08	8.3	0.0	13.6	10.0	2.95	2.39
Residence												
Rural	11.7	3.4	4.5	2.4	2.20	2.12	10.1	2.2	4.0	0.9	2.74	2.29
Urban	9.9	4.1	6.0	1.5	2.25	2.07	11.7	8.8	6.5	2.6	2.33	1.96
All	10.5	3.8	5.4	1.9	2.22	2.09	11.5	7.7	6.1	2.4	2.67	2.23

Table 7: Utilization of reproductive health services, underweight of children, IMR and child mortality among poor and non-poor in Maharashtra and Orissa, 1992-2006

Health care Utilisation	Poor			Non-poor			Non poor-poor ratio	
	1992-93	1998-99	2005-06	1992-93	1998-99	2005-06	1992-93	2005-06
		Maharashtra						
Percentage of Mother receiving three or more ANC during last live birth in three years	47.7	47.8	54.0	71.0	73.3	80.6	1.49	1.49
Percentage of births assisted by medical professionals in last three years	40.4	37.8	44.4	61.4	68.2	76.7	1.52	1.73
Percentage of currently married women in unmet need for contraception								
Spacing method	8.1	9.9	7.2	5.9	7.5	5.1	0.73	0.71
Limiting method	6.3	5.7	4.5	6.6	4.9	4.0	1.05	0.89
Any method	14.4	15.6	11.7	12.5	12.4	9.1	0.87	0.78
Percentage of children aged 12-23 months covered under full Immunisation	51.9	60.3	42.1	70.8	77.8	61.7	1.36	1.47
Percentage of children under age three years who are sever underweight	28.0	26.8	34.3	17.4	14.2	16.8	0.62	0.49
IMR	76	60	61	51	41	47	0.67	0.77
Child mortality rate	36	24	24	18	13	16	0.50	0.67
		Orissa						
Percentage of mother receiving three or more ANC during last live birth in three years	26.0	36.1	47.9	42.7	58.0	68.7	1.64	1.43
Percentage of births assisted by medical professionals in last three years	13.9	20.7	26.8	28.0	44.1	59.3	2.01	2.21
Percentage of currently married women in unmet need for contraception								
Spacing method	10.3	8.0	7.1	11.5	9.1	6.7	1.12	0.94
Limiting method	9.6	7.6	9.7	9.1	6.5	7.4	0.95	0.76
Any method	19.9	15.6	16.8	20.6	15.6	14.1	1.04	0.84
Percentage of children aged 12-23 months covered under full Immunisation	27.1	29.9	37.2	43.4	49.7	61.6	1.60	1.66
Percentage of children under age three years who are sever underweight	26.4	26.8	30.3	19.2	15.9	15.8	0.73	0.52
IMR	111	99	93	97	80	77	0.87	0.83
Child mortality rate	68	57	50	55	39	36	0.81	0.72

Full immunisation refers to BCG+3DPT+3 Polio+ Measles

Table 8: Decomposition of Total Fertility Rate (TFR) by poverty status in Maharashtra and Orissa, 1992-2006

	TFR 1992-93	TFR 2005-06	Change in TFR, 1992-06	Proportion of poor in 1992-93	Proportion of poor in 2005-06	Change in proportion of poor, 1992-06	Change in TFR due to change in poverty proportion	Change in TFR due to other factors	Percentage change in TFR due to change in poverty	Percentage change in TFR due to change in other factors
M	**A**	**H**	**A**	**R**	**A**	**S**	**H**	**T**	**R**	**A**
Poor	3.18	2.5	-0.68	0.31	0.16	-0.15	-0.0705	-0.6869	9.31	90.69
Non poor	2.72	2.03	-0.69	0.69	0.84	0.15				
Combined	2.90	2.10	-0.8							
			O	**R**	**I**	**S**	**S**	**A**		
Poor	3.08	2.92	-0.16	0.45	0.40	-0.05	-0.405	-0.4515	8.23	91.77
Non poor	2.80	2.11	-0.69	0.55	0.60	0.05				
Combined	2.90	2.40	-0.50							

Table 9: Perception on economic status of households in 2002 by poverty status in 1998-99 in rural Maharashtra

Perception on economic status during inter survey period (1998-2002)	Asset Poor, 1998-99	Asset Non-poor, 1998-99
Better	19.5	38.9
Worse	12.4	8.7
Same	68.1	52.5
Total Percent	100	100
N	307	808

Table 10: Current use of contraception during 1998-2002 among all non-users of contraception in 1998 by poverty status in rural Maharashtra

Family Planning Methods	Remained poor during 1998-2002	All other
Pill	0	2.3
IUD	0	1.0
Condom	1.0	2.6
Periodic Abstinence	2.9	3.9
Withdrawal	0	0.3
Female sterilization	48.5	44.1
Male sterilization	5.8	1.0
Any Spacing method	3.9	10.5
Any Limiting Method	54.3	45.1
Any method	**58.2**	**55.6**
N	103	306

Table 11: Determinants of contraceptive use (during inter survey period) among non-user of contraception in 1998 in rural Maharashtra

Explanatory Variables	Exp (B)	Sig
Age		
Less than equal to 30	1	
30+	0.494	.008
Education		
Illiterate	1	
Little but middle school completed	1.860	0.021
High school completed and above	4.213	0.001
Caste		
Schedule caste	1	
Schedule Tribe	0.723	0.518
Others	1.218	0.644
Religion		
Hindus	1	
Muslims	1.114	.865
Others	2.227	.174
Sex composition of living children		
No son but daughter	1	
At least one son	11.836	.000
Home visit of Health Worker		
No visit	1	
Irregular visit	1.651	0.058
Regular Visit	1.847	0.036
Any child loss	1.053	0.849
Poverty status		
Remained poor	1	
Otherwise	0.719	.249
Constant	0.106	0.000

Appendix 1: Factor score (weight) of variables used in construction of wealth index, India 1992-06

Sr No	Variables	2005-06		1998-99		1992-93	
		Rural	Urban	Rural	Urban	Rural	Urban
	Consumer Durables						
1	Mattress/ Sofa	0.165	0.203	0.229	0.238	0.231	0.245
2	Pressure cooker	0.240	0.235	0.250	0.255	***	***
3	Chair	0.230	0.211	0.249	0.239	***	***
4	Cot	0.090	0.141	0.106	0.152	***	***
5	Table	0.237	0.229	0.254	0.244	***	***
6	Radio	0.132	0.120	0.177	0.167	0.234	0.214
7	Black and white television	0.112	-0.038	0.195	0.038	0.296	0.289
8	Colour Television	0.216	0.235	0.177	0.223	***	***
9	Sewing Machine	0.169	0.150	0.179	0.177	0.216	
10	Mobile	0.181	0.205	***	***	***	***
11	Telephone-non mobile	0.200	0.202	0.166	0.210	***	***
12	Computer	0.070	0.125	***	***	***	***
13	Refrigerator	0.185	0.229	0.195	0.239	0.204	0.247
14	Watch	0.162	0.137	0.218	0.190	0.256	0.235
15	Bicycle	0.069	0.056	0.115	0.092	0.134	0.122
16	Motorcycle	0.194	0.197	0.194	0.208	0.214	0.217
17	Car	0.091	0.115	0.087	0.108	0.096	0.115
18	Electric fan	0.237	0.186	0.261	0.222	0.318	0.287
19	VCD/VCR	***	***	***	***	0.087	0.150
	Housing and household amenities						
20	Improved drinking water	0.038	0.029	0.023	0.053	0.051	0.077
21	No toilet facility	-0.218	-0.204	-0.228	-0.216	-0.268	-0.238
	Pit toilet	0.022	-0.045	0.115	-0.018	0.105	-0.052
	Flush toilet	0.226	0.209	0.193	0.191	0.256	0.246
22	Cooking fuel	0.195	0.245	0.208	0.269	0.214	0.282
23	Electricity	0.193	0.157	0.204	0.173	0.254	0.236
24	Person per room						
	2	0.049	0.074	0.134	0.164	0.137	0.158
	3-4	0.020	0.002	-0.071	-0.094	-0.065	-0.071
	5 and more	-0.076	-0.094	-0.090	-0.114	-0.097	-0.125
25	Floor type/kachha house	0.206	0.177	-0.169	-0.152	-0.169	-0.206
26	Wall type/Semi pucca house	0.187	0.169	0.003	-0.146	0.003	-0.112
27	Roof type/ Pucca house	0.130	0.139	0.208	0.226	0.208	0.256
28	No window	-0.192	-0.182	***	***	***	***
	Window without cover	0.014	-0.087	***	***	***	***
	Window with cover	0.193	0.210	***	***	***	***
29	Kitchen	0.148	0.209	0.173	0.208	0.179	0.211
30	Own House	**	0.041	**	0.039	***	***
31	Bank/post office account	0.175	0.194	***	***	***	***
	Land and agricultural accessories						
32	Water Pump	0.117	**	0.139	**	***	***
33	Thresher	0.060	**	0.067	**	***	***
34	Tractor	0.089	**	0.095	**	***	***
35	No land	-0.038	**	-0.057	**	-0.048	**
	Marginal holding (Upto 2.5 acer)	-0.032	**	-0.031	**	-0.047	**
	Small holding (2.51-5 acer)	0.035	**	0.036	**	0.025	**
	Medium/Large holding (5+ acer)	0.085	**	0.094	**	0.107	**
36	Any Irrigated Land	0.059	**	0.066	**	0.048	**
37	Animal drawn cart	0.048	**	0.057	**	***	***

* Type of house as Kachha, Semi Pucca and Pucca used for NFHS 1 and NFHS 2, ** Collected but not used, *** Not collected