



International
Labour
Organization



Occupational health and safety assessment of child workers in the brick industry, Nepal

International
Programme on
the Elimination
of Child Labour
(IPEC)

Copyright © International Labour Organization 2014
First published 2014

Publications of the International Labour Office enjoy copyright under Protocol 2 of the Universal Copyright Convention. Nevertheless, short excerpts from them may be reproduced without authorization, on condition that the source is indicated. For rights of reproduction or translation, application should be made to ILO Publications (Rights and Permissions), International Labour Office, CH-1211 Geneva 22, Switzerland, or by email: pubdroit@ilo.org. The International Labour Office welcomes such applications.

Libraries, institutions and other users registered with reproduction rights organizations may make copies in accordance with the licences issued to them for this purpose. Visit www.ifrro.org to find the reproduction rights organization in your country.

FPRW-IPEC

Occupational Health and Safety Assessment of Child Workers in the Brick Industry, Nepal / International Labour Office, International Programme on the Elimination of Child Labour (IPEC) - Geneva: ILO, 2014

ISBN: 978-92-2-129405-4 (PRINT); 978-92-2-129406-1 (Web PDF)

International Labour Office; ILO International Programme on the Elimination of Child Labour

child labour / child worker / occupational health / occupational safety / hazard / safety management / brick / industry / Nepal – 13.01.2

ILO Cataloguing in Publication Data

Acknowledgements

This publication was elaborated by Dr. Sunil Kumar Joshi, Occupational and Public Health Consultant, for IPEC and coordinated by Susan Gunn from IPEC Geneva Office.

Thanks also to the study team: Dr. Sunil Kumar Joshi, Ir. Pranab Dahal, Mr. Umesh Raj Aryal, Mr. Subash Chandra Sharma, Mr. Madhab Bista, Dr. Subhadra Vaidya; and the medical team: Dr. Nitin Bhandari, Dr. Ashish Dhungana, Dr. Aakriti Malla, Dr. Mukta Singh Bhandari.

Funding for this ILO publication was provided by the United States Department of Labor (Project GLO/09/56/USA).

This publication does not necessarily reflect the views or policies of the United States Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the United States Government.

The designations employed in ILO publications, which are in conformity with United Nations practice, and the presentation of material therein do not imply the expression of any opinion whatsoever on the part of the International Labour Office concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers.

The responsibility for opinions expressed in signed articles, studies and other contributions rests solely with their authors, and publication does not constitute an endorsement by the International Labour Office of the opinions expressed in them.

Reference to names of firms and commercial products and processes does not imply their endorsement by the International Labour Office, and any failure to mention a particular firm, commercial product or process is not a sign of disapproval.

ILO publications and electronic products can be obtained through major booksellers or ILO local offices in many countries, or direct from ILO Publications, International Labour Office, CH-1211 Geneva 22, Switzerland. Catalogues or lists of new publications are available free of charge from the above address, or by email: pubvente@ilo.org or visit our website: www.ilo.org/publns.

Visit our website: www.ilo.org/ipec

Available only in PDF version
Photocomposed by IPEC Geneva

Table of content

Abbreviations.....	ix
Acknowledgements.....	xi
Executive Summary.....	xiii
1. Background	1
2. Objectives.....	3
3. Methodology.....	5
3.1 Quantitative study	5
3.2 Sampling strategy.....	5
3.3 Data Collection tools	8
3.4 Analysis by tripartite group.....	10
4. Policies and Laws relating to Child Labor in Nepal	13
4.1 Policy Gaps in Combating Child Labour	15
5. Results of hazard assessment	17
5.1 Worker's living environment and hygiene.....	17
5.2 General Environment.....	18
5.3 Risk assessment in brick making	21
5.4 Ambient air quality, workplace noise level, and heat stress	24
6. Socio-Demographic Profile	27
6.1 Sex and Age Distribution of Study Samples	27
6.2 Migration status of the child workers.....	27
6.3 Educational status of the respondents	31
6.4 Living situation	32
7. Work History	33
7.1 Work duration and intensity	33
7.2 Involvement in other work	34
8. Injuries.....	37
8.1 Injury prevalence (working children and controls).....	37
8.2 Types of injuries experienced	37
8.3 Types of treatment for injury.....	40
9. Acute and chronic health problems.....	41
9.1 Acute illness	41
9.2 Musculoskeletal disorders	43
9.3 Respiratory problems.....	47
9.4 Stunting	49
9.5 Other health conditions	52

10. Health behaviours	57
10.1 Knowledge of alcohol/drug and tobacco products being used by others	57
10.2 Leisure time spent by the respondents	58
10.3 Distribution of sleeping hours.....	58
11. Psycho-social functioning.....	61
11.1 Work-related attitudes	62
11.2 General psycho-social functioning.....	68
11.3 Psychosocial functioning and work.....	76
12. Treatment and Health Expenditures.....	79
12.1 Treatment seeking behavior	79
13. Conclusions and Recommendations	83
13.1 Protection	84
13.2 Prevention.....	86
13.3 Prosecution	87
13.4 Other Supporting Actions	88
14. Bibliography	89
Annex A: Questionnaire	91
Annex B: Workplace Environmental Monitoring.....	104
Annex C: Photos	106
Annex D: Case Examples	107
Annex E: Ethnicity of the respondents.....	109

Tables

Table 1: Number of registered brick factories in Sarlahi by district village development committee	6
Table 2: Number of registered brick factories in Bhaktapur district by village development committee	7
Table 3. Number of children selected for the study in Bhaktapur and Sarlahi District by VDC.....	7
Table 4. Temperature Recorded at the Brick Kiln	18
Table 5. Summary of Identified Occupational Hazards	21
Table 6. Summary of Hazards in Brick Making.....	24
Table 7. Soil Test.....	25
Table 8. District wise Sex and Age Distribution of Study Samples.....	27
Table 9. District-wise seasonal migration of study population.....	29
Table 10. Formal education and Literacy Status of the respondents	31
Table 11. Percentage of the respondents who are living with parents and other relatives.....	32
Table 12. Percentage Distribution of Marital Status of respondents	32
Table 13. Involvement in work other than brick kilns (workers only)	34
Table 14. Type and number of hours spent in tasks in own household during the past week	35
Table 15. Off-season jobs	35
Table 16. Work duration and intensity in off-season	35
Table 17. Types of injuries experienced by study population	37
Table 17a: Severe injury experienced during last one year.....	37
Table 18. Part of body injured	38

Table 19. Causes of injuries	38
Table 20. Percentage of survey respondents having injury marks	39
Table 21. Percentage of respondents experienced burns	39
Table 22. Percentage of respondents having cuts.....	39
Table 23. Association between work and injuries among working and non-working children.....	39
Table 24. Percentage of the respondents having fractures.....	40
Table 25. Types of the treatment during injury by the respondents.....	40
Table 26. Person who provided the treatment for injury.....	40
Table 27. Health problems during last year.....	42
Table 28. Association between illness and work	42
Table 29. Association between types of health problem and working years	43
Table 30. Percentage of the respondents who had MSD in last 12 months.....	44
Table 31. Pain experienced in different body parts.....	44
Table 32. Percentage reporting ache, pain and discomfort within last week	45
Table 33. Association between experience of pain in body and working children	45
Table 34. Ache, pain or discomfort in last week.....	46
Table 35. Experience of neck pain or backache during last year.....	47
Table 36. Percentage of Musculoskeletal Deformity among survey respondents	47
Table 37. Respiratory problems.....	47
Table 38. Results of Pulmonary Function Test among survey respondents	48
Table 39. Association between work and pulmonary function	49
Table 40. Classification of Body Mass Index	51
Table 41. Percentage of Anemia among survey respondents	52
Table 42. Association between work and anemia among working and non-working children.....	52
Table 43. Percentage of Anemic cases identified after blood sample examination (n=198)	53
Table 44. Percentage of Conjunctivitis among survey respondents.....	53
Table 45. Association between work and conjunctivitis among working and non-working children	53
Table 46. Percentage of hearing loss among survey respondents	54
Table 47. Association between work and hearing loss for working and non-working children.....	54
Table 48. Percentage of the respondents having skin problems.....	55
Table 49. Association between work and skin problems among working and non-working children	55
Table 50. Association between different components of clinical examinations and study population	56
Table 51. Frequency distribution of leisure time spent by the respondents.....	58
Table 52. Hours of sleep	58
Table 53. Percentage of the respondents who feel energetic.....	68
Table 54. Percentage of the respondents who have difficulty sleeping.....	68
Table 55. Percentage of the respondents who have trouble concentrating.....	69
Table 56. Percentage of the respondents who feel restless.....	69
Table 57. Percentage of the respondents who feel sad	69
Table 58. Percentage of the respondents who get into fights and quarrels easily	69
Table 59. Percentage of the respondents who feel lonely	70
Table 60. Percentage of the respondents who get very angry and often lose their temper	70
Table 61. Percentage of the respondents who have little appetite or interest in food	70
Table 62. Percentage of the respondents who are forgetful	70

Table 63. Percentage of the respondents who feel tense	71
Table 64. Percentage of the respondents reporting dizziness	71
Table 65. Percentage of the respondents who feel afraid or nervous	71
Table 66. Percentage of the respondents who feel worried and think a lot	72
Table 67. Percentage of respondents who think life is worse than that of other children	72
Table 68. Percentage of the respondents who think life isn't worth living.....	72
Table 69. Percentage of the respondents who feel supported and loved by their family	73
Table 70. Percentage of the respondents who feel conflict in the family.....	73
Table 71. Percentage of the respondents who feel accepted by the other families.....	73
Table 72. Percentage of the respondents who have one or more good friends to support	74
Table 73. Percentage of the respondents who feel rejected or teased	74
Table 74. Percentage of the respondents who feel different from other children of similar age.....	75
Table 75. Percentage of the respondents who get scolded, or criticized or made to feel small or stupid	75
Table 76. Percentage of the respondents who get beaten at home or work.....	75
Table 77. Percentage knowing of possible sexual abused.....	76
Table 78. Percentage of the respondents severely punished for mistakes.....	76
Table 79. Percentage of respondents who feel safe	76
Table 80. Association between different domains of psycho-social functioning and work	76
Table 81. Association between domains of psycho-social functioning and work by District	77
Table 82. Types of the treatment for ill health.....	79
Table 83. Health expenses incurred (Mother/Adult informant)	81

Figures

Figure 1. Health related illness due to heat.....	19
Figure 2. District wise place of residence of study population	28
Figures 3a & 3b. Districts and Area wise distribution of migrated to work (Cases only).....	29
Figure 4. Number of respondent's family who migrate after the brick kiln season finishes	29
Figure 5. Percentage distribution of working years of the respondents	33
Figure 6. Percentage distribution of working days per week	33
Figure 7. Duration of work other than brick kilns.....	34
Figure 8. Prevalence of injury in last one year.....	37
Figure 9. Sickness experienced by the respondents in the last one year	41
Figure 10. Respondents prevented from doing normal work because of pain	45
Figure 11. Percentage of the respondents having Restrictive pulmonary diseases among cases.....	49
Figure 12. Classification of body mass index, according to age (female)	50
Figure 13. Classification of body mass index, according to age (Male)	51
Figure 14. Percentage of the respondents having abnormal ear after audiogram among cases.....	54
Figure 15. Knowledge about serious injury and death	55
Figure 16. Information on use of alcohol/drug and tobacco products by others.....	57
Figure 17. Knowledge of Sexual and Physical abuse.....	57
Figure 18. Percent of respondents who nap or sleep during the day	59
Figure 19. Percent of respondents who are proud of their work.....	62
Figure 20. Percent of respondents feeling that they need more skills.....	62

Figure 21. Percent of respondents who feel appreciated in their work,.....	63
Figure 22. Percent of respondents feeling looked down due to the job they perform.....	63
Figure 23. District wise numbers of the respondents feel that family relies on them and needs their help	63
Figure 23a: Percent of respondents feeling that their family relies on their help	64
Figure 24. Percent of respondents who feel they work under pressure.....	64
Figure 25. Percent of respondents who feel bored	64
Figure 26. Figure 26. Percent of respondents who feel bored doing the same thing for hours.....	65
Figure 27. Percent of respondents who feel family, employer or others ask too much from them	65
Figure 28. Percent of respondents tired because of the long working hours or heavy workload.....	65
Figure 29. Percent of respondents who feel work prevents them from doing things they like	66
Figure 30. Percent of respondents who feel free to make choices about their work	66
Figure 31. Percent of respondents feeling bothered by work environment	67
Figure 32. Percentage of the respondents feeling comfortable with their fellow workers	67
Figure 33. Percent of respondents who feel that others watch out for their safety at work	68
Figure 34. Percentage of families with minor medical expenses during last one year	80
Figure 35. Percentage of families who borrowed money for medical care or medicines.....	80

Abbreviations

AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CCWB	Central Child Welfare Board
CDS	Child Development Society
CWIN	Child Workers in Nepal Concerned Centre
CWISH	Children Women in Social Service and Human Right
DDC	District Development Committee
FGD	Focused Group Discussion
FNCCI	Federation of Nepalese Chamber of Commerce and Industries,
GO	Governmental Organization
Hb	Hemoglobin
ILO	International Labor Office
INGO	International Non-Governmental Organization
IPEC	International Programme on Elimination of Child Labor
KMC	Kathmandu Metropolitan City
KMCTH	Kathmandu Medical College Teaching Hospital
LCCI	Lalitpur Chamber of Commerce and Industries
MoF	Ministry of Finance
MoLE	Ministry of Labor & Employment
N/A	Not Applicable/Not Available
NGO	Non-Governmental Organization
NPC	National Planning Commission
OH	Occupational Health
OR	Odds Ratio
OSH	Occupational Safety & Health
OSHP	Occupational Safety & Health Project
TBP	Time Bound Programme
UN	United Nation
UNICEF	United Nation Children's Fund
VDC	Village Development Project
WMSD	Work related musculoskeletal disorders

Acknowledgements

On behalf of the study team, I would like to acknowledge International Labor Organization (ILO), World Education Inc. (WEI), Child Development Society (CDS), Child Protection Organization (CPO) Sarlahi, CWIN, Minergy Nepal, SDC, ICIMOD, Trade Unions, FNCCI, LCCI, for their support in terms of devoting time and effort to share valuable information and data relevant to the study.

I would also like to express my sincere gratitude to International Labor Office in Kathmandu and the World Education Inc. (WEI) Nepal for financial and technical support for the study.

I sincerely acknowledge Mr. Suresh Kumar Shrestha, Secretary, Ministry of Labor and Employment (MoLE), Mr. Krishna Hari Pushkar, Director General, Department of Labor (DoL), Er. Barun Kumar Jha, Chief, Occupational Safety and Health Project (OSHP) for their timely interaction and feedback on study matters. I would like to take this opportunity to express our sincere gratitude to all the members of Technical Committee on CLEP, all the staff members of Child Labor and ILO/IPEC Section of the Ministry of Labor and Employment for their feedback on the study.

My sincere gratitude goes to the Dr. Susan Gunn, Sr. Technical Adviser, Hazardous Child Labor at ILO, Geneva, Ms. Helen Sherpa, Country Director, WEI Nepal, Ms. Bipina Sharma, National Project Coordinator, Support to the implementation of Nepal's National Master Plan on the Elimination of Child Labor Project, ILO Nepal, and Ms. Agya Poudyal, Monitoring and Evaluation Officer, WEI Nepal for their valuable support during developing the project concept, designing of the study, data collection and report writing.

Similarly, I would like to sincerely thank Mr. Youraj Roka, Coordinator, CDS, Kapan and Mr. Kishor Sharma, Coordinator, CPO, Sarlahi for their valuable support during data collection in Bhaktapur and Sarlahi respectively. Sincere thanks also go to the team members of CDS Kapan and CPO Sarlahi for accompanying us during field visits.

I am very grateful to the study team members Ir. Pranab Dahal, Development Sociologist, Mr. Subash Chandra Sharma, Clinical Psychologist, Mr. Umesh Raj Aryal, Statistician, Mr. Madhav Bhatt, Health Officer, MoLE, OSHP, Dr. Nitin Bhandari, Dr. Ashish Dhungana, Dr. Aakriti Malla, Dr. Mukta Singh Bhandari, Dr. Subhadra Vaidya, and Lab Assistant Ramesh Bhujel for their excellent contributions in the study. I would also like to thank public health graduates Ms. Nikita Baiju, Mr. Amit Mishra, Mr. Swastika Regmi and Ms. Anju Gautam for their valuable input in data entry.

Last but not the least, I would like to express my sincere gratitude to all the employers and the respondents of respective brick kilns and organizations who have positively contributed to bring this study to its' present form.

Sunil Kumar Joshi, MD, DrPH

Executive Summary

Almost 30,000 children, 5-17 years old, are estimated to be working in the brick factories of Nepal.¹ And this number appears set to grow given the increasing demand for bricks to support the current rate of urbanization. Poverty, conflict, lack of opportunities and alternatives, and debt bondage are the major factors which are thought to be funneling children out of school and into this industry. Should we be concerned? Is the work that children do really harming them or is it simply a minor role that enables parents to put adequate food on the table?

What is known from adult studies is that brick manufacturing is labor intensive, requiring muscular effort in most stages of production. Workers carry heavy loads, remain squatting for long periods, and engage in repetitive tasks -- all within an environment that is often hot, dusty, and polluted. Working conditions in the brick industry are known to harbour many hazards. Lack of basic sanitation, no personal protective equipment, unfenced pools of stagnant water, and heavy metals (arsenic and lead) in the soil, are some of factors which pose serious risks to exposed workers. Adults who have worked in the brick kilns for years evidence a number of chronic health conditions such as musculoskeletal disorders (WMSDs) and pulmonary disease² that not only cause human suffering but are economically costly in that they reduce capacity to work and overall lifetime production. Theoretically, risks to children would be potentially more serious due to the fact that their bodies are still growing and they are more vulnerable than adults to a host of physical and psychological stressors. However, despite the large number of child workers in the brick industry, only two studies in Nepal³ have looked at health implications of child work.

On the national scale, child labour has been gaining greater attention in recent years. The fact that one in every three Nepalese children is working is no longer assumed to be inevitable or desirable. Increasingly, a child labourer is seen as a symbol of a vulnerable and marginalized family, a reminder of an inadequate education system and unstable government. It is slowly being recognized that child labour can destroy children's potential, rob them of the opportunity to go to school, and thereby perpetuate a cycle of poverty and marginalization that threatens the modernization of the country.

The Government of Nepal plans to review the Child Labor (Prohibition and Regulation) Act of 1999 which lays forth the parameters for child labour (all work that is performed by children younger than 14 years, and hazardous work performed by children younger than 16 years) and bring it more into line with national priorities and international law.

¹ Ref: World Education A Rapid Assessment of Children in the Brick Industry (2012).

² Ref: Asian-Pacific Newsletter on Occup Health and Safety 2009.

³ Doocy et al. The Risks and Impacts of Portering on the Well-Being of Children in Nepal Journal of Tropical Pediatrics Advance Access March 25, 2007.

Methodology

The study's principle objective was to assess the health status of children in the brick industries of Nepal with a view to providing input for policy reform on child labour. Nakhel, Tathali and Sudal VDC from Bhaktapur and Bela, Gaurishankar and Laxmipur VDC from Sarlahi were identified as the study sites using standard sampling techniques. Multi-stage stratified sampling was used to select the number of children required for the study. Previous studies conducted in different parts of the country had showed that health problems among child laborers were 37 per cent. Therefore, the sample size required ($n = 90$) was calculated according to the expected percentage of health problems of 37 per cent with a precision of 10 per cent and a confidence level of 95 per cent. Hence, 101 child laborers were selected from Bhaktapur district (62 males and 38 females) with 64 controls (27 males and 37 females) for a total of 165, and 97 child laborers were selected from Sarlahi district (26 males and 71 females), with a control group of 43 (19 males and 24 females) for a total of 140.

The selection of controls was challenging due to the difficulty in finding children with equivalent characteristics in terms of socio-economic status, ethnicity, migration and parental occupation. Thus, the control group was selected using purposive sampling techniques. Only those children who met the criteria were selected for the control group, yet it would not be correct to say that they were 'non-working' as, in addition to study, many did some form of work-like activity, such as household tasks, agriculture and/or livestock-raising.

The two study populations were unique in certain respects. The majority of child workers in Sarlahi were found to be part time workers who were utilizing their annual school leave to earn some money, while those in Bhaktapur tended to be full-time. Migrant workers dominated the labour force at Bhaktapur with 97 per cent originating from outside the district. In Sarlahi, locals dominated the population of both child workers and controls. Although 72.3 per cent of the child workers in Bhaktapur claimed to be literate, only 16.8 per cent were currently attending school. The literacy level in Sarlahi was much higher with 93.8 per cent of the respondents claiming literacy and 35.1 per cent currently in school. In addition, the kiln technologies and work processes (e.g. carrying bricks on the head vs. the back) at the two sites also differ. These unique characteristics are important for demonstrating the variability in the brick industry globally and the implications these differences have for the health profile of the workers.

Results

Working children were nearly twice as likely to be sick compared to the control children. Work-related injuries and infections were prevalent in the working children in the sampled brick kilns, as well as diseases deriving from the poor physical conditions and nutritional deficiency disorders. The major physical health problems of the children were musculoskeletal, respiratory, dermatological and auditory. The psychosocial analysis pointed to considerable stress, low self-esteem and impaired social relationships.

Virtually all (95.8 per cent) brick kiln children in Sarlahi worked seven days a week. In Bhaktapur, although Saturday is considered an informal day off, almost a third of workers

continued to work the whole week. Also in Bhaktapur, work was sometimes carried on at night which incurs a wide variety of additional risks. The children worked for seven hours at the brick kilns in both districts, but afterwards, the majority (57 per cent of the respondents in Bhaktapur and 58.8 per cent in Sarlahi) shifted to other types of work – mainly household work and some agriculture-related tasks -- for an average of 3 hours, making a total workday of ten hours. The study showed evidence also that the duration of work was a factor in health events. The children who have been working in brick factories for more than two years were more likely to have some type of health problem than those who had worked a shorter time.

Almost half of the working children reported they had had an injury of some kind within the last month, and in the last year, 42 per cent of working children in Bhaktapur and 40 per cent in Sarlahi had experienced at least one serious injury. What was unexpected was that the prevalence of injury was found to be fairly high (more than 30 per cent) for the control group as well. A possible area to explore is whether an aptitude for minimizing risk could have been instilled in the working children that were absent from the control group.

Musculo-skeletal disorders were present, as was expected, but the rates were found to be much higher than expected with 100 per cent of the child worker sample in Sarlahi complaining of pain in the neck and back (70 per cent in Bhaktapur). It is particularly important to note that a substantial portion of the working children described their pain was severe or at least moderate (20.2 per cent and 30.9 per cent respectively) while the controls that experienced some neck and back pain (51.7 per cent in Bhaktapur and 79.1 per cent in Sarlahi) described it largely as mild. Almost none of the controls were experiencing pain at present, whereas roughly 40 per cent of the child workers in both districts were currently suffering pain.

The study confirmed the risk of respiratory disorders in brick kiln workers finding, in Sarlahi, that a high proportion of the young workers (42.71 per cent) had obstructed or restricted lungs, compared with 9.3 per cent for the controls in Sarlahi. However, the situation was reversed in Bhaktapur which appears to be linked with general environmental pollution from the kilns which affects the surrounding villages. Cumulative exposure affects non-working children from neighboring communities while children who have only worked for a single season in the brick factories show less respiratory damage.

The Body Mass Index (BMI) of the respondents was found to follow normal distribution patterns. However, almost a quarter (24.6 per cent) of the Sarlahi working children were underweight compared with only 8.3 per cent of their controls and blood analysis showed a high prevalence of anemia (43.7 per cent) among girls in Sarlahi. The rate was lower in Bhaktapur (26.6 per cent) but still of concern. Working children's poorer BMI and anemia status is reflective of inadequate nutrition, and high work load.

The most commonly reported health problems for the cases in Bhaktapur included headache, cough, fever and stomach problems, whereas Sarlahi respondents reported skin problems and stomach diseases as their major health problems. It is suspected that the skin problems at Sarlahi might be the result of high arsenic content in the soil; this will need to be confirmed through further analysis. Also almost 10 per cent of the respondents in Sarlahi

reported feeling unwell without a specific cause which was not recorded with any other respondent group in either district. The frequency of other health problems seems to be more or less equal for the control groups in both the districts.

The treatment seeking behavior of working respondents indicates that about 45 per cent of cases in Bhaktapur and 18 per cent in Sarlahi did not seek medical attention for their injuries and illnesses but attempted to take care of the condition themselves. That this might well be due to lack of resources is suggested by the finding that 43.8 per cent of the Sarlahi sample were obliged to borrow money for medical treatment during the last year. In this way, child workers' ill health might be, in effect, creating or exacerbating bonded labour conditions.

With regard to the psychological variables, it was recorded that 8.4 per cent of the respondents in Bhaktapur and 7.2 per cent in Sarlahi always felt looked down by others with the nature of job they perform. 28.4 per cent and 5.2 per cent in Bhaktapur and Sarlahi responded to receiving appreciation for their work at all times. 4.2 per cent of the respondents in Bhaktapur and 2.1 per cent from Sarlahi perceive that their work is crucial for family support. Specifically, the psychological measures for emotional attachment, hopelessness and helpless were positively associated ($OR > 1$, $P < 0.05$) ($AOR > 1$, $p < 0.05$) with working status of children, which means that working children were more likely to be emotionally fragile and felt helplessness than non-working children.

Conclusion

Basic occupational health and safety measures are completely missing in this sector. This, together with a debilitating physical environment, difficult working conditions and psychosocial stresses creates in the brick industry a favorable ground for a high incidence of work-related diseases. Laws are not followed, nor are they enforced at the brick kilns, which makes it easy for the management to escape from their obligations.

The findings of this study about child workers' health are important in a number of ways. First, they lend support to the idea that improvements in technology will be associated with improved health outcomes, especially for the most vulnerable workers – in part because improved kilns generate less smoke⁴. Second, they provide some evidence that lower socio-economic status has a compounding or synergistic effect on occupational risks, in that the poorer population in Sarlahi has the highest rates of occupational illness in spite of the fact that the children are spending more time in school and consequently less exposed, and the community is stable, not migrating. Finally, this research study provides evidence that this work sector is indeed a very hazardous sector for children regardless of the duration of their exposure.

To address the existing loopholes in policies and enforcement, as well as the lack of health care and basic occupational health services at the brick kilns requires multiple measures. A critical first step could be a massive awareness campaign that sensitizes the kiln community

⁴ http://www.devalt.org/newsletter/jun03/of_5.htm
http://www.swisscontact.org/fileadmin/media/Medienberichte/0913_Vertical_Shaft_Brick_Kiln_VS_BK_01.pdf.

to the dangers –both visible and invisible – that children may be exposed to at the kiln sites. Following this, a positive, problem-solving dialogue among kiln owners, brick buyers, and community leaders could decide on ways to provide immediate protection for children while seeking longer term solutions that would reduce risks to all workers and increase kiln productivity.

The plight of the brick kiln children can be an example and entry point to stir a larger public discussion on workers' health, expanded monitoring of informal economy enterprises, adoption of risk reduction strategies in various sectors to promote safe work opportunities for youth of legal working age, and removal of school-age children from the work altogether in line with the basic rights of children for a safe and healthy childhood.

1. Background

It is estimated that in Nepal 1.6 million children in the 5-17 year age group fall into the category of child labor, which constitutes about 50.9 per cent of all working children and 20.6 per cent of the total child population. Of these, 0.91million are girls and 0.69 million are boys. The overwhelming proportion of child workers (over 1.5 million) reside in rural areas; by age group the distribution is 24.7 per cent (395,000) in the 5-9 year age group, 51.3 per cent (821,000) in the 10-13 year age group and 24 per cent (383,000) in the 14-17 year age group (BK and Bista, 2012).

Occupational Safety and Health (OSH) is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational safety and health programs is directed toward fostering a safe work environment (Joshi, 2011). OSH is the science of anticipation, recognition, evaluation and control of hazards arising in or from the workplace which could impair the health and well-being of workers, or which impact the surrounding communities and the environment (Pun, 2011). Although the International Labor Organization (ILO) has maintained and developed a system of international labor standards since 1919 which aim at promoting opportunities for decent and productive work in conditions of freedom, equity, security and dignity, the concept is relatively new in Nepal and very few industries achieve even basic occupational standards.

The OSH situation is even worse in non-formal sectors including the brick industries which have many child laborers within the work force. The normal vulnerabilities of children are compounded by hazardous work and harmful working conditions which pose a risk of developing work and non-work related ill health. The challenge of achieving a viable livelihood results in poor families sending children to work independently or accompanying their parents to earn extra income. Industrial sectors generally have more risks than other sectors. This is due to hazards that are inherent in the materials, processes, technologies or products, and which may generate diseases or accidents either to the employees or the general public who are in the vicinity, as well as damage to the general environment. Among the factors creating high risk for safety and health in the workplace are working with machinery and equipment, use of electricity, tasks involving construction or transportation, use of chemicals, and dusty, congested or dark workplaces (Upadhyay, 2005).

Child labor can have several detrimental consequences for the health and rights of the child. Poor nutritional status plus unhealthy working conditions increases the risk of the child falling ill. The ergonomics of work combined with factors such as fatigue, age, experience, environment, and presence of support or supervision also affects the well-being of a child worker. Child labor is often entwined with poverty and social injustice and cannot be addressed in isolation. Moreover, some types of work are not harmful and can even be beneficial for children. While some forms of 'worst forms of child labor' may be relatively easy to identify and agree on eliminating, the distinction between acceptable work and harmful labor is not always clear and assessments can be muddled by local practices

and traditional beliefs. This is often the case in the informal sector where child labor is particularly common (FAO & ILO, 2011).

Brick manufacturing is a labor intensive industry that involves carrying heavy loads, remaining in awkward postures for long periods of time, and doing repetitive tasks. One of the major risks is Work-related Musculoskeletal Disorders (WMSDs) which include a range of inflammatory and degenerative diseases resulting from forceful, repetitive and long duration tasks. These may cause pain or discomfort and functional impairment and may affect the body's soft tissues, tendons, tendon sheaths, muscles, and the nerves of the hands, wrists, elbows, shoulder, neck and low back. Pain in neck, shoulders and lower back may cause long periods of disability and sick leave. WMSD may worsen with the nature of the job (Chaudhary, Biswas and Roy, 2012).

In the Terai region, green (unbaked) and baked bricks are transported by carrying them on the head, which strains neck muscles and can damage vertebra. In Bhaktapur both green and baked bricks are carried on a back-board using a head strap which has less concentrated impact as the load is more equally distributed on the back. The brick-firing process uses traditional techniques and workers do not use any protective equipment, which increases the risk of burns. Working outdoors in rain or sun poses risk of heatstroke, sunburn and other conditions related to exposure. Dust, fumes and smoke are synonymous with the brick industry and workers, as well as local residents, inhale this polluted air, resulting in increased risk of respiratory tract infections and diseases. Other studies have shown that the frequency of injury is also higher in children compared to that of adults due to their age and lack of experience in handling the job requirements. Little is known about the psychosocial hazards for children but it would seem likely that bullying, physical/sexual abuse and insecurity are factors that affect their emotional well-being. The harmful and hazardous working conditions for children not only perpetuate serious risks of occupational related illness but also have negative impacts on their overall growth and development.

This study assesses health impacts associated with the brick industry focusing on child workers. The study provides supportive evidence to inform policy and practical interventions that will a) protect the health, safety and well-being of youth of legal working age and b) enable the removal of children less than the legal working age (i.e. below 14) from exploitative work in the brick industry. The results of the study on the occupational health status of children working in brick industries of Nepal can be used in advocacy efforts and to inform policies. This study also aims to increase collaborative efforts of concerned stakeholders in responding to and mitigating adverse health impacts through use of its findings.

2. Objectives

The study's principle objective was to assess the health status of children working in the brick industries of Nepal. The specific objectives of this research were as follows:

- Determining health status and health history of child workers
- Identifying occupational hazards in the brick industry and the associated lifestyle
- Assessing and comparing prevalence and severity of physical and psychological occupational impacts for child workers
- Measuring anthropometric parameters of child workers for nutritional analysis
- Documenting health expenditures attributable to work related injuries and illnesses

3. Methodology

3.1 Quantitative study

Study Design: This was a cross-sectional study design involving children 17 years and below of age. The children were classified into two groups i.e. children working in brick factories (case) and non-working children (control) with similar socio-economic backgrounds such as ethnicity, migration and languages etc.

Study Site: The seventy districts of Nepal have been classified into two categories based on the child labor population i.e. more than 10,000 (8 districts) and less than 10,000 (67 districts). The selected two districts were ranked as the best (Bhaktapur) and worst (Sarlahi)⁵. There were 64 brick factories in 10 village development committees of Bhaktapur district. Similarly in Sarlahi district, there were 55 brick factories in 27 village development committees.

Study Respondents: Working and non-working children through age 17 were the respondents in this study, as per ILO Convention 182 which defines "child" as the persons under the age of 18.

Sample Size: The aim of the study was to determine the health status of children working in brick industries. Previous study conducted in different parts of the country showed that health problems among child laborers were 37 per cent⁶. Therefore, the sample size required ($n = 90$) was calculated according to the expected percentage of health problems of 37 per cent with a precision of 10 per cent and a confidence level of 95 per cent. This resulted in a study sample of 101 child laborers from Bhaktapur district and 97 from Sarlahi district.

Similarly, it has been decided to take 90 non-working children as a control group, 45 from each district, by identifying non-working children from the school near the brick factories whose characteristics were very similar to the brick kiln child workers. Practically, the study team was able to identify only 64 non-working children from Bhaktapur and 43 children from Sarlahi who met these criteria.

3.2 Sampling strategy

a. Selection of cases:

A multi-stage stratified sampling approach was used to select the number of children required for the study. At the first stage, two districts were selected based on available

⁵ Districts Classified by Child Labor population [2001].

⁶ Plan International and World Education. A Rapid Assessment of Children in the Brick Industry: Kathmandu, 2012.

information and the categories of district they represent i.e. worst and best, hill and Terai. Bhaktapur was selected as a best district and Sarlahi as a worst. In the second stage, village development committees (VDC) having brick factories were selected using probability proportional to size. Bela, Laxmipur and Gaurishankar VDC were selected from Sarlahi district and Tathali, Nakhel and Sudal VDC were selected from Bhaktapur district (See table 1 and 2). In the third stage, two brick factories were selected randomly from each selected VDC except for Bela as there was only one brick factory there (names of brick industries cannot be mentioned due to ethical issues). After selection, 30 working children were selected randomly for the study from two brick factories except Bela. All 18 children who were working in Bela VDC during the survey time were taken for the study (See table 3). Besides children, we also collected information from their mothers (23 in Bhaktapur and 76 in Sarlahi) among cases. Interviews and clinical tests were done with all child respondents.

Note: It was difficult to prepare a sampling frame for child workers due to the limitation of time and their being a migrating population. Therefore, random selection was done on the spot by throwing a coin. Gender balance was prioritized during sample selection.

Table 1: Number of registered brick factories in Sarlahi by district village development committee

SN	Village Development Committee (VDC)	No of industries
1	Basantapur	2
2	Batraul	1
3	Bela	1
4	Brahmapuri	4
5	Dhanakaul Purba	1
6	Dumariya	2
7	Farahadawa	4
8	Gadahiyabairi	1
9	Gamhariya	1
10	Gourishankar	3
11	Hariyon	4
12	Ishworpur	1
13	Jabdi	2
14	Kabilasi	3
15	Kaudena	2
16	Khoriya	1
17	Laxmipur	5
18	Motipur	1
19	Murtiya	1
20	Nawalpur	1
21	Netraganj	2
22	Noukailawa	1
23	Raniganj	1
24	Sangrampur	3
25	Sasapur	4
26	Sundarpur	2
27	Sundarpur Choharwa	1
Total		55

Highlight indicates study VDC.

Table 2: Number of registered brick factories in Bhaktapur district by village development committee

SN	Village Development Committee(VDC)	No. of industries
1	Bageshori	1
2	Chaling	3
3	Chitapol	3
4	Duwakot	8
5	Dadhikot	1
6	Jhaukhel	12
7	Nakhel	4
8	Sipadol	3
9	Sudal	10
10	Tathali	19
Total		64

Table 1. Number of children selected for the study in Bhaktapur and Sarlahi District by VDC

Group	District and VDC		Number of The respondents	Percent
Case	Bhaktapur	Nakhel	30	29.7
		Tathali	36	35.6
		Sudal	35	34.7
		Total	101	100.0
	Sarlahi	Bela	18	18.6
		Gaurishankar	41	42.3
		Laxmipur	38	39.2
		Total	97	100.0
Control	Bhaktapur	Jhaukhel	64	59.8
	Sarlahi	Haripur	43	40.2
	Total		107	100.0

b. Selection of Controls:

It was difficult to select controls who had equivalent characteristics in terms of socio-economic status, ethnicity, migration and parental occupation to the cases. Thus, the control group was selected using purposive sampling techniques. Only those non-working children who met the above-mentioned criteria were selected as control group. The schools at the peripheries of the brick kiln were the major source of controls along with non-working children living near the brick kilns.

Data Collection Modality. The study was conducted in two stages. The first stage consisted of activities like collection of background information, secondary data collection and review, site visits followed by job task analysis, hazards identification, risk evaluation and preparation. The second stage of the study focused on assessment of health and financial impacts.

3.3 Data Collection tools

a. Quantitative Study:

The modified and objectively designed semi-structured questionnaires provided by ILO were used to collect primary data. Standard questionnaires on 1) Socio-demographic background information, 2) Work history, 3) Health history, 4) Psycho-social functioning, 5) Finance related questions for Mother/Other Adult, 6) Clinical Examination, and 7) NORDIC Ergonomic questions for MSD were used for collection of primary quantitative data. All the questionnaires were used for the working children, whereas, questionnaires 1, 3, 4, 5 and 6 were used for non-working or control children.

Similarly, a blood test for haemoglobin, pulmonary function tests, and audiometric screening were performed on the working children. Blood samples for haemoglobin testing were taken using Haemocue 201®. The pulmonary function test was performed using the COPD-6 vitalograph. The audiometric test was performed among the working children to assess the level of noise-induced hearing loss using a screening audiometer, Danplex AF42.

Monitoring for ambient air quality, workplace noise level, and heat stress was performed in Bhaktapur. Personal SKC samplers were used to measure the dust exposure levels. Noise meter SPL was used to assess the noise levels in the brick kilns. Similarly, a Microtherm® Wet Bulb Globe Thermometer was used to monitor heat stress among the child workers.

b. Qualitative Study:

The qualitative study focused more on understanding the nature and processes of children's brick kiln work. It was directed to obtaining information on perceptions, practices and the realities inside the brick factories. The methods for obtaining this information used focused group discussion (FGDs), in-depth interviews, observations and case study methods.

The FGDs were conducted at each study site. The participants included workers, parents, locals and the brick kiln owner. The average number of participants per discussion was 6-7 individuals. Standard FGD procedures with facilitator, note takers and observers were used.



Focus Group Discussions

The in-depth interview collected information from working children and control groups, parents, kiln management and locals at both the districts. Six in-depth interviews were conducted at each study site with the targeted respondents.



In-depth interview

The observation process included non-participant observation methods with researchers assessing and collecting information on physical environment, work processes, risks and hazards, and work conditions at the kiln.

Data Management and Analysis: Collected data was manually edited by field supervisors in the field as well as in the office. Trained medical doctors, a sociologist, a psychologist and public health graduates collected the data. Two days' training was organized at the Department of Community Medicine at Kathmandu Medical College by the study team to familiarize them with the tools and their responsibilities.



Data entry



Data analysis by the statistician

Trained public health graduates entered the data in Microsoft Excel 2007 software and data were analyzed using IBM SPSS version 20 and Microsoft Excel 2007. Both descriptive and inferential statistics were performed. In descriptive statistics, data were presented by number, percentage, median and inter-quartile range. In inferential statistics, Chi-square test and odds ratio were computed to measure association between different components of clinical examinations and working and non-working children. P value was set at 5 per cent level of significance.

Ethical Considerations: Researching child labor issues in the informal sector entails multifold ethical concerns. Thus, the research team has followed basic ethical guidelines which emphasize respect and justice for the study participants and informed consent. Because the brick kiln management felt threatened by the research, they were given assurances as to its anonymity and the fact that it dealt with the health of the child worker. The interviews focused primarily on getting information on health status, rather than on child labor per se. The ethical concerns were addressed at all levels of this study, as well as rapport and trust-building with the gatekeepers at all levels. All the information was kept confidential and can be used only for research purposes. Kathmandu Medical College obtained prior ethical clearance from the Institutional Research Committee of Kathmandu Medical College for conducting the medical procedures as part of the government of Nepal's research requirements.

3.4 Analysis by tripartite group

A Stakeholders' Consultation Workshop for Legal Reform on Child Labour Elimination was organized on 21-23 May 2013 in Kathmandu by the Ministry of Labour and Employment and International Labour Organization. This workshop facilitated a consultation among stakeholders for formulation and necessary reforms in the legal documents regarding child labour in Nepal. It was also focused on finding gaps between international standards and commitments with national existing relevant legislation and recommendations for detailed legislative amendments. More specifically, the workshop aimed to:

Find the gaps and challenges in existing laws and legal framework on child labour:

- Finalize the following for further consultation and Government endorsement: National Child Labour Policy; Amendment of Child Labour (Regulation and Prohibition) Act, 2000; and Hazardous Child Labour List;
- Develop common understanding on child labour and related issues;
- Share the knowledge, insights and understandings; and
- Extend solidarity for child labour elimination in Nepal.

Forty-nine participants (9 female/40 male) from the Nepal Government, social partners and civil society took part in the consultation. In one session Dr. Sunil Kumar Joshi, Associate Professor at Kathmandu Medical College, presented the preliminary research findings on the effects to the health and safety of children working in brick kilns. He discussed the risks associated with (physical, mental, psychosocial, chemical, ergonomics) health and safety of children working and living in the brick industry and explained that lack of protective tools and environment in making, burning and carrying bricks have posed threat to musculoskeletal system, respiratory system and deposits of arsenic contents in the body of the children working. The cases of illness, injury and death of children identified among families living in the brick industry due to drowning in open ponds, unhygienic living conditions and sanitation facilities were discussed. Overall the findings revealed that the harmful and hazardous working conditions have not only perpetuated serious occupational related illness among working children but also affected the health of young workers in the brick industry.

During discussion participants concluded recommendations should also see if the environment within the brick industry is safe and secure for the non-working children who live with their parents involved in brick making: sanitation issues, possibilities of sexual exploitation, cases of drowning. Also raised in the discussion was that the situation may be hazardous in terms of sexual abuse. Safety mechanisms and monitoring system should be regulated in the brick industries which is non-existent at this stage- for e.g. Methods of reducing dust, use of proper chimneys, introducing tools for transporting the bricks, management of ponds, regulating the quality of bricks - so that child labour is prohibited for children under 14 and the adult workers (15-17 years) who are of legal employment age are not trapped into hazardous work conditions. The participants suggested that the findings of the research should be determined by the members of the National Steering Committee on Child Labour and get approved by the Central Labour Advisory Board (CLAB) which is tripartite in nature for submission for further Government endorsement.

Major Recommendations

- Informal sector needs to be defined and addressed well in Nepal's new child labour legislation.
- 14 should be kept as the legal employment age for children and the age should be gradually upgraded with the increase in age for compulsory education.

- The recommendation to prohibit the engagement of children in sectors and occupations as tourism, domestic work, brick industry needs to be followed with realistic alternatives. Balance between rights and work for survival is necessary especially in Nepal's context.
- The following should be added in the hazardous child labour list: electromagnetic radiation, atomic radiation, vending in the moving vehicles.
- Domestic area is too broad, so removing it from the list of WFCL is necessary.
- Occupational safety and health standards need to be in place and should be sector specific. Occupational Safety and Health Department under the MoLE should be capacitated.
- Periodic reviews are to be made to update the HCL list once within two years (this includes brick-industry). Joint mechanisms are to be made for enforcement.
- Gender-sensitive mainstreaming of child labour issues and concerns in national policies related to education, poverty among others is necessary.
- Integrate child labour related monitoring, coordination and reporting elements into new child labour legislation by indicating clear roles and responsibilities of existing mechanisms/structures at multi-sectoral and multi-tiered level.
- The draft National Child Labour Policy, Hazardous Child Labour List and Amendment to the Child Labour (Prohibition and Regulation) Act to be finalised and placed before the Government soon for endorsement.
- The legal drafts including the findings of the research should be determined by the members of the National Steering Committee on Child Labour and get approved by the Central Labour Advisory Board (CLAB) for Government endorsement.
- There needs to be a periodic review of the legislation on child labour. New acts/policies should promote the campaign against child labour.

The Stakeholders' Consultation Workshop for Legal Reform on Child Labour Elimination was a great opportunity for the stakeholders to have their say regarding the draft policy, legal amendment and hazardous work list. The opinions, comments and suggestions contributed to refining the draft documents. Addressing and incorporating the recommendations will help make the legal frameworks more practical and effective in eliminating the child labour in Nepal. The workshop narrowed down the gaps in the draft legal frameworks as per the international and regional conventions and commitments as well as national context. All the comments, suggestions and recommendations will be considered before taking it to the higher level discussions.

4. Policies and Laws relating to Child Labor in Nepal⁷

The Constitution of Nepal (1990) allows through Article 11 for the provision of laws to advance the interest of women and children, while Article 20 expressly forbids the trafficking in human beings, slavery, serfdom or forced labor, as well as minors from working in mines, factories and in other hazardous work. Article 26 obliges the state to protect the rights and interests of children, and to protect them from exploitation.

Interim Constitution, 2063 (2007) was promulgated in 2007 with one specific section for children's rights. Article 22 of the Interim Constitution of Nepal protects the rights of the child, among which the "right against physical, mental or any form of exploitation", including "helpless, orphans, mentally retarded, conflict victims, displaced, vulnerable and street children" and the prohibition for any "minor to be employed in factories, lines or in any other such hazardous work or in army, police or in conflicts".

The Labor Act (1992) and Labor Regulations (1993) prohibits the employment of a "child" under 14 years and sets terms on the types and conditions of employment of "minors" between 14 and 18 years.

The Children's Act (1992) and the Children's Rules (1995) are intended to protect children's rights and interests. A "child" is defined as being under the age of 16 years. A child is banned from hazardous work and cannot work at night. Children under 14 years cannot be employed. The Act also established conditions of employment and provides for the establishment of a Central Child Welfare Board and 75 District Child Welfare Boards. Businesses employing children 14 years and over must register the child with the District Child Welfare Board.

The Child Labor Prohibition and Regularization Act (1999), which revises certain sections of the Labor Act and Children's Act, gazettes certain occupations and working environments as hazardous and forbids children below the age of 16 from being employed in them. The Act provides heavy penalties for violations. While the brick kiln industry is not on the hazardous list the hours and conditions worked by children fall under the Labor Act making this work illegal.

The Municipality Act (1992), District Development Committee Act (1992), and the Village Development Committee Act (1992) were combined into the Local Self Governance Act in 1997 and devolve a number of child development responsibilities to the local level.

The Human Trafficking and Transportation (Control) Act, 2064 (2007) gives a large definition of human trafficking and human transportation, including the acts of selling or purchasing a person, use of someone for prostitution, extracting of human organs, taking someone from

⁷ Adapted from, Nepal Government, Ministry of Labor and Employment, Department of Labor, Minbhawan, Kathmandu Publication 2012.

his/her home or place of residence by any means for the purpose of prostitution and exploitation. The act provides several penalties for anyone who engages in any activity included in the definition of trafficking. Finally, the law has given provisions for the rescue, rehabilitation and reconciliation of Nepali citizens sold in foreign lands.

The Juvenile Justice Procedure Regulations, 2006, provided for a separate police unit with qualified staff, guidelines for investigations and inquiries, and rules regarding the composition and minimum requirements for the juvenile bench and disposition procedures. A Central Child Justice Coordination Committee was also established to develop and promote an interdisciplinary juvenile justice system, but it cannot instructor issue orders to resolve problems that have arisen in connection with implementing provisions of the law and so remains ineffective.

In recent years, there have been several successes in raising the profile of child labor through several key Nepal Government policy and plan documents. The Ninth National Development Plan made the elimination of child labor a national priority, as well as targeted the determinants of child labor. Several statements were made about the need to eliminate child labor in the context of access to education and labor force skills development. It also commented upon the need to enforce existing laws, improve local labor administration and inspection, and include the informal sector within the Labor Act. It announced the development of a national plan on child labor in order to adopt "...multipurpose strategies of awareness, enhancement, identification of the income growth of parents, direct interference, rehabilitation programme, educational and vocational training..."

The Tenth National Development Plan's (2002-2007) included the target to eliminate "most of the worst forms of child labor existing in various sectors in Nepal", and that "provision will be made to eliminate the worst forms of child labor within the next five years and all forms of child labor within the next 10 years". The Plan envisaged that programs related to the elimination of child labor should be integrated with poverty alleviation programs. The capacity of employees of concerned ministries, departments and offices related to the implementation of programs aimed at child labor elimination should be enhanced, and a high level Central Coordination Committee should be constituted in order to coordinate the program on child labor elimination.

In 2007 the Government concluded that "the legal, policy, institutional and operational efforts to protect and promote child rights continued to be ineffective" and thus developed the next plan to address those issues. Three-Year Interim Plan (2007-2010) proposed the implementation of policies "to create a child-friendly environment and to put an end to all kinds of discriminations and exploitation against children". According to this plan "children will be defined by age and necessary legal, policy and institutional arrangements will be put in place to free them from all kinds of torture, abductions and discriminations."

The current Three-Year Plan (2010/11-2013/14) calls for the implementation of the National Action Plan (2004-14) in an effective manner toward the goal of abolishing child labor. The Plan has made provision for a national level central steering and coordination committee to ensure that programs related to children would be implemented in a coordinated fashion as well as to assist in the mobilization of resources. A Central Child Welfare Board (CCWB) has

been set up in order to ensure that the National Plan achieves the declared goals of promoting and protecting the rights of children in crisis and, notably, child laborers. The National Master Plan on Child Labor (2001-2010) was initiated by the Ninth National Development Plan. According to it, the Ministry of Labour and Employment (MoLE) would function as the nodal point with the National Planning Commission, the Ministry of Finance, the donor community and sectoral ministries, as well as representatives of local bodies, social co-workers, donor communities and civil society. At the implementation level, committees would be formed for coordination and implementation and child labor inspection would be undertaken in a systematic manner through the local labor offices. Programmes would be monitored according to set indicators and targets in line with a monitoring Action Plan.

4.1 Policy Gaps in Combating Child Labour

A summary of the significant gaps of the current policy framework includes:

- The Labor Act with its focus on the registered enterprises has no jurisdiction over all unregistered (informal) enterprises and business entities of less than ten employees, where most child laborers are situated. This creates the impression that children hired outside formal establishments are not covered by the Act. The Labor Act also does not cover children who are "self-employed" and appears to provide for legal child labor for children less than 14 years.
- There is the contradiction between the Children's Act and the Labor Act on the definition of a "child" and the minimum age for entry to hazardous work.
- Hazardous work is not defined nor is there a mechanism for having a form of work declared hazardous. Also the current laws regarding the age of legal hazardous work are not in line with international commitments in ILO No. 182 and 138 (the lower age limit for engaging in hazardous work in these instruments is 18).
- The penalties for illegal employment of children are small and seldom applied.
- The Child Labor Prohibition and Regularization Act requirements for a manager to make arrangements for the health and safety of working children are weak.
- No law requires the provision of education, recreation or nutrition to child workers. No law states that the employment of children brings additional responsibilities to an employer for their well-being (e.g. guardianship, educations, nutrition, sleep, etc.)
- District Child Welfare Boards have no inspection powers, resources and in most districts not active.
- Complaints related to offences under the Labor Act must be filed within 3 months; 12 months for the Children's Act. This has been shown to be insufficient.
- The lack of a comprehensive birth and/or citizenship registration system seriously hampers age determination.

5. Results of hazard assessment

The risk assessment was conducted in all the sampled brick kilns to identify and evaluate hazards associated with the brick making work. An observation guide and risk assessment tool obtained from ILO was used for assessment in the selected sample brick kilns.

5.1 Worker's living environment and hygiene



Basic sanitation in the kilns is not satisfactory in any of the kilns under study, and can be a major threat to health. Only one sampled kiln in *Bhaktapur* had temporary toilets constructed for workers while in other kilns, workers were found to be attending natural calls in nearby open areas adjacent to the kiln. Pools of stagnant water are used both for brick manufacturing and cleaning purposes. The lack of basic sanitary practices and non-availability of safe water is likely one of the major causes of ill health, resulting in water borne diseases and skin ailments.

Water Source

Ground water which is pumped up from deep boreholes is the source of water for brick making and consumption in both the districts. Electric motors were used for pumping in *Bhaktapur* while mechanical hand pumps were in operation at *Sarlahi*. Electrical hazards are consequently high in *Bhaktapur* due to faulty wiring and inadequate electrical insulation.



Accessibility

The brick kilns are found in isolated areas away from major human settlements. Most of the brick kilns do not allow outsiders on their premises. The nearest market, medical services, school and other available services are at least several kilometers away from every kiln under study. The kiln itself covers a huge swath of land with workers working on the perimeter and around the furnace. The molding and sun drying areas where most of the child workers do their work are between 50-300 meters from the furnace in all sampled sites.



5.2 General Environment

Heat

Brick work is seasonal, starting from September/October and usually ending before the arrival of the monsoon in April. Conditions are fair to work outside until mid-February. As all of the brick making jobs are done out in the open, the later months are treacherous with scorching heat. In the dry season, daytime temperatures increase with dry winds blowing in the afternoon.

The working conditions are poor; no shades or covers were visible in any of the sampled brick kilns. The workers took a break for two hours in the middle of the day to avoid the heat. The mean temperatures recorded by a Wet Bulb Globe Thermometer at the hottest period of the day for the sites are shown in the table below. Weather was relatively mild in Sarlahi during our field visits.


Table 4. Temperature Recorded at the Brick Kiln

Site	Mean Temperature (°C)
Site 1 Bhaktapur	32
Site 2 Bhaktapur	31
Site 3 Bhaktapur	31
Site 4 Sarlahi	33
Site 5 Sarlahi	33.5
Site 6 Sarlahi	32.8

The external environment affects the body's heat exchange process during work. As ambient temperature increases – both from the weather and from radiation from the furnace – body temperature increases. The time of day also determines the temperature, reflecting the intensity of sun and exposure. The absence of shade makes the worker vulnerable to heat. Winds have a coolant effect but under dusty and dry conditions the dust exposure increases the threat of other health hazards. The work, since it entails rigorous physical movement and heavy workload, such as molding clay and transporting brick, generates more body heat and makes children more susceptible to heat related illness. Heat-related illness can range from minor heat rashes to heat stroke. Through observation

and discussions with workers, there was ample evidence of heat cramps and heat exhaustion. The figure below describes illnesses caused by heat exposure.

Figure 1. Health related illness due to heat



Heat rash Prickly heat	Signs and symptoms:	Red spots on the skin that resemble blisters; prickly or itchy sensation.
	What's happening:	Sweat glands become clogged and inflamed when sweat cannot evaporate; happens in humid conditions and/or when clothing traps sweat against the skin.
Heat cramps	Signs and symptoms:	Spasms of the legs, arms or abdomen; often accompanied by heavy sweating and thirst; happens after physical labor.
	What's happening:	A loss of body salt, through sweat, causes water to rush into the muscles, resulting in cramping or spasms.
Early heat illness	Signs and symptoms:	Fatigue; dizziness; irritability; inability to concentrate; impaired judgment.
	What's happening:	Blood flow to the brain is reduced as the body redirects blood to release heat from the skin.
Heat syncope	Signs and symptoms:	Sudden dizziness; pale complexion; moist skin; normal body temperature.
	What's happening:	Blood flow to the brain is reduced as the body redirects blood to release heat from the skin.
Heat exhaustion	Signs and symptoms:	Excessive sweat; dry mouth; extreme thirst; headaches or feeling dizzy; lightheadedness; mood changes or irritability; rapid breathing; chills; fainting or weakness; heat cramps; nausea; decrease or dark-colored urine; pale, moist skin; fatigue.
	What's happening:	Less blood flow to the brain, resulting from blood flow to the body's surfaces; this results in less oxygen reaching the brain and therefore lightheadedness, headaches, and mood changes; the body's temperature regulator is still functioning, trying to cool the body.
Heat Stroke	Signs and symptoms:	Often occurs suddenly; extremely high body temperatures; lack of sweating; confusion or aggressive behavior; seizures or convulsions; coma in severe cases; unresponsiveness to clapping; dizziness; fast pulse; dry, hot, red skin.
	What's happening:	Over 150°F, the body stops sweating and the temperature-regulating system stops functioning due to too much heat; blood flow to the brain is significantly reduced; rising internal temperatures risk damage to organs including the heart, brain, central nervous system, liver and kidney; brain damage or death can result.

Light

Brick making is an outdoor job and done under natural light. Light can be a physical risk, but it does not seem to be a problem during the daylight hours. However in *Bhaktapur*, brick molding is also performed during the night and workers can wake up as early at 1 AM in the morning to start this job. Artificial lights that are mostly used for this purpose are chargeable flash lights and electric lamps. The luminosity of these lights was not assessed in this study but hazards associated with it were observed. The workers reported that the light was not sufficient for working in the darker conditions. Moreover, artificial light increases the risk from nocturnal animals and insects. The other risk associated with light is the source of electricity. It is not related to the quality of the light but to the way electricity is

accessed. Electricity is mostly obtained by hooking into the main lines and dark conditions increase the risk of electrocution.

The situation is different in *Sarlahi* where all work is done during the daytime under natural light. In other words, the work stops when the light is no longer sufficient. The hazards associated with light were not observed in *Sarlahi*.

Air Quality

Brick making takes place when conditions are dry, which means that the worker is exposed to clay dust, blowing sand, fumes from machines, and smoke from the furnace. The exposure to dust occurs during excavation of soil, molding of clay and transportation of baked brick. Fine carbon particulates are also released when the coal used for fuelling the furnace is crushed. The height of the chimney keeps smoke from being dispersed at ground level but fine soot and other particulate matter gets dispersed in the vicinity. The erratic wind patterns can also carry smoke from nearby kilns exposing workers and nearby communities to smoke and soot particles.



Respiratory diseases, such as silicosis and anthracosis, and poor lung functioning are a major health impact associated with the brick kilns. The workers are aware of dust hazards but none of them were found to be using any personal protective equipment apart from covering their nose and mouth during the worst conditions. Tree barricades around the kilns would reduce dust being blown to a distance but these are absent and consequently it was observed that, during periods of high wind, dust is blown with great intensity thus increasing workers' exposure to dust. The conditions were found to be similar in both the districts under study.

Fall Risks



There are three types of fall risks: a) the holes left by excavation of soil for bricks and the water reservoirs where there are no barricades and there is risk of small children falling in and drowning, b) toppling of the elevated areas used for kneading which do not have

permanent structures for support, and c) carrying baked brick down from the furnace as it involves transporting a heavy load over a narrow inclined wooden plank.

Equipment Risk

The equipment risks mainly come from the machines used for soil kneading and coal crushing. This risk is more prevalent in Bhaktapur than Sarlahi because of the use of electricity. But mechanical tools are used for soil extraction in Sarlahi which pose risk of cuts and bruises. Equipment can also trap clothes and crush fingers and limbs. This work is mainly done by adults and even if children are found to be operating or assisting the kneading process by machinery they are under the watched by adult workers.



Table 5. Summary of Identified Occupational Hazards

	Source	Health Risk
Physical Hazard	Thermal stress Dust Coal	Heat exhaustion, dizziness, lack of concentration, anorexia, respiratory track infection
Biological Hazard	Soil, Human Contact, Personal Hygiene, Insects and animals	Infection, communicable diseases, dermatitis, snake bite, scorpion sting
Mechanical Hazard	Equipment and machinery, pools, trenches and holes	Crushing of body parts, electric shock, falls and drowning
Chemical Hazard	Exhausts of fuel, Arsenic and Silica	Respiratory problems, peripheral nerve damage, anemia, Pneumoconiosis, and arsenic poisoning
Ergonomic Hazard	Loads, repetitive tasks, poorly designed work area	Locomotive disorders, Musculoskeletal problems, Heat stroke
Psychosocial Hazard	Repetitive tasks, Work pressure, Stress, Self Esteem, Abuse	Cognitive damages

5.3 Risk assessment in brick making

The process for making bricks was different in the two districts under study. A more mechanized process was observed in *Bhaktapur* while most of the process in *Sarlahi* used manual labor. The excavation of earth in *Bhaktapur* used power-operated excavators and the kneading process was also aided by power-operated mixers. The kneaded soil was transported in a wheel barrow to the place where the bricks would be molded. Although the excavation and kneading processes were controlled largely by adults, transportation of clay ready to make bricks was observed to be the work of children.

The bricks are made by hand molding using a metal or wooden key-frame. The brick molding is a painstaking job often performed by family members. As the payments are made per the numbers of bricks molded it requires fast-paced work. Most of the families are found to be doing this work with the involvement of children for close to 8-10 hours in a day. Once formed, the green brick are left to dry in the sun and stacked later for almost a week to dry completely before sending to the furnace. The furnace operation is a highly technical job and is mostly done by Indian laborers. The furnace is an area where children do not work

except for transportation jobs. Fuels for firing the furnace are mostly coal in *Bhaktapur* while the kilns at *Sarlahi* rely on both wood and coal. Fixed chimney kilns, both single and double, are common in both districts. Vertical Shaft Brick Kilns (VSBKs) have been shown to be the least polluting and safest, yet only two have been installed within the Kathmandu Valley and only one is operational.

Digging out the soil

As noted above, machines were used to dig earth in *Bhaktapur* while manual labor was used in *Sarlahi*. Children were not used for this task in either district as it requires skills, expertise and intense labor. However, a few children were observed exploring and playing with the excavator. A worker's child who was climbing on the arm of the excavator fell, sustaining some minor injuries. There is also risk of fatal accidents as the excavator, when idle, is unguarded and the inquisitiveness of children might have serious results. Arsenic and lead in the soil also pose health risks.



Control Measures required

- Cordon and fencing of the pit.
- Safety regulations with excavators while in use or at idle.
- Testing for arsenic and lead levels in the soil.

Mixing soil with water and kneading

Mechanized mixers operating on electricity are used in the kilns of *Bhaktapur* for this procedure. The soil is fed into the machine and mixed with water. The potential risks are (a) that the machine will fall as it is on an unstable structure, (b) electric shocks and (c) crushing of body parts. Both children and adults were found operating this machine which requires constant musculoskeletal effort movement for feeding the soil. The mixing of soil with water and kneading involves manual labor in *Sarlahi*. Water is channeled through small canals controlled by gates. The kneading process requires manual pressure using either hands or feet. Children were found to be squatting and using their arms to knead the soil, while adults mostly used their feet.



Control measures required

- Proper insulation to avoid electric shock
- A stable platform for the machine to reduce risk of its toppling off or the soil shifting
- Safety instructions for machine operation
- Guards on the machine belt to reduce the danger of entrapment or parts of the body being crushed

Rolling Clay into balls and Moulding

The child work force comes to play a major role for this work. The kneaded soil is rolled into a ball using a bit of sand as the drying matter. It is then placed in the mold to give it the shape of the brick. The posture for doing this work requires the worker to remain squatted for a long period, and intense hand-eye coordination. Workers themselves define it as a treacherous job. The children were observed to be working under scorching heat at midday without any shade to protect them from the sun. The workers use a piece of cloth over their nose and mouth to keep out the dust.



Control measures required

- Availability of shade would decrease heat related problems
- Use of protective masks to reduce dust inhalation
- Breaks at regular intervals would reduce musculoskeletal problems
- Awareness-raising about better postures while molding brick

Brick transport

The stacked brick is manually carried to the furnace for firing. The distance the bricks are carried is approximately 150 meters on average. During one day, a child worker may carry bricks the equivalent of 12.5 kilometers loaded (and walk another 12.5 kilometers unloaded) in total. How the bricks are carried differs in *Bhaktapur* and *Sarlahi*. In *Bhaktapur* a rope is used to adjust the weight that is supported by the head, while in *Sarlahi*, the whole load is carried on top of the head cushioned by a thick cloth. Both practices exert considerable pressure on the



cervical vertebra. It was observed that the workers hurry to carry as many bricks as they can as the payments are made as per the number of bricks carried, which entices the workers to carry the maximum load.

The weight of a single brick is 2 kilograms in the Terai and 1.5 kilograms in Kathmandu Valley. Children begin to carry bricks as early as age 8 in proportion to their size. An average load for a child 10-14 years of age might be 32 kilograms; a male child 15-17 years of age, for who the average weight is 35.6 kilograms, may be carrying a load of as many as 42 kilograms, in other words, more than his total body weight.

Control measures required

- A ceiling weight on the load to be carried should be set and maintained
- Adequate rest should be ensured at regular intervals

5.4 Ambient air quality, workplace noise level, and heat stress

Workplace monitoring was done for ambient air quality, workplace noise and heat stress using tools such as SKC personal samplers, SPL noise meter and WBGT equipment in Bhaktapur district. Results of the findings were within acceptable limits and attached in Annex B.

Table 6. Summary of Hazards in Brick Making

Task	Hazard	Potential Injuries	Risk Level	Control
Digging out Soil	Tipping of mechanical excavator, injuries using manual tools, Heat exposure	Falls, Entrapment, Crushing of body parts, Cuts	Moderate to High	Training, Education, Awareness, use of protective equipment, Fencing of pits
Mixing Soil with Water and Kneading	Electrical shock, Sharp objects in clay, Toppling of mixing machine, Heat exposure, Trapping in moving motor parts	Electric shocks, cuts and bruises, fall, skin exposure to soil	Moderate to High	Stabilizing structures, Proper insulation, Use of protective equipment
Rolling Clay into balls and Molding	Exposure to heat and dust, Repetitive work, Body posture	Respiratory infections, Heat fatigue, Musculoskeletal disorder	Moderate to High	Canopy and shade for work, use of protective equipment, periodic break
Brick Transport	Heavy load, Heat and dust exposure	Musculoskeletal disorder, Upper respiratory tract infections, heat fatigue	Moderate to High	Load limit, regular break, Use of protective equipment

Results of soil test

Four samples of soil were collected from various brick kilns in Sarlahi and three samples from Bhaktapur district for the analysis of arsenic and lead levels. Soil samples were collected from the spots used for digging out clay for brick making. The samples were analyzed in a national level environmental and scientific laboratory. The soil was tested using SDDC and spectrophotometric test, and Atomic Absorption Spectrometer (AAS),

Food and Agriculture Organization, Fertilizer and Plant Nutrition Bulletin No. 19 were followed for the analysis of soil for Lead.

The results of the soil test are presented in the table below:

Table 7. Soil Test

Sample sites	Arsenic ($\mu\text{g/g}$)	Lead ($\mu\text{g/g}$)
Sarlahi 1	3.4	22.3
Sarlahi 2	5.3	26
Sarlahi 3	5.1	22.57
Sarlahi 4	3.6	27.5
Bhaktapur 1	0.9	10.02
Bhaktapur 2	1.1	9.07
Bhaktapur 3	1.4	11.05

Table 7 shows that the levels of arsenic and lead in soil were higher in the Sarlahi district compared to Bhaktapur.

6. Socio-Demographic Profile

The total sample size in Bhaktapur was 165 with 101 cases and 64 controls. The cases consisted of 62 males and 38 females, while the control group had 27 males and 37 females, i.e. 54.3 per cent male and 45.7 per cent female. The total sample size in Sarlahi was 140 with 97 cases and 43 controls. The cases comprised of 45 males and 52 females, while the control group had 19 males and 24 females (32.4 per cent male, 67.6 per cent female).

6.1 Sex and Age Distribution of Study Samples

The respondents were classified in three categories: <10 years, 10-14 years and 15-17 years. (Note: this study did not include youth in the 18-24 age range.)

Table 8. District wise Sex and Age Distribution of Study Samples

Variables	Bhaktapur District		Sarlahi District	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
	Number (%)	Number (%)	Number (%)	Number (%)
Sex:				
Male	62 (61.4)	27 (42.2)	26 (26.8)	19 (44.2)
Female	39 (38.6)	37 (57.8)	71 (73.2)	24 (55.8)
Age (Years):				
Under 10	21 (20.8)	4 (6.2)	14 (14.4)	1 (2.3)
10-14	38 (37.6)	44 (68.8)	53 (54.6)	22 (51.2)
15-17	42 (41.6)	16 (25)	30 (30.9)	20 (46.5)
Min -Max (IQR)	6-18(11.8-15.0)	10-17 (13-14)	10-17 (12-15)	10-18(11-15)

The majority of the study population fell into or close to the age bracket of 10-14 years which, with the onset of puberty and the adolescent growth spurt, is a period of increased physical and emotional vulnerability and therefore heightened risk if exposed to brick work. Negative health outcomes at this age can affect the individual for life. The sex representation in Bhaktapur was dominated by males while the female population was high at Sarlahi. The possible reason for this might be related to migration because, as noted earlier, the Sarlahi population was dominated by a resident local population which had established cultural norms of greater female involvement in work both at home and outside.

6.2 Migration status of the child workers

Migrant workers dominated the kilns of Bhaktapur with 97 originating outside the district. The control group in Bhaktapur was similar with 65.6 per cent of children coming from outside the district. Sarlahi showed the dominance of locals for both the cases and controls. This was likely due to the fact that the study was conducted at the end of the brick season when most of the migrant workers had already returned to their district of origin and secondly, the academic year had ended which allowed children free time to work in the kilns

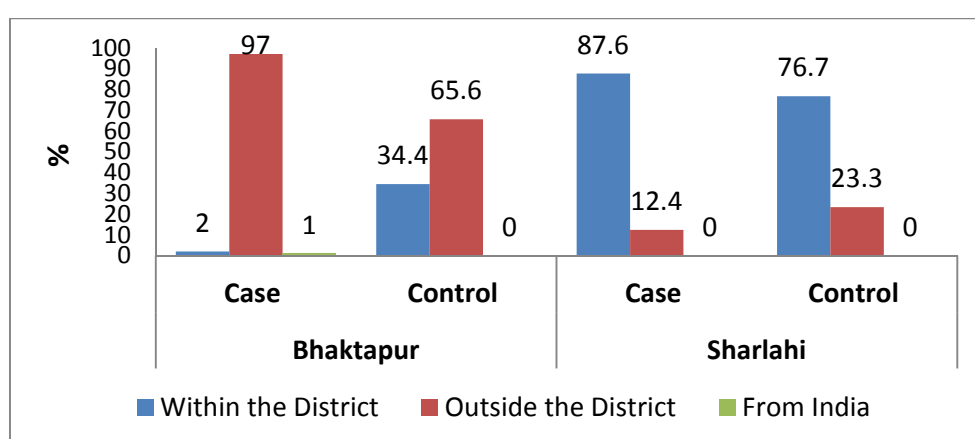
to complete the few remaining jobs at the end of the season. Sarlahi observed only 12.4 per cent of migrant children among the cases and 23.3 per cent in the controls.

Bhaktapur district is a relatively well-off district within the Kathmandu Valley. The brick factories are located on the outskirts of the city in semi-rural communities. As the workers are mainly migrants they camp for upwards of six months in temporary huts with minimal sanitation. While there are good public health and educational services available brick factory workers often find access difficult as temporary residents. Being in an enclosed Valley in the mountains the smoke and pollution from the factories is trapped beneath and cold inversion layer. This means that communities close to the factories are also exposed to air pollution with health impacts for the control group as well as the children actually working in the factories.

Sarlahi is located in the Terai plains and experiences extremely high day-time temperatures on clear days. In the winter the pollution from fires on the plains is held down by the inversion layer creating freezing fog which the poor communities are ill-prepared to cope with lacking winter clothing or adequate housing. This is one of the poorest districts of Nepal and the majority of the brick factory workers live in their own villages and commute daily to the factories. As local residents they have access to schools and health posts but these are generally in poor condition.

The Control Group was selected from the neighboring communities. However once the researchers interviewed and assessed the health of the control group it was found that in Bhaktapur the children in the neighboring community were experiencing multiple years of exposure to air pollution from the factories. Another aspect not anticipated was that Control children from brick factory worker families not working in the factories were experiencing negative psychosocial impacts from supporting other family members to work by doing household tasks but were not benefitting from the recognition and appreciation afforded children directly contributing to family income.

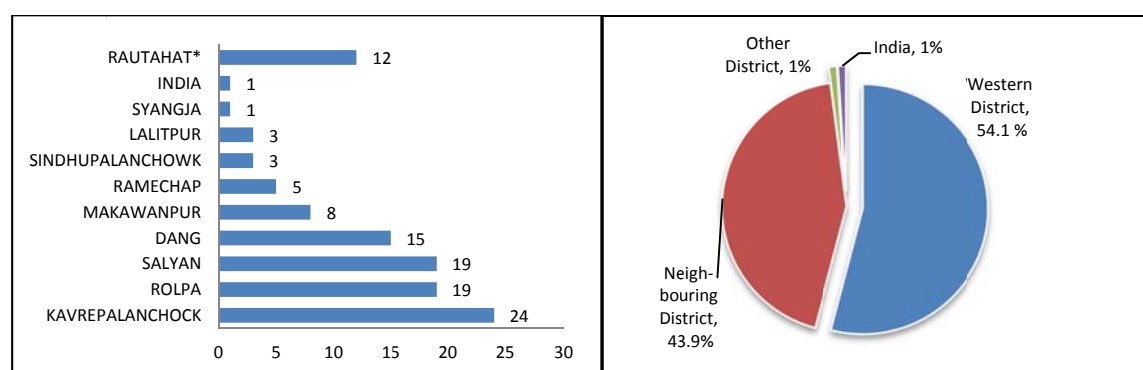
Figure 2. District wise place of residence of study population



The origin of the migrant workers in the sampled districts is shown below with the highest number coming from neighboring districts, Kavrepalanchok for Bhaktapur and Rautahat being the major origin district in Sarlahi. The majority of the respondents (54.1 per cent)

were from the western districts of Nepal followed by 43.9 per cent from neighbouring districts, whereas, 1 per cent each were from other districts and India.

Figures 3a & 3b. Districts and Area wise distribution of migrated to work (Cases only)



* In Sarlahi district, 12 migrated workers are only from Rautahat district, no one in Bhaktapur is from Rautahat

Almost all of the migrant population returns to the district of origin with only a few cases having alternative work in the host district.

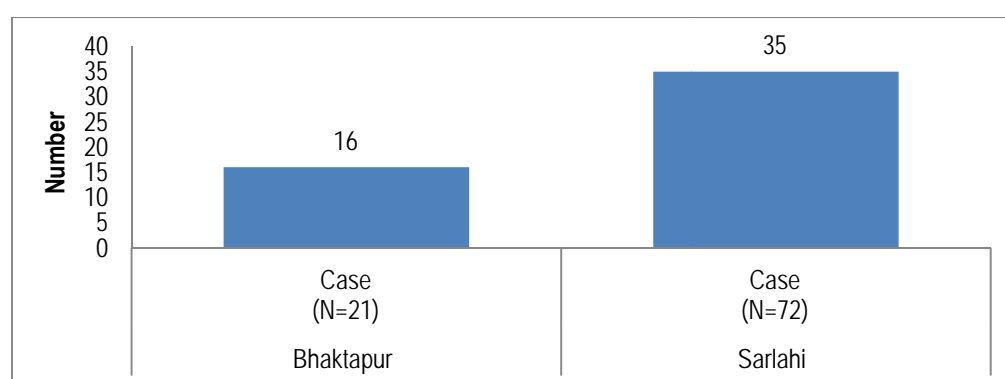
Table 9. District-wise seasonal migration of study population

Moving Seasonally	Bhaktapur District		Sarlahi District	
	Brick (N=98) ^a	Control (N=59) ^a	Case (N=95) ^a	Control (N=31) ^a
	Number (%)	Number (%)	Number (%)	Number (%)
Yes	90 (91.8)	45 (70.3)	12 (12.6)	2 (6.1)
No	8 (8.2)	14 (21.9)	83 (87.4)	31 (93.9)

Missing cases were excluded from analysis. Median number of moving in last two years is 2 for cases in each district. Min- Max moving in last two years: 1-8 (Bhaktapur) & 1-7 (Sarlahi).

Migration after the brick season

Figure 4. Number of respondent's family who migrate after the brick kiln season finishes



It was found that 16 cases were migrating in Bhaktapur to the place of their origin after the end of the brick season while 35 cases in Sarlahi planned to migrate, mainly to India, after the end of the brick season.

The brick industry, despite its overall importance to the economy and the size of individual factories, falls under small/cottage industry regulations. Therefore, it has been exempt from VAT tax and labor factory inspection. It is a seasonal industry and provides only seasonal employment for the workers; therefore many workers take advance payments and then return to engage in agricultural work in the other season. With the expansion of urban areas, the brick industry is also rapidly growing. Construction work in urban areas, where houses are mainly built using concrete and bricks, is increasing at a fast rate due to migration of people from rural areas. To reduce transport costs, brick kilns are increasingly situated close to suburban areas (GEFONT, 2007) in the Kathmandu Valley. In Sarlahi the kilns are located in more rural areas.

Poor families pull their children out of school to provide labor in the face of an income shortfall. Parents put children to work as part of a survival strategy to minimize the risk of an interruption of the income stream (which may be caused by failed harvests or loss of employment of an adult household member). Interruption in the income stream is naturally more severe for poor households, as it can be life threatening. Thus for extremely poor households, child labor seems quite rational, broadening the base of income sources.

Poverty, conflicts, lack of opportunities and debt bondages are the major source fuelling children to the brick industries of Nepal. Child labor does not replace adult labor, but complements it, either directly in the labor market or in the household, enabling adult family members to enter the labor market (Grimsrud, 2003). It is evident that majority of migrating population are marginalized population with deprivation and lack of opportunities at the source of origin. The vicious circle established at the kiln largely limits children to step out of this industry and finds them adhered to this. The process largely starting as a consequence of poverty and lack of opportunities surmounts with debt bondages and a hallmark of expertise and experiences attained, largely makes children follow the seasonal routines of the brick industries.

The brick industry relies on a squatter worker population who live in the makeshift homes with a unique world of work where work for the workers and profit for the owners is the only primary concern and interest. The brick kilns of Nepal in the legal documents is found to be operated with 3-5 workers as a cottage industry but the reality is a vibrant mass of hundreds of actively engaged workers. The obligations and making work a safer process are ignored by most owners, with this brutal reality and an absence of cross checking mechanisms and safety guidelines making brick kilns a safe haven for risks and hazards. This has resulted in work mayhem where use of standard safety and protection equipment is unheard of. The workers sweat and toil in a surrounding where pools of stagnant water are unfenced, the scorching heat from the sun remains overhead and the risks from mechanical and electrical equipment remains a constant threat. The plains of Nepal including Sarlahi report higher arsenic content and the workers constantly wrestling with soil and water without any information nor use of any protective means remain susceptible to serious consequences of arsenic poisoning. Every single brick kiln lacks adequate hygiene and sanitation facilities, together with risk associated with works and lack of basic sanitation often increases the chances of illness. Drinking water is often found in short supply and open defecation areas around the kiln with the lack of toilets increases the chances of spread of water borne diseases. Chapagain (2000), states there is no legal binding to the

employer to take precautions on the safety and health of the contract labor. It again depends solely on the attitudes of the employer. The kiln management dispenses symptomatic treatment medicine without any medical consultations threatening and often resulting in serious health consequences.

The socio demographic profile of the migrant workers indicates that there are two distinct categories: one from the nearby districts (43.9 per cent) and the other mainly from the mid- and far-western districts of Nepal (54.1 per cent). While further research may be needed to explain why this segment of the migrant population travels this far to work in the brick kilns of Bhaktapur, a common view is that it is because of the history of violent conflict which has afflicted the sending area. The mid and the far-western regions of Nepal were the major areas from which the Maoists waged an armed revolt against the state. Conflict often limits access for the population to opportunities, is responsible for complete or partial breakdown of infrastructure and social relations, results in loss of lives and properties and generates a perpetual fear rising from the culture of impunity. This forces the population to move from their place of origin to escape and look for every possible means for sustaining life.

6.3 Educational status of the respondents

Educational status was determined by attendance in formal schooling and literacy level. Although 72.3 per cent of the case population in Bhaktapur claimed to be literate, only 16.8 per cent of the working children were attending school, either at the factory sites or at their place of origin. The literacy levels in Sarlahi were much higher with 93.8 per cent of the respondents claiming literacy and 35.1 per cent still going to school. The control groups in both the study districts were largely comprised of children attending formal school.

Table 10. Formal education and Literacy Status of the respondents

Variable	Bhaktapur District		Sarlahi District	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
	Number (%)		Number (%)	
Formal Schooling ^a				
Yes	17(16.8)	64(100)	34(35.1)	43(100)
No	84(83.2)		63(64.9)	
Can You read and write				
Yes	73(72.3)	64(100)	91(93.8)	43(100)
No	28(27.7)		6(6.2)	

Mean (SD) years of formal education for cases: 4.17(2.38) -Bhaktapur; 5.20(2.06) –Sarlahi.

Mean (SD) years of formal education for control: 8.03(1.58) -Bhaktapur; 7.62(1.75) –Sarlahi.

The educational status of the working child respondents is alarming. It is evident that the migrating population is losing the opportunity for formal schooling as noted in the case of Bhaktapur. Entry to the labor force is often determined by the point at which a child is separated from formal education or schooling. A similar situation obtains in Sarlahi, which is lagging behind most other districts in terms of enrolment and in experiencing higher rates of drop out. The close proximity of the brick factories makes them an easy alternative and ensures that education will continue to fall behind. The fact that one hundred percent of the controls are in school is a welcoming sign comparing to the bleak picture shown by the

working children, although the quality and use of attained education can be another pertinent issue of inquiry. The control group represents the population for whom the brick industry is a major influence in that many have relatives who are already involved, and with the backdrop of poverty and deprivation, this population group always remains vulnerable to dropping out and joining the workforce. Their immediate need is income and the brick kilns are always around the corner; whereas education may pay in the distant future, labor pays immediately to put bread on the table.

6.4 Living situation

Both working children and controls in Sarlahi were generally living with their parents (more than 95 per cent for both groups) as was the control group for Bhaktapur (94 per cent). But almost a third (30.9 per cent) of working children there were living with someone other than their parents; some of the reasons cited were death of parents (2 cases) and parental conflicts (6 cases). This may also indicate that children are migrating alone to work.

Table 11. Percentage of the respondents who are living with parents and other relatives

Whom do you live with?	Bhaktapur District		Sarlahi District	
	Case (N=94)	Control (N=57)	Case (N=97)	Control (N=43)
	Number (%)		Number (%)	
Parents	65(69.1)	54(94.7)	93(95.9)	41(95.3)
Other Relatives	18(19.1)	2(3.5)	4(4.1)	2(4.7)
With Friends	9(9.6)	0(0)	0(0)	0(0)
Alone	2(2.1)	1(1.6)	0(0)	0(0)

Marital status of the respondents

Twelve of the working children in Bhaktapur and two in Sarlahi were married. Six were female, eight were male. None of the control group were married.

Table 12. Percentage Distribution of Marital Status of respondents

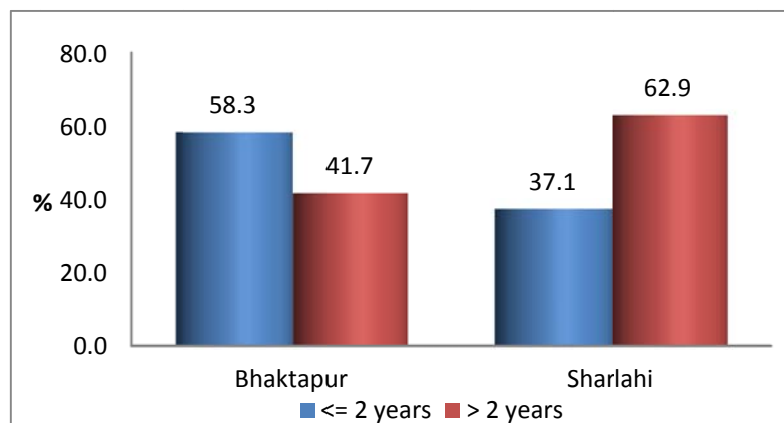
Are You married?	Bhaktapur District		Sarlahi District	
	Case (N=94)	Control (N=57)	Case (N=97)	Control (N=43)
	Number (%)		Number (%)	
Married	12(11.9)	0(0)	2(2.1)	0(0)
Unmarried	89(88.1)	57(100)	95(97.9)	43(100)

The age at which girls were married ranged between 9 and 17 years and for boys it was 16-17 years. This finding shows that it is important to take marital status into account in a child labour study.

7. Work History

The work history of the children in Bhaktapur shows that close to 42 per cent have been involved in the labor force for more than two years with an inter-quartile range of 1-4 years of work, compared with 62.9 per cent in Sarlahi with an inter-quartile range of 2-5 years.

Figure 5. Percentage distribution of working years of the respondents



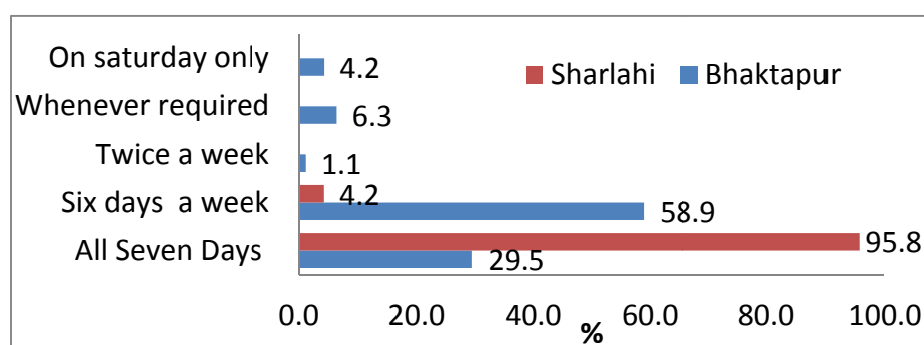
Min – Max years of working for Bhaktapur = 1-9 (IQR=1-4) years

Min – Max years of working for Sarlahi = 1-8 year (IQR=2-5) years

7.1 Work duration and intensity

The number of days worked per week in the brick kilns varied in the two districts. Majority of the respondents (95.8 per cent) were found to be working for all seven days a week in Sarlahi. At the kilns of Bhaktapur many fewer (29.5 per cent) worked through the week. The median working hours for both districts was observed to be 7 hours per day.

Figure 6. Percentage distribution of working days per week



Min – Max hours of working for Bhaktapur = 1-9 (IQR=2-8) years, median=7 hours

Min – Max hours of working for Sarlahi = 1-8 year (IQR=5-8) years, median= 7 hours

7.2 Involvement in other work

Work during brick kiln season

The child brick workers were found to be engaged in other types of work at the same time as they are doing brick kiln work. These include household chores, study and agriculture-related activities. None of these were observed to include significant risks, and especially not the type of hazards that the children experienced in the brick kilns.

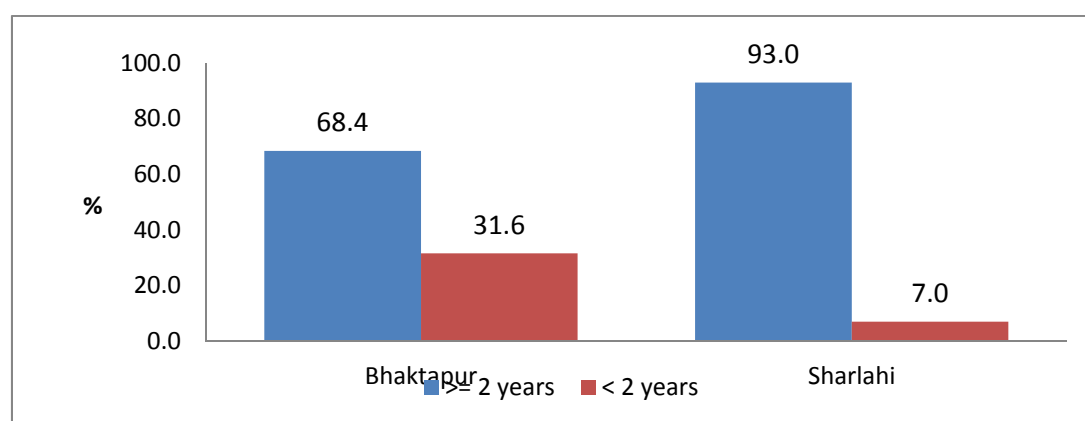
Table 13. Involvement in work other than brick kilns (workers only)

Are you involved at present in any kind of work other than brick kilns?	Bhaktapur District (N=100) ^a	Sarlahi District (N=97)
	Number (%)	Number (%)
Yes	57 (57)	57 (58.8)
No	43 (43)	40 (41.2)
If yes, types of other works (Multiple Answer)		
Agriculture (Including livestock)	2 (3.5)	13 (22.8)
Housework	44 (77.2)	53 (92.9)
Labor work	3 (5.3)	2 (3.5)
Study	11 (19.3)	26 (45.6)

^ainformation is missing in 2 cases.

The findings suggests that most child *workers in Sarlahi* are involved in other types of work at the same time as they are doing brick work (here, we do not refer to off-season work) and have been doing this for more than 2 years; the proportion is somewhat less in Bhaktapur.

Figure 7. Duration of work other than brick kilns



(n= 57 for each district)

Table 14 describes in more detail the household tasks in which children are engaged. This table compares the tasks done by the brick kiln workers with the control group, but surprisingly shows little variation between the two groups. Household work predominates amongst the tasks with a median of 1-3 hours of work for both working children and controls.

Table 14. Type and number of hours spent in tasks in own household during the past week

Name of Tasks	Bhaktapur District		Sarlahi District	
	Brick wkrs (N=97) ^a	Control (N=64) ^a	Brick wkrs (N=88) ^a	Control (N=43) ^a
	Number (%)	Number (%)	Number (%)	Number (%)
Shopping for household	33 (34.0)	26 (40.6)	29 (33)	19 (44.2)
Repairing anything around the house	9 (9.3)	4 (6.2)	7 (8)	13 (30.2)
Cooking	70 (72.2)	54 (84.4)	60 (68.2)	29 (67.4)
Cleaning utensils/ cleaning house	77 (79.4)	58 (90.6)	67 (76.1)	33 (76.7)
Washing clothes	71 (73.2)	53 (82.8)	54 (61.4)	39 (90.7)
Caring for younger children or old/sick	42 (43.2)	22 (34.4)	41 (46.6)	16 (37.2)
Fetching water	81 (83.5)	55 (85.9)	63 (71.6)	29 (67.4)
Fetching wood	42 (43.3)	8 (12.5)	21 (23.9)	5 (11.6)
Lighting the fire/stove	20 (20.8)	7 (10.9)	13 (14.8)	9 (20.9)
Toilet/ Sewage cleaning	5 (5.1)	22 (34.4)	4 (4.5)	4 (9.3)
Other household tasks	7 (7.2)	5 (7.8)	21 (23.9)	5 (11.6)

N represents those who were involved in any chores or tasks in own households.

Average hours spent by the respondents in any chores or tasks in own households during the past week

Min–Max hr for working children: Bhaktapur =0.5-6 hrs (IQR=1-3), Median =2 hrs; Sarlahi =1-8 hrs (IQR=2-4), Median =3 hrs

Min–Max hr for controls: Bhaktapur =0.5-4 hrs (IQR=1-2), Median =1 hr; Sarlahi =0.5-6 hrs (IQR=2-4), Median =3 hrs

Off season jobs of child brick kiln workers

The majority of child workers in both Bhaktapur and Sarlahi engage in off-season activities. Agricultural work and household chores were again the major activities, but in Sarlahi, education predominates with close to 91 per cent, in contrast to Bhaktapur with only 33 per cent of the respondents claiming study as their major activity during the brick off-season.

Table 15. Off-season jobs

Are you involved in any kind of work in off-season?	Bhaktapur District (N=95) ^a	Sarlahi District (N=97)
	Number (%)	Number (%)
Yes	67 (70.5)	86 (88.7)
No	28 (29.5)	11 (11.3)
If yes, types of off-season works (Multiple Answer)		
Brick work in another place	4 (5.9)	2 (2.32)
Agriculture (Including livestock)	56 (83.6)	64 (74.4)
Housework	62 (92.5)	76 (88.37)
Labor	21 (31.4)	19 (22.1)
Study	22 (32.83)	78 (90.69)

^a Missing cases are excluded from analysis

A slight majority of child workers have been involved in off season work for more than two years.

Table 16. Work duration and intensity in off-season

Variable	Bhaktapur District (N=63) ^a	Sarlahi District (N=88) ^a
	Number (%)	Number (%)
Duration of working years		
>=2years	51 (81)	77 (91.6)
<2 years	12 (19)	7 (8.3)
Working days per week	N=64	N=82
All days	8 (12.5)	13 (15.8)
Half days	33 (51.5)	53 (64.6)
Short time ^b	23 (35.9)	2 (2.4)

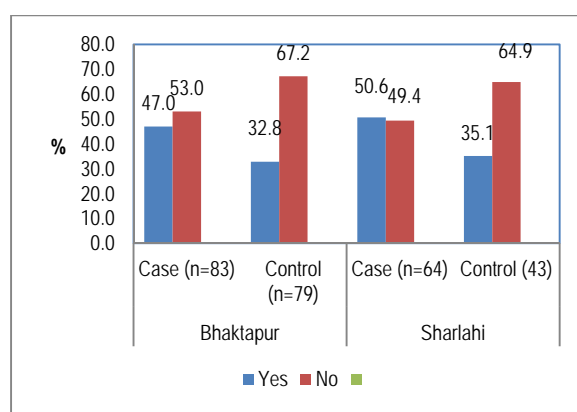
^a Missing cases were excluded from analysis ^b Short time = 30 minutes to 4 hours

8. Injuries

8.1 Injury prevalence (working children and controls)

Injury prevalence is higher than expected in both working and non-working children. One possible explanation for the high rate among controls is that the working children's experience of working and surviving in the conditions around the brick factories could have instilled in them an aptitude for minimizing risk; the control group would have no such experience.

Figure 1. Prevalence of injury in last one year



8.2 Types of injuries experienced

Table 17. Types of injuries experienced by study population

Types of Injuries (Multiple Response)	Bhaktapur		Sarlahi	
	Case (n=42)	Control (n=19)	Case (n=39)	Control (13)
Burns, scalds, frostbites	3	8	6	2
Cuts, bruises or open wounds	20	12	33	6
Sprains, strains or dislocations	17	0	27	6
Broken bones	7	1	5	0

Very severe injuries in last year

Three cases of broken bones in Bhaktapur occurred at home and for 6 reported injuries of Sarlahi 3 cases occurred at work while the others were non-work related injuries.

Table 17a: Severe injury experienced during last one year

Especially severe injuries	Bhaktapur		Sarlahi	
	Case (N=62) ^a	Control (N=45) ^a	Case (N=93) ^a	Control (N=20)
Cuts, bruises or open wounds	1	0	6	0
Broken bones	3	0	1	0
Sprains, strains or dislocations	1	1	2	0
Burns, scalds, frostbite	0	2	0	0

a. Missing cases were excluded from analysis.

Parts of the body injured

The findings suggest that almost 42 per cent of cases in Bhaktapur and 40 per cent in Sarlahi had experienced an injury of some kind in the past one year. An injury to the leg and lower foot was the most common injury site.

Table 2. Part of body injured

Variables	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control(N=43)
	Number (%)		Number (%)	
Any part of body injured				
Yes	42(41.6)	19(29.7)	39(40.2)	13(30.2)
No	59(58.4)	45(70.3)	59(58.4)	30(69.8)
Parts of body injured (Multiple Response)				
Leg or Foot	22(21.8)	5(7.8)	31(32.0)	10(23.3)
Arm or hand	19(18.8)	12(18.8)	24(24.7)	4(9.3)
Head	5(5.0)	1(1.6)	2(2.1)	3(7.0)
Neck	1(1.0)	1(1.6)	12(12.4)	1(2.3)
Back	0(0)	0(0)	20(20.6)	3(7.0)
Eye or Ears	2(2.0)	2(3.1)	0(0)	1(2.3)
Abdomen	5(5.0)	1(1.6)	0(0)	1(2.3)
Shoulder	0(0)	0(0)	3(3.1)	1(2.3)
Hip	0(0)	0(0)	0(0)	1(2.3)

Causes of injuries

The Sarlahi cases and the controls give an indication of the types of activities that generate the most injuries (results are missing for most of the Bhaktapur respondents). The median leave from work due to injury ranged from 4-7 days depending upon the severity of injury.

Table 19. Causes of injuries

Variables	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case(N=97)	Control (N=43)
Can you remember what are you doing when this happened?				
Yes	2	15	23	11
No	99	49	74	32
Causes of Injuries (Cumulative cases within a year)				
Transportation	1	N/A	16	N/A
Stacking	0	N/A	16	N/A
Making Bricks	0	N/A	13	N/A
Kitchen Work	0	8	2	2
Fall down	0	3	0	5
Night blindness	0	1	0	0
Labor	1	0	0	0
Playing	0	0	0	4
Burn Plastic	0	1	0	0

Average days of leave taken by the respondents who were injured.

Min–Max days for cases: Bhaktapur = Information are missing; Sarlahi =4-15 days (IQR=4.7-7, Median =5 days.

Min –Max days for controls: Bhaktapur =3-24 days (IQR=3.75-21, Median =7 days; Sarlahi =1-7 days (IQR=3-4, Median =4 days.

Injury marks among survey respondents

The injury marks sustained by the respondents are both work related and non-work related incidents giving the general scenario of vulnerability to the injuries. It was found that 95 per cent of the control in Sarlahi and close to 80 per cent of control in Bhaktapur reported to have injury marks present in their body. The cases on the other hand reported to have sustained injury marks in close to 25 per cent of study population in Bhaktapur and almost 50 per cent in Sarlahi.

Table 20. Percentage of survey respondents having injury marks

Injury Marks	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Present	25(24.8)	51(79.7)	49(50.5)	41(95.3)
Absent	76(75.2)	13(20.3)	48(49.5)	2(4.7)

Respondents who experienced burn injuries

Burns were reported by less than 10 per cent of both cases and control groups in Bhaktapur while close to 20 per cent of cases and 11 per cent of controls in Sarlahi reported to have experienced burns.

Table 21. Percentage of respondents experienced burns

Experience of Burn	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Present	10(9.9)	5(7.8)	19(19.6)	5(11.6)
Absent	91(90.1)	59(92.2)	78(80.4)	38(88.4)

Respondents who experienced cuts

Close to half of working children in Bhaktapur and a quarter per cent in Sarlahi reported to have cuts ranging from minor cuts to serious ones, both at the kilns and at home during the last month.

Table 22. Percentage of respondents having cuts

Experience of cuts	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Present	49(48.5)	23(35.9)	24(24.7)	16(37.2)
Absent	77(51.5)	41(64.1)	73(75.3)	27(62.8)

Table 23. Association between work and injuries among working and non-working children

Clinical Variables	Case - (N=198) ^a	Control - (N=107)	Odds Ratio (OR) - (95% CI)
Injury marks			
Yes	74	92	0.09(0.05;0.18) [#]
No	124	15	1
Burns			
Present	29	10	1.66(0.78;3.52)
Absent	169	97	1
Cuts			
Present	73	39	1.01(0.63;1.69)
Absent	125	68	1

Missing cases were excluded from analysis.

Respondents who experienced fractures

The incidence of bone fractures was close to 7 per cent among working children in Bhaktapur and 5 per cent in Sarlahi; all of the incidents were non-work-related injuries. Nearly 2 per cent of controls in Bhaktapur reported to have had fractures but none were reported in Sarlahi.

Table 24. Percentage of the respondents having fractures

Experience of fracture	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Yes	7(6.9)	1(1.6)	5(5.2)	0(0)
No	94(93.1)	63(98.4)	92(94.8)	43

8.3 Types of treatment for injury

The treatment sought for the injury was one of the major areas of non-response with close to 50% non-response in both the districts. Those that did respond indicate that in Bhaktapur they were mainly treating themselves or were treated by family members. In contrast, more than 50% of the case population in Sarlahi indicated they went to a clinic or hospital.

Table 25. Types of the treatment during injury by the respondents

Variables	Bhaktapur		Sarlahi	
	Case (N=39) ^a	Control (N=20) ^a	Case (N=33) ^a	Control (N=17) ^a
	Number (%)			
What did you do to take care during the injury?				
Did nothing	13(33.3)	6(30)	2(6.1)	2(11.8)
Care by self or family member	15(38.5)	2(10)	8(24.2)	10(58.8)
Went to a local healer	0(0)	10(50)	6(18.2)	0(0)
Went to a clinic or hospital	11(28.2)	2(10)	17(51.5)	5(29.4)

a. Missing cases were excluded from analysis

Person providing the treatment

Out of 32 respondents responding to the questions on treatment of injury only 3 cases in Bhaktapur confirmed that the brick kiln owner helped them get treatment while the majority relied on their parents. Similarly Sarlahi reported zero cases of treatment by kiln owner while 97 per cent of the respondents were treated by parents on the advent of injury.

Table 26. Person who provided the treatment for injury

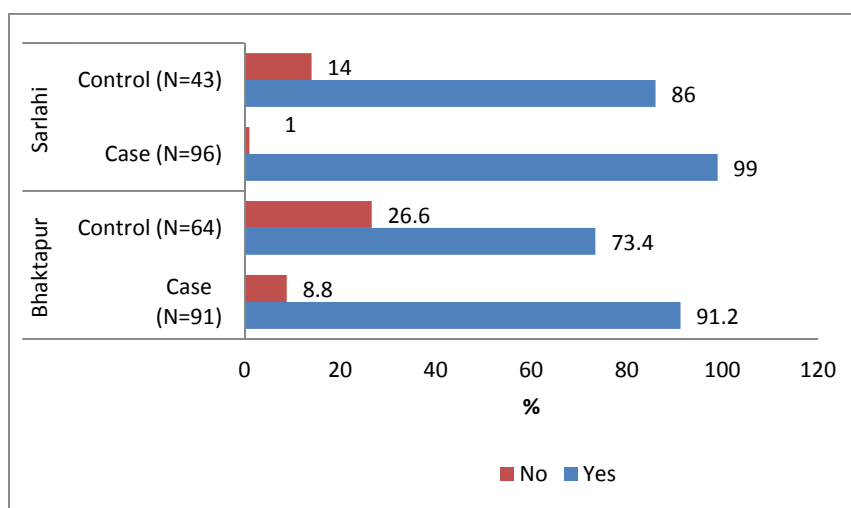
Variables	Bhaktapur		Sarlahi	
	Case (N=32) ^a	Control (N=16) ^a	Case (N=38) ^a	Control (N=12) ^a
	Number (%)	Number (%)	Number (%)	Number (%)
Self	8(25.0)	7(43.8)	1(2.6)	1(8.3)
Parent	21(65.6)	9(56.3)	37(97.4)	11(91.7)
Brick kiln owner/contractor	3(9.4)	N/A	0(0)	N/A

a. Missing cases were excluded from analysis

9. Acute and chronic health problems

9.1 Acute illness

Figure 9. Sickness experienced by the respondents in the last one year



More than 90 per cent of working children in Bhaktapur and 99 per cent in Sarlahi reported being ill during the last one year, a rate higher than the control group (73 per cent and 86 per cent in Bhaktapur and Sarlahi respectively.)

Types of acute health problems

The most commonly reported health problems for the working children in Bhaktapur included headache, cough, fever and stomach problems. Sarlahi reported skin problems and stomach diseases as the major health problems. The frequency of other health problems seems to be more or less similar to that experienced by the control group in both the districts. Almost 10 per cent of the respondents in Sarlahi reported feeling unwell without cause which was not recorded with any other respondents groups in either of the districts.

Table 27. Health problems during last year

Types of Sickness (Multiple Answers)	Bhaktapur		Sarlahi	
	Case (N=91) ^a	Control (N=64) ^a	Case (N=96) ^a	Control (N=43) ^a
	Number (%)	Number (%)	Number (%)	Number (%)
Breathing problems	21 (23.1)	7 (10.9)	35 (36.5)	5 (11.6)
Cough	34 (37.4)	19 (27.7)	18 (18.8)	12 (27.9)
Eye problems	19 (20.9)	11 (17.2)	33 (34.0)	7 (16.3)
Skin problems	6 (6.6)	7 (10.9)	66 (68.8)	8 (18.6)
Stomach problems/Diarrhea	27 (29.7)	20 (31.3)	61 (63.5)	11 (25.6)
Fever	30 (29.7)	28 (43.8)	26 (27.1)	20 (46.1)
Headache	48 (58.5)	24 (37.5)	37 (38.5)	25 (58.1)
Extreme fatigue	7 (7.7)	6 (9.4)	20 (20.8)	3 (7.0)
Feeling Weak	6 (6.6)	11 (17.2)	39 (40.6)	7 (16.3)
Feeling bad overall	0(0)	0(0)	10 (10.4)	0(0)

a. Missing cases were excluded from analysis.

Average days of leave taken by the respondents who were sick or had health problems.

Min –Max days cases: Bhaktapur = 2-7 days (IQR=4-6, Median =5 days; Sarlahi =3-61 days (IQR=4-54, Median =8.5 days.

Min –Max days controls: Bhaktapur =2-10 days (IQR=3-6, Median =5 days; Sarlahi =2-14 days (IQR=2-4.25, Median =3 days.

Table 28. Association between illness and work

	Case (N=198) ^a	Control (N=107) ^a	Odds Ratio (95% CI)
Experience of any type of sickness in last one year			
Yes	79	33	1.87(1.15;3.15) #
No	83	65	1
Breathing Problem			
Present	56	12	3.38(1.72;6.66) #
Absent	131	95	1
persistent cough			
Present	52	31	0.94(0.56;1.59)
Absent	135	76	1
Eye Problems			
Present	52	18	1.90(1.05;3.47) #
Absent	135	89	1
Skin Problems			
Yes	106	18	5.70(3.09;10.61) #
No	92	89	1
Stomach Problems			
Present	88	31	2.18(1.31;3.61) #
Absent	99	76	1
Fever			
Present	56	48	0.52(0.32;0.86) #
Absent	131	59	1
Headache			
Yes	85	49	0.98(0.61;1.58)
No	102	58	1
Feeling weak			
Yes	45	18	1.56(0.85;2.87)
No	18	89	1

Missing cases were excluded from analysis.

indicates results were statistically significant at 5% level of significance.

Table 27B shows that working children were nearly two times more likely to be sick compared to the control children. Breathing problems, eye problems, skin problems,

stomach problems were more likely to occur in working children ($OR > 1$, $P < 0.05$). Fever was less likely to occur in cases ($OR < 1$, $p < 0.05$) and other morbidity patterns were not statistically significant ($P > 0.05$).

Association between different types of health problems and working years

The table below demonstrates the association between different types of health problems experienced and number of years worked.

Table 29. Association between types of health problem and working years

Items/Working Experience	> 2years	≤ 2 years	Odds Ratio - (95% CI)
Experience of Injuries during last 12 months before survey			
Yes	52	32	3.32(1.63;6.77) [#]
No	24	49	1
Experience of Sickness during last 12 months before survey			
Yes	92	3	1.87(0.37;10.23)
No	82	5	1
Experience of trouble during last 12 months before survey			
Yes	66	27	1.61(0.83;3.14)
No	53	35	
Experience of Sickness during last 7 months before survey			
Yes	35	55	0.90(0.47-1.72)
No	36	51	1

Missing cases were excluded from analysis. # indicates results were statistically significant at 5% level of significance.

The children who have been working in brick factories for more than two years are more likely to have health problems than the control group. The children with more than two years of experience had more than three times the likelihood of having injuries than those with less than two years of work experience. Similarly, they were twice as likely to be sick than those who have worked less than two years

9.2 Musculoskeletal disorders

The ergonomics of brick kiln involves the interaction of personal factors such as fatigue, fitness, age and work experience and circumstantial factors such as work organization, schedule, work load, factory layout, furniture, equipment and psychological support within the work team, which combine to affect the efficiency of work and working life (Manoharan, Singh, and Jha, S.K., 2012). Neumann et al. (2000) examined changes in general health and time with back pain and neck pain and identified predictors of any such changes. The study showed that there was a significant decline in general health and significant increases in time with neck pain and back pain. They concluded the predictors of changes in these outcomes were mainly work-related variables such as job interference with family, work psychological demands, job influence and hours worked. Most of the recent researches have concentrated on problems of the elbow, hands and wrists. High risk jobs require repeated, forceful movements of body parts held at the extremes of their ranges of movements, such as with the wrist flexed, extended and promoted.

Prevalence of musculoskeletal disorders

Almost three quarters of working children in Bhaktapur and 58 per cent of case respondents in Sarlahi are experiencing pain and discomfort.

Table 30. Percentage of the respondents who had MSD in last 12 months

Had trouble (ache, pain, discomfort)	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=85) ^a	Control (N=43)
Yes	73(72.3)	12(18.8)	49(57.6)	7(16.3)
No	28(27.7)	52(81.3)	36(42.6)	36(83.7)

a. Missing cases were excluded from analysis

Location of pain

The respondents reported pain in different parts of the body although predominantly in the limbs, neck and back. The table below gives the frequency and percentage of this pain.

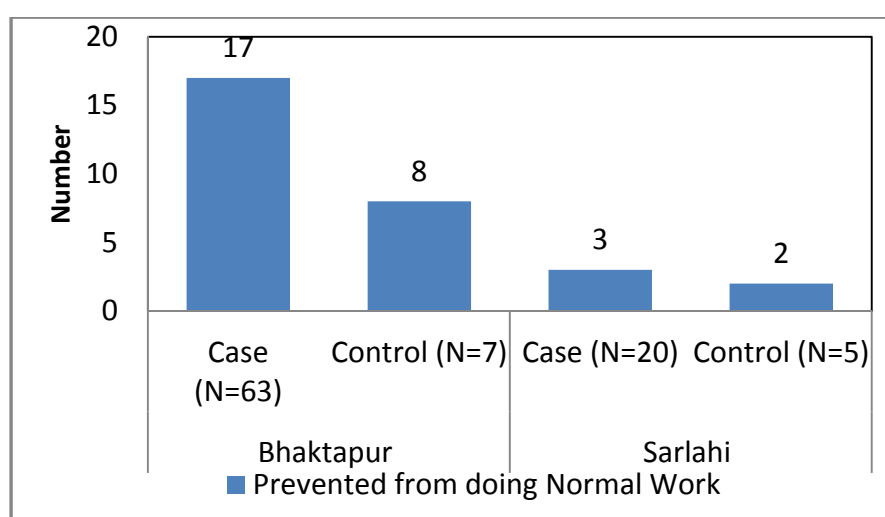
Table 31. Pain experienced in different body parts

Parts of body where pain occurred	Bhaktapur		Sarlahi	
	Case(N=73)	Control (N=12)	Case(N=49)	Control(N=7)
	Number (%)	Number (%)	Number (%)	Number (%)
Neck	38(52.1)	3(4.7)	22(44.9)	2(4.7)
Shoulders	31(42.5)	1(1.6)	19(19.6)	1(14.3)
Elbows	25(34.2)	2(3.1)	16(33.1)	2(28.6)
Wrists/hands	28(38.4)	2(3.1)	17(34.2)	2(28.6)
Upper back	40(54.8)	9(75.0)	4(8.2)	6(85.7)
Lower back	40(54.8)	0(0)	5(10.2)	0(0)
Hips/thighs	37(50.7)	5(41.7)	16(41.7)	3(42.9)
Ankles/feet	44(60.3)	0(0)	22(57.9)	0(0)
Knees	45(68.2)	0(0)	16(69.2)	0(0)

Respondents prevented from doing normal work because of pain

Pain was serious enough at times to impede normal work. The figure below indicates the percentage of respondents who were unable to work for 3 days or more due to the pain. Out of a total of 63 suffering from pain in Bhaktapur 17 were unable to work and out of 20 in Sarlahi, 3 reported not able to work due to the pain. Similarly, 6 controls in Bhaktapur and 2 in Sarlahi reported of non-functioning due to the pain.

Figure 10. Respondents prevented from doing normal work because of pain



a. Missing cases were excluded from analysis

Incidence of current pain

Current pain (occurring in the last week) was found to be more prevalent among the child workers than the control groups. 42 per cent of cases in Bhaktapur and 35.4 per cent of cases in Sarlahi reported to have been suffering from pain and discomfort within the last 7 days. Close to 90 per cent of the control groups in both districts did not report any incidents of pain whatsoever in that time.

Table 32. Percentage reporting ache, pain and discomfort within last week

Had trouble (ache, pain, discomfort)	Bhaktapur		Sarlahi	
	Case (N=100) ^a	Control (N=64)	Case (N=82) ^a	Control (N=43)
Yes	42(42.0)	8(12.5)	29(35.4)	5(11.6)
No	58(58.0)	56(87.5)	58(64.6)	38(88.4)

Missing cases were excluded from analysis

The likelihood that the pain experienced by the children is derived from their work has been tested statistically and found to be significant.

Table 33. Association between experience of pain in body and working children

	Case - (N=198) ^a	Control - (N=107) ^a	Odds Ratio
Experience of any trouble in last one year			
Yes ^b	122	19	8.82(4.93;15.78) [#]
No	64	88	1
Pain in Neck^c			
Yes	60	5	2.70(0.92;7.98)
No	62	14	1
Pain in Shoulders^c			
Yes	50	2	5.93(1.30;26.69) [#]
No	72	17	1

	Case - (N=198) ^a	Control - (N=107) ^a	Odds Ratio
Pain in Elbow^c			
Yes	58	4	3.39(1.06;10.82) [#]
No	64	15	1
Pain in Upper back^c			
Yes	44	15	0.15(.05;0.48) [#]
No	78	4	1
Pain in Hips/Thighs^c			
Yes	53	8	1.23(0.46;3.30)
No	59	11	1

Missing cases were excluded from analysis. Children with pain in last one year. c. Only yes answers from b were included in analysis. # indicates results were statistically significant at 5 per cent level of significance.

This table shows that the working children were 8 times more likely to have experienced body pain compared to non-working children. Neck pain, shoulder pain and elbow pain are positively associated with work and the association was significant at 5 per cent level of significance ($p < 0.05$).

Location of pain

The pains experienced within the past 7 days for the respondents tended to be concentrated in the limbs, shoulder, neck and back, although 31 cases in Bhaktapur indicated that they had knee problems, and elbow pain was frequently reported in Sarlahi.

Table 34. Ache, pain or discomfort in last week

Parts of body where the respondents had trouble	Bhaktapur		Sarlahi	
	Case (N=42)	Control (N=8)	Case (N=29)	Control (N=5)
Neck	30	0	14	0
Shoulders	24	0	14	3
Elbows	25	1	16	0
Wrists/hands	22	1	15	0
Upper back	29	0	13	0
Lower back	29	0	11	0
Hips/thighs	29	0	13	0
Ankles/feet	8	0	9	0
Knees	31	1	12	0

Experience of neck pain or backache in last year

Seventy percent of case respondents in Bhaktapur and 100 per cent in Sarlahi reported to have problems related to neck and backache. The pain was graded very severe by close to 11 per cent of respondents in Bhaktapur and 2 per cent in Sarlahi. The control group also reported to be suffering from similar problems but for the majority of controls the pain was not severe.

Table 35. Experience of neck pain or backache during last year

Variables	Bhaktapur		Sarlahi	
	Case (N=78)	Control (N=58)	Case (N=94)	Control (N=43)
	Number (%)		Number (%)	
Experience of neck or backache				
Yes	55 (70.5)	30 (51.7)	94 (100)	34 (79.1)
No	23 (29.5)	28 (48.3)	0(0)	9 (20.9)
If yes, grade of pain				
Very bad	6 (10.9)	1 (3.3)	2 (2.1)	0(0)
Medium	11 (20.0)	10 (33.3)	17 (18.1)	2 (5.9)
Not bad	38 (69.1)	19 (63.3)	75 (79.8)	32 (94.1)

Missing cases were excluded from analysis

Musculoskeletal deformity among the survey respondents

The muscle skeletal deformity was found in only 1 case and 1 control in Bhaktapur and was not recorded in Sarlahi.

Table 36. Percentage of Musculoskeletal Deformity among survey respondents

Musculoskeletal Deformity	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Yes	1(1.0)	1(1.6)	0(0)	0(0)
No	100(99)	63(98.4)	97(100)	43(100)

9.3 Respiratory problems

Experience of trouble breathing

Seventy percent of the case respondents in Bhaktapur and 100% of Sarlahi reported to have breathing problems, while 22% and 65% of control respondents in Sarlahi and Bhaktapur said they had trouble breathing sometimes. This was described as 'very bad' in a small percentage of the cases (6.7 per cent in Bhaktapur and 3.2 per cent in Sarlahi).

Table 37. Respiratory problems

Experience with trouble breathing	Bhaktapur		Sarlahi	
	Case (N=64) ^a	Control (N=58) ^a	Case (N=94) ^a	Control (N=41) ^a
	Number (%)	Number (%)	Number (%)	Number (%)
Yes	45(70.3)	20 (34.5)	94 (100)	32 (78)
No	19 (29.5)	38 (65.5)	0(0)	9 (22)
If yes, level of seriousness				
Very bad	3 (6.7)	1 (5.0)	3 (3.2)	0(0)
Medium	7 (15.6)	1 (5.0)	16 (17.0)	1(3.1)
Not bad	35 (77.8)	18 (90.0)	75 (79.8)	31 (96.9)

Pulmonary function

The pulmonary function test measures the capacity of lungs to take in and release air and the efficiency of moving gases such as oxygen from the atmosphere into the body circulation. The pulmonary function test was conducted among the child workers and non-working children using COPD 6 – Vitalograph equipment.



It was found that 5.21 per cent of working children in Sarlahi and 1.6 per cent of the controls in Bhaktapur had obstructed lungs⁸. Similarly, it was found that 13.5 per cent of cases and 17.5 per cent of control in Bhaktapur and 37.5 per cent of case and 9.3 per cent of control in Sarlahi had restrictive pulmonary disorders⁹.

Table 38. Results of Pulmonary Function Test among survey respondents

Pulmonary Function	Bhaktapur		Sarlahi	
	Case (N=74)	Control (N=63)	Case (N=25)	Control (N=43)
Normal	64(86.48)	51(81.0)	55(57.3)	39(90.7)
Restrictive	10(13.5)	11(17.5)	36(37.5)	4(9.3)
Obstructive	0(0)	1(1.6)	5(5.21)	0(0)

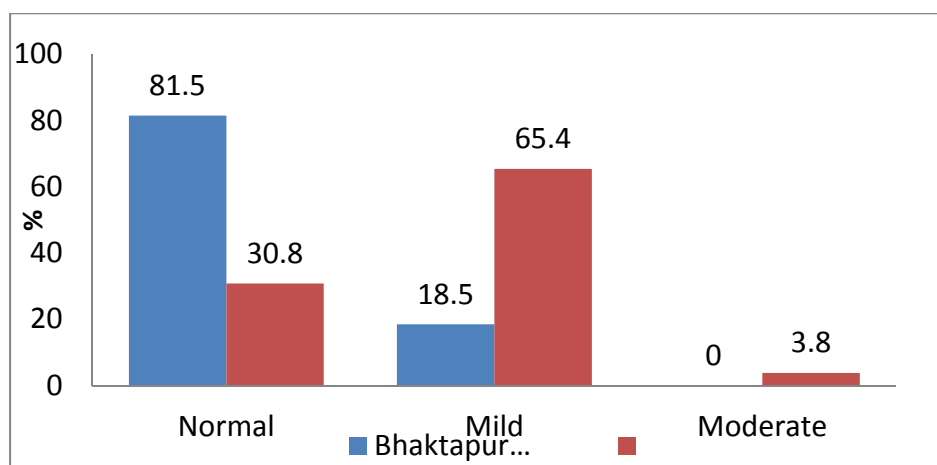
a. Missing cases were excluded from analysis

The analysis of pulmonary function using the COPD-6 vitalograph showed that the majority of child workers in Bhaktapur have largely normal lung function (81.5 per cent). In Sarlahi, however, 65 per cent of the child workers evidenced some restrictive pulmonary problems with about 4 per cent suffering from moderate restrictive lung disorder.

⁸Obstructive lungs refers to a respiratory disease characterized by airway obstruction characterized by inflamed and easily collapsible airways, obstruction to airflow, problems in exhaling. The disease associate can include asthma, bronchitis and chronic obstructive pulmonary disease (COPD).

⁹ Restrictive diseases are a category of extrapulmonary, pleural, or parenchymal respiratory diseases that restrict lung expansion, resulting in a decreased lung volume, an increased work of breathing, and inadequate ventilation and/or oxygenation.

Figure 11. Percentage of the respondents having Restrictive pulmonary diseases among cases



a. Missing cases were excluded from analysis

When obstructive index was measured using COPD (the gold standard), it was found that 12 respondents in Bhaktapur had Stage I COPD of which 5 respondents were females. Similarly, In Sarlahi, 18 had stage I, 4 had Stage II and 1 had stage III. Among 18 respondents, 13 were female while in other stages all were female. The association between work and pulmonary function shows that the impacts of work clearly impact pulmonary function (Table 35B).

Table 39. Association between work and pulmonary function

Working (case) and non-working (control) children

Clinical Variable	Case (N=198) ^a	Control (N=107)	Odds Ratio (OR) (95% CI)
Pulmonary function Test			
Normal	123	96	1
Restrictive and Obstructive ^b	67	7	7.42(3.28;17.01) [#]

There are only 7 cases of obstructive so it is combined with restrictive.

indicates results were statistically significant at 5% level of significance.

9.4 Stunting

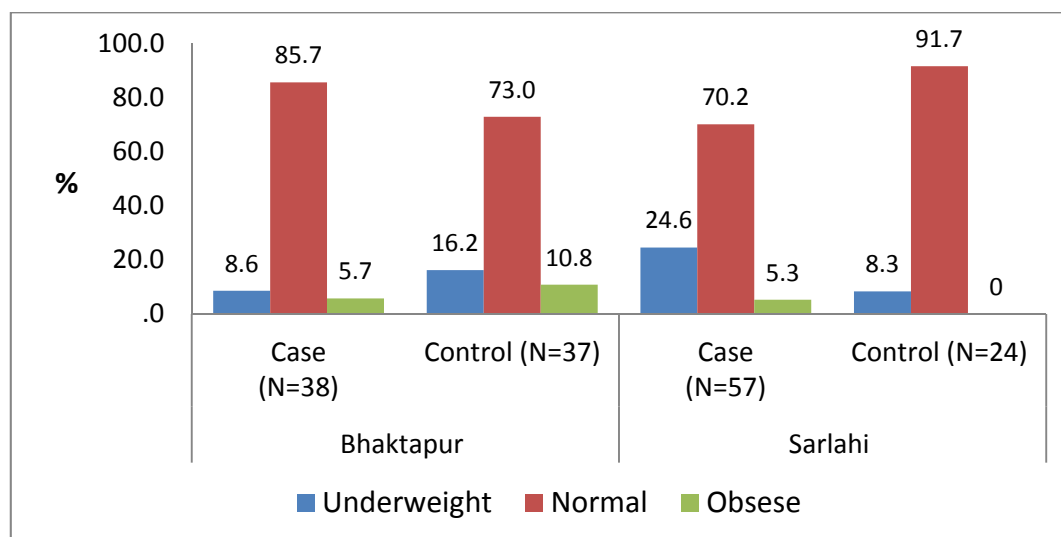
The WHO standards for stunting and malnutrition were used to body mass index

Girls

The body mass index for the female cases and controls was found to be normal for most of the respondents. 85.7 per cent of cases in Bhaktapur and 70.2 per cent of cases in Sarlahi were reported to be having normal BMI. Similarly, 73 per cent of control in Bhaktapur and 91.7 per cent of control in Sarlahi were found to have normal BMI. The underweight study population included 8.6 per cent of cases and 16.2 per cent of control in Bhaktapur, and 24.6 per cent of case and 8.3 per cent of control in Sarlahi. The relatively high levels of underweight girls in the control girls in Bhaktapur as many of the girls in the control group were playing supportive roles for brick factory workers but were not benefitting from the

additional food being provided for children engaged in the paid work. The obese study population included 5.7 per cent and 5.3 per cent of cases in Bhaktapur and Sarlahi and 10.8 per cent of control group in Bhaktapur.

Figure 12. Classification of body mass index, according to age (female)

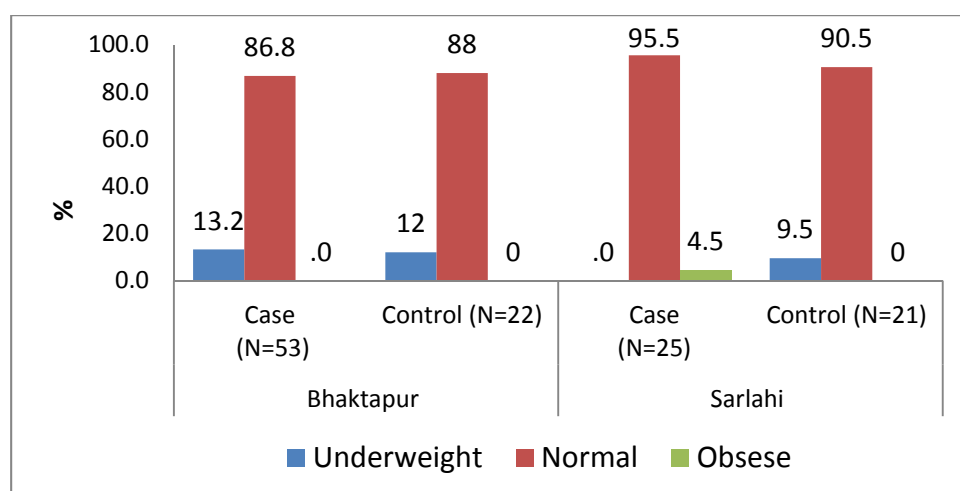


Source : http://www.gmon.info/man_en/bmiguidelinevaluesforchildrenandyoungpeople.htm (For BMI Classification)

Boys

The body mass index for the male cases and controls was found to be normal for most of the respondents. 86.8 per cent of cases in Bhaktapur and 95.5 per cent of cases in Sarlahi were reported to be having normal BMI. Similarly, 88 per cent of control in Bhaktapur and 90.5 per cent of control in Sarlahi were found to have normal BMI. The underweight study population included 13.26 per cent of cases and 12 per cent of control study population in Bhaktapur, and 9.5 per cent of control in Sarlahi. For boys in Sarlahi working improved their BMI while 9.5 per cent boys in the control groups lacked the benefits of increased access to food that resulted from working. The obese study population included 4.5 per cent of case in Sarlahi again reflecting working boys have increased access to food.

Figure 13. Classification of body mass index, according to age (Male)



Source : http://www.gmon.info/man_en/bmiguidelinevaluesforchildrenandyoungpeople.htm (For BMI Classification)

The table below shows the distribution of BMI of the study population, both male and female under study.

Table 40. Classification of Body Mass Index

Sex	BMI ^a	Bhaktapur		Sarlahi	
		Case (N=53)	Control (N=22)	Case (N=25)	Control (N=21)
Male	Underweight	13.2	12	0	9.5
	Normal	86.8	88	95.5	90.5
	Obese	0	0	4.5	0
Sex	BMI	Case (N=38)	Control (N=37)	Case (N=57)	Control (N=24)
Female	Underweight	8.6	16.2	24.6	8.3
	Normal	85.7	73.0	70.2	91.7
	Obese	5.7	10.8	5.3	0

Source : http://www.gmon.info/man_en/bmiguidelinevaluesforchildrenandyoungpeople.htm (For BMI Classification)

9.5 Other health conditions

Anemia among survey respondents

Based on the observations, the cases of anemia were found to be higher in Sarlahi compared to Bhaktapur, almost 11 per cent of cases in Bhaktapur were anemic compared to 18 per cent of cases in Sarlahi. The control group also showed higher anemic study population in Sarlahi with close to 23 per cent compared to 6 per cent of anemic control study population in Bhaktapur. The assessment was based on visual indicators.



Table 41. Percentage of Anemia among survey respondents

Anemia	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=90) ^a	Control (N=43)
Present	11(10.9)	4(6.3)	16(17.8)	10(23.3)
Absent	90(89.1)	60(93.8)	74(82.2)	33(76.7)

a. Missing cases were excluded from analysis

The blood sample analysis of the case respondents (n=198) using a device Hemocue[®] identified 27.5 per cent anemic populations. In both district anemia is prevalent in female and higher in Sarlahi district.

Table 42. Association between work and anemia among working and non-working children

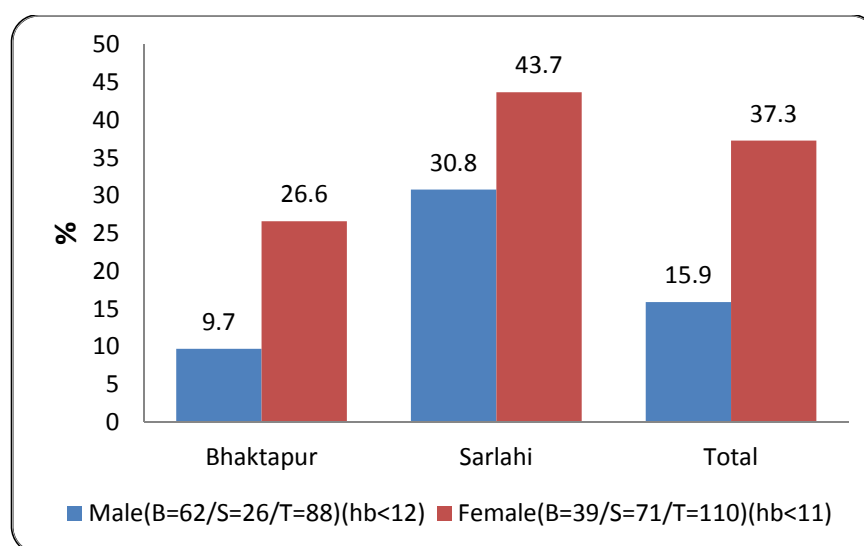
Clinical Variables	Case (N=198) ^a	Control (N=107)	Odds Ratio (OR) (95% CI)
Anemia			
Present	27	14	1.05(0.55;2.09)
Absent	171	93	1

a. Missing cases were excluded from analysis.

b. There are only 7 cases of obstructive so it is combined with restrictive.

c. # indicates results were statistically significant at 5% level of significance.

Table 43. Percentage of Anemic cases identified after blood sample examination (n=198)



B= Number of Children in Bhaktapur (Cases); S= Number of Children in Sarlahi (Cases);
T= Total number of cases

Conjunctivitis

The number of cases of conjunctivitis was not alarming at either of the study districts. However, there was some difference between working children and controls. There were 5 children in Bhaktapur (3 among controls) and 11 in Sarlahi (0 among controls) who had suffered from eye problems related to conjunctiva.

Table 44. Percentage of Conjunctivitis among survey respondents

Conjunctivitis	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Present	5(5.0)	0(0)	11(11.3)	3(7.0)
Absent	96(95.0)	64(100)	86(88.7)	40(93.0)

Table 45. Association between work and conjunctivitis among working and non-working children

Clinical Variables	Case (N=198) ^a	Control (N=107)	Odds Ratio (OR) (95% CI)
Conjunctivitis			
Present	16	3	3.04(0.8-10.70)
Absent	182	104	1

Missing cases were excluded from analysis.

There are only 7 cases of obstructive so it is combined with restrictive.

indicates results were statistically significant at 5 per cent level of significance.

Hearing loss among survey respondents

The hearing loss was more evident in the case population compared to the control population. Almost 28 per cent of control in Bhaktapur and 31 per cent of Sarlahi were found to have problems

related to hearing impairments to that of nearly 11 per cent and 21 per cent hearing loss of the control population. The hearing loss was detected using the standard audiometric test.

Table 46. Percentage of hearing loss among survey respondents

Hearing Loss	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Present	28(27.7)	7(10.9)	31(32.0)	9(20.9)
Absent	73(72.3)	57(89.1)	66(68.0)	42(79.06)

Auditory problems

The audiogram test for the working children found a number of children with hearing impairments. The abnormality in the left ear was observed in both districts. Close to 24 per cent and 36 per cent of the respondents from Bhaktapur and Sarlahi had problems in their left ear while, 15.8 per cent and 29.6 per cent had encountered hearing problems in their right ear in the respective districts.

Figure 14. Percentage of the respondents having abnormal ear after audiogram among cases

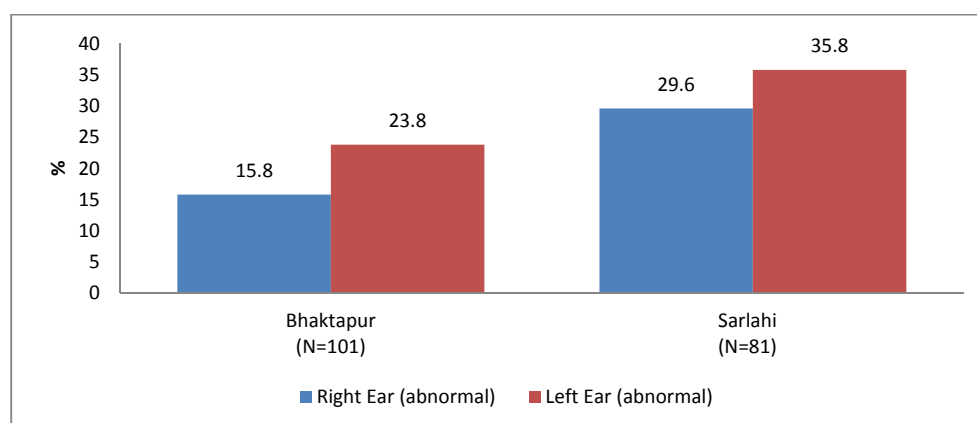


Table 47. Association between work and hearing loss for working and non-working children

Clinical Variables	Case (N=198) ^a	Control (N=107)	Odds Ratio (OR) (95% CI)
Hearing loss			
Present	59	16	2.14(1.31;4.45) [#]
Absent	139	91	1

Missing cases were excluded from analysis.

[#] indicates results were statistically significant at 5 per cent level of significance.

Skin problems

Skin problems were higher in Sarlahi compared to Bhaktapur study population. Almost 61 per cent of the case study population in Sarlahi and close to 27 per cent of cases in Bhaktapur reported to have dermatitis.

Table 48. Percentage of the respondents having skin problems

Dermatitis	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Present	29(28.7)	9(14.1)	77(79.4)	9(20.9)
Absent	72(71.3)	55(85.9)	20(20.6)	34(79.1)

The skin related problems was also found to be higher in Sarlahi compared to Bhaktapur and it was also found to be higher in cases than control. Only 9 controls each in Bhaktapur and Sarlahi had skin related problems.

Table 49. Association between work and skin problems among working and non-working children

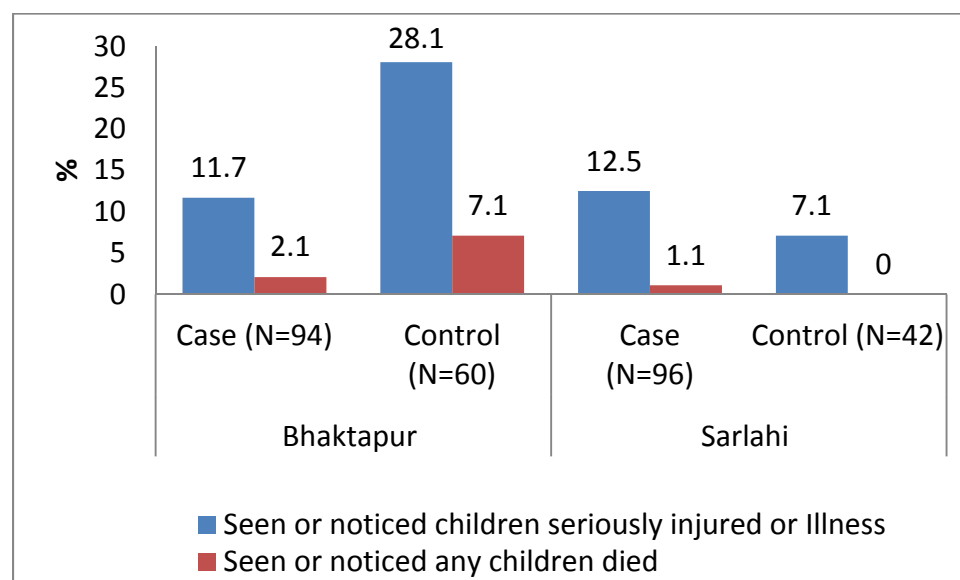
Clinical Variables	Case (N=198) ^a	Control (N=107)	Odds Ratio (OR) (95% CI)
Skin related problems			
Yes	29	9	2.46(1.01;6.35) [#]
No	72	55	1

Missing cases were excluded from analysis.

There are only 7 cases of obstructive so it is combined with restrictive.

[#] indicates results were statistically significant at 5 per cent level of significance.

Knowledge about serious injuries/deaths

Figure 15. Knowledge about serious injury and death

Almost 12 per cent of cases in both the districts are aware of someone being seriously injured in their vicinity, while 2.1 per cent and 1.1 per cent in Bhaktapur and Sarlahi are aware of death related incidents of a child. 28 per cent and 7 per cent of control group in Bhaktapur and Sarlahi have known of the injuries and illness while 7.1 per cent of control in Bhaktapur has heard of death and none has heard of death in Sarlahi.

Media and the Chief District Officer of Bhaktapur reported 9 deaths at the brick kilns of Bhaktapur during the 2012-2013 seasons which indicate the gravity of problem. It should be noted that although deaths can be major cover story but injuries go largely unreported.

Association between clinical examinations and study population

The following table shows the association between different clinical examinations and working and non-working children.

Table 50. Association between different components of clinical examinations and study population

[(Working (case) and non-working (control) children]

Clinical Variables	Case (N=198) ^a	Control (N=107)	Odds Ratio (OR) (95% CI)
Pulmonary function Test			
Normal	123	96	1
Restrictive and Obstructive ^b	67	7	7.42(3.28;17.01) ^{#1}
Anemia			
Present	27	14	1.05(0.55;2.09)
Absent	171	93	1
Hearing loss			
Present	59	16	2.14(1.31;4.45) [#]
Absent	139	91	1
Conjunctivitis			
Present	16	3	3.04(0.8;10.70)
Absent	182	104	1
Injury marks			
Yes	74	92	0.09(0.05;0.18) [#]
No	124	15	1
Burns			
Present	29	10	1.66(0.78;3.52)
Absent	169	97	1
Cuts			
Present	73	39	1.01(0.63;1.69)
Absent	125	68	1
Skin related problems			
Yes	29	9	2.46(1.01;6.35) [#]
No	72	55	1

Missing cases were excluded from analysis.

There are only 7 cases of obstructive so it is combined with restrictive.

indicates results were statistically significant at 5 per cent level of significance.

In the study, there was statistically significant positive association (OR>1, p<0.05) between pulmonary function test, hearing loss and skin diseases and working status of children. It means working children were more likely to be suffering from different health problems. Surprisingly, there was significant negative association (OR<1, p<0.05) between injury marks and working status. Remaining clinical variables were though positively associated with working status but not statistically significant (OR>1, p>0.05) (Table 45).

10. Health behaviours

10.1 Knowledge of alcohol/drug and tobacco products being used by others

About 28 per cent and 19 per cent of cases in Bhaktapur and Sarlahi are aware of their peers and friends using alcohol. The tobacco usage suggests that almost 35 per cent of case in Bhaktapur and 51 per cent in Sarlahi are aware of others using it while 64 per cent and almost 35 per cent of control groups are aware of this practice in others.

Figure 16. Information on use of alcohol/drug and tobacco products by others

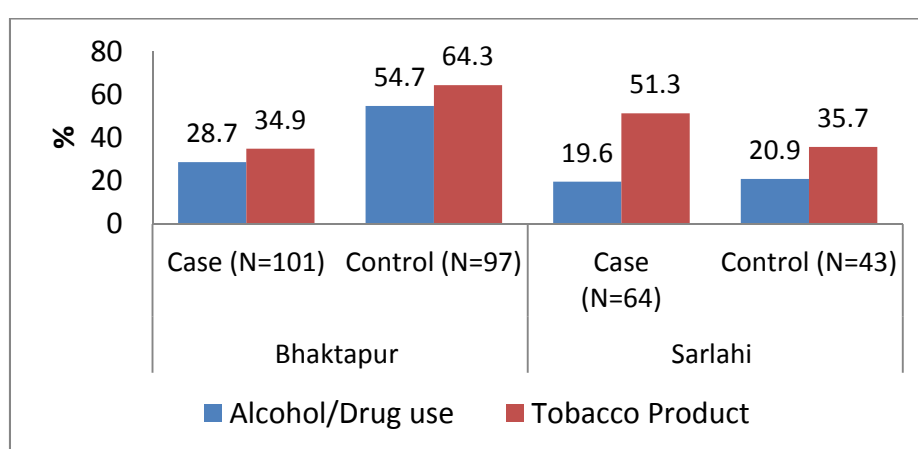
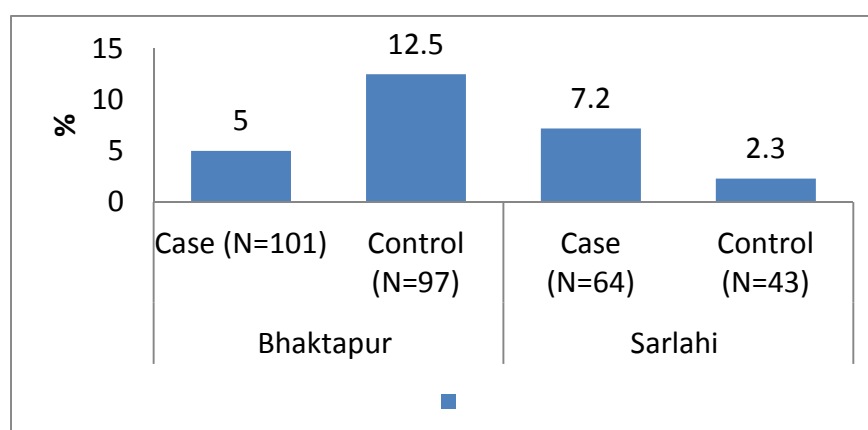


Figure 17. Knowledge of Sexual and Physical abuse



Exactly 5 per cent and 7.2 per cent of cases in Bhaktapur and Sarlahi reported to have been aware of physical/sexual abuse to others. The control group of Bhaktapur with 12.5 per cent reported this incident while only 2.3 per cent of Sarlahi are aware of this practice.

10.2 Leisure time spent by the respondents

The leisure for both the controls and cases mostly ranged between 1-4 hours. The leisure was mostly spent on personal activities including study, play, television, rest etc.

Table 51. Frequency distribution of leisure time spent by the respondents

Leisure time per day (hours)	Bhaktapur		Sarlahi	
	Case(N=92) ^a	Control (N=63) ^a	Case (N=97) ^a	Control (N=43)
	Number (%)		Number (%)	
1	22(23.9)	25(39.7)	14(14.4)	6(14.0)
2	34(37.0)	26(41.3)	21(21.6)	14(32.6)
3	21(22.8)	10(15.9)	38(39.2)	10(23.3)
4	9(9.8)	2(3.2)	19(19.6)	8(18.6)
6	3(3.3)	0(0)	3(3.1)	5(11.6)
8	2(2.2)	0(0)	2(2.1)	0(0)
12	1(1.1)	0(0)	0(0)	0(0)

Missing cases were excluded from analysis.

Min –Max days of leave for case Bhaktapur = 1-12 hours (IQR=2-3, Median =2 hours

Min –Max days of leave for case Sarlahi =3-6 hours (IQR=2-3.5, Median =3 hours

Min –Max days of leave for control Bhaktapur =1-4 hours (IQR=1-2, Median =2 hours

Min –Max hour for control Sarlahi =1-5 hours (IQR=2-4, Median =3 hours

10.3 Distribution of sleeping hours

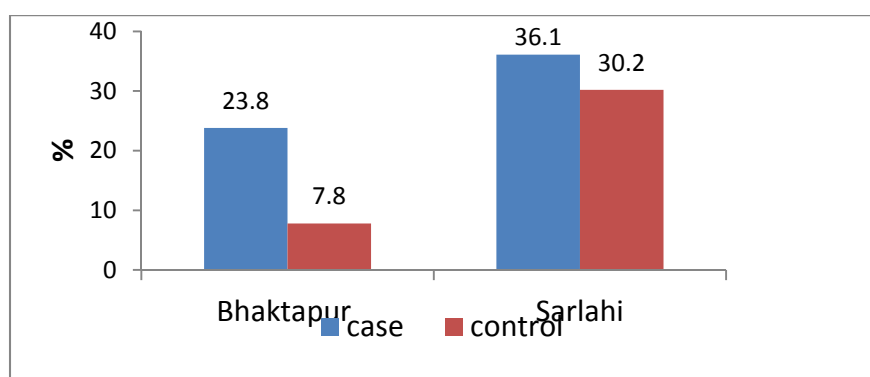
The sleeping hours for most of the cases in Bhaktapur ranged from 8-10 hours, also similar results were seen for the case group for Sarlahi ranging from 7-12 hours in maximum. The control group of Bhaktapur slept for similar 8-10 hours to that of case while the range for control group in Sarlahi averaged from 5-9 hours of sleep per day.

Table 52. Hours of sleep

# of hours	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
	Number (%)		Number (%)	
4	1(1.0)	0(0)	4(1.0)	3(7.0)
5	2(2.0)	0(0)	0(0)	5(11.6)
6	13(12.9)	6(9.4)	6(2.1)	14(32.6)
7	6(5.9)	6(9.4)	17(33.0)	10(18.8)
8	26(25.7)	10(31.3)	8(30.9)	5(11.6)
9	21(20.8)	17(26.6)	9(7.2)	5(11.6)
10	21(20.8)	12(18.8)	10(17.5)	1(2.3)
11	5(5.0)	1(1.6)	11(4.1)	0(0)
12	4(4.0)	1(1.6)	12(4.1)	0(0)
13	2(2.0)	1(1.6)	0(0)	0(0)

It was found that close to 24 per cent of case respondents in Bhaktapur and 36 per cent of Sarlahi take a nap during the day time during work breaks. It was found that only close to 8 per cent of control group in Bhaktapur and 30 per cent in Sarlahi had a nap during the day.

Figure 18. Percent of respondents who nap or sleep during the day



Oddly, the control groups appear to be working more than the cases and also resting less. The explanation for this is likely that the control group represents a population which engages in multiple tasks whereas the brick workers focus on this one area. As explained in FGDs and in-depth interviews, in addition to their regular work as a student, the control groups are found to be using their time also for household chores, agriculture, caregiving and work both inside and outside the home. The reality is starker for the control group in Sarlahi due to socio-cultural factors. In the Muslim-dominated population there, male members are generally not involved in household work which leaves the full burden of that work to the female members. The brick kiln children have a more organized sort of routine which includes taking a regular nap during the break, whereas the control population has to efficiently manage time to continue a pending job or to start a fresh one. A few of the control group had little leisure time for themselves (less than 1 hour) and as little as 4 hours of sleep. So in terms of sleep time in many cases the control group had less sleep.

11. Psycho-social functioning

The psychosocial attitudes relating to self and work are major determinants of perception and practices for an individual. Work-related stress is the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope. Stress at work can generate a range of psychosocial and physical outcomes. Longitudinal studies and systematic reviews have indicated that stress at work is associated with heart disease, depression, and work related musculoskeletal disorders and there is consistent evidence that high job demands, low control, and effort-reward imbalance are risk factors for mental and physical health problems (Leka and Jain, 2010).

Stress is presumed to result from a complex set of dynamic phenomena and not just as a consequence of a single external event, acting on a person. The theoretical basis for stress can be interactional focusing on the structural characteristics of the person's interaction with their work environment, or the basis may also be transactional focusing on the cognitive processes and emotional reactions governing person-environment interactions. Psychosocial factors include exposures thought to impact on the well-being and health outcomes of workers (e.g. temporal aspects of employment and the work itself, aspects of work content, group work, supervision, and organizational conditions). Other factors that can be included in an assessment include strain (i.e. workers' psychological and physiological reactions to stressors in terms of anxiety, depression, high blood pressure, heavy smoking, alcohol consumption, etc.) and coping strategies (Tabanelli et al., 2008). Cox (1985) reviewed the physical and psychological health effects of such work, and reported that exposure to repetitive and monotonous work is often associated with the experience of boredom, and, in turn, with anxiety and depression, resentment, and generally poor psychological health. There may also be an increased incidence of postural and musculoskeletal problems, including work-related upper limb disorders, disorders of the digestive system and various changes in health-related behaviors.

Jones et al. (1998) found that workers reporting high levels of stress and stress-related illnesses were 41/2 times more likely to report problems with *working to deadlines* and *having too much work* than the general working population. The respondents were found to be working in pressure with work overload by working longer hours and although this may offer a short term solution to the immediate problem, long working hours if sustained, may in themselves become problematic and causing serious health consequences.

On the whole, the working children of Sarlahi were found to be psychosocially more vulnerable than those from Bhaktapur. And in certain cases, the control groups were found to be psychosocially more fragile than the working children. They also tended to be more aggressive. It may be that the working children, with their exposure to a working environment, is more disciplined and bears a greater sense of obligation and of responsibility than does the control group. The process of socialization and work-related

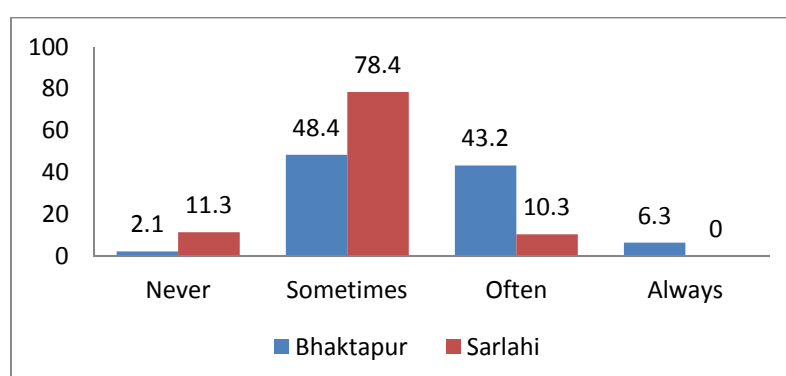
bonds are more prominent in the working children than among the controls making work within the family unit a protective factor. This is particularly the case with the migrant population which maintains a close social relationship among themselves should any one of them require help at some time. The control group on the other hand relies largely on families, so there are no particular social bonds established outside. Social relationships both at work and outside the workplace are most commonly viewed as playing a moderating role, and adverse effects of exposure to other psychosocial hazards are more likely or more pronounced when relationships provide little support (Cohen & Willis, 1985).

The following graphs and tables show the percentage distribution of attitudes on the psychosocial measures.

11.1 Work-related attitudes

Pride/shame in work

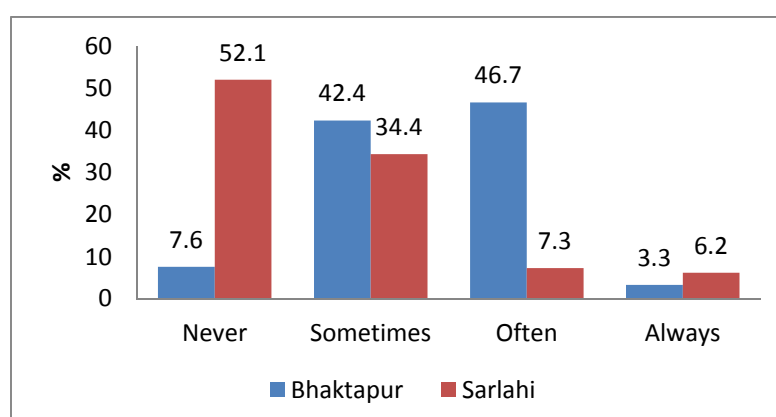
Figure 19. Percent of respondents who are proud of their work



Confident in skills

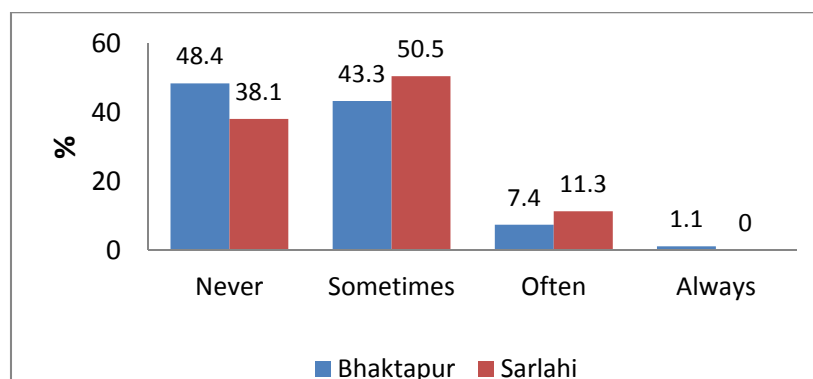
Figure 20. Percent of respondents feeling that they need more skills

(N= 92 (Bhaktapur, N= 97 (Sarlahi)



Appreciated

Figure 2. Percent of respondents who feel appreciated in their work,

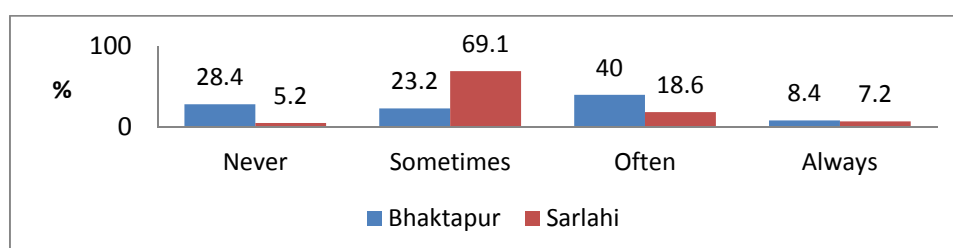


N= 95 (Bhaktapur, N= 96 (Sarlahi)

Feeling looked down upon

Figure 22. Percent of respondents feeling looked down due to the job they perform

(N= 95 Bhaktapur, N= 97 Sarlahi)



Responsibility for family

Figure 23. District wise numbers of the respondents feel that family relies on them and needs their help

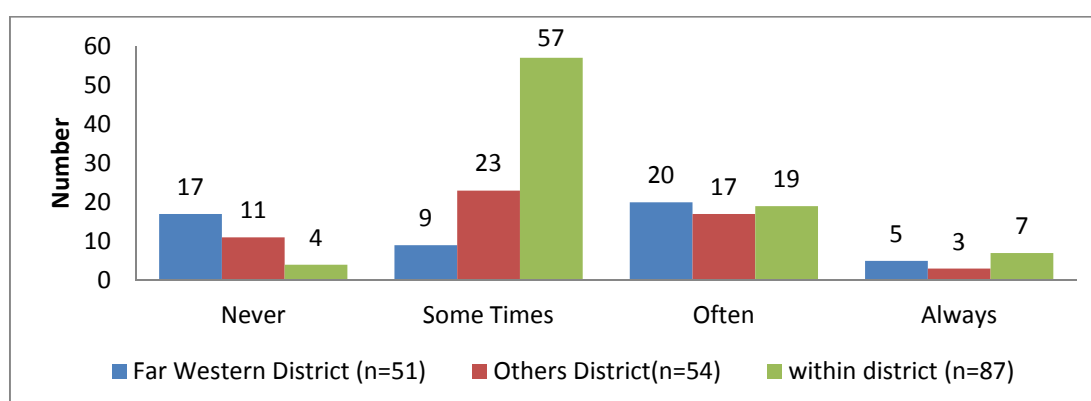
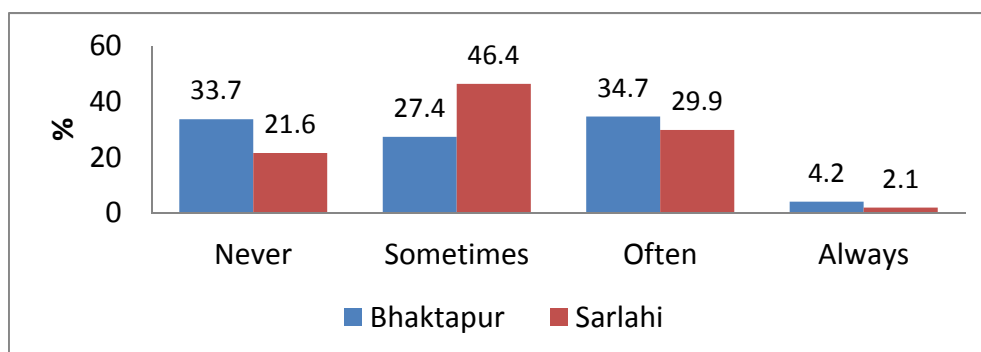


Figure 23a: Percent of respondents feeling that their family relies on their help

(N= 95 Bhaktapur, N= 97 (Sarlahi)

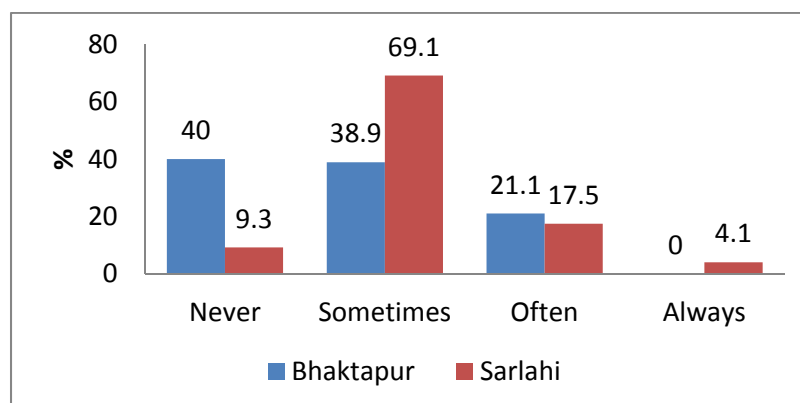


The categorization by district and help for the family shows that 17 individuals from far western districts, 11 from other districts and 4 within the district felt that their family did not need their help. It is observed that the closer the family remains, the greater the obligation and the more help is sought compared to the migrating population.

Stress

Figure 24. Percent of respondents who feel they work under pressure

(N= 95 Bhaktapur, N= 97 Sarlahi)



Boredom

Figure 25. Percent of respondents who feel bored

(N= 93 Bhaktapur, N= 95 Sarlahi)

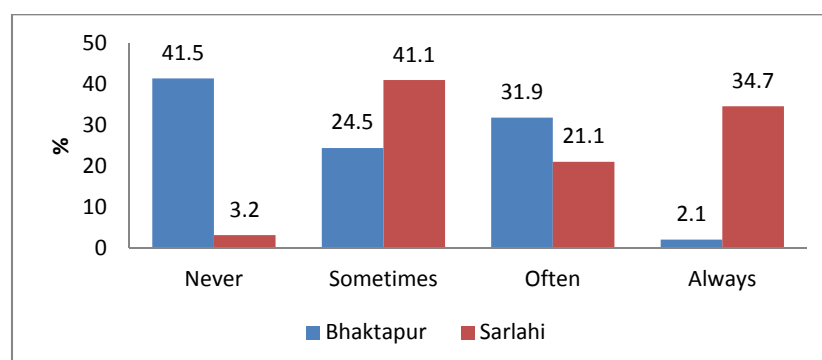
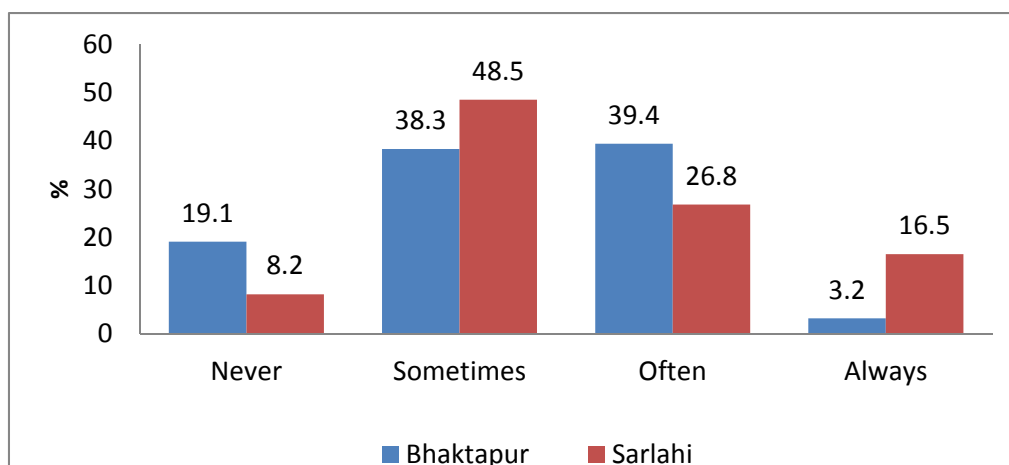


Figure 26. Figure 26. Percent of respondents who feel bored doing the same thing for hours

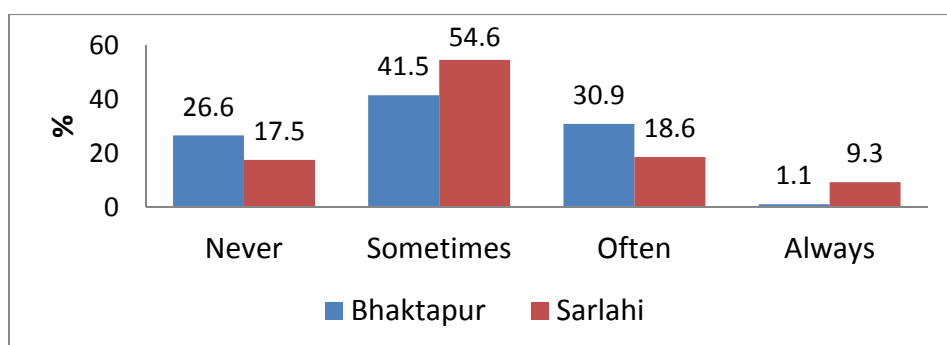
(N= 93 Bhaktapur, N= 97 Sarlahi)



Work pressure

Figure 27. Percent of respondents who feel family, employer or others ask too much from them

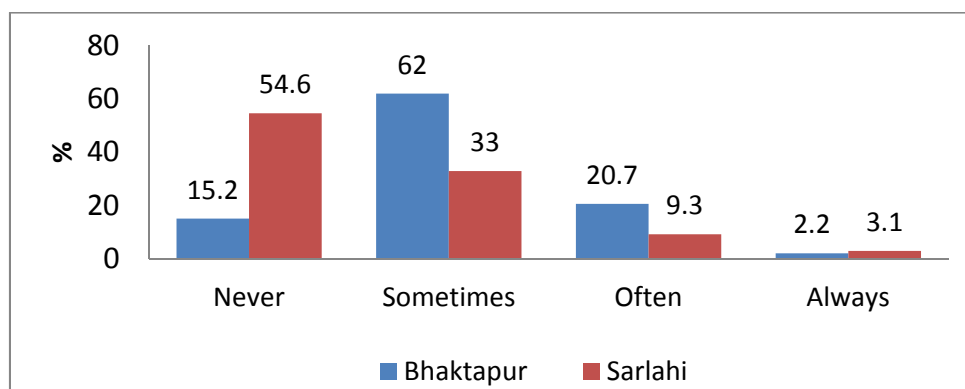
(N= 93 Bhaktapur, N= 97 (Sarlahi)



Fatigue

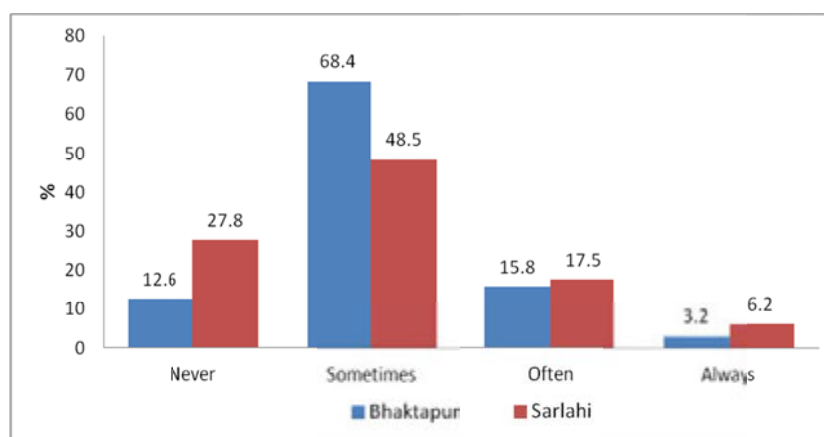
Figure 28. Percent of respondents tired because of the long working hours or heavy workload

(N= 92 Bhaktapur, N= 97 (Sarlahi)



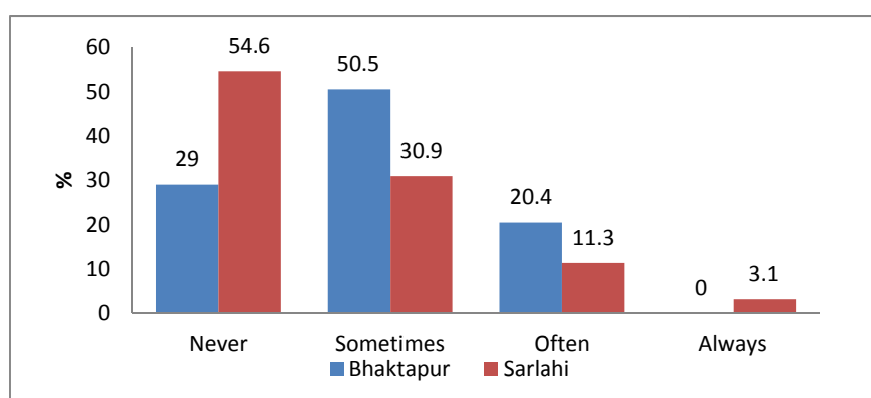
Lack of choice

Figure 29. Percent of respondents who feel work prevents them from doing things they like
(N= 93 Bhaktapur, N= 97 (Sarlahi)



Freedom of choice on work

Figure 3. Percent of respondents who feel free to make choices about their work
(N= 93 Bhaktapur, N= 97 (Sarlahi)

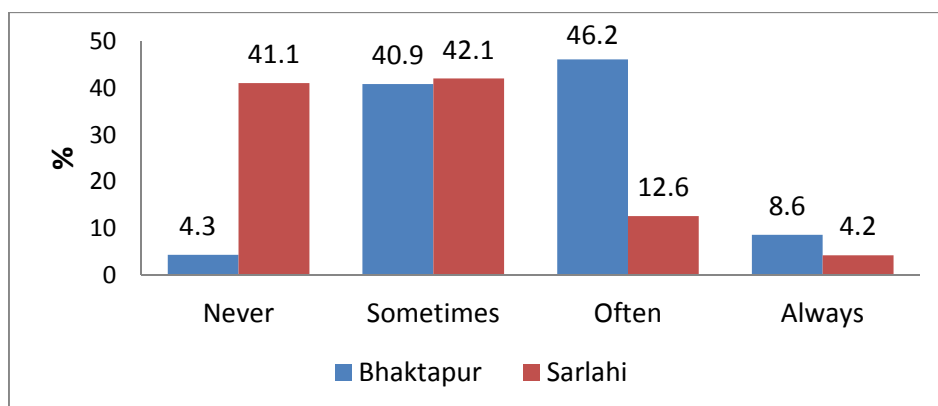


This item explores locus of control. On the whole, respondents felt they had comparatively little control over what they did. Almost 30 per cent of Bhaktapur respondents and more than half of Sarlahi ones reported they have never felt free to choose. Mostly the workers were found to have *limited* choices at times with 50 per cent in Bhaktapur and close to 31 per cent in Sarlahi.

Bothered by work environment

Figure 31. Percent of respondents feeling bothered by work environment

N= 93 (Bhaktapur), N= 97 (Sarlahi)

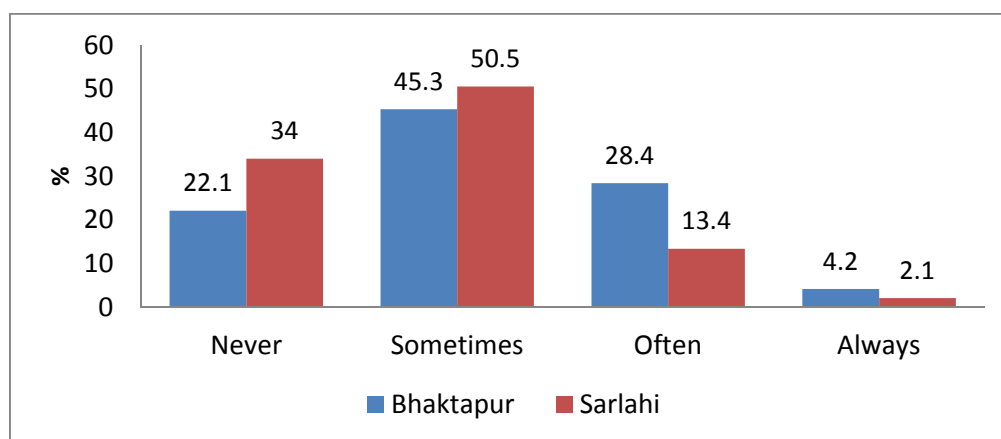


Comfort with fellow workers

On the whole, almost half of the children (45 per cent in Bhaktapur and 50 per cent in Sarlahi) tended to feel uncomfortable with their fellow workers.

Figure 32. Percentage of the respondents feeling comfortable with their fellow workers

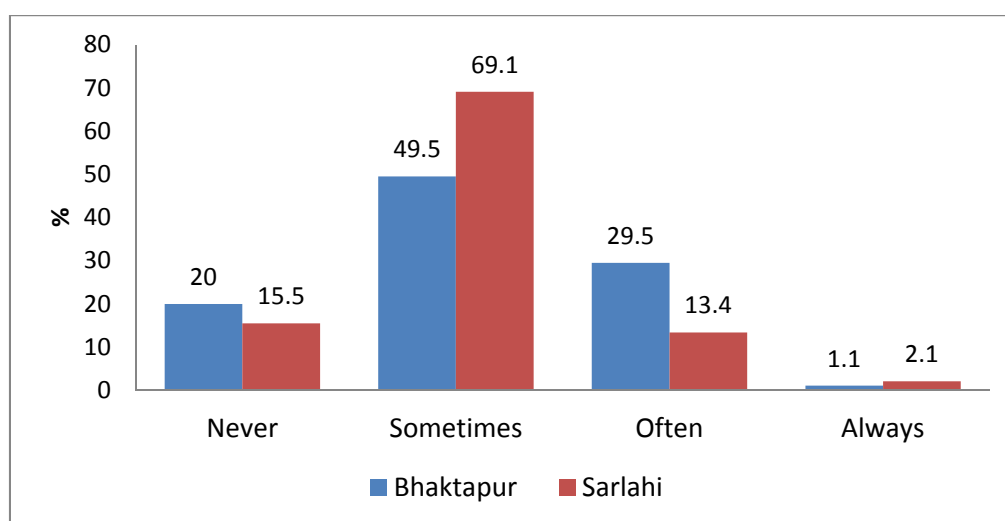
N= 95 (Bhaktapur), N= 97 (Sarlahi)



Guidance for safety at work

Supervision is critical in the case of young workers as they tend to be injured due to inexperience or impetuous movements. Most of the respondents felt they were only sometimes being watched over. A substantial number *never* felt that their safety was being attended to.

Figure 33. Percent of respondents who feel that others watch out for their safety at work



11.2 General psycho-social functioning

Energy level

Table 3. Percentage of the respondents who feel energetic

Feel confident	Bhaktapur		Sarlahi	
	Case (N=101)	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	5.3	1.6	19.8	0.0
A little	45.7	25.0	59.4	37.2
Quite a bit	46.8	46.9	12.5	62.8
A lot	2.1	26.6	8.3	0

Insomnia

The sleeping pattern for most of the respondents was found to be normal with no problems during sleep, with only 6.2 per cent of cases in Sarlahi and 2.1 and 3.1 per cent of cases and control in Bhaktapur faced lots of problem with the sleep. The control groups were found to have even fewer sleeping problems compared to the cases.

Table 4. Percentage of the respondents who have difficulty sleeping

Any difficulty sleeping	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	58.3	78.1	23.7	86.1
A little	29.2	17.2	40.2	11.6
Quite a bit	10.4	1.6	29.9	2.3
A lot	2.1	3.1	6.2	0

a:Missing cases were excluded from analysis

Concentration

The majority of the respondents have little or no problems at all in concentrating.

Table 55. Percentage of the respondents who have trouble concentrating

Have trouble concentrating	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	67.4	39.1	28.9	37.2
A little	24.2	46.9	49.5	48.8
Quite a bit	7.4	14.1	16.5	14.0
A lot	1.1	0.0	5.2	0.0

a: Missing cases were excluded from analysis

Restless

Similarly restlessness does not seem to be a problem with either cases or controls. More than 50 per cent of cases and controls in Bhaktapur were observed to having no problem with restlessness.

Table 56. Percentage of the respondents who feel restless

Feel restless and cannot stay calm for a very long period	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	51.6	50.0	42.3	37.2
A little	38.9	33.3	40.2	44.2
Quite a bit	9.5	13.3	14.4	16.3
A lot	0	3.3	3.1	2.3

a: Missing cases were excluded from analysis

Sad

Table 57. Percentage of the respondents who feel sad

Feel sad and crying	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	56.3	54.7	30.9	69.8
A little	34.4	31.3	49.5	27.9
Quite a bit	9.4	14.1	16.5	2.3
A lot	0.0	0.0	3.1	0.0

a: Missing cases were excluded from analysis

Quarreling

Rage and anger, fighting or quarreling was not found to be prominent in the study population. Most of the respondents thought of it as limited or nonexistent. Only 6.3 per cent of controls in Bhaktapur and 1 per cent of cases in Sarlahi responded as having aggressive behavior.

Table 58. Percentage of the respondents who get into fights and quarrels easily

Get into fights and quarrels easily	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=63) ^a	Case (N=97)	Control (N=43)
Not at all	52.1	40.6	49.0	48.8
A little	40.6	31.3	42.7	41.9
Quite a bit	7.3	21.9	7.3	9.3
A lot	0.0	6.3	1.0	0.0

a: Missing cases were excluded from analysis

Loneliness

Table 59. Percentage of the respondents who feel lonely

Feel Lonely	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=61) ^a	Case (N=97)	Control (N=43)
Not at all	50	67.2	38.1	86.1
A little	37.5	24.6	43.3	11.6
Quite a bit	11.46	8.2	17.5	0
A lot	1.04	0	1.0	2.3

Anger

Table 60. Percentage of the respondents who get very angry and often lose their temper

Get very angry and often lose temper quickly	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=96) ^a	Control (N=43)
Not at all	41.1	28.1	20.8	30.2
A little	46.3	43.8	52.1	55.8
Quite a bit	12.6	21.9	22.9	7.0
A lot	0.0	6.3	4.2	7.0

Missing cases were excluded from analysis

Appetite

Table 61. Percentage of the respondents who have little appetite or interest in food

Have little appetite or interest in food	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=96)	Control (N=43)
Not at all	59.4	32.8	9.4	14.0
A little	32.3	45.3	36.5	27.9
Quite a bit	5.2	9.4	25.0	46.5
A lot	3.1	12.5	29.2	11.6

Missing cases were excluded from analysis

Forgetfulness

The respondents, both controls and cases, had little or no sign of forgetting things and events.

Table 5. Percentage of the respondents who are forgetful

Have forgotten things	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=96)	Control (N=43)
Not at all	67.7	33.3	34.0	39.5
A little	21.9	60.3	38.1	44.2
Quite a bit	9.4	6.4	23.7	14.0
A lot	1.0	0.0	4.1	2.3

Missing cases were excluded from analysis

Body tension

Table 63. Percentage of the respondents who feel tense

Feel tension in body	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=62) ^a	Case (N=96) ^a	Control (N=43)
Not at all	61.46	38.71	22.92	55.81
A little	21.88	46.77	45.83	41.86
Quite a bit	16.67	11.29	28.13	2.33
A lot	0.0	3.23	3.13	0.0

Missing cases were excluded from analysis

Dizziness

Dizziness is a somatic indication of stress. Around 17.5 per cent of Sarlahi cases and 1.6 per cent of Bhaktapur controls reported to have felt dizziness *a lot* followed by 7.3 per cent of case in Bhaktapur and 21.6 per cent in Sarlahi reported of feeling dizziness *quite a bit*.

Table 64. Percentage of the respondents reporting dizziness

Feel dizzy	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=62) ^a	Case (N=96) ^a	Control (N=43)
Not at all	68.6	43.6	12.4	48.8
A little	23.9	41.9	48.5	46.5
Quite a bit	7.3	12.9	21.6	4.7
A lot	0.0	1.6	17.5	0.0

a: Missing cases were excluded from analysis

Fear or nervousness

Most of the respondents (over half of the working children in Bhaktapur and over a quarter in Sarlahi) did not feel nervousness or fear of any kind. The controls were similar. The fear here largely denoted fear of existing conditions or events in the near future involving studies, job security, family etc.

Table 65. Percentage of the respondents who feel afraid or nervous

Feel afraid or nervous	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=96) ^a	Control (N=43)
Not at all	55.8	42.2	27.4	41.9
A little	37.9	40.6	40.0	53.5
Quite a bit	6.3	14.1	24.2	2.3
A lot	0.0	3.1	8.4	2.3

Missing cases were excluded from analysis

Worry

Table 66. Percentage of the respondents who feel worried and think a lot

Feel worry and think a lot	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=95) ^a	Control (N=43)
Not at all	45.8	33.3	40.1	40.0
A little	48.9	39.6	45.3	41.1
Quite a bit	4.2	23.8	11.9	15.8
A lot	1.1	3.2	1.9	3.2

Missing cases were excluded from analysis

Negative view of life

The majority of controls and cases do not have a negative outlook on life nor think their life is significantly different from others their age.

Table 67. Percentage of respondents who think life is worse than that of other children

Think life is worse than other Children	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=42)
Not at all	42.1	50.0	32.0	67.4
A little	46.3	29.7	37.1	20.9
Quite a bit	10.5	14.1	25.8	11.6
A lot	1.1	6.3	5.2	0.0

Missing cases were excluded from analysis

Life not worth living

Another measure of depression or despondency found more variation. Approximately a quarter thought about this quite a bit. A positive attitude towards life was found more in the Bhaktapur study population than that of Sarlahi.

Table 68. Percentage of the respondents who think life isn't worth living

Think life isn't worth living	Bhaktapur		Sarlahi	
	Case (N=93) ^a	Control (N=64)	Case (N=95) ^a	Control (N=43)
Not at all	78.5	70.3	30.5	39.5
A little	16.1	23.4	32.6	25.6
Quite a bit	4.3	3.1	24.2	27.9
A lot	1.1	3.1	12.6	7.0

a. Missing cases were excluded from analysis

Family support

This is a resilience factor. The control groups in both district had good family ties and felt loved by family, as did the working children in Bhaktapur but somewhat less in Sarlahi.

Table 69. Percentage of the respondents who feel supported and loved by their family

Feel supported and loved by your family	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=95) ^a	Control (N=43)
Not at all	13.5	4.7	14.7	4.7
A little	11.5	9.4	34.7	9.3
Quite a bit	57.3	26.6	29.5	27.9
A lot	17.7	59.4	21.1	58.1

a. Missing cases were excluded from analysis

Family conflict

Conflict in the family would be a factor that reduces resilience.

Table 70. Percentage of the respondents who feel conflict in the family

Have conflict in your family	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	53.7	48.4	29.9	16.3
A little	27.4	39.1	55.7	44.2
Quite a bit	12.6	12.5	9.3	25.6
A lot	6.3	0.0	5.2	14.0

Acceptance by other families

Feeling accepted and supported by one's social group is an important protective factor as well. Here the controls in both districts appeared to have positive social relations and to be well-accepted by other families, whereas this is not the case with the working children.

Table 71. Percentage of the respondents who feel accepted by the other families

Feel accepted by the other families	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	8.4	6.3	15.5	2.3
A little	16.8	12.5	47.4	16.3
Quite a bit	68.4	39.1	29.9	34.9
A lot	6.3	42.2	7.2	46.5

Supportive friends

Another protective factor, it is noteworthy that the majority of both case and control respondents reported to have quite a few friends on whom they could rely for support.

Table 72. Percentage of the respondents who have one or more good friends to support

Have one or more good friends that support you	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	8.3	3.1	8.3	0.0
A little	19.8	17.2	41.2	32.6
Quite a bit	66.7	53.1	39.2	60.5
A lot	5.2	26.6	11.3	7.0

Missing cases were excluded from analysis

Feel rejected or teased

The majority of respondents feel accepted and not teased in the case of both the controls and the working children.

Table 73. Percentage of the respondents who feel rejected or teased

People rejecting or teasing	Bhaktapur		Sarlahi	
	Case (N=93) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	49.5	42.2	20.6	39.5
A little	33.3	46.9	53.6	44.2
Quite a bit	17.2	6.3	16.5	16.3
A lot	0.0	4.7	9.3	0.0

Missing cases were excluded from analysis

Playing with friends

It was found that children above 15 years and who have free time from work still have limited engagement in sports. This is true for both the controls and cases. It is interesting that no working children in Bhaktapur report that they play a lot with friends.

Playing with friends	Bhaktapur		Sarlahi	
	Case (N=95) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	25.3	9.4	9.3	7.0
A little	48.4	29.7	48.5	39.5
Quite a bit	26.3	50.0	34.0	44.2
A lot	0.0	10.9	8.3	9.3

Missing cases were excluded from analysis

Feeling different

The respondents did not feel much difference from other children of similar age, only 3.2 per cent of cases in Bhaktapur and 2.1 per cent of case in Sarlahi reported to have felt significant differences.

Table 74. Percentage of the respondents who feel different from other children of similar age

Feel different from other children with similar age	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	45.8	58.7	18.6	59.5
A little	49.0	25.4	54.6	35.7
Quite a bit	5.2	12.7	24.7	4.8
A lot	0.0	3.2	2.1	0.0

Missing cases were excluded from analysis

Scolded or criticized

Table 75. Percentage of the respondents who get scolded, or criticized or made to feel small or stupid

Get scolded, or criticized or made to feel small or stupid	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	65.6	54.7	43.3	35.7
A little	31.3	42.2	39.2	52.4
Quite a bit	2.1	0.0	10.3	7.1
A lot	1.0	3.1	7.2	4.8

Missing cases were excluded from analysis

Physical punishment

Table 76. Percentage of the respondents who get beaten at home or work

Get beaten at home or work	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=63) ^a	Case (N=97)	Control (N=43)
Not at all	75.0	61.9	39.2	72.1
A little	24.0	33.3	46.4	23.3
Quite a bit	1.0	4.8	11.3	4.7
A lot	0.0	0.0	3.1	0.0

Missing cases were excluded from analysis

Sexual abuse

The incidences of sexual abuse and molestation existed, but not at a significant level. However, 6.3 per cent and 35.4 per cent of cases in Bhaktapur and Sarlahi and 4.7 per cent of control in both the districts reported to have experienced some abuse and 4.2 per cent of working children in Sarlahi reported to have experienced a lot at work or at home.

Table 77. Percentage knowing of possible sexual abused

Any one try to touch them in a bad way	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=96) ^a	Control (N=43)
Not at all	93.7	92.2	52.1	95.4
A little	6.3	4.7	35.4	4.7
Quite a bit	0.0	3.1	8.3	0.0
A lot	0.0	0.0	4.2	0.0

Missing cases were excluded from analysis

Severe punishment

The control group responded to have been less punished severely for mistakes than the working children, although the numbers are still relatively low. Those at Sarlahi often get more punished than children in Bhaktapur.

Table 78. Percentage of the respondents severely punished for mistakes

Severely punished for mistakes	Bhaktapur		Sarlahi	
	Case (N=96) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	87.5	59.4	46.4	88.4
A little	8.3	39.1	35.1	11.6
Quite a bit	4.2	1.6	14.4	0.0
A lot	0.0	0.0	4.1	0.0

Missing cases were excluded from analysis

Sense of safety

Table 79. Percentage of respondents who feel safe

Feeling Safe at Work	Bhaktapur		Sarlahi	
	Case (N=93) ^a	Control (N=64)	Case (N=97)	Control (N=43)
Not at all	11.8	9.4	77.3	9.3
A little	28.0	21.9	14.4	18.6
Quite a bit	49.5	43.8	5.2	46.5
A lot	10.8	25.0	3.1	25.6

Missing cases were excluded from analysis

11.3 Psychosocial functioning and work

Table 80. Association between different domains of psycho-social functioning and work

Domain	Unadjusted Odds ratio (OR) (95% CI) Working vs. Non-working Children	Adjusted Odds ratio (AOR) (95% CI) Working vs. Non-working Children
Emotional	1.13(1.02;1.24) [#]	1.01(0.88-1.17)
Somatic	1.12(0.85;1.48)	1.03(0.71;1.51)
Chronic fear and anxiety	1.05(0.85;1.31)	1.08(0.87-1.34)
Hopelessness and helplessness	1.57(1.18;2.09) [#]	1.65(1.14;2.39) [#]
Social factors	1.08(0.86-1.33)	0.99(0.75;1.24)
Abuse and maltreatment	0.76(0.63-0.91) [#]	0.84(0.66-1.06)

Adjusted odds ratio (AOR) was computed when all domains were entered simultaneously in logistic regression. # indicates results were statistically significant at 5 per cent level of significance.

When association between different domains of psycho-social function and working status were tested, only emotional attachment and hopelessness and helpless were positively associated (OR>1, P<0.05) (AOR>1, p<0.05) with working status of children. It means working children were more likely to be emotionally fragile and felt less helpless than non-working children. Other psychosocial domains were not positively associated with work at a significant level. It is also found that working children were less likely to have abuse and maltreatment comparison to non-working children (OR<1, P<0.05) but when it is adjusted with other domains it was not statistically significant (AOR<1, p>0.05).

Table 81. Association between domains of psycho-social functioning and work by District

Domain	Odds ratio (95% CI) Working vs. Non-working Children(Bhaktapur)	Odds ratio(95% CI)b Working vs. Non-working Children (Sarlahi)
Emotional	0.98(0.82;1.18)	1.78(1.17;2.70) *
Somatic	0.61(0.36;1.04)	1.89(0.86;4.17)
Chronic fear and anxiety	0.96(0.67;1.42)	0.89(0.48;1.64)
Hopelessness and helplessness	1.89(1.05;3.39) *	1.91(0.91;4.04)
Social factors	1.19(0.84;1.68)	0.86(0.45;1.63)
Abuse and maltreatment	1.40(1.01;1.94) *	0.30(0.16;0.56)

* Significant OR at 95 per cent CI. The OR is significant when CI does not include 1 (P <0.05). OR =Odds Ratio

In Bhaktapur, the OR of working children showed an increasing trend (1.89-times) with one unit increased in hopelessness and helplessness score. Likewise, the OR of working children showed an increasing trend (1.40-times) with one unit increased abuse and maltreatment score. In Sarlahi district, the OR of the working children showed an increasing trend (1.78-fold) with a per unit increase in emotional score. The rest of the domains were not statistically significant at 5 per cent level of significance (P>0.05).

12. Treatment and Health Expenditures

12.1 Treatment seeking behavior

The treatment seeking behavior of child workers for cases of illness indicates that less than half seek professional treatment (45 per cent in Bhaktapur; 18 per cent in Sarlahi), whereas the control group seeks treatment by going to a clinic or local healer. The practice of consultation with local healer was absent in Bhaktapur while 27 per cent of cases in Sarlahi reported this form of treatment.

Table 82. Types of the treatment for ill health

What did you do to take care during the sickness?	Bhaktapur		Sarlahi	
	Case N=62) ^a	Control (N=64) ^a	Case (N=47) ^a	Control (N=25) ^a
	Number (%)		Number (%)	
Did nothing	28(45.2)	14(29.8)	10(18.2)	6(24)
Care by self or family member	14(22.6)	9(19.1)	8(14.5)	7(28)
Went to local healer	0(0)	0(0)	15(27.3)	2(8.0)
Went to a clinic or hospital	20(32.3)	24(51.1)	22(40.0)	10(40.0)

Missing cases were excluded from analysis

The practice of not seeking medical treatment for illnesses is common at the brick kilns of Nepal. The migrant population lacks information and access to local health care facilities. This, compounded with dependency on the brick kiln management for medical supplies, leads to this population largely confining itself to the kiln world when it comes to dealing with health issues. The control group, on the other hand, with knowledge of local resources and access to local information, regularly seeks treatment, whether from modern medical services or local healers, and is more able to demand necessary services from the government than are the migrants.

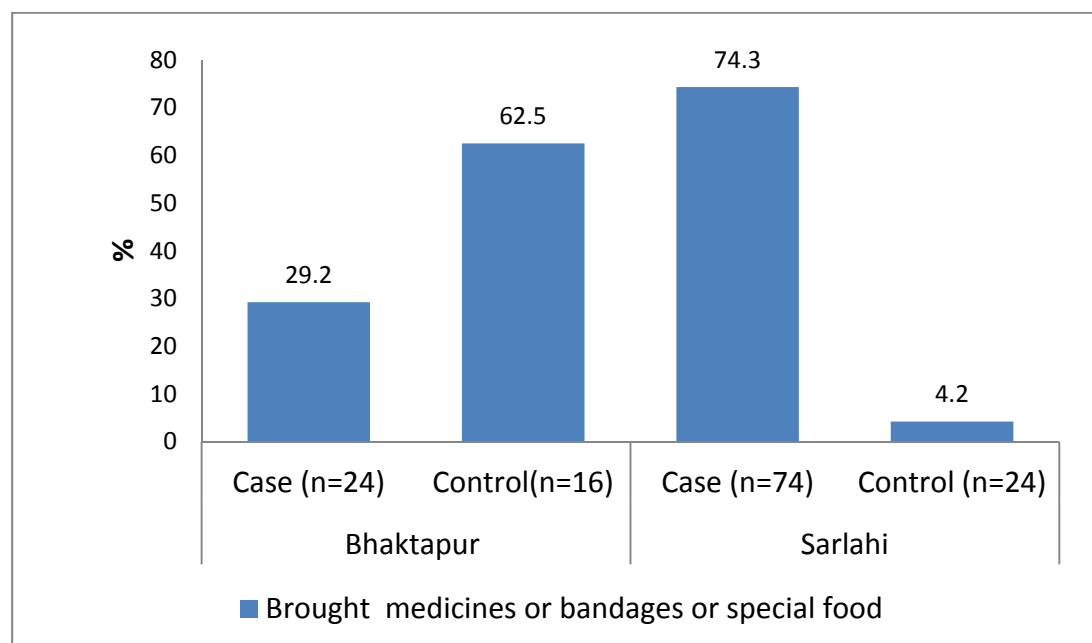
Analysis of the study findings shows very few responses on the costs incurred due to injuries and illnesses. Although one possible explanation is that they had no expenses at all, it is not at all likely given that brick kilns harbor a population that is comparatively fragile health wise with frequent incidences of sickness as clearly demonstrated by the frequency and details of health impacts found by this study. The more likely explanation for this under reporting for the health expenses is that the workers, a mostly illiterate population, do not keep accounts and have difficulty making calculations.

The health expenditures included medical expenses incurred during one year and the source of information was collected from adults in the control group and adult cases wherever applicable. In Bhaktapur, 23 adults associated with working children were interviewed (18 controls) and 76 adult respondents for the cases (24 controls) in Sarlahi. The median family size was identified to be 5 for both cases and controls in Bhaktapur and 6 for Sarlahi.

Three cases and 16 controls in Bhaktapur confirmed that medical expenses were incurred by the family in the last one year with 1 case and 9 controls having to borrow money for the treatment. Likewise, 37 cases and 2 controls in Sarlahi reported medical expenses, where 32 cases and 2 controls borrowed money for the treatment.

Almost 30 per cent and 75 per cent of cases in Bhaktapur and Sarlahi reported spending small amount on medicine, bandages and food for the sick people at home. Similarly 62.5 per cent and 4.2 per cent of control in Bhaktapur and Sarlahi reported similar expenses.

Figure 34. Percentage of families with minor medical expenses during last one year



It was found that 13.6 per cent of cases in Bhaktapur and 43.8 per cent of cases in Sarlahi have borrowed money for treatment while close to 70 per cent of control in Bhaktapur and 4.2 per cent of control in Sarlahi reported the same. The amount taken ranged from NRs. 500 to Rs.20, 000.

Figure 35. Percentage of families who borrowed money for medical care or medicines

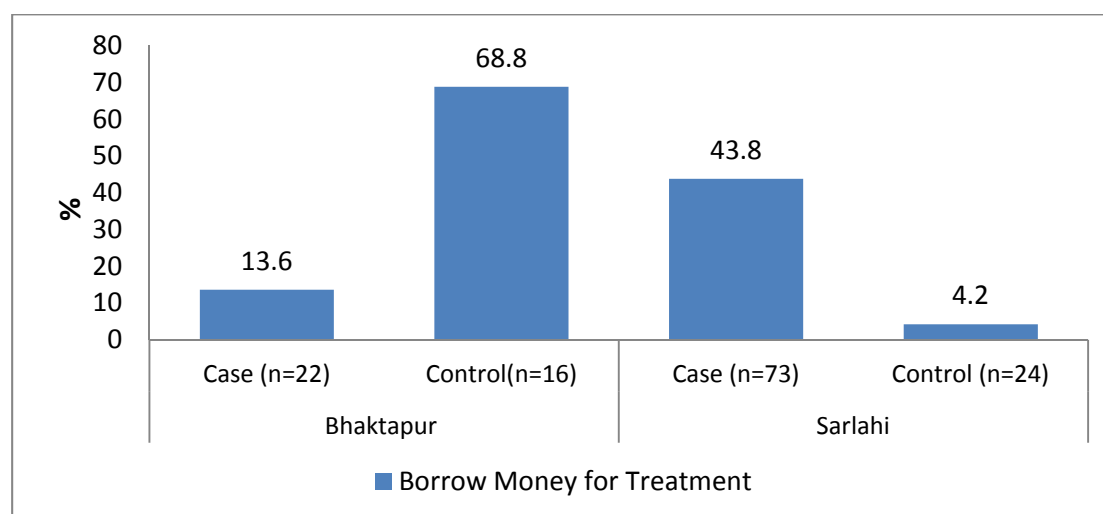


Table 83. Health expenses incurred (Mother/Adult informant)

Variable	Bhaktapur		Sarlahi	
	Case (n=23)	Control(n=18)	Case (n=76)	Control (n=24)
	Min – Max (Median)	Min – Max (Median)	Min – Max (Median)	Min – Max (Median)
Number of Family Members	2-7(5)	3-8(5)	2-9(6)	4-9(6)
Cost of Medical Treatment (NRs.)	Case (n=3)	Control(n=16)	Case (n=37)	Control(n=2)
	Min – Max (Median) ^a	Min – Max (Median)	Min – Max (Median)	Min – Max (Median) ^a
	500-10,000	200-5,000 (1750)	250-20,000 (3000)	600-2,000
Money Borrow for Treatment(NRs.)	Case (n=1)	Control(n=9)	Case (n=32)	Control(n=2)
	Min – Max (Median) ^c	Min – Max (Median)	Min – Max (Median)	Min – Max (Median) ^a
	10,000	4,000-20,000 (8000)	500-20,000 (5000)	600-2,000

a. Median cannot be computed because of few respondents

b. Range and median cannot computed because of only one respondents

c. Missing cases were excluded from analysis

13. Conclusions and Recommendations

The study finds that occupational health and safety status at the sampled brick kilns of Nepal are non-existent. The children working as the major force in the brick kilns have no provisions to safeguarding their health and security issues. The basic concept of occupational health and safety are completely missing in this industry. The absence of needed occupational health and safety measures together with inferior physical environment, working conditions and psychosocial issues makes brick industries a favorable ground in harboring work related diseases with higher possibilities of risks and hazards. The lack of rule of law and un-following of existing legal bindings at the brick kiln provides an easy escape for the kiln management from their obligations.

The study population comprising control and case groups showed some unique independent traits. The control populations were found to be multi-taskers being engaged in study, household tasks, agriculture and livestock while the cases were mostly confined to brick making jobs. The majority of cases in Sarlahi were found to be part time workers who were utilizing their annual school leave to earn some money. The study visit at Sarlahi concluded with the end of brick making season, where most of the migrant workers had returned and the remaining brick works at the kiln were being completed by the local population. The control groups at Bhaktapur were mainly full time students with most of their parents working at the kiln. The generalization of case vs. case thus seems inappropriate due to the background and nature of work.

The migrating population working who are the major labor force in the brick industries is uninformed about health and lacks clear understanding of health and safety measures. Poverty, lack of education and absence of social ties at the place of work have increased their vulnerability in seeking adequate health and safety protection.

The work related diseases and casual infections and diseases due to the poor physical conditions at the workplace and nutrient deficiency disorders were more prevalent in the sampled brick kilns. The major identified health problems included musculoskeletal problems, pulmonary disorders, skin problems and hearing impairments. The psychosocial analysis of the sample assessed the factors of stress, working conditions and processes; self-esteem and work related relationships. The proportionate balance of mental health to physical health contributes to the general well-being of an individual. The external factors, the way of processing these externalities and physical and mental abilities corresponds to the good health.

The lack of basic occupational health and safety in practice and absence of information on optimum working conditions pose greater risks. The unmonitored informal industries of Nepal and the reality of grave issues relating to health and work are significant but mostly unheard and unnoticed. The association of child labor under these conditions not only

increases the vulnerabilities but also poses greater risks to attaining physical, mental and overall well-being.

Based on the study's findings and stakeholder consultations the research team makes the following protection, prosecution and prevention recommendations to address the occupational safety and health of children engaged in the brick industry:

13.1 Protection

1. Declare the Brick Industry a Hazardous Occupation for Children:

The study found that both young children and teenagers were suffering serious health impacts as a result of work in the brick industry. These impacts are cumulative with children working for several years having greater impacts. By declaring the brick industry hazardous under the Child Labour Act no child under 16 would be permitted to work under any circumstances in the brick industry.

2. Remove all children under 16 from the brick industry and rehabilitate them

To protect children's health all children under 16 need to immediately removed from work in the brick factories. It is evident that immediate evacuation of children from brick industries will increase threats to livelihood on the dependent families. A package of support will be needed for these children and their families including scholarships to return to school, vocational educational for children of legal working age i.e over 14, and family livelihood support to help families diversify their livelihoods to increase incomes and reduce dependency on child labour in the brick industry.

3. Ensure Greater Protection For Young Workers in 16-18 Age Group

The current Child Labour Act permits children over 16 to work even in an industry as hazardous as the brick industry. Young workers 16-18 are still more vulnerable than adults to the negative health impacts of work in the brick industry. For this age group special restrictions on the load weights being carried should be enforced. Youth this age should also be restricted from being engaged in the firing of the bricks and from working more than 42 hours per week.

4. Separation of Work and Accommodation Areas

The majority of the factories have temporary huts for accommodation across factory sites. This makes it difficult to prevent children from working alongside parents and means that even children not working are inhaling toxic dust and smoke that causes lung damage. Factories should be required to demarcate and separate living areas and position them so as to reduce the impacts of dust and smoke.

5. Health Education and Services

Factory workers are often migrants separated from their regular health care support system. Communities that host brick factories need to receive special support for this

vulnerable migrant population. The District Health Offices should orient Health Post staff and mobilize them at the start of the brick season to visit factories to provide health education and make sure workers know where to go to access services. This is critical to ensure continuity of care for pregnant women, TB patients, childhood vaccination etc. In addition government Health Posts close to factories such as in Bhaktapur with migrant populations with tropical diseases not usually found in the Valley should be provided with free medicines for these illnesses that migrants suffer from even though these would not normally be required. Also the government needs to ensure additional medical supplies during the season. With the large numbers of workers in this industry with many having serious health issues the needs of this community should be addressed in the National Health Plan.

6. Medical Response

Employers should support periodic occupational health checkups to assess occupational illness as necessary. Self-dispensing of prescription medicines by the kilns has to be stopped. A standard first aid kit and availability of skilled medical professional at the times of need has to be ascertained. A standard referral process for major health issues has to be guaranteed.

7. Adequate Sanitation and Personal Hygiene facilities

The brick kilns lack proper sanitation and hygiene facilities. Factories should be required to provide clean toilets (at a ratio of 1 toilet/ 50 workers) and adequate drinking water. Personal hygiene and sanitation measures have to be emphasized as workers dealing with soil and being exposed to dust and smoke can reduce the health impacts with proper bathing and hygiene. This will not only help to reduce the burden of disease but also help ensure a better, healthier workforce.

8. Psychosocial Wellbeing

Psychosocial impacts were observed for both children and adults. Removing children will be a major step but as many of the families are under great stress and have had years working in the factories, parenting education and psychosocial activities such as child clubs and recreational activities should be supported.

Adults in the brick industry are under severe stress. The use of debt bondage to secure workers encourages them to work excessive hours to repay loans or work off advances. Adult workers can be found working up to 16 or 18 hours a day for 6-8 months of the season. Workers are also stressed as in Nepal they can lose all the anticipated income if rain destroys the bricks before firing. Alcohol abuse and family stress are often associated with these conditions and more effort is needed to reduce stress and tensions at factories such as by reducing the debt burden and improving accommodation. The ergonomic factors fuelling unsafe psychosocial behavior have to be checked for the overall wellbeing of the workers.

9. Immediate improvement of physical environment:

The physical environment of brick kiln work poses more risks and vulnerabilities. The external factors of temperature, heat, light conditions, ambient environmental hazards have to be adjusted and improved at the earliest. The brick making process is an outdoor job so a shade or a canopy to protect from heat and sun has to be guaranteed. The factory owners need to be supported by technical experts to experiment and test with different designs that provide shading (especially in hot Terai districts). Many young children of workers drown each year at the factories. Proper fencing around the open ponds and the management of pools of stagnant water must be addressed. Unsafe wiring and illegal “hooking” of electricity put workers at high risk of electrocution. Proper insulation of electrical appliances has to be ensured. Over time if machinery is used more new efforts will need to be made to ensure such machinery is safely managed as pug mills and other equipment, while reducing physical effort, can create new dangers and in some countries more accidents involve machinery in brick factories. Factory layout can also be improved to reduce ergonomic stress and use of pushcarts (as in Bhaktapur Chinese design factory) or the use of rickshaw carts (as in Bangladesh) can be tested. Where donkeys managed by children are being used, how to manage these donkeys to reduce the spread of fecal matter, reduce loading stress and incidences of bites needs investigation.

10. Adoption of Health Friendly Technologies

The brick kilns have been considered to be a major source of ambient air pollution and traditional kilns have regularly been replaced by Hoffman and VSBK technologies. Still standardized and uniform technologies are missing in Nepal. The pollution at the source with oxides of Nitrogen, Carbon and Sulfur and particulate matter are still unchecked and uncontrolled, leaving not only working population at risk but also posing threat to communities’ health and biodiversity. Adoption of health and environment friendly technologies must be prioritized with effective and efficient control measures in reducing health and environment vulnerabilities.

13.2 Prevention

1. Address Root Causes of Child Labour in the Brick Industry in Source Communities

- Long-term solutions include a number of different initiatives in source communities such as:
- Ensuring poverty alleviation efforts target the poorest families with children engaged in the brick industry (including in the districts in the periphery of the Kathmandu Valley – especially Kavre and Rhamechaap - factory communities in the Terai and districts in west Nepal such as Rolpa, Salyan, Dang and Rukum that are source districts for unaccompanied teenage workers).
- Increasing effectiveness of “Free and Compulsory Education” and extending it up to 14 years of age - the minimum age for full time employment.
- Address child protection system to ensure support for families in crisis, and families where abuse, neglect, alcoholism or domestic violence likely to push children in to exploitative labor.

- Debt bondage is a major issue and financial literacy and microfinance programs are needed in source communities to reduce vulnerability.

2. Ensure Fair Wages for Adult Workers in Brick Factories

Factory workers are not regarded as employees and work on piece rates under labor contractors. If workers are not to be hired on set wages piece rates need to be reviewed at regular intervals set by the government to ensure that for an average worker working a standard 42 hour week that at the very least the minimum wage can be earned. As workers are seasonal and have taken large advances (and are effectively in debt bondage) they are pushed to work long hours and involve children to repay the debt. By ensuring that all workers of legal age on land owned or leased by a factory for brick production are guaranteed minimum wage for a standard production rate the pressure to engage children will be reduced.

13.3 Prosecution

1. Regular Factory Inspection

Brick factories are not being regularly inspected as other factories are and this needs to be done to ensure no child labour is being used and to address the protection of adult workers. By having workers under sub-contractors on piece rates factories are then able to register as “Cottage Industries” thereby avoiding regulation even though this legislation is intended only for enterprises with fewer than 20 employees. As a result even factories with as many as 400-800 workers are not being visited by Labour Inspectors. The loophole in the legal status of these factories that allows them to evade labor inspection needs to be addressed.

District Child Welfare Boards should also be made aware of the child protection issues in these factories and ensure Women and Children’s Officers and Child Rights Officers also monitor these factories periodically.

2. Policy and Institutional Development

Child labor has been briefly touched on in the Labor Policy of the government. A clearer government policy and implementation and follow-up mechanisms with regard to child labor must be in place through effective government initiatives. Strong co-ordination among various central and local governments must be developed. For this, capacity of respective agencies should be enhanced. Codes of conduct by employers can also play a vital role in changing attitude of the people towards child labor.

3. Legislation and Enforcement

Without serious attempts to implement and enforce the existing laws on child labor and related issues, it is difficult to point out the exact amendments required. So, effective implementation and enforcement should take priority over new legislation and

amendments. Clear divisions of responsibility, a culture of accountability, an end to impunity, hassle free and efficient justice systems are fundamental pre-requisite for effective legal enforcement.

13.4 Other Supporting Actions

1. Awareness, Advocacy, Networking and Social Mobilization

Awareness, advocacy and sensitization should go hand-in-hand with other interventions. The ultimate weapon may be the development of greater awareness and revulsion of child labor among the general public, which we are beginning to see in several industrialized countries. The resultant publicity is leading to damage to the image of organizations marketing products produced by child labor, protests by their stockholders and, most important, refusal to purchase these products even though they may cost a bit less. This aspect is needed to put pressure on the brick industry for improved practices.

2. Further Research

Nepal lacks research on OSH issues and research is necessary in risk reduction and identifying vulnerabilities. Addressing components of livelihood, education, health etc together with OSH is imperative. Further research on socio-cultural components, the presence and effects of arsenic and lead as reported in Sarlahi, gender issues in other informal working industries of Nepal can give a representative picture for devising needed policies, strategies and plans in safeguarding worker health.

Finally, while it is entirely appropriate and healthy for children to work as part of normal development and family life, child labor as described in this article is a scourge that not only damages the health and well-being of the child workers but, in the long run, also impairs the social and economic security of communities and nations. It must be attacked with vigor and persistence until it is eradicated. There are many other informal sectors where child laborers are employed. It is imperative that such studies are conducted in those sectors too.

14. Bibliography

- AFOP, (2010), Heat Stress Farm worker Health and Safety- Training Guide and Work Book, Association of Farm worker Opportunity Program, Washington DC, USA.
- Chapagain, D.P, (2000) Contract Labor in Nepal, ILO Seminar/June.
- Chaudhary, S.S., Biswas, C., Roy, K., (2012), A Subjective and Objective Analysis of Pain in Female Brick Kiln Worker of West Bengal, International Journal of Occupational Safety and Health, Vol 2, No 2.
- Cohen, S., & Willis, T. A. (1985) Stress, social support and the buffering hypothesis. Psychological Bulletin, 98,310-357.
- Cox, T., (1985), The nature and measurement of stress, Ergonomics, Volume 28,pp 1155-1163.
- FAO-ILO, (2011), FAO-ILO Good Practice Guide for Addressing Child Labor in Fisheries and Aquaculture: Policy and Practice, FAO, Rome.
- GEFONT, (2007), Nepal Labor under the Chimney: A Study on the Brick Kilns of Nepal, Kathmandu, Nepal.
- ILO, (2011), Children in hazardous work- What we know- What we need to do, International Programme on the Elimination of Child Labor (IPEC), Geneva, Switzerland.
- Jones, J.R., Hodgson, J.T., Clegg, T.A., & Elliot R.C. (1998). Self-reported Work-related Illness in 1995: Results from a household survey. Sudbury: HSE Books.
- Joshi, S.K (2011) Occupational Safety and Health in Nepal, International Journal of Occupational Safety and Health, Vol 1, Issue 2.
- Joshi SK, Dahal P, (2008), Occupational Health in Small Scale and Household Industries in Nepal – A Situation Analysis. Kathmandu University Medical Journal (KUMJ). Apr-Jun; 6(2):152-607.
- Leka,S., and Jain, A., (2010), Health Impact of Psychosocial Hazards at Work: An Overview, World health Organization, Geneva, Switzerland.
- Li, J., & Jin, T.Y. (2007). Work stress and health - current research activities and implications in China. WHO Global Occupational Health Network (GOHNET) Newsletter, Special Issue, 25-28.

- Manoharan,P.K, Singh,B.K, and Jha, S.K., (2012), Ergonomics investigation using Psycho-physiological study for brick kilns' in Jharkhand, International Journal of Environmental Sciences, Volume 2, No 3, 2012.
- Neumann, W.P., Wells, R.P., Norman, R.W.K., Kerr, M.S., Shannon, H.S., Frank, J., (2000), Measuring Exposure to Low Back Pain Risk Factors in Occupational Settings using a Work and Posture Sampling Method. Proceeding of the IEA 2000/HFES 2000 Congress, San Diego, California USA.
- Pun, K. R., (2011), Occupational safety and health situation in industrial sector in Nepal. Retrieved from <http://www.scribd.com/doc/50002585>, assessed date 02/06/2013.
- Tabanelli, M.C., Depolo, M., Cooke, R.M.T., Sarchielli, G., Bonfiglioli, R., Mattioli, S., & Violante, F.S. (2008). Available instruments for measurement of psychosocial factors in the work environment. Journal International Archives of Occupational & Environmental Health, 82(1),1-12.
- Upadhyay, U. (2005), Occupational health, safety and environment in the construction sector. Issue of the world of work in Nepal. Kathmandu: General Federation of Nepalese Trade Unions.
- World Vision, (2007), Child Workers in Brick Factories: Causes and Consequences, A Research Study for Campaign of Combating the Worst Forms of Child Labor, Phnom Penh, Cambodia.

Annex A: Questionnaire

1. Occupational Health and Safety Assessment of Child Workers in the Brick Industry Survey, 2013-Nepal.

Namaskar, My name is.....I'm representing International Labor Organization(ILO) and World Education International, Nepal. ILO and WEI are now conducting study on Occupational Health Safety Assessment of Child Workers in the Brick Industry, 2013. The main objective of the survey is to determine the work-related health impacts including injuries and hurts on the child population of children in Brick industry of Nepal. This survey also compares health status and psychological functioning of working and non-working children. Your valuable information helps to identify status of children working in brick industries in Nepal. All personal information provided in this study will be kept confidential. The obtained information will be used only for analysis purposes. (will be explained in Nepali or local language)

Signature of Respondent

Signature of Enumerator

Name :

Name:

Date:

Date:

Signature of supervisor
entry Operator

Signature of Data

Name:

Name

Date:

Date:

Circle or fill the answer

Section I. Socio-demographic background information

Indicator	Question	Coding	Interviewer Instruction
District	Name of the Survey District	1. <i>Bhaktapur</i> 2. <i>Sarlahi</i>	
Age	Q 1 Do you know your age?	<i>Write in birth year</i>	Calculate birth year from the age cited.
	Q2 How do you know your age?	1= <i>documented (Birth Registration)</i> 2= <i>estimated</i> 3 = <i>by parents</i> 4= <i>unsure/not reliable</i>	Note source and reliability a. recorded birth, other document showing age b. estimated by event c. estimated by interviewer from further questioning of family
Sex	Q3 (none)	1 = <i>Female</i> 2 = <i>Male</i>	Observation only
Migrant status	Q4 Do you know where you were born?	1 = <i>Within district</i> 2 = <i>Outside district</i> 3 = <i>From India</i>	for 2 & 3 note which
	Q4.a. If outside, write name of the district		
	Q5 Do you always live here or do you move from time to time?	1 = <i>live here always</i> 2 = <i>move every season</i>	If move from time to time, ask Q6 a
	Q6 How many times have you moved in the last 2 years?	1 = <i>once</i> 2 = <i>twice</i> 3= <i>(exact number)</i>	
Ethnicity	Q7 What is your caste?		
	Classification of caste according to Government of Nepal	1= <i>Upper caste</i> 2= <i>Disadvantaged Non-Dalit Terai Caste</i> 3= <i>Socially disadvantages (Dalit)</i> 4= <i>Relatively disadvantages</i> 5= <i>Relatively advantages</i> 6= <i>Religious Minorities</i>	See Annex for Detail
Schooling	Q8 Do you go to school now for formal education?	1 = <i>yes</i> , 2 = <i>no</i> , 3 = <i>sometimes</i>	
	Q8a Do you go to school when you are not working in the brick kilns (e.g. the off-season)?	1 = <i>yes</i> , 2 = <i>no</i> 3 = <i>sometimes</i>	Purpose of these questions is not to get the precise schooling history but to know if these children are spending any substantial amount of time not working.
	Q9 how many years of school have you had up until now? <i>write in # of years</i>	
	Q9a can you read and write?	1 = <i>yes</i> 2 = <i>no</i>	This is a crosscheck on Q 9
Family	Q 10 who do you live with now?	1 = <i>parents</i> 2 = <i>other relative</i> 3 = <i>with friends</i> 4 = <i>alone</i> 5 = <i>other (write in)</i>	Do not assume that the child lives with her/his family. Purpose of this question is to identify the very vulnerable children who are living outside family care.

Indicator	Question	Coding	Interviewer Instruction
Other	Any other demographic questions?		
	Marital Status	1= Married , 2=Unmarried	
	Live with Parents at home?	1=Yes 2= No	
	If do not live with parents , why	1= Marriage 2=Deaths of parents(Father or Mother or both) 3= Long term sickness of father/mother 4= Debt 5= Parental conflicts 6= Scold by parents 7=Others (Specify.....)	


Section II. Work history

Indicator	Question	Coding	Interviewer Instruction
Work duration	Q1. Do you remember when you started working or helping out in the brick kilns?	1= Yes 2= No	Critical question. Be sure to get an accurate answer. If more than 2 years, interviewer should prompt using events. E.g. Was it before or after the time that X occurred?
	How long ago was that?	1 = <i>first year</i> 2 = <i>second year</i> 3 = ____ # of years (<i>precise</i>) 4 = ____ # of years (<i>approximate</i>)	
	Q2a. How many days do you work in the kiln per week?	1 = <i>every day/all seven days</i> 2 = <i>every day except Saturday or any other day</i> 3 = <i>Twice a week</i> 4 = <i>Thrice a week</i> 5 = <i>whenever required</i> 6 = <i>other (Specify.....)</i> .	
	based on question Q2a, Mention the hours per day	_____# hours worked per day	On the basis of the answer in 2a above, calculate the number of hours of work that the child works (do not ask the child the number of hours because it is difficult for a child to remember)
Other work	Q3. Are you doing any kind of work other than in the brick kilns right now?	1 = yes 2 = no <i>If no, go to Q4</i>	Prompt if "no": Explain that this can be for pay or not. It can be just "helping out".
	Q3a. What other kinds of work are you doing right now (along with brick kiln work)?	1= <i>only brick work</i> 2 = <i>agriculture (including livestock)</i> 3 = <i>housework</i> 4= <i>Labor work</i> 5= <i>Study</i> 6 = <i>other ____ (specify)</i>	Purpose of these questions is to see if other kinds of work may be contributing to the disease/injury profile other than brick kilns.
	Q3b. How long have you been doing that work?	1 = ≥ 2 years 2 = < 2 years	Optional
	Q3c. When you are doing that work, how long do you do it?	1 = <i>All day</i> 2 = <i>Half day</i> 3 = <i>short time (specify if possible)___</i>	Optional
	No question		On the basis of the answers in 2a

Indicator	Question	Coding	Interviewer Instruction
		_____ # hours worked per week	and 3a-c, calculate the TOTAL number of hours of work that the child works per week.
	Q4. Do you do any kinds of work in the off-season (when you are in your other place)?	1 = yes 2 = no	
	Q4a. Tell me what kinds of work you do in the off-season?	1 = brick work in another place 2 = agriculture (including livestock) 3 = housework 4 = Labor work 5 = Study 6 = other (specify.....)	
	Q4b. How long have you been doing that work?	1 = ≥ 2 years 2 = < 2 years	Optional
	Q4c. When you are doing that work, how long do you do it?	1 = All day 2 = Half day 3 = short time (specify hours if possible) _____	Optional
	Q5. Did you ever in your life do any other kinds of work before the brick kilns?	1 = yes 2 = no	
	Q5a. Tell me about all the other kinds of work you have done in your life	List each 1 = agriculture (including livestock) 2 = housework 3 = Labor work 4 = Study 5 = other (specify.....)	
Domestic service	Q6. During the past week, did you do any chores or tasks in your own household? (Multiple Answer)	1 = shopping for household 2 = repairing anything around the house 3 = cooking 4 = cleaning utensils/cleaning house 5 = washing clothes 6 = caring for younger children or caring for old/sick people 7 = fetching water 8 = fetching wood 9 = lighting the fire/stove 10 = Toilet/ Sewage cleaning 11 = other household tasks	Read each of the options and mark "yes" or "no" for all options.
	Q6a. In a normal day, about how many hours did you spend doing each of these tasks?hours	For each of the options above, mark the estimated hours.
	Q7. Since last year this time, have you ever done this kind of work for any other household?	1 = yes 2 = no	
	No question	Total number of hours _____	Calculate the total number of hours the child spends daily in all types of work.

Section III. Health history

This section seeks to identify health-related incidents in last 12 months either at work or outside.

Indicator	Question	Coding	Interviewer Instruction
Injuries	Q1. Since this time last year, have you experienced any of these injuries? (Multiple Answer)	1 = Cuts, bruises or open wounds 2 = broken bones 3 = Sprains, strains or dislocations 4 = Burns, scalds, frostbite	Read each of the options. Mark "YES" or "NO" for all options. Do not ask the respondent to attempt to attribute these to work.
	Q1a. What part of your body was injured? (Multiple Answer)	1 = leg or foot 2 = arm or hand 3 = head 4 = neck 5 = back 6 = eyes or ears 7 = abdomen 8 = shoulder 9 = hip	
	Q1b. Can you remember what you were doing when this happened?	1 = injury ___ Making bricks/stacking brick/transporting/others specify 2 = injury ___ Making bricks/stacking brick/transporting/others specify 3 = injury ___ Making bricks/stacking brick/transporting/others specify	As several injuries may have been listed, note what happened for each one.
	Q1c. Did this injury keep you from your normal activities (e.g. work, school, housekeeping) for at least 3 days?	1 = injury ___ days 2 = injury ___ days 3 = injury ___ days	As several injuries may have been listed, note what happened for each one. Purpose of this question: it is an indicator of serious injury.
	Q1d. What did you do to take care of this injury?	1 = did nothing 2 = self or family member did 1 st aid 3 = went to a local healer 4 = went to a clinic or hospital 5 = Brick kiln did 1 st aid/treatment 6 = Others (Specify.....)	
	Who did the treatment?	1= Self 2= Your parent 3= Brick kiln owner/contractor 4= Others (Specify.....)	
Illnesses	Q2. Since this time last year, have you had any of these illnesses or health problems?	1 = Breathing problems 2 = persistent cough 3 = Eye problems 4 = Skin problems 5 = Stomach problems / diarrhea 6 = Fever 7 = head ache 8 = Extreme fatigue 9 = feeling weak 10 = feeling bad all over	

Indicator	Question	Coding	Interviewer Instruction
		11=Others, Specify	
	Q1c. Did this sickness keep you from your normal activities (e.g. work, school, housekeeping) for at least 3 days?	1 = illness _____ days 2 = illness _____ days 3= illness _____ days	
	Q1d. What did you do to take care of this illness or pain?	1 = did nothing 2 = care by self or family member 3 = went to a local healer 4 = went to a clinic or hospital	
	Who did the treatment?	1=Self 2=Your parent 3=Brick kiln owner/contractor 4=Others (Specify.....)	
	Calculate total number of days missed		
Serious health incidents	Q2. I want to ask you particularly about your back. Since this time last year, have you noticed that your neck or back has been hurting you? If so, on this chart if red means very bad, yellow means not too bad, and green means not bad at all, how bad was your pain?	1 = very bad (Red Colour) 2 = medium (Yellow Colour) 3 = not bad (Green Colour)	Purpose of this question is to explore further the extent of musculo-skeletal pain that may, or may not have been mentioned earlier. If the child indicates that s/he has experience back problems, interject items from the Roland-Morris questionnaire in Annex 1.
	Q3. I want to ask you also about your breathing. Since this time last year, have you been having trouble breathing such that it is hard for you to run, or talk, or do your normal activities? If so, show me on this same scale, how bad it is	1= very bad (Red Colour) 2= medium (Yellow Colour) 3= not bad (Green Colour)	Purpose of this question is to explore further the extent of respiratory distress that may, or may not have been mentioned earlier.
	Q4. Beside Q2, Q3 was there any other illness or injury that was really bad?	1= Yes 2 =No	Note what the child says. Parent may assist. Prompt: Was there any other illness or injury that was really bad?
	Please specify the name of the injury (Q4). What was it?	1 = Cuts, bruises or open wounds (Specify.....) 2 = broken bones (Specify.....) 3 = Sprains, strains or dislocations (Specify.....) 4 = Burns, scalds, frostbite (Specify.....)	
	Q4a. Can you remember what were you doing when this happened?	1=at work, Specify Types of Job..... 2 = at home Specify Types of Job..... 3 = other Specify Types of Job.....	Parent may assist. If work-related, note the activity, tool, or other circumstance.
For Snowball	Q5 Do you know of any other children who have been hurt badly or become very sick at work?	1 = yes 2 = no	Obtain names and information on how to identify the child(ren)
		If yes, Name of the child Sex: Male/Female	

Indicator	Question	Coding	Interviewer Instruction
		Age :years	
Delicate questions	Q5a. Do you know of any child who has ever died because of an injury at work or getting sick at work?	1 = yes 2 = no If yes, Age..... yrs, Sex : Male/ Female Nature of the incident.....	Obtain names and information (age/sex/nature of the incident)
	Q6. Do you know of any young people here that use drugs or alcohol?	1 = yes 2 = no	To be handled with great care, using euphemisms and locally acceptable terminology. Purpose: to
	Do you know of any young people here that use tobacco products?	1= yes 2=No If yes , Smokeless/Smoking/Both If Smoking use filter Cigarettes / Non –Filter/Bidi	
	Q7. Do you know of any young person (under 18) who has been sexually/physically abused or had bad things done to them?	1 = yes 2 = no	
Leisure	Q8: how much free time do you have each day to do just what you want?	1 = <1 hour 2 = # ____ hours	
	Q8a: how much free time do you have every week to do just what you want? Mention the hours	1 = After work (.....hours) 2= Only on Friday/Saturday (.....hours) 3= Other times (.....hours)	
Fatigue	Q9. How many hours of sleep do you get every night?	1 = ____ hours	If estimating time is a problem, ask: how long after the sun goes down do you go to bed; do you get up before the sun rises?
	Q9a. Do you have a nap or rest during the day?	1 = yes 2 = no	

Section IV. Psycho-social functioning

Indicator	Question	Coding				Interviewer Instruction
						Explain to the child how to answer the questions. Show them the pictorial scale in Annex 2.
For working children only						
Self-esteem	1. I would like to ask you some questions about how you feel about your work. First, are you proud of your work?	1= Never	2= Some-times	3= Often	4= Always	
	2. Do you feel like you have the skills needed to do your job well?	1= Never	2= Some-times	3= Often	4= Always	
	3. Do you think others appreciate the work you do?	1= Never	2= Some-times	3= Often	4= Always	
	4. Do you feel that some people look down on this kind of work or on you because of the work	1= Never	2= Some-	3= Often	4= Always	

Indicator	Question	Coding				Interviewer Instruction
						Explain to the child how to answer the questions. Show them the pictorial scale in Annex 2.
	you do?		times			
	5. Do you feel that your family relies on you and needs your help	1= Never	2= Some-times	3= Often	4= Always	
Stress	1. Do you feel under pressure to work faster and harder?	1= Never	2= Some-times	3= Often	4= Always	
	2. Do you feel bored because there is not enough to do?	1= Never	2= Some-times	3= Often	4= Always	
	3. Does your family, employer or others ask too much of you?	1= Never	2= Some-times	3= Often	4= Always	
	4. Do you get bored at work doing the same thing for many hours in a row?	1= Never	2= Some-times	3= Often	4= Always	
	5. Do you feel tired because of the long working hours or heavy work load?	1= Never	2= Some-times	3= Often	4= Always	
Personal agency	1. Do you feel like your work is prevents you from doing things you would like to do?	1= Never	2= Some-times	3= Often	4= Always	
	2. Do you feel that, if you wanted to, you could choose what to do and what not to do?	1= Never	2= Some-times	3= Often	4= Always	
Relationships	1. Does the environment in which you are working bother you at all?	1= Never	2= Some-times	3= Often	4= Always	
	2. Are you comfortable with the people you work with?	1= Never	2= Some-times	3= Often	4= Always	
Supervision & Training	1. At work, do you feel that people watch over you to make sure you don't get hurt?	1= Never	2= Some-times	3= Often	4= Always	
	2. Do people at work teach you what to do and how to do it?	1= Never	2= Some-times	3= Often	4= Always	
For all children (working and non-working)		1=Not at all	2=A little	3=Quite a bit	4=A lot	
Emotional	1. Do you have lots of energy?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	2. Do you generally feel pretty confident?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	3. Do you have any difficulty sleeping?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	4. Do you have trouble concentrating?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	5. Do you feel restless and cannot stay still very long?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	6. Do you feel sad and like crying?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	7. Do you get into fights or quarrels easily?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	8. Do you feel lonely?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	9. Do you get very angry and often lose your temper?	1=Not at all	2=A little	3=Quite a bit	4=A lot	

Indicator	Question	Coding				Interviewer Instruction
						Explain to the child how to answer the questions. Show them the pictorial scale in Annex 2.
	10. Do you have little appetite or interest in food?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	11. Do you find that you forget things?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
Somatic	1. Do you feel tension in your body?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	2. Do you feel dizzy?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
Chronic fear & anxiety	1. Do you feel afraid or nervous?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	2. Do you worry and think a lot?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	3. Do you think back about all the bad things that have happened to you?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
Hopelessness & helplessness	1. Do you think your life will get better some day?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	2. Do you think your life is worse than that of other children?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	3. Do you think life isn't worth living?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
Social factors	1. Do you feel supported and loved by your family?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	2. Is there conflict in your family?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	3. Do you feel accepted by the other families around here?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	4. Do you have one or more good friends that support you?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	5. Do you people reject or tease you or call you names?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	6. Do you play games or sports with friends?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	7. Do you feel very different from other children your age?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
Abuse and maltreatment	1. Do you get scolded, or criticized or made to feel small or stupid?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	2. Do you get beaten at home or work?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	3. Has anyone at work tried to touch you in a bad way?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	4. Have you been severely punished for mistakes made at your work?	1=Not at all	2=A little	3=Quite a bit	4=A lot	
	5. In your day-to-day life do you feel safe?	1=Not at all	2=A little	3=Quite a bit	4=A lot	

Section V: Finance Related Question for Mother and Other Adult

if applicable (This section is best done by an adult member of the family)

Family Demographics					
Indicator	Question	Coding			Interviewer Instruction
Household composition	Q1. Could you please tell me how many people are living together here?	# _____			Fill in the number
	Q2. For each of these people, could you tell me their age and what they mainly do during the day while they are here?	Relationship (1=Head, 2= Husband/wife, 3=Son/Daughter, 4= Father/Mother, 5=Brother/Sister, 6= Nephew/Niece, 7=Father/Mother In law , 8=Son/Daughter in law, 9= Grand Child 10=Brother/Sister in law 11=Other Family Relative, 12= Servant /Servant Family Member 13= Other person not Related , 14= Tenant/ Tenant's Relative)	age	Main activity 1=Agriculture, 2=Service 3=Labor, 4= Business 5=Study, 6=Elderly/Retired 7=Housework , 8=Jobless 9=Other, (specify.....)	Fill in for each person in the household including non-family residents
Health care costs	Q3. Which ones of this household has had to seek medical care from a clinic or hospital since this time last year?	Relationship	Ailment	cost	For each medical visit, ask the purpose and the cost incurred including travel, medicines, etc.
	Q3a. Have you had to buy medicines or bandages or special food for a	1 = yes 2 = no			If it is possible to probe further, ask the respondent how much this cost

Family Demographics			
Indicator	Question	Coding	Interviewer Instruction
	sick person since this time last year?		
	Q3b. Did you have to borrow money for the medical care or medicines?	1 = yes 2 = no	If it is possible to probe further, ask the respondent how much they had to borrow
	How Much money did you borrow?	
	Q3c. Have you been able to pay off this debt yet?	1 = yes 2 = no	
Migrant status	Q4. Do you usually go away from here after the brick kiln season finishes?	1 = yes (location) _____ 2 = no, family does not move	

Section VI: Clinical Examination

Test/measurement		Respondents	Interviewer Instruction
Height		cms	
Weight		Kg	
Pulmonary function		1= Normal 2=Restrictive 3=Obstructive	
Musculo-skeletal deformity		1= Present 2= Absent	
Anaemia		1= Present 2= Absent	
Conjunctiva		1= Present 2= Absent	
Hearing Loss		1= Present 2= Absent	
Injury marks	Burns	1= Present 2= Absent	
	Cuts	1= Present 2= Absent	
	Fractures	1= Present 2= Absent	
Dermatitis/skin problems		1=yes 2=No	
Skin allergy		1=yes 2=No	

Section VI : NORDIC Ergonomic questions for MSD

Have you at any time during last 12 months had trouble (ache pain, discomfort in:			To be answered only by those who have had trouble			
			Have you at any during the last 12 months been prevented from doing your normal work (at home or in the brick kilns) because of the pain?		Have you had trouble at any time during the last 7 days?	
Neck	1 No	2 Yes	1 No	2 Yes	1 no	2 Yes
Shoulders	1 No	2 yes in right shoulder				
		3 yes in left shoulder				
		4 yes in both shoulders				
Elbows	1 No	2 yes in right elbow				
		3 yes in left elbow				
		4 yes in both elbow				
Wrists/hands	1 No	2 yes in right wrist/hand				
		3 yes in left wrist/hand				
		4 yes in both wrist/hand				
Upper back	1 No	2 Yes	1 No	2 Yes	1 no	2 Yes
Lower back	1 No	2 Yes	1 No	2 Yes	1 no	2 Yes
Hips/thighs	1 No	2 Yes	1 No	2 Yes	1 no	2 Yes
Knees	1 No	2 Yes	1 No	2 Yes	1 no	2 Yes
Ankles/feet	1 No	2 Yes	1 No	2 Yes	1 no	2 Yes

Pictograms to facilitate the interpretation of the response scales, especially for younger children.



2. Caste/Ethnicity Composition

Upper Caste	Disadvantaged Non-Dalit Terai Caste	Dalit	Relatively Disadvantaged Janajatis	Relatively advantaged Janajatis	Religious Minorities
a. Hill Group 1. Brahman 2. Chhetri 3. Thakuri 4. Sanyasi b. Terai Group 1. Brahman 2. Rajput 3. Kayastha 4. Baniya 6. Marwadi 7. Jain 8. Nurang 9. Bangali	1. Yadav 15. Rajbar 2. Teli 16. Kewat 3. Kalwar 17. Malla 4. Sudhi 18. Nuniya 5. Sonar 19. Kumhar 6. Lohar 20. Kahar 7. Koiri 21. Lodhar 8. Kurmi 22. Bing 9. Kanu 23. Banda 10. Haluwai 24. Bhediya 11. Hajaam 25. Mali 12. Thakur 26. Kamarm 13. Badhe 27. Dhunia 14. Bahae	a. Hill Dalit Group 1. Kami 2. Damai 3. Sarki 4. Ganine 5. Badi b. Terai Dalit Group 1. Chamar 2. Mushar 3. Dhusadh/Paswan 4. Tatma 5. Khatway 6. Bantar 7. Dom 8. Chidimar 9. Dhobi 10. Halkhor	a. Mountain 1. Sherpa 2. Bhote 3. Walung 4. Byansi 5. Hyolomu 6. Baramu 7. Pahari 8. Yakkah 9. Lepcha 10. Hayu Terai 1. Tharu 2. Dhanuk 3. Rajbansi 4. Tajpuriya 5. Gangai 6. Dhimal 7. Meche 8. Kisan 9. Munda 10. Santhal/Satar 11. Dhangad/Jhagad 12. Koche	b. Hill 1. Magar 2. Tamang 3. Rai 4. Limbu 5. Gharti/Bhujel 6. Kumal 7. Sunwar 8. Chhantal 9. Jirel 10. Darai 11. Dura 12. Majhi 13. Danuwar, 14. Thami 15. Chepang 16. Bote 17. Raji 18. Raute 19. Kusunda	1. Newar 2. Gurung 3. Thakali 1. Muslim 2. Churaute

Source : Ministry of Health and Population (MoHP) [Nepal] 2012, Nepal Adolescents and Youth Survey 2010/11. Kathmandu, Nepal: Ministry of Health and Population.

Annex B: Workplace Environmental Monitoring

Air quality measurement in the plant was done at different points of operation and locations to obtain the status of quality of air in the work area and also for the purpose of identifying its exposure to concerned workers. For the measurement of dust parameters such as RSPM – PM 2.5, TSPM – PM 10, dust was collected in the cyclone cassette using personal sampler (low volume) for required period of time and then collected sample was analyzed to get the result of each parameter.

SN	RSPM mg/Nm ³	NRSPM mg/Nm ³	Total Dust (SPM)mg/Nm ³	Area
1	0.816107383	2.312304251	3.128411633	Brick Molding
2	0.677852349	1.220134228	1.897986577	Kneading clay
3	0.274720358	0.686800895	0.961521253	Firing
4	1.496196868	1.224161074	2.720357942	Coal feeding
5	0.545861298	1.091722595	1.637583893	Rubbish feeding

Exposure Duration and Allowable for Ambient Air Quality (ACGIH)

Parameter	Permissible level of Exposure
Particulate Matter PM ₁₀	TWA - 10 mg/m ³
Particulate Matter PM _{2.5}	TWA - 5 mg/m ³

Heat stress Monitoring in different working Area

SN	Area	DBT	WBT	GT	WBGT value 0c	Sampling Time	Types of work
1.	Coal feeding	34 0c	15 0c	36.6 0c	21.22	12:00	
2.	Brick Molding	31 0c	15 0c	30.5 0c	19.7	12:15	Moderate
3.	Kneading clay	29.5 0c	15 0c	31.1 0c	19.67	12:30	Moderate
4.	Dug	33 0c	20 0c	36.1 0c	24.52	11:15	Moderate
5.	Coal feeding	33 0c	20 0c	36 0c	24.5	11:00	Moderate

Permissible heat exposure threshold limit values

Work/ rest regimen	Work load		
	Light	Moderate	Heavy
Continuous work	30 0C(86 0F)	26.70C(80 0F)	25.00C(77 0F)
75% work, 25% rest each hour	30.60C(87 0F)	28.00C(82 0F)	25.90C(78 0F)
50% work, 50% rest each hour	31.40C(89 0F)	29.40C(85 0F)	27.90C(82 0F)
25% work, 75% rest each hour	32.20C(90 0F)	31.10C(88 0F)	30.00C(86 0F)

Values are in °C and °F, WBGT, Source: American Conference of Governmental Industrial hygienist (ACGIH-9292). Its state that workers should not be permitted to work when their deep body temperature exceeds 38 °C (100.4 °F)

Noise level Measurement

S. N.	Area	Noise Level in dB (A)					Allowable Sound Level (ACGIH guidelines)
		East	West	North	South	Average	
	Coal feeding	64	65	63	61	63.25	85 dB(A) for 8 hour, Assumed exchange rate of 3 dB(A)
	Brick molding	68	70	69	67	68.5	
	Kneading clay	70	64	58	62	63.5	
	Dug	56	60	62	63	60.25	
	Coal feeding	64	63	65	62	63.5	

Annex C: Photos

Study Team in Bhaktapur

Study Team in Sarlahi

Personal Sampler to monitor dust inhaled

BMI Measuring

Monitoring Hemoglobin using Haemocue 201

Lungs function analysis

Audiometric Test

Psychosocial Interview

Interview of the child workers

Young girls waiting for interview

Detail physical examination of the child worker
the child worker

Distribution of medicines to

Anthropometry examination of the control children
children

Interview of the control

COPD – 6 Vitalograph
Vitalograph

Child worker using COPD – 6

Audiometer

Audiometric test of a child worker

Noise Meter

Heat Stress Meter

Annex D: Case Examples

A Journal of a Child Worker

Sarswati Danuwar, 15 from Kavrepalanchowk dropped out of school while at grade 6 to help her family earn two sets of meal. Sarswati has been accompanying her father for the second time to a brick kiln in Bhaktapur leaving behind her mother and a younger sister at home. She wakes up every day at 2 AM in the morning to mold the bricks, in the absence of electricity she works under flashlights until the day breaks. Her saga of making bricks continues until 11 AM in the morning. She quickly transforms herself as a cook and prepares lunch for her and her father. She takes a brief nap, manages to do the dishes and revitalizes herself until 1 PM to start her work again. During the day she stacks the molded bricks until the last ray of sun appears from the sinking sun behind the hill. At 7 PM she manages to start cooking her final set of meal for the day, by 9 PM she manages to snuggle inside her temporary bed after doing the dishes. Her new home not bigger than 40 square feet shares a kitchen and two floor beds beside belongings. This has been a routine for Sarswati for the past 4 months. It will come to an end as the season for brick making ends with the onset of monsoon but Sarswati seems to be determined to come again the next season so that she could contribute to her poor family and earn education of her younger sibling.

Tilak will not enter again to the World of Kiln

Tilak Pun, 16 hailing from Rolpa ferries brick in the kiln of Bhaktapur. Tilak previously used to work as a helper in the transportation industry. With few peer pressure and the debt taken from the labor contractor Tilak comes to Bhaktapur to have a bitter experience of carrying heavy loads all day. He feels that his previous work was easier and provided much freedom than current work. Tilak feels that the world of kiln is like a bondage with very little to offer and much to exploit. He claims to be suffering from severe pain in his legs due to the heavy loads he carries every day. Tilak has taken a vow for not coming to the brick world ever again in his life.

This brick world is not for my kids

Abhiman Pariyar, from Kavrepalanchowk lives with his family in the brick kiln of Bhaktapur. His eldest daughter is 9 and his younger son is 4 years old. He laments of living a life of gypsy and not able to provide a secure future to his children due to poverty. The Also a manual labor back home, Abhiman has come to Bhaktapur to work in the Kiln for three years in row now. He fears that his children seeing their parents working might be enticed to start working in the kilns offering petty help. But Abhiman is determined not to let his kid help or work in the kiln as he feels that kiln offers very less to what they contribute in terms of their time and energy.

Abhiman explains that issues of sanitation, palatable drinking water and health are some of the neglected issues in the kilns and workers have been living, earning and paying for medical expenses and often at the time of returning had to take money as debt from owner as the earnings has to be spent on health care and food. 'The vicious cycle of debt bondage entraps the labors' says Abhiman and I have to think of alternatives for my kid as this is not a secure heaven for them.

The Story of Naik

Bhim Bahadur Rana has been supplying labors since 8 years from Rolpa to the brick kilns of Bhaktapur. He says that the brick kiln owners have strictly prescribed him not to bring minors in the kiln as the labors. But he admits that the minors accompanying the parents sooner or later start helping their parents working in the kiln. Rana holds 23 Ropanis of land in Rolpa where he is a seasonal farmer producing off seasonal vegetables. He adds that it is usually the poorest of the poor who often takes debts to start off as the kiln labors, the well to do usually go for foreign employment rather than coming to the brick industry. When inquired upon the loan defaulters Rana shares that the social pressure often bars individuals to elope with the money and there are only few cases where he has lost money with a potential labors. Rana admits that the conditions of working in the kiln are not well enough and especially the absence of health facilities and poor living conditions increases vulnerabilities for workers.

The owner's version

Aash Kumar Koju has been operating brick kiln since more than two decades in Bhaktapur. He agrees that the living conditions and health facilities provided at the kiln are not optimum. He pointed out issues of sanitation, water and hygiene requires changes for the benefit of workers. In his kiln he has one make shift temporary toilet for all the workers which he himself feels ashamed of. The water scarcity as responded by the workers for personal consumption was agreed to be taken care of by Koju in the FGD by next year. Koju informed about operating periodic health camps in his kiln for the workers while the workers who are always vulnerable with the work and living conditions has mostly to rely on nearby pharmacy and health center for their medical needs. Although the kiln management were found to be dispensing minor medicine without any consultation with medical personnel but the workers needs have not been catered to the fullest.

Jagat Narayan Yadav, a kiln owner in Sarlahi feels that the idea of demand and supply exists everywhere, he questions, 'Why should I be investing in constructing toilets and provide other benefits when the workers have never demanded for it?' Yadav is well aware that the informal labors in the kiln are not empowered to voice their concern.

Another Child Worker in the Making

Ranju Yonjan is 12 and presently a school going child. Her parents including her elder sister (age 13) and brother (age 16) are kiln workers. At her tender age during the brick season, she helps the family with cooking and other household chores before coming to the school. The family works shoveling and carrying sand in the nearby sand-mine during brick off season. The family has taken a debt of Rs 50,000 this year from the kiln owner which was largely spent on buying a television set, a cooking gas stove and two beds for the family. Ranju is determined that the next season would be her warm welcome to the world of brick with her tiny hands molding the bricks. The push factor of poverty and needs coupled with debt forces child like Ranju to join as an active force in the kilns. Despite of labeling herself as an active child labor from the coming season, Ranju is determined to continue her education and find some changes in her future life.

Annex E: Ethnicity of the respondents

Caste for cases	District		Total
	Bhaktapur	Sarlahi	
Ansari	0	7	7
Bhandari	2	0	2
Bhattarai	1	0	1
Bista	1	0	1
BK	11	0	11
Budha	1	0	1
Chaudhary	0	33	33
Danuwar	9	0	9
Das	0	12	12
Gharti	5	0	5
Giri	3	0	3
Gole	5	0	5
Joshi	1	0	1
Kami	1	0	1
KC	5	0	5
Khatun	0	23	23
Kumar	1	3	4
Kuwar	0	2	2
Lama	3	0	3
Magar	3	0	3
Majhi	3	3	6
Manandhar	1	0	1
Mansur	0	7	7
Mohammad	0	1	1
Moktan	3	0	3
Nagarkoti	1	0	1
Nepali	7	0	7
Newar	1	0	1
Oli	4	0	4
Pariyar	2	0	2
Pun	3	0	3
Rana	7	0	7
Sah	0	3	3
Shekh	0	2	2
Suwal	1	0	1
Tamang	11	0	11
Thakuri	1	0	1
Thapa	2	0	2
Yadav	0	1	1
Total	99	97	196

Ethnicity of Control

Ethnicity for control	District		Total
	Bhaktapur	Sarlahi	
Baraily	0	1	1
Bhujel	2	0	2
BK	1	0	1
Budathoki	2	0	2
Budha	1	0	1
Chaudhary	2	18	20
Dahal	1	0	1
Gelal	1	0	1
Gharti	0	1	1
Giri	1	0	1
Gosai	0	1	1
Guragain	1	0	1
Hanju	2	0	2
Khadka	3	0	3
Kuchumani	1	0	1
Lakhe	1	0	1
Lama	6	0	6
Mansur	0	2	1
Magar	4	0	5
Mahato	0	2	2
Majhi	3	1	4
Nepali	1	0	1
Pandey	1	0	1
Pandeya	0	1	1
Pandit	1	2	3
Panta	2	0	2
Pulami	1	0	1
Rajchal	1	0	1
Sah	0	5	5
Shrestha	4	0	4
Sunwar	1	0	1
Suwal	1	0	1
Tamang	10	0	10
Thakuri	1	0	1
Tharu	0	7	7
Thuya	4	0	4
Waiba	3	0	3
Yadav	0	2	2
Yonjan	1	0	1
Total	64	43	107