Original Article

DISADVANTAGEOUS SITUATION OF TRIBAL WOMEN AND CHILDREN OF ORISSA, INDIA: A SPECIAL REFERENCE TO THEIR HEALTH AND NUTRITIONAL STATUS

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ABSTRACT

Background: Orissa, one of the most scenic state in eastern India occupies a unique place in the tribal map of the country having largest number of tribal communities with a population of 8.2 million constituting 22.3% of state's population and 9.7% of the total tribal population of the country. This study aims to explore the health and nutritional disadvantage among tribal women and children in Orissa in comparison to non-tribals.
Methods: Data on a representative sample of 4,540 women (comprising 955 tribal and 3,585 non-tribal women) and 1,599 children (426 tribal and 1,173 non tribal) from the third National Family Health Survey (NFHS-3, 2005-06) for the state of Orissa was used. Simple bi-variate analysis has been applied and a disadvantage ratio was computed for key health and nutritional indicators for women and children.

Results: Tribal women as compared with non tribal women were 2.3 times more illiterate, 2.5 times more likely to bear a child by age 19 years, 2.1 times more likely in not receiving 2+ Tetanus Toxoid injection during pregnancy and 2.7 times more likely to have 4+ children, 1.3 times more likely to be underweight and anemic and were 4 times more likely to never/occasionally consume milk/curd or pulse/beans. Tribal children of Orissa were 2.6 times less to receive any vaccination, 1.4 times more anemic, 1.6 times more underweight and had 1.3 and 1.8 times higher risk of infant and under five mortality compared to non-tribal children.

Conclusion: These finding calls for urgent implementation of special health care strategies for reducing health and nutritional disparities among the tribal women and children population of Orissa.

Key words: Tribal women, children, maternal health, nutrition, disadvantage ratio, Orissa, India.

INTRODUCTION

India is a home to more than half the world's tribal population. Over 84 million people belonging to 698 communities are identified as members of Scheduled Tribes (ST) in India [1], constituting 8.2% of the total Indian population [2] which is four times larger than that of the population of Australia. Scheduled Tribes are mainly the tribal population in India that the Government of India identifies as socially and economically backward and are in need of special protection from social injustice and exploitation. The Government of India identifies communities as scheduled tribes based on a community's 'primitive traits, distinctive culture, shyness with the public at large, geographical isolation and social and economic backwardness', with substantial variations in each of these dimensions with respect to different scheduled tribe communities [3]. Through a constitutional mandate, formulated in 1950, scheduled tribes have been formally recognized as a distinct community in India [4]. There exist clear government policies for

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affirmative action targeted at scheduled tribes [1], and their members are routinely enumerated in national surveys [5-7] and censuses. The proportion of scheduled tribes in the total Indian population has increased from 5.3% in 1951 to 8.2% in 2001 since their formal recognition in 1950. The concentration of scheduled tribes varies substantially across the Indian states.

Orissa, one of the most scenic state in eastern India, occupies a unique place in the tribal map of the country having largest number of tribal communities (62 tribes including 13 primitive tribes) with a population of 8.15 million constituting 22.3% of state's population [2] and 9.7% of the total tribal population of the country. The recently conducted National Family Health Survey (NFHS-3, 2005-06) also shows that 21% of the total women sample populations of Orissa belong to scheduled tribe [8]. The Scheduled tribe population in the State is overwhelmingly rural, with 94.5% residing in villages. Out of 62 Scheduled tribes, Khond is the most populous tribe constituting 17.1% of the total ST population followed by Gond having 9.6% share in the total ST population (Census of India, 2001). Six other tribes namely, Santhal, Kolha, Munda, Saora, Shabar and Bhottada along with Khond and Gond constitute 64.2% of the total ST population of the State [9].

Tribal population is the most marginalized and vulnerable communities in India [10-12]. In India tribal are neglected a lot, discriminated in terms of income distribution and social status. Most of them are desperately poor, backward, generally uneducated and lead a hard and miserable life [13]. The tribal societies in India are undisputedly considered to be the weakest sections of the population in view of common socio-economic and socio demographic factors such as poverty, illiteracy, lack of developmental facilities and lack of adequate primary health facilities [11,14]. Despite the protection given to the tribal population by the constitution of India in 1950, scheduled tribes remain the most disadvantaged groups in India [15]. They are disadvantaged not only in comparison to the general population, but also compared to those from 'Scheduled Caste'. In fact, the socio-economic and health conditions of tribal populations in post-independence India has worsened in many ways [16].

Tribal women in India are at a great disadvantage due to illiteracy and ignorance [17]. Tribal women are malnourished [18,19] and their dietary energy intake is not adequate to compensate their heavy physical workload [20]. Tribal women with poor health and nutrition are more likely to give birth to low weight infants [21,22]. They are also less likely to be able to provide food and adequate care for their children. As a women's health affects the household economic well being, therefore as a women with poor health will be less productive in the labour force. While malnutrition is prevalent among all segments of the population, poor nutrition among women begins infancy and continues throughout their lifetime [23].[23] Because of prevailing culture and traditional practices in India, the health and nutritional status of women becoming worse effected. It is a striking feature that though the tribal women in India suffer from high levels of morbidity and mortality, they do not generally seek medical aid from facilities such as health centers [24]. The extent of knowledge and practice regarding family planning was also found to be low among the scheduled tribes [25].

Tribal people are amongst the poorest and most marginalized population groups experiencing extreme levels of health deprivation [26]. Although several studies on maternal health and nutritional status have been carried out in India among the general population, there is a dearth of information pertaining to the health and nutritional status among women in tribal populations. Given the fact that every twelfth woman in India belongs to a tribal community, improving their health status becomes an important developmental goal. Improving tribal people's health, especially women's health, as well as eliminating the tribal /non- tribal health divide requires the addressing of the knowledge gap related to understanding the patterns of tribal health deprivation. Since the state of Orissa has a sizeable proportion of tribal population, knowledge of the health and nutritional status of tribal women needs special attention. This study focuses broadly on the differentials existing in health and nutritional parameters among tribal and non-tribal population in the state of Orissa. More specifically this study aims to explore the disadvantageous condition of tribal women and children of Orissa in terms of socio-demographic, health and nutritional status.

METHODS

Data

Data for the study has been extracted from the recently conducted National Family Health Survey (NFHS-3, 2005-06). This survey was designed on the lines of the Demographic and Health Surveys (DHS) (available at www.measuredhs.com) that have been conducted in many developing countries since the 1980s. Briefly, NFHS-3 collected demographic, socioeconomic, and health information from a nationally representative probability sample of 109,041 households. All states of India are represented in the sample (except the small Union Territories), covering more than 99% of the country's population. The sample is a multi-stage cluster sample with an overall response rate of 98%. Details of sample design, including sampling frame and sample implementation, are provided in the basic survey report for all India [7]. NFHS-3 provides information on women's fertility and family planning, and important aspects of health, nutrition, and health care.

For this study, data from NFHS-3 for the state of Orissa has been analyzed. NFHS-3 has collected data of a representative probability sample of 4,540 ever-married women aged 1549 years residing in 3,910 households in the state of Orissa [8]. The analysis in this study is based on a representative sample of 4,540 ever-married women (comprising 955 tribal and 3,585 non-tribal women) and 1,599 children (comprising of 426 tribal and 1,173 non tribal from Orissa.

Statistical Analysis

Simple bi-variate analysis has been carried out and the results are shown in percentage for different health and nutritional indicators. To examine and compare the disadvantageous condition of tribal women with the non tribal women in the state itself, a disadvantage ratio (DR) has been computed for key indicators by dividing the indicators of tribal to non-tribal. For example, higher ratio value of any indicator means poorer the conditions. DR of more than 1 represents poorer conditions of tribal women than non-tribal women. However, DR of less than 1 represents better conditions of tribal women than non-tribal women. And the DR value of exactly 1 shows a similar status of tribal women and non-tribal women.

Human subject's informed consent

The analysis presented in this study is based on secondary analysis of existing survey data, with all identifying information removed. The survey obtained informed consent from each respondent before taking the interview.

RESULTS

Profile of tribal and non-tribal women of Orissa

Table 1 presents the percentage distribution of tribal and non-tribal women aged 1549 years in Orissa by selected socio-economic and demographic characteristics. One out of five tribal women falls in the age group 1519 years, a majority of them resides in a rural area, almost three fourth were illiterate and only 1% completed higher education (high school and above). Not only a majority of tribal women of Orissa were illiterate themselves, but a substantial proportion of their husband were also illiterate (54% of tribal husband vs 23% of non-tribal husband). More than half of the tribal women were currently working and two-third belongs to household with lowest wealth quintile. Nearly half of the tribal women were not exposed to any media at all. 96% tribal women follow Hindu religion.

Table 1: Percentage distribution of Tribal and Non-tribal women age 15-49 by selected characteristics, Orissa, India, 2005-06

Characteristics	Tribal women	Non-tribal women
Age		
15-19	22.5	18.6
20-34	49.9	50.6
35-49	27.6	30.8
Residence		
Rural	90.2	80.3
Urban	9.8	19.7
Educational status		
No education	73.7	31.5
Primary	10.2	21.0
Secondary	15.2	41.7
Higher	0.9	5.8
No education	53.6	22.7
Primary	20.3	23.2
Secondary	21.3	41.6
Higher	1.7	11.4
Working Status		
Not working	47.6	77.8
Working	52.4	22.2
Religion		
Hindu	95.8	97.6
Non Hindu	4.2	2.4
Wealth index		
Lowest	66.7	27.9
Second	19.5	20.3
Middle	8.5	20.7
Fourth	3.0	16.6
Highest	2.2	14.4
Exposure to mass media		
Not exposed	46.6	16.5
Exposed	53.4	83.5
Number of women	**955**	**3,585**

Socio-demographic and behavioral characteristics and disadvantage ratio

Table 2 presents the socio-demographic and behavioral characteristics among tribal and non-tribal women in terms of illiteracy, husband's illiteracy, wealth status, and media exposure and their successive Disadvantage ratio. For illiteracy, the DR was 2.3 times higher in tribal women than non-tribal. Similar DR is also found for husband illiteracy and belonging to lowest wealth quintile. Behavioural characteristics such as tobacco smoking and alcohol drinking were higher among tribal women of Orissa. The DR for smoking tobacco is 7 for tribal women. Moreover, more than one-third tribal women consume smokeless tobacco. However, a much wider DR (46) was noticed for drinking alcohol where one out of every ten tribal women drinks alcohol almost every day.

Table 2: Socio-demographic and behavioral characteristics among Tribal and Non-tribal women and the Disadvantage Ratio, Orissa, India, 2005-06

Characteristics	Tribal women	Non-tribal women	Disadvantage ratio
Socio-demographic			
Women illiterate	73.7	31.5	**2.3**
Husbands illiterate	53.6	22.7	**2.4**
Belonging to lowest wealth quintile	66.7	27.9	**2.4**
Not exposed to any mass media	46.6	16.5	**2.8**
Behavioral			
Smokes tobacco	2.8	0.4	**7.0**
Consume smokeless tobacco	37.4	24.9	**1.5**
Consume alcohol almost every day	9.2	0.2	**46.0**

Maternal health status and disadvantage ratio

Table 3 presents the maternal health status and their successive Disadvantage ratio for tribal women of Orissa. A higher proportion of tribal women (one-fourth) became mother by age 19 giving a DR of 2.5. More than one-third (37%) of tribal women have undergone a birth order of more than 4 children, which gives a DR of 2.7. Despite having a birth order of 4+, desire to have more children with four living children was quite substantial (more than fivefold) among tribal women than non-tribal women (12% and 2.4% respectively), describing a DR of 5. Total Fertility Rate (TFR) for Orissa tribal women was 3.1 compared to only 2.2 among non-tribal women, depicting a DR of 1.4.

In case of three-fourth of tribal women, the antenatal care provider was not a doctor, one-fourth of tribal women had not received 2+ Tetanus Toxoid injections, making a DR of 2.5 and 2.1 respectively. However, this gap was not noticed in case of Iron and Folic Acid tablets consumption during pregnancy. 88% of tribal women had a non-institutional delivery with 83% deliveries not assisted by health personnel (DR 1.6 and 1.9 respectively). As there were more non institutionalized deliveries, three-fourth of the tribal women had no post natal check up (PNC) and 81% did not have a PNC within 2 days of delivery. A higher proportion (65%) of tribal women of Orissa were currently not using any contraception positioning the tribal women on a DR of 1.4. In not hearing about HIV/AIDS, the DR was 2.6.

Table 3: Maternal health status among Tribal and Non-tribal women and the Disadvantage Ratio, Orissa, India, 2005-06

Characteristics	Tribal women	Non-tribal women	Disadvantage ratio
Maternal health Indicators			
Begun childbearing by age 19	25.3	10.2	**2.5**
Birth order 4+	36.7	13.7	**2.7**
Total Fertility Rate	3.1	2.2	**1.4**
Desire for more children after 4+ living children	12.0	2.4	**5.0**
ANC provider was not a doctor	74.2	30.2	**2.5**
No 2+ TT injections	26.7	12.7	**2.1**
Not consumed IFA tablets for at least 90 days	68.4	65.1	**1.1**
Did not had ultrasound for the last pregnancy	95.9	81.6	**1.2**
Non institutional delivery	88.3	53.7	**1.6**
Delivery not assisted by a health personnel	82.7	44.3	**1.9**
No Post natal checkup	74.5	52.9	**1.4**
No Post natal checkup within 2 days	81.4	60.6	**1.3**
Currently not using any contraception	64.8	45.0	**1.4**
Not heard about HIV/AIDS	67.4	25.6	**2.6**

†*doctor, ANM, nurse, midwife, LHV, other health personnel*

Nutritional status and disadvantage ratio

Table 4 gives the nutritional status among Tribal and Non-tribal women in terms of never or occasional intake of specific food items, salt iodization, anemia and underweight status and their Disadvantage Ratio. Nine out of ten tribal women never or occasionally consume milk or curd, two out of five never or occasionally consume pulse or beans and almost one out of ten never or occasionally consumes dark green, leafy vegetables. 91% of tribal Orissa tribal women never or occasionally consume milk/curd compared to 70% of non tribal women. Disadvantage ratio for pulses or bean consumption for Orissa tribal women was as high as 3.9. In other way, Orissa tribal women were more than eight times less likely to consume dark green, leafy vegetables, almost four times less likely to consume pulses or beans than their non tribal counterparts. The effect of nutritional intake was visible on the women's nutritional status, as more than half of tribal women of Orissa were underweight (Body Mass Index =18.5 kg/m^2) compared to 39% of non-tribal women, making a DR of 1.3. Similarly higher percentage of tribal women of Orissa were anemic (hemoglobin level =12.0 g/dl) than non tribal women (74% vs. 58%), depicting a DR of 1.3.

Table 4: Nutritional status among Tribal and Non-tribal women and the Disadvantage Ratio, Orissa, India, 2005-06

Characteristics	Tribal women	Non-tribal women	Disadvantage ratio
Nutrition Indicators			
Never/occasionally consume:			
Milk or curd	90.6	70.1	**1.3**
Pulse or beans	19.7	5.0	**3.9**
Dark green, leafy vegetables	7.9	0.9	**8.8**
Fruits	94.8	85.4	**1.1**
Eggs	66.5	68.1	**1.0**
Fish	69.1	42.6	**1.6**
Chicken/meat	87.8	83.6	**1.1**
Salt not iodized at all (0 ppm)	33.7	20.8	**1.6**
Anemia (hbd12.0g/dl)	73.8	57.8	**1.3**
Underweight (BMI d18.5 kg/m^2)	51.3	38.9	**1.3**

†*ppm-parts per million*

Health and nutritional status among tribal children and disadvantage ratio

Table 5 presents the health and nutritional status for tribal and non tribal children of Orissa and the successive disadvantage ratio. Not only tribal women but also the tribal children of Orissa were very much disadvantage in terms of health and health care such as complete immunization, vitamin A supplementation and nutritional status such as anemia and under nutrition. 22% of tribal children had not received any vaccination compared to 9% of non-tribal children, making Orissa tribal children 2.6 times more disadvantage in immunization. 86% of tribal children age 6-59 months did not receive Vitamin A supplementation in the last 6 months compared to three-fourth non-tribal children.

Looking into the anemic and malnutrition status, tribal children were far behind than non-tribal children. 80% of Orissa tribal children were anemic and one out of ten suffered from childhood diarrhea in the last two weeks preceding the survey making a DR of 1.3 and 1.1 respectively. More than half of the tribal children were underweight (low weight for age) than 35% of non-tribal children, depicting a DR of 1.6.

Manifestation of poor health seeking and nutritional status were quite visible on the mortality situation among tribal children. Mortality rates among tribal children of Orissa were more than non-tribal children (see Table 5). Infant mortality rate was 16 point more among tribal (78.7/1000 live births) than non-tribal (62.5/1000 live births) counterparts, making disadvantage ratio as 1.3. Even more disadvantageous condition for under five mortality among tribal was found. Orissa tribal children were 1.8 times higher disadvantageous than non-tribal children for under five mortality. Under five mortality is 136.3 /1000 for Orissa tribal children compared to 77.5/1000 for non-tribal children.

Table 5: Health and nutrition status among Tribal and Non-tribal children and Disadvantage Ratio, Orissa, India 2005-06

Child health and mortality indicators	Tribal children	Non-tribal children	Disadvantage Ratio
Children age 12-23 months who did not receive any vaccination	22.3	8.5	**2.6**
Children age 6-59 months who did not receive Vitamin A supplementation in last 6 months	85.5	76.7	**1.1**
Children age 6-59 months who are having any anemia	80.1	59.6	**1.3**
Children under age 5 who had diarrhea in last two weeks preceding the survey	12.2	11.4	**1.1**
Children underweight (low weight for age)	54.2	34.8	**1.6**
Neonatal mortality rate/1000 live birth	54.0	42.6	**1.3**
Infant Mortality Rate/1000 live birth	78.7	62.5	**1.3**
Under five mortality rate/1000 live birth	136.3	77.5	**1.8**
Total	**426**	**1,173**	

DISCUSSION

Tribal populations are amongst the poorest and most marginalized groups in India experiencing extreme levels of health deprivation [3]. Notably, the health and economic disparities between tribal and non-tribal populations are universal, and it persists globally [27,28]. There exist few systematic accounts of the health of tribal peoples in developing countries and intensive research on tribal women's health in India, and more specifically in the state of Orissa, is inadequate. From this perspective, this study examined the disadvantaged condition of the tribal women in Orissa, India, in terms of socio-economic, demographic and health indicators through constructing a 'Disadvantage Ratio', by exploring the data of 4,540 women extracted from India's third National Family Health Survey conducted during 2005-06 in the state of Orissa.

The study has two major findings related to patterns of health and nutritional disadvantage among tribal women in Orissa. First, there are substantial maternal health and nutritional disadvantage among tribal women than non-tribal, the disadvantage ratio being inexplicably higher for most of the indicators for tribal women. The disadvantage in these parameters such as socio-economic, demographic, maternal health and nutrition among tribal and non-tribal women accounts for a substantial division between these two groups. Other important finding of this study is that there are substantial heterogeneities in all the socio-demographic and health parameters between the tribal and non tribal women and children of Orissa. Differentials in the educational attainment and standard of living are major producers of health-related heterogeneities within tribal populations [29]. This finding reiterates the importance of social and economic well-being in creating health differences within tribal groups, as well as between tribal women and non-tribal women.

Our study showed a different pattern of age-structure for tribal and nontribal women. Tribal women are often in a younger cohort than nontribal women, which shows a relatively high prevalence of lower age at marriage among tribal women. A huge gap has been noticed in educational attainment between tribal and non-tribal women. A majority of the tribal women of Orissa were illiterate. Also, there exists more than an eight-fold gap between both the groups in education level of high school and above. Tribal women were very less exposed mass media which deters them in their development and utilization of healthcare services. Also, there was a huge gap in economic status between tribal and non-tribal women. A substantially higher proportion of tribal women belong to the lower wealth quintile household and almost negligible proportions are from higher wealth stratum of the society.

The poor literacy coupled with non exposure to mass media was apparent on early age of childbearing among the tribal women of Orissa. Our findings show that a higher proportion of tribal women of Orissa are in the higher birth order (4+) and desire more children after having four living children. The possible reason for this high desire for children could be high infant and child mortality among the tribal population in India [22], which is largely due to lack of health care and poor condition of water and sanitation. Maternal health care is an important aspect of health seeking behavior, which is largely neglected among the tribal women of Orissa [24]. At the same time contraceptive use among this group is quite low. Use of modern methods of contraception is significantly less among the tribal women in India [30] and thus unintended pregnancies are quite high among the tribal women [31].

Malnutrition as expected is the most common health problems among tribal women of Orissa as in other tribal population of India [19,23,32-33]. Generally, tribal diets are seen to be deficient in protein, iron, iodine and vitamins [34]. A comparative analysis of nutritional status of tribal and non tribal women shows poor pattern of consumption of some important and specific food items except green leafy vegetables. The effect of nutritional deficiency is visible on the women's health also as we found a substantially higher proportion of tribal women of Orissa are underweight as well as anemic.

Our study clearly indicates that tribal populations in Orissa, India display little health modernity as compared to the rest of the population [35]. Their own beliefs, illiteracy, poverty and lack of access to scientific information contribute to this low health modernity status. It also emphatically brought out in our study the differential in the socioeconomic demographic, health and nutrition parameters among the tribal and non-tribal women in Orissa. The study finds that the tribal women of Orissa are in a vulnerable condition. They are not only disadvantageous from the non-tribal women within the state but also from the tribal women of all India in various aspects (analysis not shown). The disadvantage ratios for almost all indicators are unfavorable for Orissa tribal women. For some indicators the disadvantage ratio increases two folds, e.g. belonging to lowest wealth stratum, non exposure to mass media, begun childbearing by age 19, birth order 4+, ANC provider was not a doctor, not receiving two or more TT injections during the pregnancy, and knowledge about HIV/AIDS. In never/occasionally consuming green leafy vegetables and pulses or beans at least once a week the disadvantage ratio was fourfold and eightfold respectively. Also, malnutrition is pervasive with high prevalence of anemia among the tribal women. All these are likely to have not only an adverse long-term impact on their own health and well being, but also on that of their children which is also imperative from this study. Tribal children in comparison to non-tribal children of Orissa were 2.6 times less to receive any vaccination, 1.4 times more anemic, 1.6 times more underweight and had 1.3 times higher risk of infant mortality 1.8 times higher risk of under five mortality.

CONCLUSION

Our study demonstrated that, tribal women and children of Orissa were deprived in important aspects of health and nutrition. The finding calls for urgent implementation of special health care strategies for reducing health and nutritional disparities among the tribal population of Orissa. The health of the tribal women will play an important role in shaping the future population scenario of the state because every fourth person in the state is a scheduled tribe.

In India, the National Health Services have often neglected the tribal people in general and tribal women in particular. In 1982, with the establishment of the National Health Policy, the Indian government declared the need to improve the health status and quality of life of underprivileged groups. However, programs to improve the health status and quality of life of underprivileged groups cannot succeed unless they form part of a larger effort to bring about an overall transformation of society. The interventions for improving the health status of women under the Government of India's Child Survival and Safe Motherhood Programme, have not been able to significantly improve the services for women, especially among the tribal women and children of Orissa.

To achieve holistic development, attention should be given more towards the health of the tribal women in a realistic manner. Their health status can be improved significantly by scientifically executed intervention with target-appropriate educational material and techniques. There is an urgent need for the educational empowerment of the tribal women in Orissa. In order to improve the health status of the tribal women in Orissa, the health care delivery system should be designed effectively to cater to the specific needs of the tribal women during pregnancy and at childbirth by ensuring their personal involvement. Second, the 'Information Education and Communication' should reach all tribal women for enhancement of knowledge of HIV/AIDS and 'Behavioural Change Communication' should be strengthened to utilize more health care services. Health interventions must focus on tribal culture, medical training of the tribal people and a knowledgeable health care delivery system catering to the needs of tribal women.

In conclusion we can say that while there are critical issues related to political and social marginalization that are central to improving the health and wealth of tribal populations in absolute terms. Our findings suggest that a focused approach to addressing inequalities in social and economic well-being within and between the tribal and non-tribal populations in Orissa would contribute to reducing health inequalities to a large extent.

Limitations of the study

Although rigorous methods were employed to maintain the data quality of NFHS-3, some limitations are inherent to a cross-sectional survey of this type, which involves reporting of past behaviors. Also, what has been reported in this study as the contribution of socio-economic status in perpetuating the tribal/non-tribal health divide, and the extent of socio-economic inequalities in health within tribal groups, are likely to be underestimates of the true contribution of socioeconomic circumstances to explaining health differentials between and within population groups

[36]. It is, however, possible that the socio-economic measures considered in this study may not have the same meaning within tribal and non tribal peoples, leading to inadequate control for this determinant of health differences between the population groups [37].

Although retrospective surveys are good sources with which to analyze the reproductive process of women, recall errors are a common feature of these survey data, especially in poorly developed societal conditions. Nevertheless, the study clearly shows empirically the disadvantageous condition of tribal women and children of Orissa and the need for urgent appropriate action.

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