



LOSS OF LIFE YEARS OF BEEDI WORKERS AN EMPIRICAL STUDY IN PURULIA DISTRICT OF WEST BENGAL

Economics

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ABSTRACT

In order to reduce the escalating production costs within the factory sector, there has been a tremendous growth of home-based work based on sub contracting. This form of work within the home-based production offers lesser protection to workers. Longer working hours in an unhealthy working condition is increasing the morbidity of the workers. Workers are suffering from various reported ailments and this attempt has studied the mortality pattern of the selected workers. Premature death out of occupational health ailments were studied in the sample worker families along with and medical advice seeking behavior of the workers. The study found hazardous nature of work like beedi rolling has significant adverse impact on mortality along with health advice seeking behavior of the workers. Based on primary data collected from 1152 beedi rollers on different settlements in and around Jhalda, Purulia, the study found estimated impact of socio economic indicators along with beedi rolling works on health status of the worker families. The study used cross section data collected from 576 beedi workers and 576 non beedi workers living in four different blocks of Purulia District. We used STATA 11 software for estimating our model.

KEYWORDS

Occupational Health; Health Hazards; Beedi Workers; Life Year Lost; Purulia

1. INTRODUCTION

A healthy workforce is vital for sustainable social and economic development. With time, role of labor in the production system has been changed drastically. In order to reduce the escalating production costs within the factory sector, there has been a tremendous growth of home-based work as entrepreneurs; decentralize production by subdividing the entire production process into elements that need not be carried on at one place. Big companies sub-contract their work to smaller units or contractors who distribute the work to the workers who work at home according to the requirements of the employers and hand over the finished products to them (Pandey, 1989). Home based work relies largely on female labor in comparison to the factory or shop where fewer women are employed (GOI, 1988). The organization and distribution of work within the home-based production offers less protection to workers, and leads to the non-recognition of issues of occupational health of workers.

The traditional approach of ensuring health and safety in the workplace has depended mainly on the enactment of legislation and inspection of workplaces to ensure compliance with health and safety standards. While this approach has been effective in controlling many specific occupational hazards mainly for the factory based workers in industrially developed countries but has not been found very effective in the past several decades, particularly in developing countries. The ultimate burden is borne by the labor force itself in the short run and the national economy as a whole in the long run.

1.1 Defining Occupational Health

There is a continuous two-way interaction between a person and the physical and psychological working environment: the work environment may influence the person's health either positively or negatively and productivity is, in turn, influenced by the worker's state of physical and mental well-being. Population of the developing world is increasing most rapidly adding new batches of laborer with the existing stock but not creating enough number of jobs as new technologies are truncating existing jobs and hiring cheap labor even outside the geographical boundaries of a country. Literature calls it jobless growth. The potential threat of not getting a job or even losing the existing one is compelling laborer to take part in hazardous and exploitative production system with gross violation of existing labor laws. Both feelings of job insecurity and knowledge of impending job loss have been associated with mental and physical health complaints. If unemployment persists, the person's health continues to decline and chronic disorders can appear. The mental and financial distress caused by the joblessness or by job loss can spread to other family members. In a developing country, these can have profound effects that spread beyond the worker's own family since, where there is limited paid employment; a person in a well-paid job exerts an important influence in the community.

Working on a sub contracting basis is a regular practice in many developing countries especially in Asia and Africa. In the absence of acceptable alternatives, workers choose hazardous activities and that too with harsh working conditions. Exploitative production relations and unhygienic production process often take a great toll on workers and their family member's health.

The nature and extent of the problem is not often understood and considered as important in many places resulting direct loss of resources to the society and indirect threats to the environment which can be prevented. Many environmental hazards and burdens are derived from occupational settings, e.g. industry, agricultural practices, transportation and services. Those responsible for occupational health and safety are well informed of processes and agents that may be hazardous to the environment. Often this information is available to them from the earliest stage of a problem enabling primary prevention which is no longer possible once the hazardous elements are released into the general environment.

1.3 Beedi Industry in India

Beedi rolling is a traditional agro-forest based industry, spread over almost all major states in India. A beedi is a thin Indian indigenous cigarette made of tobacco flake wrapped in a tendu leaf and secured with coloured thread at lower end. Beedi industry in India employs over 4 million people, the lion share being women. About 19% of tobacco consumption in India is in the form of cigarettes, while 53% is smoked as beedis. It is cheap form of tobacco smoking especially for rural people. Work is done through contractors and by distributing work in private dwelling houses where the workers take the raw material given by the contractor and handover the finished product to him. It is an arduous, labour intensive task because each beedi is rolled individually. Women constitute a very high percentage of labour force in the industry. The reason for this is, firstly, the work is done generally from home and women can do it while at the same time attending to their children and other household chores; secondly, their deft fingers are more suited to the work of beedi rolling, besides, women are considered to be more sincere and hardworking.

Although Beedi manufacturing is undertaken throughout the length and breadth of the country, over the passage of time some prominent centre of production has emerged. Since very small amount of capital is required to set up a beedi manufacturing unit, the established employers find it very convenient to shift their units from one state/area to another. Thus, whenever minimum wages fixed by the state government get increased or the enforcement of social security laws is made more effective, the employers find it convenient to leave for greener pastures in the adjoining states with the sole aim of reaping more profits and in the process leaving their workers high and dry. This has resulted in shifting of centre of concentration of beedi making over

the years. This has also resulted in unemployment and under-employment, as the workers who had worked in beedi making job which involves very less physical labour for a long time, find it very difficult to get adjust in any other job involving more physical labour. Common occupational health problems faced by the beedi workers are Skeleto-Muscular; Respiratory; Gastrointestinal; Neurological and Others.

Jhalda I & II, Arsha and Joypur these four blocks constitute our study area which comes under extended part of Chhotonagpur Plateau & is located roughly 45 km. away from Purulia Town According to 2011 census the total population of these four blocks was 5.66 lakhs. Large section of its working population is engaged in Beedi rolling. Lack of other employment opportunities often forces them to earn their livelihood from beedi making alone. Frequency of visit to a doctor is very high among these workers.

Only basic medical advice and medicines are available in Beedi Workers Health Clinic (SCMMU; Jhalda) they have to go to private clinics and some times out of stations for health treatment. Some of the beedi rollers are also engaged with other part time jobs like crop cultivations, wage labour etc. but due to lack of work opportunities they are rolling beedis as a safety net of family income. Long hours of work specially by the females leaves lesser time left for maintaining personal health and hygiene as well as that of other family members especially of young ones and the aged ones in these families. They live at settlements mostly without any sanitation facilities and waste disposal system, making them almost like huge waste dumping yards. Open defecation is the most common practice among the people here. Some drains are there but rarely cleaned, solid wastes are disposed in the common passage in most cases in the roads in front of houses making it a huge common dustbin.

Due to inclined land structure rain water rarely gets stored but runs off easily to lower parts of West Bengal like Midnapur, Howrah etc. Ground water level is very deep and people are dependent on common water bodies like tanks, ponds, rivers, dug well or bore wells. Through public efforts safe drinking water is made available in many places but water bodies are very ill maintained and drinking water sources are ill managed. Lack of management of water bodies and drinking water sources are making availability of usable water scarce.

Objective of the Study

1. To look into the fact whether beedi workers are facing more health hazards than non-beedi workers of the area or not
2. Whether female workers are more adversely affected by the occupational health consequences or not
3. How family size affects occupational health consequences of the workers
4. Whether education is playing important role on occupational health outcomes of beedi and non-beedi workers
5. How working hours are influencing occupational health outcomes of beedi and non beedi workers
6. Whether workers of different reserved category are facing more adverse affects of occupational health hazards
7. Whether the occupational health hazards increases with income earned by these workers and how far that is significant Section two of this study surveyed the literature in brief. The third section discusses about the data sources, modeling and methodology. Fourth section covers the empirical estimation and analysis of the results. Fifth and final section depicts conclusion and recommendations of this study.

2. Survey of literature

Lot of research works have been made on the beedi workers covering various issues of the workers in different states of India. Important works gone through for this research are listed below.

M.Mohandas,(1980), throws light on the conditions of the workers in the beedi industry all over the country. This work has highlighted the miserable life of workers in specific regions of Maharashtra, Karnataka and West Bengal. This paper explains the economic conditions of beedi workers, and highlights the impact of existing

labour legislation in the industries of Kerala. He reported high incidence of occupational diseases owing to exposure to tobacco and postural problems arising out of the monotonous work.

M.Gopal (1999) discussed about the production of beedi, through contracting to home-based workers. The home workers work as housewives, care for children and perform her household tasks at the same time they can use their time in wage work. Women put in long hours to fulfil production targets set by employers but have no idea how their wage rate is determined.

Sudarshan R and Kaur R, (1999) envisaged gender perspective on the employment situation in the beedi industry and highlighted the policy issues relating to women's employment in this industry. The estimated number of women in the beedi manufacturing in India vary from 2.2 to over 4 million and 192,000 are girls under the age of 14 years. The bargaining position of beedi workers is weak. Various strategies were suggested by the Government for empowering women beedi workers, organizing the workers to demand their rights, and creating new livelihoods for them. Bagwe Bhisey (1995) pointed out the elevation of mutagenic burden among beedi industry workers. Kuruvilla *et al.* (2002) investigated on occupational dermatoses in beedi rollers. Occurrences of callosities and nail changes were argued to be associated with the extent of work. Mandelia *et al.* (2010) analyzed the effects of occupational tobacco exposure on fetal growth and claimed that exposure beyond 6 h per day has trivial but definite adverse effects. According to Bagwe and Bhisey (1991) and Swami *et al.* (1995) beedi rollers are exposed to unburnt tobacco, mainly through the cutaneous and nasopharyngeal routes. Ranjitsingh and Padmalatha (1995) reviewed that beedi rollers were affected by respiratory disorders, skin diseases, gastrointestinal illness, gynaecological problems, lumbosacral pain and are susceptible to fungal diseases, peptic ulcer, haemorrhoids and diarrhoea. Numbness of the fingers, breathlessness and stomach pains including cramps and gas, have also been reported in beedi rollers (Dikshit and Kanhere 2000; Mittal *et al.* 2008), found that postural pains, eye problems and burning sensation in the throat are common ailments in women beedi rollers. Bhisey *et al.* (2006) recorded that inspirable dust of tobacco in the tobacco factory was associated with chronic bronchitis in workers. Kaur S, Ratna R (1999); Aghi and Gopal (2001) reported indurations of the hands and complications of pregnancy in women beedi rollers.

Nakkeeran, Pugalendhi (2010) accounted respiratory, gastrointestinal, and osteological problems among beedi rollers in four districts of Tamil Nadu. Yasmin *et al.* (2010) shed some light on the work related health issues of female beedi rollers in Patna, Bihar. The study identified lower haemoglobin levels and SGPT (ALT) enzyme concentration among beedi rollers. Joshi *et al.* (2013) made an epidemiological survey of occupational health hazards among beedi workers of Amarchinta, Andhra Pradesh and noticed that almost 90% of the workers developed pain in various body parts, the prominent among them being shoulder pain, back pain and neck pain. Prakash Vyas (2013) examined the association between occupational tobacco exposure and health risks among women beedi rollers in Ajmer. The tobacco dust contain toxic nitrosamines which is readily absorbed by body tissues giving rise to cough, breathlessness, ocular and dermatological health issues. The ocular manifestations among beedi rollers were furthermore discussed by Mittal *et al.* (2008). Umadevi *et al.* (2003) made a study on the Cytogenetic effects in workers occupationally exposed to tobacco dust. An increase in frequencies of chromosomal abbreviations was observed among the exposed group. Mahimkar Bhisey (1995) made similar inferences.

Manjula Anil, Leonard Machado, Anna Sequeira, K. S. Prasanna & Jayaram Subramanya, 2012, in their research paper entitled, " Study of morbidity pattern of female beedi workers in the urban field practice area of Mangalore, Southern India" showed common problems of beedi rollers are musculoskeletal disorders followed by anaemia. Also gastrointestinal disorders, obstetric and gynaecological conditions, ophthalmic conditions, were the common health problems encountered in this group.

Kate Summers, Kimberly Jinnett & Stephen Bevan, 2015 showed, living in a community with high household poverty rates and lower educational attainment is associated with poorer outcomes in relation to hip osteoarthritis. For individuals with systemic lupus erythematosus, early work disability has been found to be associated with having an income below the poverty line as well as with receiving

Medicaid or having no health insurance (Partridge et al., 1997). The characteristics of some low-paying jobs that mean individuals are more likely to develop Musculo Skeletal Disorder, or are more likely to suffer detrimental effects of a musculo skeletal disorder once it has developed.

Various health ailments are making these workers more morbid and that leads ultimately to premature death of the workers themselves or some times for the family members who are indirectly suffering from these work practices. Literature has shown several theoretical aspects of occupational health hazards but quantitative analysis are rarely attempted to measure the nature and extent of this problem.

3. Data, Modeling and Methodology

Longer working hours for prolonged period of time in an unhealthy working condition is likely to increase the morbidity of the workers. Workers are suffering from various reported ailments and we have studied the morbidity pattern of the selected workers. Types of ailments in last six months time along with the number of times medical advices taken for each types of problems are studied for the sample workers.

Incidence of premature death out of work related hazards have also been studied among beedi and non beedi workers. We have attempted to find out the factors which are significantly affecting Family Years Lost for Death (FYLD) among the workers in the study area.

3.1 The Model

We have fitted a simple regression model, where we have taken Family Years Lost for Death (FYLD) as our dependent variable and regressed it by Ordinary Least Squares Technique to find out the impacts of sex (SEX), education (EDN), beedi worker (BWORKER), average daily hours of beedi rolling activity (ADHBRA), average daily hours of other economic activity (ADHOEA), reservation status (RESSTAT), and average monthly income (AVGINC) on FYLD.

$$FYLD = \beta_0 + \beta_1 SEX + \beta_2 FAMSIZ + \beta_3 EDN + \beta_4 RESSTAT + \beta_5 BWORKER + \beta_6 ADHBRA + \beta_7 ADHOEA + \beta_8 AVGINC + U$$

In our study area we have divided total workers in two broad groups as beedi worker and non beedi worker. Beedi workers are supposed to get free medical advices and medicine from the central government health clinic for the beedi workers along with health service facilities by the regular public health service providers in the area. We have collected the data on the types of reported ailment and the frequency of a particular type in last six months of time for a worker. Family Year Lost for Death was calculated from the death statistics of the family in last five years recall period. The difference of life years between the expected life years (Census, 2017) of a member and the life year lived by the member calculates the FYLD of a family. It is expected that beedi roller families will face more health hazard than other non beedi workers and this will increase their morbidity leading towards greater loss of family years due to death out of direct and indirect impact of occupational health hazards. Female workers use to make a balance between regular household works along with participation in direct earning activities. Females learn beedi rolling from their early childhood. They start with helping elders and usually become beedi roller at an early age. It improves the economic wellbeing of the family as well as chances of their better marriage. Girls enroll in schools but unlike boys rarely go to it, rather rolls beedi to support family as well as future. Girls get married at an early age and incidentally become mothers early also. Apart from beedi rolling they use to perform various other economic activities in agriculture, household industries and in service sectors along with their regular household works as cleaning, washing, baby care, caring of aged, water collection, cooking etc. Male workers usually go for outdoor works for cultivation in the season or wage works but many roll beedi uninterruptedly while at home. It is expected that (SEX) will have definite impact on FYLD of the workers as their nature and durations of work are different. Education gives new opportunities and consciousness. Family size is usually big among these workers. A relatively bigger family helps in additional working hands but at the same time makes all vulnerable with lower level of effective care required for all. It is expected that a big family size will have definite effect on the FYLD for these workers. Workers with relatively more family education are likely to be less susceptible to FYLD as they will look for other work opportunities and try to manage the work in such a way that they will face lesser problem. We have taken the number of years spent by the family members of the worker in school (EDN) to study the impact of education on FYLD. Average daily working hours (ADHBRA, ADHOEA) have direct

impact on FYLD. Longer and monotonous works in fixed postures are likely to increase the health problems for the workers. More hours of beedi rolling activity daily implies greater exposure to tobacco related toxicity and increased probability of health ailments but it ensures certainty of income to meet several other needs of the family. More hours of other economic activity implies greater physical exhaustion with uncertain income earning opportunities or distress employment. Income indicates wellbeing of a worker. More income from beedi rolling may demand for higher hours of work for an unskilled worker but a skilled worker can earn high income with relatively lesser time as well. We have taken average monthly income (AVGINC) of a worker to study the impact of income on FYLD of a worker.

3.2 Specification and Measurement of the Variables

FYLD: Family Years Lost for Death represent the difference between the expected life years of a member and the life year lived by the member of a family. We have considered deaths of a family member only within last five years recall period. In case of more than one death we have considered the aggregate life year lost by the family.

SEX: It represents the gender of the family head of the worker. It is a binary variable taking value "0" for a male worker and "1" for a female worker.

FAMSIZ: The variable measures the size of the family and measured in number of persons. A family is defined as a unit with one cooking arrangement for all members.

EDN: The variable measures educational level of the workers family. It is measured by the number of years spent by all members of the worker in schools. It is measured by number of years.

ADHBRA: Average daily number of hours spent in beedi rolling activity by all workers in the family and is measured in number of hours per day.

ADHOEA: Average daily number of hours spent in other economic activities by all workers in the family and is measured in number of hours per day.

RESSTAT: It measures whether the family belongs to any reserved category or not. If it comes under reservation category then value of the variable is "1" otherwise "0". We have considered SC, ST, OBC category workers only as reserved category workers.

BWORKER: This variable indicates whether the family's main occupation is beedi rolling or not. If main occupation is beedi rolling then value of the variable is "1" otherwise "0".

AVGINC: This variable indicates average monthly income earned by all family members of the family and is measured by number of rupees. U: Error term.

3.3 Hypotheses

Hypothesis-1: FYLD is likely to increase for women workers. $H_0: 10b >$ against $H_1: 10b <$

Hypothesis-2: FYLD is likely to increase with increase in family size of the workers. $H_0: 20b >$ against $H_1: 20b <$

Hypothesis-3: FYLD is likely to decrease with increase in family education of the workers $H_0: 30b <$ against $H_1: 30b >$

Hypothesis-4: FYLD is expected to higher in case of families with reservation status. $H_0: 40b >$ against $H_1: 40b <$

Hypothesis-5: FYLD is expected to be higher in case of families whose main occupation is beedi rolling. $H_0: 50b >$ against $H_1: 50b <$

Hypothesis-6: FYLD will increase with increase in average daily hours of beedi rolling activity of the family. $H_0: 60b >$ against $H_1: 60b <$

Hypothesis-7: FYLD is likely to increase with increase in average daily numbers of hours spent in other economic activities. $H_0: 70b >$ against $H_1: 70b <$

Hypothesis-8: FYLD is likely to increase with increase in average monthly income of the worker. $H_0: 80b >$ against $H_1: 80b <$

3.4 Methodology and Data

Research design adopted for this study was descriptive cross-sectional. With respect to the concentration of beedi workers Purulia district is the fourth highest only after Malda & Murshidabad & Midnapur West. But alternative work opportunities for beedi rollers are least in Purulia as agriculture is very much underdeveloped due to unavailability of water poor soil condition and industries are almost absent. Household industrial activities are not economically prosperous and viable. Many people remain engaged in household industries as agriculture is only seasonal and only possible in rainy season. Large number of rural people is rolling beedis as very few other alternative options are left to them. Out of twenty blocks Jhalda I, Jhalda II, Arsha and Joypur are the four blocks with relatively high concentration of Beedi workers. More than 80 % of beedi workers of the entire district are working in these four blocks. We have selected five villages of each block as survey area where more than 70 % of the total workers are beedi rollers. We have taken sample size proportional to the total households of the village. Number of households was selected using random numbers from different villages. On the basis of pilot study conducted in the study area 1152 workers were selected. Questionnaire was prepared with the aid of literature and consultation with experts and doctors for interview purpose. Finally 30 questions are formed under five dimensions:

1. Environment and sanitation condition of beedi workers.
2. Socio-economic status of the beedi workers.
3. Physical health and occupational health profile of beedi workers.
4. Emotional fittings.
5. General awareness.

Door to door survey was conducted for data collection by pre-designed, pre-tested questionnaire and analyzed by appropriate statistical methods. Based on primary data the model has been estimated using Ordinary Least Square Technique using STATA 11 and analyzed also by MS Excel software.

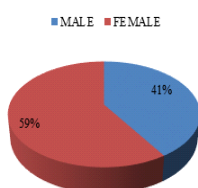
4. Empirical Estimation and Analysis

Estimation and analysis part is broadly divided in two parts as Descriptive Statistics and Estimation.

4.1 Descriptive Statistics

We have considered total 1152 workers in our study area out of which 576 are beedi workers and other 576 workers are non beedi workers. All the workers are working in various economic activities falling under unorganized sector. The qualitative statistics are presented in the graphical mode and the quantitative features are presented in a tabular form below. However we have also presented them graphically wherever required.

Figure 4.1.1 Sex wise Distribution of Beedi Workers, Purulia,2011



Among all beedi workers 59 percent is female where as 41 percent of beedi workers are male. Out of all non-beedi workers 66 percent are females and only 34 percent of the non-beedi workers are male. As Purulia is an underdeveloped district, work opportunities are relatively scarce in this area. High percentages of female workers in the unorganized sector indicate that there exist distress employment situation in the study area. Low agricultural activities, lack of industries and entrepreneurial activities are making the to joining of female labour in this sector a natural outcome.

Figure 4.1.2 Sex wise Distribution of Non-Beedi Workers, Purulia,2011

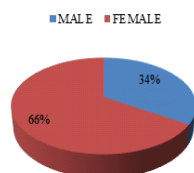
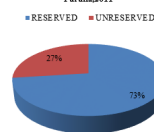
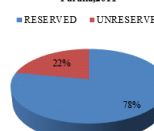


Figure 4.1.3 Reservation wise Distribution of Beedi Workers, Purulia,2011



Among all beedi workers 73 percent is reserved category workers where as only 27 percent are unreserved. Out of all non-beedi workers 78 percent are reserved category workers and only 22 percent of the non-beedi workers are unreserved. From the historical time concentration of tribal people is high in and around the table land of Chhotonagpur. The tribal aboriginals and jungle based people who got backward caste status later mainly constitute the population base of the study area.

Figure 4.1.4 Reservation wise Distribution of Non-Beedi Workers, Purulia,2011



Quantitative descriptive statistics of our study are presented in Table:4.1.1 below. Our sample consists of 1152 workers half of them are beedi worker and rest are non beedi worker. Considering all workers together we find medical advices taken by a worker is a little more than two (2.21) in six month recall period. Study shows maximum 5 visits to the doctor by a worker in the same period. Workers are there who has not visited a doctor for health problems. The value of standard deviation is as high as, 1.57 which indicates among the workers there is high differences as far as health hazards are concerned. We also find average family size of workers is 6.24 higher than the district as well as state average. Study shows in the chosen sample highest family size of a worker is 11 and lowest one is a 3 member family. The value of standard deviation is as high as, 1.69 indicating high differences among the workers with respect to family sizes. Average family education of the workers is 13.80 years corresponding maximum and minimum are 34 and 5 years. Study shows there are no families without few years of institutional education. Many families are there where incidence of school education is older than first generation. Education has spread among all workers but importance of education is not so well understood as the value of standard deviation is as high as, 5.79. Considering all workers together we find on an average workers do 10.53 hours of economic activities for earning. Study shows some are working as long as 14 hours a day and some are not working at all. The value of standard deviation is as high as, 4.62 indicating existence of high differences with respect working hours among the workers. Average family income of the workers is Rs. 13731/- with a maximum of Rs. 34119/- and a minimum of Rs. 20/- only. There exists high difference among the worker families with respect to average monthly family income earned with a standard deviation as high as Rs. 7438/-. Study reveals on an average every worker's family at Purulia has lost nearly 16 years due to premature death of a member. The highest loss is as high as 60 years. There are families who have not faced such unfortunate situation as well. The dispersion is high too (15 years), indicating incidence is prevalent but not too common for all workers.

Table 4.1.1: Descriptive Statistics of Selected Workers, Purulia, West Bengal 2011

All workers							
	FRVD OC	FAMS IZE	EDN	ADHAE A*	AVGI NC	FY LD	
Mean	2.21	6.24	13.80	10.53	13731.25	15.89	
Median	2.00	6.00	13.00	9.00	11970.00	11.00	
Maximum	5.00	11.00	34.00	14.00	34119.00	60.00	
Minimum	0.00	3.00	5.00	0.00	20.00	0.00	
Std. Dev.	1.57	1.69	5.79	4.62	7438.39	15.63	
Observations	1152.00	1152.00	1152.00	1152.00	1152.00	1152.00	
Beedi Workers							
	FRVDO C	FAMSI ZE	EDN	ADHBR A	ADHO EA	AVGI NC	FYL D

Mean	3.42	6.22	13.99	9.94	2.03	16613.79	25.71
Median	3.00	6.00	13.00	10.00	2.00	15435.00	24.00
Maximum	5.00	11.00	34.00	14.00	6.00	34119.00	60.00
Minimum	1.00	3.00	5.00	6.00	0.00	879.00	0.00
Std. Dev.	1.33	1.68	5.76	2.56	1.42	8753.79	16.56
Observations	576.00	576.00	576.00	576.00	576.00	576.00	576.00
Non-Beedi Workers							
	FRVDOC	FAMSIZE	EDN	ADHBR	ADHBEA	AVGINC	FYLD
Mean	0.99	6.27	13.62	0.00	9.09	10848.71	6.08
Median	1.00	7.00	13.00	0.00	9.00	10560.00	7.00
Maximum	2.00	10.00	33.00	0.00	12.00	23295.00	12.00
Minimum	0.00	3.00	5.00	0.00	6.00	20.00	0.00
Std. Dev.	0.46	1.71	5.83	0.00	2.05	4180.89	4.65

Source: Authors Own Calculations *ADHAEA=ADHBRA+

ADHBEA

Out of all workers (1152) half (576) are beedi worker and rest are non beedi worker. Considering only beedi workers we find medical advices taken by a worker is almost three and half (3.42) in six month recall period with maximum 5 visits in the same period. No worker is there who has not visited a doctor for health problems. Minimum number of visit is one in six months recall period. The value of standard deviation is 1.33 which indicates among the workers there are differences but a lower standard deviation than the earlier case indicates comparatively more regular visit to the doctor for a health advice. We also find average family size of workers is 6.22, highest family size of a worker is 11 and lowest one is a 3 member family. The value of standard deviation is 1.68 indicating existence of moderate differences among family size of the workers. Average family education of the beedi workers is 13.99 years corresponding maximum and minimum are 34 and 5 years respectively. Spread of Education has taken place but importance of education is not well understood as the value of standard deviation is as high as, 5.76. Considering all workers together we find on an average workers do 9.94 hours of beedi rolling activity and 2.03 hours of other economic activities for earning. Study shows maximum time spent in beedi rolling activity of a worker is as long as 14 hours a day and minimum is 6 hours a day. It also reveals that, maximum time spent in other economic activity by a worker is as long as 6 hours a day and with no other work as a minimum also. The value of standard deviation in case of beedi rolling works is 2.56 and for other economic activity it is 1.42. This is indicating existence of high differences with respect working hours for beedi rolling but comparatively other economic activities are more regular across the workers. Average family income of the workers is Rs. 16614/- with a maximum of Rs. 34119/- and a minimum of Rs. 880/-. Beedi worker's average monthly income is significantly higher than overall average and higher standard deviation among them also shows there exists relatively higher degree of heterogeneity among the beedi workers with respect to average monthly family income. A Beedi worker's family at Purulia has lost nearly 16 years of family due to premature death of a member. The highest Life Year lost is 60 years and lowest is zero with dispersion of 15.63 years.

Among the non beedi workers, in our study area results are different for few parameter at the same time some findings are very similar. Medical advices taken by a non beedi worker is far less (0.99) than the beedi workers in six month recall period. Study shows maximum 2 visits to the doctor by a worker in the same period and there are families who have not visited the doctor as well. A lower standard deviation (0.46) indicates non beedi workers are consistent with respect to this behavior. Average family size of these workers is almost similar 6.27. Study shows in the chosen sample highest family size of a worker is 10 and lowest one is a 3 member family and the value of standard

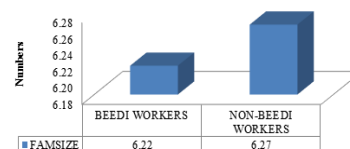
deviation is 1.71 which is again similar to beedi worker families. Average family education of the workers is similar with a value close with beedi workers measuring 13.72 years corresponding maximum and minimum are 33 and 5 years respectively. Study shows all families are with at least few years of institutional education. In many families the incidence is deeper than first generation learning. However importance of education is not well recognised as the value of standard deviation is as high as, 5.83. On an average non beedi workers do 9.09 hours of economic activities for earning. Highest working hours found is 14 hours a day and minimum working hours found as 6 hours. The value of standard deviation found is much lower, 2.05 than the beedi workers living in the same areas. Regular working is more common among non beedi workers than with beedi workers. Average family income of the non beedi workers is much lesser Rs. 10848.71/- with a maximum of Rs. 23295/- and a minimum of Rs. 20/- only. There exists high difference among the non beedi worker families with respect to average monthly family income earned with a standard deviation as high as Rs. 4180.89/- which is less than the figures with beedi workers. So it is found beedi workers on an average is working more hours and earning more income as well but the certainty of income is more in non beedi worker families than with beedi worker families. Study reveals on an average every non beedi worker's family at Purulia has lost nearly 6 years due to premature death of a member. The highest loss is as high as 12 years which is far lower than the figures of beedi worker families. The dispersion is far lower (4.65 years), indicating lower but still incidence is prevalent among these worker's families also.

Figure 4.1.5: Frequency of Visiting Doctors (FRVDOC) among Beedi and Non-Beedi Workers in Purulia 2011



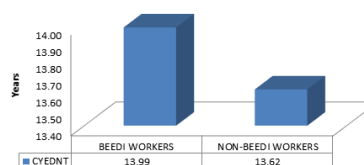
Graphical expositions of the findings with respect to the selected parameters are shown in figures below showing the comparative situations beedi and non-beedi workers in our study area. Figure 4.1.5 shows the medical advice seeking behavior of different workers in Purulia in 2011. As it is found from the study that beedi workers are taking medical advices from the doctors more regularly (3.42) than the non beedi workers (0.99), indicating incidence of greater health problems among these workers than with other workers in the same area. Figure 4.1.6 shows the comparative situation of family sizes of different worker groups in the study area.

Figure 4.1.6: Family Size (FAMSIZE) of the Workers in Purulia 2011



Average family size of all workers in the study area is higher than 6. For beedi workers the average family size is 6.22 where as for the non beedi workers family size is even greater 6.27. The preference towards the big families is common among all the worker families indicating towards traditional mentality, lower consciousness about family planning or even to get more family labour hour to fight economic hardships among other factors.

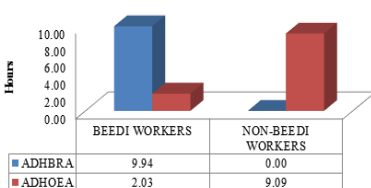
Figure 4.1.7: Cumulative Years of Family Level Education (CYEDNT) among the Workers in Purulia 2011



As the sample has been chosen from the same place, the spread of education among the worker families shows almost same pattern. For beedi worker families an average year of family education is almost 14 years where as for non-beedi workers families spread of education is

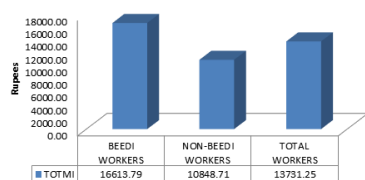
13.62 years. The hardships in life, low educational infrastructure and lack of consciousness about the importance of education explains such a lower level of educational spread in worker families. Incentive schemes for school going children of beedi workers have increased the spread of education among the beedi worker families than the non-beedi worker families. For beedi workers average daily working hour is 9.94 hours of beedi rolling and 2.03 hours of other economic activities where as for non-beedi workers average daily work hour is only 9.09 hours. Non beedi workers are working lesser hours as mostly they work in day time and outside the place of stay. But the beedi workers roll beedi at his/her own house and part of his time is also spent on secondary jobs like cultivation. The higher working hours enables the beedi workers to earn more than the non beedi workers (Figure 4.1.9)

Figure 4.1.8: Average Daily Beedi Rolling and Other Work Hours of the Workers in Purulia 2011



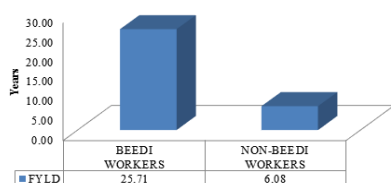
Average monthly family income of the beedi rollers is Rs. 16613.79/- where as for non beedi workers the figure is Rs. 10848.71/-. Average monthly family income from all activities of all workers stands at Rs. 13731.25/-.

Figure 4.1.9: Average Monthly Income of the Workers in Purulia 2011



Family years lost by different worker groups are presented in figure 4.1.10. It is quite striking that beedi workers have lost 25 years of family life due to premature death of one or more than one premature death of their family members. Non-beedi workers have also lost their family years but their loss is far lower, (6 years) than the beedi workers in the sample. So it is seen that beedi workers are comparatively in a better socio economic situation in our study area with more family education, lower family sizes, more working hours and higher income but are living a lower quality life with more frequent visit to doctors for health hazards and higher loss in terms of family life due to premature death of their family members.

Figure 4.1.10: Family Years Lost of Beedi and Non-Beedi Workers in Purulia 2011



4.2 Estimation

In the estimated model we have regressed the Family Year Lost for Premature Death (FYLD) on eight different regressors, namely FAMSIZE, EDN, ADHBRA, ADHOEA, AVGINC, SEX, BWORKER and RESSTAT. Last three variables are qualitative variables but first five variables are quantitative variables. Our estimation shows specified model explains almost 83 per cent of variation of the dependent variable with a R Square value of 0.84 and adjusted R Square value of 0.8395.

Out of eight explanatory variables seven are found as statistically significant out of which education is significant at 10 %. Sex has a positive impact on Family Life Years Lost with a positive coefficient measuring 13.964. This tells us that if the worker is a female then the

loss of life years increases and significantly too. When the female member becomes the main earning member of the family then all the family members become more vulnerable to numerous threats as she can take lesser care of her family members in search of income opportunities. So we accept the null hypothesis $H_0: \beta_1 > 0$ and reject the alternative as $H_1: \beta_1 < 0$

Bigger family size has a negative impact on Family Life Years Lost with a negative coefficient measuring -0.799. This tells us that as family size increases the work gets divided among the members and sharing of works reduces the burden of occupational health hazard. The variable is found as highly significant. So we reject the null hypothesis $H_0: \beta_2 > 0$ and accept the alternative as $H_1: \beta_2 < 0$

Family education has a positive impact on Family Life Years Lost with a negative coefficient measuring -0.075. This is quite obvious. This tells us that as family education increases members of the family become more enlightened and they choose the correct work practices to lessen the burden of occupational health hazard. The variable is found significant at 10 % level of significance. So we accept the null hypothesis $H_0: \beta_3 < 0$ and reject the alternative as $H_1: \beta_3 > 0$

Source	SS	df	MS	Number of obs = 1152; F(8, 1144) = 753.96	
Model	480865.25	8	60108.16	Prob > F	= 0.0000
Residual	91203.74	1144	79.72	R-squared	= 0.8406Adj R-squared = 0.8395
Total	572069	1152	496.58	Root MSE	= 8.9288

FYLD	Coef	Std. Err.	t	P> t	[95% Conf. Interval]
SEX	13.964	0.537	25.99	0.000	12.913 15.021
FAMSIZE	-0.799	0.186	-4.29	0.000	-0.164 -0.433
EDN	-0.075	0.045	-1.64	0.101	-0.0164 0.0145
RESSTAT	9.288	0.594	15.62	0.000	8.121 10.454
BWORKER	20.228	1.663	12.16	0.000	16.964 23.492
ADHBRA	-0.359	0.146	-2.46	0.014	-0.045 -0.073
ADHOEA	-0.474	0.105	-4.51	0.000	-0.0681 -0.0268
AVGINC	0.0001	0.0001	1.10	0.271	-0.00044 0.0016

Reservation status has found to have positive (harmful) impacts on Workers health measured by life year lost by the family of the worker. We accept the null hypothesis H_0 : and reject the alternative $H_1: \beta_4 < 0$

For beedi worker the family year loss is positive with a coefficient of 20.228. This tells that for beedi workers health hazards are far greater than the non beedi workers. The value is highly significant too. We accept the null hypothesis H_0 : and reject the alternative H_1 : .

Both more hours of beedi rolling or other economic activities are found as having negative coefficients indicating as average daily work hours increases that actually reduces the loss of family life years. Both are found significant also. More hours of work are bad and harmful when it is done in excess. As the sample denotes average work hours around 10 hours so the income effect of working out weighing the negative effect of occupational health hazards. We reject our null hypothesis $H_0: \beta_5 > 0$ and accept the alternatives $H_1: \beta_5 < 0$

Income is having positive (harmful) impacts in life year lost. The result is obvious though insignificant. Income of the beedi rollers are higher than non beedi rollers. Higher income as a beedi worker and working long hours can cause more life year loss of the family as they ignore healthy life practices. We accept the null hypothesis $H_0: \beta_6 > 0$ and reject the alternative $H_1: \beta_6 < 0$

5. Conclusion and Recommendations

Bidi workers and their family members are suffering from various diseases. Frequency of visiting doctor is substantially high for beedi workers than the non beedi workers. Most of the workers are women and percentage of reserved category people is high among the workers. Family income, frequency of visit to doctors, total work hours devoted daily to rolling beedi, and other economic activities, reservation status, sex and nature of work are found to be significant variables in explaining occupational health hazards measured in terms of Life Years Lost due to early death. For the occupational health improvement of the beedi workers following recommendations are suggested.

1. Rolling beedi is not good for health. Beedi rollers also know this but

it is chosen as a work opportunity as it uses family labour, requires low skill, no personal investment and can be done throughout a year with some institutional benefits. To take out them from this trap alternative earning opportunities need to be explored.

2. Government will implement minimum wage law strictly. This will increase the income of the beedi rollers and they will try to avoid multiple works at a time aggravating occupational health hazards.

3. Family planning benefits would be given to all unorganized sector workers to discourage big family size. The scheme is already there but not properly used by the workers due to lack of awareness.

4. Education has positive impacts on reducing life years loss of a family. In the given set up it will be highly beneficial to take initiatives for adult literacy as average educational level of the worker families are very low.

5. Different counselling sessions for these workers especially for women should be designed to maintain work life balance and keep their family safe from occupational health hazards.

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