



International
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Organization

A health approach to child labour

Synthesis report of four country studies on child labour in the brick industry



International
Programme on
the Elimination
of Child Labour
(IPEC)

Fundamental Principles and Rights at Work Branch (FUNDAMENTALS)

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April 2014

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Forward

How do you decide whether a particular kind of work is too hazardous for a 17 year old person to do? *How do you convince a parent, although he sees no particular danger in it, that the damage is invisible* and the work his child is doing will harm her many years from now? And how do you explain, when everyone did this kind of thing when they were young, that their children should not do it now?

At least 3 million children are involved in the brick industry which supplies the main building material for many of the world's megacities. Not only in Asia, but in dozens of countries throughout the world children make fired bricks, sun-baked bricks, or brick-type tiles.

The children are mainly just "helping out" their families. But for the families, most of whom come from some of the poorest and most disadvantaged groups on the planet (migrants, social outcasts, religious minorities), the extra hands, though small, measurably increase the efficiency and productivity of their parents. Aware of this economic imperative and given that it is the parents' "choice", employers and policy-makers have tended not to interfere with a system that functions. They see little scope for change when it is an industry where the profit margins are minimal and people need the work.

The brick industry is not special; it is like many others where children comprise a significant portion of the labour force. It was selected for this series of studies in Afghanistan, Bangladesh, Nepal and Pakistan simply as an example of child labour in what appears, from the outside, to be work "that, by its nature or conditions, is likely to harm or jeopardise their health, safety or morals." The aim of these studies is not to find out whether in fact this work is hazardous; the purpose is rather to go a step further:

- 1) to know the *nature* and *severity* of the hazard so as to more effectively argue for more attention by policy-makers and better choices by families.
- 2) to demonstrate to a wider public that health is an essential area of inquiry and action in child labour work, and
- 3) to test methods of inquiry that (a) are inexpensive, (b) can be undertaken by non-professionals, and (c) can generate the kind of information that is needed for guiding practical, low-cost, interventions.

In presenting this synthesis report, *A Health Approach to Child Labour: Example from the brick industry*, and its accompanying four country studies, ILO hopes to stimulate further work on this important area and a further refinement of the research methods it incorporates. The country studies were carried out under the direction of Susan Gunn, MPH, PhD. and build upon two earlier volumes, also prepared by her, *Hazardous Child Labour: What We Know. What we need to do* (2011) and *Looking for Answers: Researching hazardous work of children* (2013).

The results contained in these studies document child work in the brick industry in terms of the physical, psychological and environmental risks the children face, and the health impacts they incur. The studies provide quantitative evidence that working children at all ages, and both girls and boys, suffer substantially more injuries, higher levels of respiratory impairment, and more musculoskeletal disorders than their peers who do not do such work. They also show that it is not only the tasks the children do, but the conditions they work and live in which compound the effects of work and which appear to increase the prevalence of acute and chronic diseases. It is very noteworthy that social factors seem to mediate the extent to which children suffer or benefit psychologically from the work experience.

From a larger perspective, the results of the studies underline the importance of looking at occupational risks from the perspective of children's unique and greater vulnerabilities. We feel that these data can provide a more persuasive argument for elimination of child labour, as well as the importance of assessing the potential and feasibility of reducing risks so that youth of legal working age and adults can work more safely. And, specifically with regard to child labour in the brick industry, we strongly urge that those with the capacity to do so take note of the results and join ILO in taking action to protect brick children from further harm.

Corinne Vargha, Chief,
Fundamental Principles and Rights at Work Branch
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Executive summary

For well over a century, the international community has been making efforts to address child labour through legal, educational, and economic means. That these efforts have had an effect is attested to by the steady decrease in numbers of children defined as child labour from 245.5 million in 2002 to 167.25 million in 2012. Even more telling is the increase in countries' willingness to admit the existence of child labour within their borders from almost none in the early 1970s when the first comprehensive ILO Convention was adopted on the subject to, at present, almost all countries acknowledging the fact and taking steps toward resolving the problem.

International law divides work by children into three categories: a) small chores and light work which are permissible under certain conditions, b) regular work which is generally allowed after completion of basic schooling at age 14 or 15 years, and c) hazardous work which children (i.e. persons under 18 years) should not be allowed to do at all. Since society recognizes the latter category – work which jeopardizes a child's life, health or development – to be essentially “wrong” one would think that it would be the easiest to eradicate, but in fact it has proven quite difficult.

Choosing the brick industry to represent occupations which have been labeled as “hazardous”, four countries undertook simultaneous cross-sectional studies of the health of children and youth who have been working in their brick factories. Afghanistan studied two sites (total of 399 working children, 552 control children); Bangladesh studied an urban and a rural site (total of 70 working children, 50 working youth, 40 controls); Nepal studied clusters of kilns in two different ecological zones (total of 198 working children, 197 controls); and Pakistan sampled five sites in three different provinces (total of 249 working children, 89 controls, and 124 working youth), yielding a total for all four countries of 1,556 child respondents.

Although operating under tight time schedules and challenging conditions, these four countries have nonetheless been able to produce some of the first systematic field-based research studies ever to have been done on the psychological/physical health of child workers. While there are significant confounding factors that need to be taken into account when interpreting the data, not least of which was the difficulty in establishing adequately matched controls, a number of areas show a clear and statistically significant association between brick kiln work and physical or psychological disability.

Looking at the pooled results from the four countries, it is clear that children working in the brick kilns have higher rates of physical injury and illness than their peers who are either not working or doing tasks which incur little risk. This holds for all age groups and both girls and boys.

- a) **Musculoskeletal pain** from hauling, pushing, and pulling heavy loads of bricks, soil, water, and fuel for the kilns is significant and consistent across all four countries. The

brick kiln children report pain in their arms or hands 3 times more often than do their peers and at a more severe level. As children's skeletal structure is developing throughout adolescence, damage at an early age can incur lifetime disability.

- b) **Wounds**, such as cuts and bruises, are also high. Brick kiln children, especially younger ones, experience over twice as many injuries (65.1%) than did controls (29.5%). With virtually no local first aid facilities, injuries are usually treated by the child or the child's relatives and risk of infection is high. A surprisingly high percentage of brick kiln children (48.8%) experienced a serious injury, such as a broken bone, in the year prior to the study (compared to 30.5% of controls).
- c) **Respiratory illness**, as evidenced by both self reports and clinical tests, shows that the pervasive smoke and dust of the brick yards, plus the constituent chemicals of this smoke and dust, is indeed affecting the children's health and evidences a cumulative effect as the number of years worked increase. While nearby communities are also at risk, the results show that the rate of damage is higher and more severe than for the controls from the surrounding area. 54.7% of children working in the brick yards report some degree of breathing problems.
- d) **Psychological functioning and development**. The brick kiln study finds that children who work are seven times more likely to feel mistreated than children who do not do this work and they have six times higher risk of feeling insecure. On almost all indices of psychological functioning and development, brick kiln children display a greater amount of psychosocial strain and face disproportionately more psychosocial hazards than the control groups. Yet there also appear to be protective factors or learned coping skills which serve to reduce their vulnerability to some extent:
 - **Intellectual development**. Generations of brick working children do work that offers them little intellectual and social stimulation (many report being bored by the dull, repetitive work) and few chances for formal or informal education. Consequently, they are left ill-equipped to break out of brick kiln work as adults or to meet the challenges and opportunities of their societies which are now in a rapid state of development. In these studies, working children scored low on cognitive ability and skills. Sixty per cent of the brick kiln children were not attending school at the time of the study, a statistically significant difference from controls at (<.01) level. In terms of practical education, brick kilns offer few skilled jobs, and the children confirm that they receive little to no training.
 - **Personal agency**. Brick children typically began working before they were 8 years old. By mid-adolescence they had already spent a few years in this work. A majority of the brick children felt that they have little control over their lives and the scores show that they were stoically resigned to their current life trajectories. On the scale that measured personal agency of respondents (Range = 1 – 3), brick children (Mean = 1.24) scored significantly lower than the controls (Mean = 1.58).
 - **Stress**. Brick children on average reported moderate to high levels of stress (mean = 1.65, 75th percentile = 2) on a composite measurement scale ranging from 1 to 3. Statistical comparisons showed that brick kiln children manifested significantly more emotional, behavioral and somatic symptoms of stress than the

controls (99% confidence interval). A psychologically and physically hazardous work environment puts brick kiln children at high risk of getting injured or traumatized. Inability to cope with day to day work-related stress can drive children to adopt anti-social or drug-seeking behavior.

- **Abuse and maltreatment.** Another psychosocial stressor in the brick children's work environment is the incidence of abuse and maltreatment by supervisors and co-workers. On a composite scale of abuse and maltreatment (range 1 to 3), brick work children (Mean = 1.45, SD = 0.32) scored significantly higher (99% confidence interval) than the controls (Mean = 1.25, SD = 0.24). Verbal and physical abuse further exacerbates work-related stress and can have a cumulative negative effect on brick kiln children's psychological and psychosocial development.
- **Social Integration.** Social support can contribute to children's resilience and can help them to cope with negative factors in the environment. However, social integration of child workers both within and outside the brick kiln community is strikingly poor. On a composite scale ranging from 1 to 3, children working in brick kilns (Mean = 1.35, SD = 0.32) scored significantly lower (99% confidence interval) on the social integration scale compared to the controls (Mean = 1.62, S.D. = 0.35). At the same time, 51.8 % brick working children expressed discomfort with people that they worked with at the brick kilns. Social maladjustment could increase the brick children's vulnerability to physical and psychosocial hazards in their work environment.
- **Depression and anxiety.** Surprisingly, in spite of working in a stressful, and at times abusive environment that offers little or no opportunity for personal development, brick children did not appear to be unduly anxious or depressed. On a composite scale ranging from 1 to 3, brick kiln workers experienced only a marginally greater degree of fear and anxiety (Mean = 1.28) compared to controls (Mean = 1.19). Conversely, controls on average experienced a significantly (99 % confidence interval) higher degree of hopelessness and helplessness (Mean = 2.08, SD = 0.41) than the children working in the brick kilns (Mean = 1.65, SD = 0.35). This indicates that there are internal or external protective factors that moderate the negative influence of work-related stressors in the brick kiln children's environment.
- **Family support.** It appears that it is the family that provides the critical positive social support in the brick children's milieu (88.9 % of the brick working children felt that their family often or always loved and supported them compared to 71.8% of controls).
- **Coping behaviours.** A second factor which may be buffering brick kiln children against depression and anxiety is the fact that they have been exposed to a hazardous and stressful work environment at an early age which contributes to them being more self-reliant and psychologically resilient than the non-working children. As a result, despite the multitude of adversities that they face day to

day, brick children displayed a stronger sense of well being (Mean = 1.34; Range = 1 - 3) than the controls (Mean = 1.24).

The data also throw light on some of the social, cultural and environmental factors which may be contributing to these outcomes. For example, the proportion of brick kiln workers that are migrants -- an indicator of instability and one likely reason for the low rate of schooling -- is statistically significant for three of the countries. Similarly, the high proportion of religious or social minorities among the brick workers in Nepal and Afghanistan attest to the social vulnerability of this population.

It has been known for some time that many in the brick industry are bonded labourers (people who are unable to leave the brick kilns due to debts incurred) in both Pakistan and Afghanistan. This was confirmed, for example by the 83.3% of the child worker respondents in Afghanistan who said that they were forced to work because their parents owed money to someone else. What was not known previously was that there are some children who gravitate to the brick kilns to work, either alone or with someone other than their parents. In the Bangladesh brick kilns, a statistically significant number of children are living and working outside the protection of their families.

Girls and boys do basically the same work and the same amount of work when they are young, but the situation changes near adolescence with girls taking on additional household responsibilities and the boys doing heavier work. These differences are reflected in the number of hours of work that girls work, but also in health outcomes, such as the increase in burns and similar injuries that are more likely to occur in the home. After adolescence, the proportion of girls to boys in brick work ranges from virtually none in Afghanistan to almost equal in Nepal.

Following is a brief summary of some of the more compelling findings from each of the study countries.

Afghanistan

Education: Only 13.2% of child brick kiln workers are currently going to school compared with 68% of the control group. Most of the children working in brick kilns say they did not go to school because they *had to* work to raise money (82.1%) or that they *wanted to* raise money for their family (51.7%).

Violence: Exposure to violence was very frequent. A cumulative index, constructed from the answers to questions on existence of conflict in the family, getting scolded, criticized or made feel small or stupid, getting beaten at home, and severely punished at work, showed that almost half of the children working in kilns, compared with one fourth of the children in the control group experienced violence daily or most of the time.

Working conditions: Most children worked six days a week with a mean of 11 hours a day and had done so for many years. The amount and pace of work left them feeling tired -- 58.2 % were fatigued “always” or “often” -- and many felt under stress, such as under pressure to work faster and faster (51.2%).

Sense of control: A high percentage felt powerless, for example in being able to choose what to do at work (only 10.3% felt they had some choice of tasks) or to stop working in the brick kilns altogether (only 18.3% felt they would be able to do something else). These results show that the children were growing up subject to many demands, but with little control.

Self-confidence: The profile of the Afghan brick children in terms of self-confidence was diametrically opposite to that of the control group. Over two-thirds of the brick workers (69.1%) had a low sense of self-confidence, whereas over two-thirds (68.1%) of the controls felt confident “quite a bit” or “a lot.” This was significant at ($p < 0.001$).

Bangladesh

Fatigue: Over 75% of the brick kiln children report that they are “often” or “sometimes” exhausted, which is not surprising in that most are working in the brick factories for 8-10 hours a day, seven days a week (57%). Many, however, work more than this: 35.7% work more than 10 hours a day in the brick kilns. Those who work fewer hours in the kilns often have a second job or spend more time doing housework. Control group children also help around the house, but for 85 per cent of them, this work amounts to less than 30 hours per week, whereas it is the reverse with the brick kiln children where for 96.6 per cent of the sample, the total of brick kiln plus household work amounts to more than 40 hours per week. An alarming number of these (12.6%) are working more than 100 hours per week.

Injuries: Within the last month, 74% of the brick kiln children suffered a minor injury, such as a cut or bruise, compared to 42.5% of the controls; within the last year, 85.7% of the working children suffered a more serious injury requiring medical care or time off work. Most of these occurred in the brick kilns and involved carrying bricks or fuel.

Focal health problems: Musculoskeletal pain was significantly higher among the brick kiln workers (48.6%) than among the controls (15%) and the pain was comparatively more severe. Respiratory problems were also higher, with 34.3% reporting coughing and trouble in breathing, compared with 22.5% of the controls. The difference was not only corroborated by but even more pronounced in the spirometric results which showed 22.9% of the working children having either restrictive or obstructive pulmonary function compared with 5.4% of the controls.

Psychological health: The Bangladeshi child workers recognized that their families relied on them (68% thought so “often” or “always”), but relatively few felt proud of their work, confident in their skills, or appreciated by others. The majority felt under pressure to work faster, yet bored with the repetitive work either “sometimes” or “often”. The psychological tests bear out the observation that the children suffer substantial and persistent abuse from supervisors and co-workers, and that they are not trained or “looked after”. The leisure and play, necessary for children’s proper psychological development, is generally lacking.

Nepal

Children working in the Nepali brick kilns 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 deficiencies. 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.

Working conditions: Virtually all (95.8%) of the brick kiln children in one site worked seven days a week and in the other, where Saturday is usually a day off, almost a third still worked the whole week. They also sometimes worked at night which incurs a wide variety of additional risks. The children worked for seven hours at the brick kilns, but afterwards, the majority shifted to other types of work – mainly household work and some agriculture-related tasks -- for an additional 3 hours, making a total workday of 10 hours. The study showed evidence also of cumulative effects in that 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.

Injuries: Almost half of the working children reported they had had an injury of some kind within the last month, and in the last year, over 40% had experienced at least one serious injury.

Musculoskeletal disorders: All the child worker respondents in one site and 70% in the other suffered from neck or back pain. This is not surprising in that some male children were carrying loads of greater than their own body weight. For the working children, the pain was severe (20.2%) or at least moderate (30.9%) while those controls who had some neck or back pain tended to describe it as mild. Almost none of the controls were experiencing pain at present, whereas roughly 40% of the child workers in both districts were currently suffering pain.

Respiratory disorders: The study confirmed the risk of respiratory disorders in brick kiln workers finding a high proportion of the young workers (42.71%) had obstructed or restricted lungs, compared with 9.3% for the controls at one site. The higher levels of respiratory disorder among controls at the other site appear to be linked with general environmental pollution from the kilns which affects the surrounding villages.

Stunting: Almost a quarter (24.6%) of the working children were underweight compared with only 8.3% of their controls.

Emotional functioning: The psychological measures for hopelessness and helplessness were positively associated with working status (OR>1, P<0.05) (AOR>1, p<0.05), which means that working children were more likely to be emotionally fragile than non-working children.

Pakistan

Education: Over 60% of the working child respondents in Pakistan brick kilns have never attended school. More than 50% had started working at the brick kilns between the ages of 8 and 10. In one site, the majority had started working before they had reached the age of 8.

Fatigue: Among the working children, 95% complained of exhaustion during the last month.

Injuries and illnesses: In the last month, 87 % of the working children had experienced a minor injury. The difference between working children and controls was statistically significant.

The rates of ill health varied according to the site with those in eastern Pakistan experiencing the highest rates of injury, more than 50% reporting breathing problems, and 70% reporting headaches and fever in the last year. Within the last month, 95% of the child workers from these provinces reported some degree of musculoskeletal pain (as compared to 60% in the western sites).

With the exception of abuse and maltreatment, workers were found to be more vulnerable than controls on all psychosocial measures.

Implications for Action

In general, the picture that emerges from all four countries is that while the child workers themselves and their families have an immediate gain from the work, their long term prospects are in jeopardy. Injury, illnesses due to exposure to toxic substances and harsh environmental conditions, and impaired social and intellectual development due to isolation, monotonous work and lack of schooling all take their toll on the future wellbeing and productivity of the brick kiln children.

The risks and health outcomes that have been documented in this set of four linked studies demonstrate that certain of the tasks children do and the context in which they do these tasks are hazardous, and that certain aspects of the social and physical living environment compound the risk. But these data also indicate that there are factors which are neutral or even operating in a protective fashion. This underscores the point that we must avoid making black/white judgments that all of “occupation X” is hazardous for all ages, genders, and conditions. Therefore one of the main conclusions to be drawn from these studies is that it gives clues as to how to differentiate the specific tasks and contextual factors which are negative and those which are positively associated with health.

Knowing this, two courses of action present themselves. First, those directly involved (parents, kiln owners, adult workers) could decide to take the steps necessary to reduce or manage certain of these risks to a sufficient degree that children above legal working age (normally 14 or 15) can participate. Second, those responsible for the welfare of their citizens (policy-makers, government officials, labour inspectors) can decide to extend labour laws to cover informal enterprises and commit to oversight of the brick manufacturing establishments for compliance with these laws.

Neither of these options is easy to implement but both are feasible. While the sheer scale of the problem makes the situation appear hopeless (hundreds of thousands of children affected, for the most part the poorest of the poor), a number of factors are now in place that could support real change. These run the gamut from new or intermediate technologies to personal behavior change. But motivation is the factor that determines whether and to what degree change will take place. Increasingly, those who construct new buildings and those who will live in them are motivated to select goods that are produced

without the taint of child labour. This study has documented that ***every child who is working in the brick kilns is experiencing pain***. While previously, the purchaser might accept the argument that poor children might need to work to help put food on the table, studies such as this can help them to see that there is no excuse for children doing hazardous work.

The economic cost to society and to the families concerned in terms of shortened lives, reduced productivity, medical debts, unstable youth, and lost potential is just too high.

1. Introduction

This study was undertaken to show how attention to the health implications of child labour may help to address some of the practical and policy obstacles that impede withdrawal of children from hazardous work. Of the current estimate of 167.2 million child labourers, there are 85 million children doing what is defined by the International Labour Organization (ILO) as ‘hazardous work’, i.e. engaged in types and conditions of work that pose a substantial threat to their health and proper development.¹

The brick industry was selected for this study because it is an occupation in which hundreds of thousands of children in Asia, the Middle East, and South America are working. The industry is known to have risks – atmospheric pollution, heat exposure, heavy loads – but it is not clear to either parents or policy-makers that children are unduly exposed to these risks, or that the effects are serious, or that the risks are not at least negligible in comparison with malnutrition and other challenges the families face.

ILO Conventions No. 138 and 182, which have been ratified by virtually all countries where brick kiln work is undertaken, hold that while countries may set the age for entry into employment at 15 or even 14 in certain cases, no person under the age of 18 should be allowed to do hazardous work. This is clear, but in the case of brick kiln work there are both policy and practical challenges to achieving this goal.

The policy challenge for the countries concerned is that they must determine if brick-making is a “hazardous occupation” that will entail legal prohibitions for all young people under 18 years of age, or whether there are certain aspects of the work that are less hazardous and therefore should remain open for those who are over the legal minimum working age. Most of the countries concerned have a huge population bulge in the 14-17 year age group, and for them, employment is a major issue of not only economic but also social and political import.

The practical challenge stems from the high proportion and numbers of children in the brick labour force, the fact that the majority migrate with their families to areas where there is little else to do other than work, and most particularly the extreme poverty which presents these families with few livelihood options other than arduous work.

Because of these challenges, there have been few attempts and little progress in reducing child labour in this industry. Yet there is one angle – children’s health – which remains virtually untried. Health is a visceral issue, especially when it concerns children, and therefore has the potential to be more persuasive than either legal admonitions (“child labour is illegal”) or the alluring but often illusory promise of education (“children should be in school”) which are the more common arguments. In fact, there is reason to believe that children’s occupational safety and health might offer an entry point for reducing hazardous child labour in a shorter period of time than other interventions. Clear, credible and

¹ ILO-IPEC. *Global Child Labour Trends, 2008-20012*. Geneva, ILO, 2013, p.12.

convincing data about the risks and the extent to which children and adolescents are suffering physical or psychological disability as a result of these risks might be an important lever in changing societal acceptance of child labour. And having this knowledge, plus a forum in which to negotiate changes in practices or technology, the people concerned can work out a course of action that is feasible given the circumstances in which they find themselves.

Furthermore, it is possible, that seeing how children are so profoundly affected may jar an industry, inured to dangers which appear to them as commonplace and inevitable, into improving the work and working conditions for all its workers.

1.1 Study overview

This document reports on a set of linked cross-sectional studies which were designed to elicit quantitative and qualitative data on hazards and health impacts experienced by children working in what appears to be a hazardous occupation. It examines both those hazards and impacts which are visible (e.g. injuries) and those that are less so (e.g. psychological stress) and also seeks to understand more about gender-specific work and cumulative/compounded effects.

Four countries undertook the study: Afghanistan, Bangladesh, Nepal, and Pakistan. The sample size is relatively small (ranging from 100 to 900 respondents per country including controls), however, considerable effort has been made to choose sites which illustrate the range of technologies within the brick industry, and within these, to select a sample which is representative of the brick kiln population in the countries, or at least the provinces/districts under study. While the four countries used a common format and survey instruments, this was not intended necessarily as a comparative study but as four discrete studies whose prime audience is policy-makers in the respective countries. Nonetheless, on those indicators for which the quality of the method used is assured and the data robust, some notable comparisons can be made.

Child labour is found most commonly in locations and industries which are not particularly ideal for conducting research; they may be clandestine, remote, ephemeral, or otherwise not necessarily easy to access. The areas where this study was undertaken are no exception and offered the added challenges of political insecurity (Afghanistan and Pakistan), unseasonal torrential rains and floods (Nepal), and strikes (Bangladesh). However, these are factors which must be taken into consideration in any research on child labour and demand that the methodologies be designed accordingly. This study contains a number of features which distinguish it from most studies dealing with occupational health or with child labour.

- Rather than examining the industry as a whole (as would be done from the adult worker perspective) it focuses on only those components where children are engaged or situations to which they may be inadvertently exposed. It then assesses the risks in that situation or component, task by task. It leaves open for the research to answer, 'Which aspects or areas are more hazardous to children? Which are less so? Are there any where the risks can be practically and effectively

managed to reduce the risks to an acceptable level for children of working age to be engaged?’

- The field of occupational health has established standards or norms (e.g. threshold limit values) and detailed guidance with respect to most industries. However, these are all determined with respect to adult judgment, bodies, and capacities. While adult risks and interventions are taken note of, this study focuses on the **additional** vulnerabilities of children and the special protections they require.
- Most attempts to look at child workers’ health consist of a general physical health screening and tend to pick up normal acute conditions of childhood that would be common in a developing country context (colds, diarrhea, parasites, etc.). In contrast, this study targets the health conditions that research indicates might be characteristic of the occupation under study, several of which may not yet be symptomatic due to a latency period.
- Similarly, virtually all child labour studies that look at health, focus on physical health and safety. The studies of psychological health of child workers which do exist (there are a few) confine themselves to only that aspect. The brick kiln study attempts to give equal attention to psychological and physical factors in determining the combined threat (or benefit) of the work to a child’s well-being.
- This study attempts to take into account the fact that children may well have multiple jobs. In addition to what is often assumed to be their “main” work, they may be doing other work after hours, or on their off days, or interspersed with their main work, or in the off-season. They also are frequently called upon to do household work such as gathering wood or water, cooking food or cleaning dishes, or caring for older or younger members of the household. All of these entail risks and compound the impacts.
- The unit of analysis is the child, rather than the household or the enterprise.

1.2 The brick industry

One of the most commonly-used photographs used in advocacy campaigns against child labour depicts a South American child of about 3 years old struggling to carry several bricks in his little arms. He is squinting because of the sun in his eyes and his face is streaked with dirt and sweat. This one photo exemplifies three aspects of child labour in this occupation: the extreme youth of the workforce, the harsh environmental conditions, and the effort involved in the work.

No global estimates have been made to date of child labour in brick kilns; nonetheless, some idea of the scale can be gained from national figures. For example for India, one estimate suggests there are 1.7 million children working in the brick kilns,² for Pakistan³ at least

² Miller, R.C.W. “Work or Starve: Child labour in Pakistan’s brick kilns”, in *Action Aid*, 30 Jan 2014.

³ Wainwright, O. “Blood bricks: How India’s urban boom is built on slave labour”, in *The Guardian*, 8 Jan 2014, (estimated on the basis of 150,000 brick units).

500,000, for Bangladesh⁴ there are thought to be about 110,000 child brick kiln workers, and for Nepal 30,000. As these calculations – particularly in the case of India –probably include only children under 14 years of age, they are likely to be a substantial underestimate. Another way of calculating is on the basis of the number of kilns. With an estimated total of more than 300,000 brick kilns worldwide,⁵ a bottom figure would be in the neighborhood of 3.3 million children working in brick kilns.

While brick kiln production is dominated by four Asian countries: China (54% of world production), India (11%), Pakistan (8%), and Bangladesh (4%),⁶ child labour is found in brick manufacturing enterprises across the world. Child brick workers are documented in 17 countries in Latin America, Asia, the Middle East, and Africa, and suspected in another dozen countries as well (see Figure 1). Children assist in the production of sundried brick as well.

Figure 1. Map of countries known and suspected to have child labour in brick kilns



Legend: Red = known to have child labour in brick kilns.

Where concerns have been raised about artisanal brick manufacturing, they have mainly focused on either (a) environmental pollution^{7, 8} or (b) bonded labour; whereas comparatively little has been said about child labour, poverty, or other socio-economic

⁴ Croitoru, L. and Sarraf, M. (2012) "Benefits and Costs of the Informal Sector: The Case of Brick Kilns in Bangladesh", in *Journal of Environmental Protection*, 2012, 3, pp. 476-484. Published Online in June 2012. <http://dx.doi.org/10.4236/jep.2012.36058>, accessed in July 2014.

⁵ Baum, E. (2010). "Black Carbon from Brick Kilns", in *Clear Air Task Force*, April 11, 2010.

⁶ Ibid.

⁷ Ahmad, M.N., van den Berg, L.J.L., Shah, H.U., Masood, T., Buker, P., Ashmore, M. (2011) "Hydrogen fluoride damage to vegetation from peri-urban brickkilns in Asia: A growing but unrecognised problem?" *Environmental Pollution* Volume 162, March 2012, Pages 319–324.

⁸ Joshi, S.K., Dudani, I. (2008). "Environmental health effects of brick kilns in Kathmandu valley", *Kathmandu University Medical Journal* (2008), Vol. 6, No. 1, Issue 21, 3-11.

issues. The concern about environmental pollution stems from the fact that the megacities of Asia and the Middle East, which have been the target of rapid urbanization in recent years, are largely constructed of bricks and concrete. Yet despite the importance of brick production to construction, it remains largely a manual, low technology industry requiring little skill, and yielding low profit margins. Most of the kilns are fired with coal, but will resort to almost any low-cost fuel and burnable materials that are available (straw, tires, plastics, used oil, dung, even chicken feathers). With little investment, the kiln technology has stagnated, and as a result is neither energy-efficient nor ecological. A recent study of Dhaka has modeled the ecological impact of the brick kilns around the city, finding that over 40% of the fine particle matter pollution in Dhaka's air can be traced to the kilns, translating to an increase of over 5,000 premature deaths annually in the city.⁹

Bonded labour has been the subject of a number of campaigns and projects particularly in India. Characteristics of brick production, such as its growth, seasonality, and low skill requirements, have led many to seek loans who have been rendered destitute by political conflict, environmental disaster, family emergency including medical costs, or chronic poverty. Because of the low level of remuneration in the brick industry, these loans become virtually impossible to repay. Whole families, or occasionally children alone, are "bonded", in effect for life, subject to abuse and unable to escape through either education or alternative work.

While less attention has been drawn to the plight of child labourers in the industry, there are indications that the health effects could be quite serious. For example, a study of child laborers in Cambodia showed that child workers in brick factories suffered more from work-related health effects than child scavengers, children in fish processing centers or child car-washers. Sickness and injury were reported by 65 per cent of the children, in comparison with less than 50 per cent of child workers working in other job categories, and 85 per cent experienced frequent fatigue due to overwork, cuts and wounds from carrying bricks, and bruises from bricks falling onto their feet. The children also complained of body ache, backaches, skin diseases, eye problems, headache, diarrhea and respiratory problems, some of which may be attributable to their work. It is these conditions which the present set of studies sought to verify.

⁹ UrbanEmissions.info "Impact Analysis of Brick Kilns on the Air Quality in Dhaka, Bangladesh
Update: November 2013.

2. Background and preparation

The research project began as an ILO interdepartmental initiative between the International Programme on Elimination of Child Labour (IPEC) and the Sectoral Activities branch (SECTOR) with the intention of developing a “Model of Intervention” for the construction industry. Under their direction, two reviews of the literature were undertaken to determine what is currently known about the nature and extent of child labour in the industry, the quality of the information available, and the range of measures that have been attempted to address this issue and specifically to identify good practices that could be emulated. The first review, by Abdul Saboor, looked for literature on child labour in brick kilns, and the second on health of brick kiln workers was undertaken by Ayaz Achkazai.¹⁰ Because there were known to be large numbers of children in the brick kilns of Asia, special efforts were made to include grey literature (newspaper articles, students’ essays) in Asian languages such as Pashtun, Farsi, and Urdu in these literature reviews, in addition to published studies in English and French.

It was assumed, prior to undertaking the literature review, that good studies already existed, and that the task at hand was to analyse them from the perspective of identifying which policies and interventions had been most effective. The review, however, was able to locate only about a dozen studies on child labour in the brick industry and all but two of these¹¹ dispensed with the issue of health in a few sentences by recounting a few obvious hazards. Furthermore, due to funding constraints, no follow-up studies were undertaken subsequent to any interventions that would have provided guidance for action programmes. Nonetheless, these reports served as the basis for a background document that outlined what is currently known about child labour in the brick industry, its hazards, and the gaps in knowledge, policy, and interventions.¹²

A workshop was then convened in Bangkok in November 2012 that brought together a group of researchers from nine countries who had studied various aspects of child labour in the brick kiln industry, including the persons who had carried out the two health-related studies.¹³ One was Dr. Catherine Bruck, a specialist in occupational health and safety, who led the workshop and trained the group on the use of risk assessments as a method of research, as well as reviewing other approaches that could be used. The other was Saeed Awan, Director of an OSH institute in Pakistan,¹⁴ who presented the findings of his initial

¹⁰ Achkazai, A. Annotated Bibliography: Health of Brick Kiln Workers.

¹¹ ILO-IPEC. (2008). “Assessing the occupational health and safety issues for children aged 15-17 years working in the brick factories in Cambodia,” *Research Report by ILO-IPEC Cambodia, November 2008*; and ILO-IPEC, (2008). “Occupational Health and Safety Hazards of brick kiln workers” *Report of a research study by Centre for the Improvement of Working Conditions & Environment, Lahore, Pakistan, September 2008*.

¹² ILO. “Background Paper: Child labour in brick kilns in Afghanistan, Bangladesh, Egypt. Iran, Nepal, Pakistan, and Paraguay.

¹³ ILO. “Workshop Report: Research on Health of Children Working in Brick Kilns, ILO Regional Office, Bangkok, 10-12 October 2012.

¹⁴ Center for Improvement in Working Conditions kilns in Afghanistan, Bangladesh, Egypt. Iran, Nepal, Pakistan, and Paraguay.

research on child labour in brick kilns that had generated concern about the health of these workers. The group discussed the current state of knowledge on health of child workers and reviewed the opportunities and needs for further information in their respective countries. They then outlined the objectives and general approach to be taken in a future study. A report of the workshop was produced.¹⁵

A global research grant from the U.S. Department of Labor, International Labor Activities Branch (USDOL/ILAB), provided funding for the workshop and \$40,000 for subsequent research. While seven countries were interested in undertaking a study, it was decided to divide this amount among four countries (\$10,000 for each), selecting those which were able to lever matching resources and which had ongoing projects or other activities that would enable them to use the results of the research. In Afghanistan, the ILO office partnered with UNICEF for an additional contribution of \$30,000. Bangladesh provided in-kind resources. In Nepal, the ILO office partnered with an NGO, Educational International, for a contribution of \$15,000. In Pakistan, the ILO office facilitated the involvement of two EU-funded projects (“Bonded Labour”¹⁶, and “Combating Abusive Child Labour-II”) to provide an additional \$20,000. It is useful to be cognizant of these amounts and the partnerships they leveraged as they are indicative of the level of funding and cooperation that could be expected for similar research efforts in future. Conducting research with very modest funding and reliant on partners whose time constraints and output requirements may not be congruent adds to the complexity of such an effort. However, it can be argued that the time spent in constructing and nurturing these partnerships also had important benefits, especially considering that the ultimate objective is not the study of the problem but stimulating action to address it, and that building research capacity in local institutions can be an end in itself.

In preparation for the studies, the CIWCE undertook a very simple prospective study in Punjab Pakistan to determine the approximate frequency rate of health events (injuries and illnesses) occurring at the brick kilns. They engaged the “lady health visitors” (LHVs) who were visiting the brick kilns regularly with the support of a non-governmental organization, Action Aid. The LHVs selected one literate person from each of ten brick kilns. This person was given a record book and a small first aid kit and asked to record each injury or illness that occurred to workers in his/her brick kiln, noting their age and sex. The LHVs then checked the record books during their monthly visits and at the end of three months compiled the results. This rough frequency rate aided in the subsequent sample design.

¹⁴ ILO. “Workshop Report: Research on Health of Children Working in Brick Kilns, ILO Regional Office, Bangkok, 10-12 October 20012.

¹⁴ Center for Improvement in Working Conditions and Environment (CIWCE), Lahore, Punjab.

¹⁵ ILO-IPEC. “Research on health of children working in brick kilns: A Workshop Report”, ILO Regional Office, Bangkok, 10-12 October 20012.

¹⁶ Full title of the project is: Strengthening Law Enforcement Responses and Action against Internal Trafficking and Bonded Labour in Sindh and Punjab Provinces of Pakistan”.

2.1 Development of instruments

The study instruments were compiled using standardized items, wherever possible, from ILO's SIMPOC¹⁷ child labour questionnaire, UNICEF's Multiple Indicator Cluster Surveys (MICS), the World Bank's Living Standards Measurements Study (LSMS), the Demographic & Health Surveys funded by USAID, and condition-specific instruments such as the Nordic questionnaire on musculo-skeletal disorders. A risk assessment checklist, specific to brick kilns, was developed based on previous studies and reports describing the brick kiln environment. The generic instrument and risk assessment checklist were pre-tested in each participating country, including translation and back-translation, to adjust the wording to the local culture.

The instrument for the psychological component of the study was more complicated as there was little precedent for this kind of study. It was developed over a two-year period involving the following steps:

1. A literature search was undertaken to identify existing instruments that had been designed to assess the psychological health of children, and which would not require administration by a professional psychologist.¹⁸
2. A search for literature or unpublished experience (via networks) was undertaken for tools that were designed to assess occupation-related psychological health (of adults).
3. A background paper was drafted which analyzed and summarized the existing instruments and which made recommendations on how to study child workers' psychological functioning on a population-wide basis.¹⁹
4. Ten researchers who had done previous research on psychological aspects of child labour were identified from the literature and were invited to participate in a three-day consultation in turin italy in january 2011. The researchers were asked to review the background paper and other documentation, and to either select from the existing tools or to advise on the design of a new one.²⁰ the group determined that a new child-oriented osh questionnaire on psychological health would need to be designed in that existing instruments focused on pathology rather than overall psychological health, or were skewed to western and/or industrial populations, or were too adult-oriented.
5. A new instrument was drafted²¹ by first identifying the domains and indicators most likely to be salient by drawing on previous studies.
6. A first pilot was undertaken in two districts of Punjab, Pakistan in the spring of 2011 with child workers in 10 occupations (n=1,996) and non-working controls (n=464)

¹⁷ Statistical Information and Monitoring Programme on Child Labour.

¹⁸ Martijn Hofman. *Psycho-social Impact of Child Labour: An Annotated Bibliography*, 2012.

¹⁹ Stavroula Leka and Aditya Jain, *Assessing Psycho-social concomitants of Child Labour*, ILO, 2011.

²⁰ Betancourt, Fekadu, Forastieri, Gamlin, Hofman, Jain, Leka, Ndayisaba, Pelanq, Servili.

²¹ TPO Healthnet, Netherlands.

using a tool with subscales on: emotional difficulties (existing instrument: Depression Self Rating Scale) ($\alpha=.52$); work stressors ($\alpha=.47$); sense of agency ($\alpha=.63$); social integration ($\alpha=.61$); traumatic stress reactions (existing instrument: Children's Revised Impact of Events Scale - 8) ($\alpha=.96$); coping ($\alpha=.52$); and future outlook ($\alpha=.75$).²²

7. A panel of 30 child labour experts was asked to allocate priorities among these domains; the ones that had been demonstrated or hypothesized to be associated with psychosocial wellbeing or vulnerability of child workers were selected.
8. A second field-test was conducted in nepal for the purpose of generating further indicators of psycho-social wellbeing among child labourers and to rank them. Participatory group discussions were conducted with nepali working children (n=27), ranging in age between 8 and 16, and representing different sectors of child labour (stone-breaking, domestic service, street work). Items derived from this and the previous work were compiled, resulting in a list of 66 possible questions, which were organised in different categories through pile-sorting.
9. A third validation study was then conducted among nepali child labourers (n=180) and non-working peers matched for age, ethnicity and locality (n=180) to reduce the items to those most relevant and indicative of good psychometric properties.²³
10. Other existing measurement tools were consulted (sdq²⁴, who-das, etc.).
11. A final selection was made of 25 items which measured three domains:
 - a. *psychosocial distress* (both inter- and intra-personal),
 - b. *social participation and integration* (participation in social activities and feeling supported by others), and
 - c. *sense of agency* (feeling of control over the situation and pro-social behavior).

Selection was made through a two-staged process: first, exploratory factor analyses (principal components) to generate a three factor structure; second, individual items correlated with relevant constructs (symptoms of depression, sense of hope, impairment in daily functioning). Items included in the prior step were omitted if correlation was $<.30$, items not selected in the previous step were still included if there was a correlation $>.40$ on one of the three constructs of comparison.

12. The questionnaire and results of the pilots were compared with the recommendations of the Turin group to ensure the group's guidance had been taken fully into account.²⁵
13. The questionnaire was reviewed by ILO's child labour survey division which expressed concern that the 25 item instrument was not adequate with respect to occupational variables. Items from the original Leka and Jain recommendations²⁶ were added.

²² Internal consistency [alpha] within the sample is noted between brackets.

²³ Ethical approval for this study was gained from the Nepal Health Research Council (NHRC).

²⁴ Strengths and Difficulties Questionnaire, by Robert Goodman.

²⁵ Hofman, *The Evidence Base for the Psychosocial Assessment Instrument for Child Labour*, ILO, 2012.

²⁶ Op cit. Leka and Jain (2011).

2.2 Country-specific preparation

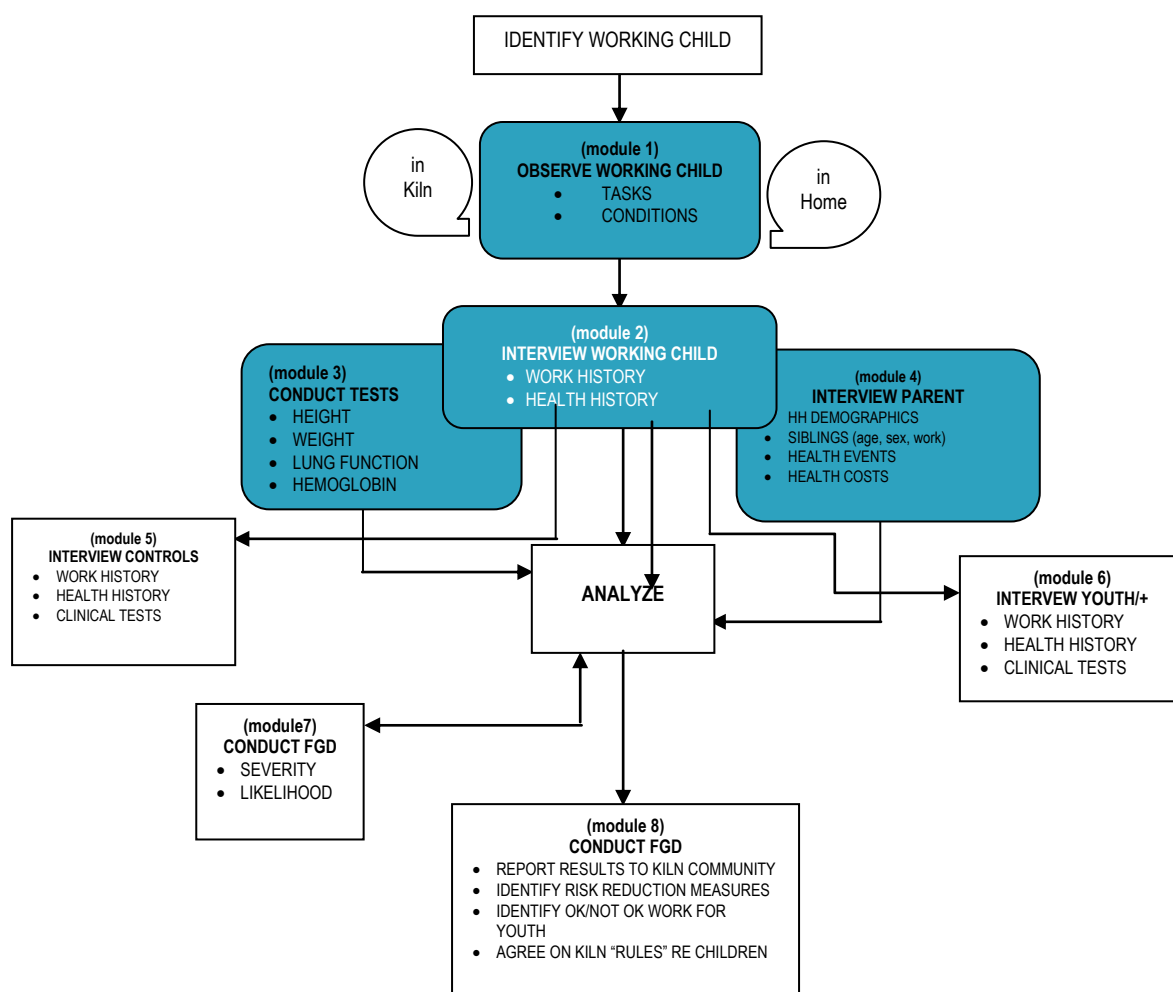
Each of the participating countries was requested to make the following preparations for their study:

1. Meet with relevant government agencies (ministry of labour, health) and representatives of workers' and employers' organizations that might have interest or jurisdiction over the brick industry to discuss the plans for the study and seek their input in finetuning or adapting the approach to their country.
2. Establish a locally-valid procedure for ethical clearance and informed consent. While clearance is necessary from the concerned ministry or provincial authority (as in the case of Pakistan which is a federal state), the crucial persons to grant permission were the local leaders – the brick kiln owners and/or their representatives (e.g. the site supervisor or labour contractor) and community elders or representatives of the brick kiln families. At the time of the interview, a parent of each child respondent was informed about the study and asked if her/his child could participate and, in addition, each child was informed of the purpose of the study and also asked if s/he was willing to continue. The latter was important as not all child workers live with a parent or other relative. The research team was requested to keep a record of these permissions on file.
3. Determine what action would be taken if a case of severe illness or immediate danger was identified during the study. This was to include identifying the nearest health centre and means of transport, the social welfare agency with jurisdiction in the area, and an NGO or government agency with ability to finance care.
4. Establish local criteria for selection of the control groups as this might differ from country to country. If possible, these were to be children who live in the nearest village who are of the same ethnic and/or linguistic group as the brick kiln workers and the same economic strata as evidenced by local indices of wealth (e.g. domestic livestock, media (radio), appliances, cookware, type of dwelling).
5. Establish locally relevant signal events for one month and one year to help children answer time-related questions.
6. Translate and pilot-test the instrument at one of the brick kiln sites, making adjustments as necessary.

2.3 Organization of the study

The study had eight parts, called “modules”, each accompanied by an instrument and a set of guidelines. Figure 1 shows the order in which these modules were conducted and how they relate to each other; the parts coloured orange designate the most crucial elements of the model. Countries were accorded some leeway in undertaking some of the non-core elements if local conditions made it impossible to implement them correctly. The following section briefly describes each module and how it was implemented. See Annexes 1 and 2 for the instruments accompanying the modules.

Figure 2. Flowchart of Health Study of Children working in Brick Kilns



2.3.1 Module 1. Risk assessment

The objective of this component was to systematically identify and describe the workplace hazards to which child workers were exposed, both in the brick kilns and in other work they were doing.

Six working children were selected, each representing one boy and one girl from each of three age categories: <11, 11-14, 15-18. The selected children were observed from 'dawn to dark', the observers charting all tasks in which the child was engaged, the way in which the tasks were undertaken (quantitatively where necessary), as well as the conditions in which these tasks were taking place. Work in which only adults were engaged (e.g. kiln firing) was **not** studied.

The hypothesis for this component is that life in the brick-working communities holds two kinds of potential danger for children:

- hazards related to the work the child does in the brick factories and/or in her/his home,

- contextual (social and environmental) hazards which could contribute to reduced physical and psychological health and increased likelihood of injury.

The method used was a standard occupational safety and health risk assessment, adapted to take into account the heightened vulnerability of children, which includes looking for:

- **Safety hazards** (e.g. wet or uneven surfaces, motorized equipment, cutting or power tools, vehicles)
- **Chemical hazards** (e.g. exposure to smoke, fibres, exhaust, mineral dust or toxic chemical agents)
- **Physical hazards** (e.g. noise, vibration, exposure to heat and cold, electricity, poor ventilation)
- **Ergonomic hazards** (e.g. lifting/moving heavy objects, repetitive motions, awkward postures)
- **Working conditions** (e.g. long hours, lack of security, poor sanitation, unclean drinking water)
- **Biological hazards** (e.g. contact with biological wastes, noxious plants or animals)
- **Psychological hazards** (e.g. abuse, humiliation, isolation, lack of learning opportunities, stress)

The tools to support this observation were a risk assessment checklist adapted to take particular account of the characteristic hazards of brick kiln work;²⁷ as well as equipment for measuring conditions which are associated with brick kiln work and to which children are expected to be particularly vulnerable:

- **dust and fumes**, including crystalline silica content of soil
- **weight** of loads carried, pushed, pulled
- **distance** of transport of loads as well as commuting between home and work
- **temperature** from kilns and sun
- **wind direction** from kiln chimneys toward housing

Post research analysis

Doing a risk assessment was a new experience for all of the teams (except for Pakistan) yet with the checklist there seemed to be little problem in carrying out the assessment. Note

²⁷ The checklist was constructed based on informal observation of brick factories but particularly on two pieces of earlier research: Bruck, C. and Dr Yi Kannitha, “*Assessing the occupational health and safety issues for children aged 15-17 years working in the brick factories in Cambodia*”, Research Report by ILO-IPEC Cambodia, November 2008; and Awan, S., “*Impact of work on the Health, Safety and Psychosocial well-being of children in Brick Kilns in Sahiwal and Sukkur Districts*”, Center for the improvement of Working Conditions & Environment, Lahore, Pakistan, 2010.

that the checklist required only observation of the hazards, not judgments as to the severity and health implications of the hazards or likelihood of the risks, hence it was something non-health professionals could accomplish. What was less successful was conducting an adequate risk assessment of the home environment or of any collateral tasks the child workers were undertaking. In Afghanistan, the research teams – even the women – were not allowed into the homes. In the others, the home observations tended to be perfunctory, if they were conducted at all.

Although strenuous efforts were made to find a lab and funding for the analysis of soil and air samples, in the end, the teams had to rely on local services and only limited analyses could be undertaken. The teams assisted each other in this, e.g. the Pakistan team brought its equipment to Afghanistan and trained the researchers on its use and analyzed its samples.

2.3.2 Module 2: Child interviews

A purposive sample of children (age 11-17) and youth (18-24) was selected for interview and measurement from among those who work in the brick kilns; a sample of non-working children and youth was selected from the nearby communities to serve as a control group. The interview schedule for both working and non-working children was the same, with the exception of the work-related section of the psychological module. The sampling procedure is described in Annex 4.

This component gathered information on the demographic profile, work history, and recent health history of the children and youth with the aim of identifying probable health impacts associated with the work, as well as possible explanatory factors. It focused on five dimensions which previous research (see Annex 5 for a summary) had indicated were associated with brick kiln work:

- injuries,
- musculo-skeletal impairment,
- respiratory impairment,
- stunting,
- certain aspects of psychological functioning.

The study placed emphasis on these dimensions because, while child brick kiln workers have reported a number of additional health issues (e.g. gastro-intestinal problems, fevers), it is extremely difficult to differentiate those which can be attributed to work, from those which derive from the living conditions and other poverty-related factors characteristic of brick kiln families.

Three hypotheses governed this module:

- a) health and development are compromised as a result of hazardous work at a young age (which was to be tested by determining if children working in brick kilns suffer

more injuries, more acute illnesses due to exposure and general debility, more chronic disability, more stunting and poorer psychological functioning than non-working children or children doing less hazardous work);

- b) girls are at greater physical and psychological risk than boys (which was to be tested by determining whether they worked more hours (hours at the kiln combined with time spent in household chores), had less sleep, and had lower self-concept and less social integration than non-working girls; and
- c) the physical and psychological strain of brick kiln work can be mediated by having adequate food, more social support and a positive self-concept derived from being able contribute to the family's welfare.

Post research analysis

Accustomed to doing questionnaire-based surveys, the research teams were able to conduct these interviews largely as directed. The interviews were generally conducted at the workplace during a break (the control groups were interviewed in their homes). The children were not paid, but in the case of Pakistan were given vitamin/mineral supplements which were appreciated, and in the case of Bangladesh and Nepal given food. In the case of Afghanistan, there was some initial criticism as parents felt that they had seen no improvement in their situation as a result of their participation in an earlier survey.

As children generally worked as part of a family group, parents or older adults were allowed to listen in to the interview and encouraged to contribute facts such as the nature or timing of an illness. This was not so successful with regard to the psychological component as it involved personal reflections, some of which could be negative. We feel that this has influenced the results, with children being disinclined to express opinions on the extreme ends of the scale. Some interviews made efforts to conduct this part of the interview with the child alone; in other cases, as this was near the end of the interview and somewhat tedious, adults had drifted away. The brick kiln management was asked not to be present for the interviews although the content was discussed with them previously. To a certain degree, the fact that the interview concerned the health of children, and was not inquiring into sensitive subjects such as family finances, seems to have increased the comfort level of all concerned and made them more willing to allow the study to take place. Exceptionally, the Afghanistan team included questions concerning bonded labour in order to see if that variable may be associated with ill health.

2.3.3 Module 3. Physical Measurements

The third component involved a brief physical exam of the children. The exam intended to look particularly for conditions which have a strong linkage with brick manufacture and to use those tests that, although requiring some training, did not require to be administered by a physician. Given the remote locations of most study sites, the limited availability of health professionals, and cultural sensitivities concerning the body and blood, measures were selected that were simple and did not require refrigeration or transport, complicated analyses or electrical equipment:

- height and weight (to compute Body Mass Index),
- lung function (using spirometer),
- anemia (observing conjunctival pallor).

In addition to addressing national ‘Protection of Human Subjects’ requirements, the research teams were required to ensure that those directly involved – the parents and the children – understood and gave consent to the procedures. The study teams were required to have written documentation that this was done, noting time, place, and a mark of agreement from the person concerned. In addition, the study teams were required to have a procedure mapped out in case a child was found who had a health problem that required care.

While, ideally, this component could show a link between exposures and health outcomes, given the sample size and the limited types of test that could be conducted, the results were expected to only be indicative. Together with the self-reported health outcomes from the interviews, however, the clinical exam helped to add strength to the findings.

Post-research analysis

This component was less likely to be conducted in accordance with the guidelines. The teams chose to engage professional health providers (physicians) and, as a result a more thorough clinical exam was conducted than was foreseen. Nepal, Pakistan, and Bangladesh (Afghanistan has not yet reported on this component) examined the working and non-working children, at a minimum for:

- injury marks
- hearing
- eye problems including conjunctivitis
- skin problems

In addition, two of the teams, which had prior Ministry of Health clearance (Nepal and Pakistan) conducted blood tests as well (for anemia). No instances of acute ill-health were encountered that required care.

2.3.4 Module 4: Adult interview: Health costs

The fourth component, the interview with an adult member of the household in which there is a working child or in the case of the controls the household of the respondent child, was intended to provide information about the costs incurred as a result of injury or illness, and additional socio-demographic information if necessary.

A prior study in Afghanistan had documented the fact that costs of health crises was the second most common reason for families taking a loan, and thus for becoming bonded labourers. There was anecdotal evidence from the other countries that this was a major concern as well.

Post-research analysis

Unfortunately, most respondents found it difficult to either remember what they spent on health care or to compute the costs of specific health events in the last year. Much less was it possible to determine what proportion of the family budget was being spent on health care. The research teams reported that in the majority of brick kiln families, the adults were not literate or in any case not accustomed to keeping household accounts. Some of the payments may have been in-kind as well, or co-mingled with more general items such as transport to the health care facility, food for the sick person, etc.

In future, in order to explore this question of whether families who work in brick kilns spend a greater proportion of their income on health crises than do families who are engaged in less hazardous occupations and whether families who work in brick kilns pay for health crises by taking loans or advances from kiln owners or managers would require a separate or more detailed study.

2.3.5 Module 5: Control group

This component consists of the interviews with the control group using the same questionnaire and measurements.

2.3.6 Module 6: Youth: Latent conditions

This component involved an interview with young adults, between 18 and 24 years of age, ideally who were members of the same household of the working child being interviewed or of the matched controls for the working child. The criteria for selection were that the young persons began work in the brick kilns before the age of 15, and worked in the brick kilns for at least 3 years before the age of 18.

One purpose of this component was to identify chronic health problems resulting from starting work as a young child, i.e. to identify conditions that have a longer latency period or where symptoms do not appear until after a period of time. For example, testing the lungs of a 10 year old brick kiln worker may show no impairment, simply because the damage has not yet built up to symptomatic levels, and so the study is obliged to report no evidence of respiratory impact. Whereas the effect may show up when testing the lung function of one who has worked in those conditions for over five years or who started at age eight. In other words, there are two factors which may be at work: a) duration, and b) fragility. Regarding duration, we know that exposure to dusts, such as in brick kiln work, is associated with chronic respiratory conditions. Theoretically, the longer one works in such conditions, the more likely it is that damage will become evident. Hence, persons who begin working in such conditions in childhood will show more illness. Regarding fragility, we know that young children breathe faster than adults and other aspects of their stage of development, as well, might contribute to a higher risk of chronic disease later on, or a faster onset of such disease. There is also ample research evidence for industrialized countries that youth in the 18-24 age group have some of the highest rates of occupational injury, but it is not known whether the gradient appears as a gradual increase or rises sharply in that age group, or whether the increase is due to youth doing different kinds of work than are children.

Post-research analysis

This component was undertaken as an experiment since this age group is never included in child labour studies, being above 18 years which is the internationally recognized upper threshold for childhood. There were also a number of unknowns in setting the criteria: how many years of exposure should be required? what should be the required starting age? – a 24 year old who started work at age 17 might have a very different health outcome than an 18 year old who started at age 11 in spite of the fact that they have the same number of years of exposure.

There was another reason also for exploring the health profile of youth brick kiln workers: youth unemployment is becoming a critical issue in much of the world. Generally defined as ages 15-24 at least for statistical purposes, youth are increasingly being studied using a “life cycle” approach, rather than in the previous way which was more compartmentalized (divided into the categories of infants, school-aged, adolescents, and young adults) and which placed greatest priority on those in the youngest, 0-5 year age group. The life cycle approach takes into account the fact that physical and psychological outcomes may stem from experiences in the middle years of childhood and suggests that these age groups need to be studied together. It is these considerations on which this component tried to shed some light or at least make an initial exploration to see if it would be a fertile area for a proper study in its own right.

The issues which were of particular concern for comparisons between youth and the younger age groups in this study were:

- injuries,
- respiratory conditions,
- musculoskeletal disorders,
- self-confidence,
- sense of agency.

2.3.7 Module 7: Risk analysis

This module finalizes the risk assessment begun in Module 1. Usually the analysis of the severity of risks and the likelihood of a health impact occurring is carried out by an OSH professional at the time that s/he observes and documents the hazards. In this case, the risk assessment was separated into two parts and used two different methods. While the prior part used systematic observation by the research team, this part used a Focus Group Discussion (FGD) in which knowledgeable people from the brick kiln communities took part. It is true that a professional will have information about occupational illnesses that the untrained person will not ... but conversely, the brick kiln community has a good sense of the likelihood of an event taking place based on their experience. More to the point, the community’s **perceptions** of the severity of the risk or the health outcome would be crucial for planning interventions.

Three types of information were sought from the FGDs. The first was input for the Risk Assessment, that is, understanding (a) the likelihood of an adverse health event occurring to the working children, and (b) the seriousness of the health outcome should this event take place.

A second type of information pertains to the costs of ill health and injury. Since earlier studies indicated that such costs were a major factor in seeking loans – in its most extreme form, putting the family in bondage -- this aspect was included in order to explain more about the families' and employers' decision-making process and the options they perceived. This study was not designed, however, to actually test this.

A third, and especially critical issue from the standpoint of bias, concerns the healthy worker effect, i.e. exploring whether the families are opting to send their strongest children to work and to feed them better than others, hence making the deleterious health effects less evident. It was thought a discussion in a group may lead to a fuller understanding of how the healthy worker effect operates, if indeed it is in this context.

Post-research analysis

In the predominantly Muslim countries, the FGD was undertaken with women and men separately. The research teams were familiar with the technique and the activity seemed to be well-accepted by the community. However, they were poorly documented; neither were the results taken into consideration in the analysis of the quantitative data to any extent, with the exception perhaps of Afghanistan. There was skepticism at first as to whether the brick kiln families would be willing to talk about the costs of ill health in a group setting, but this concern appears to be unfounded.

The concern about the healthy worker effect also appeared to have a minor effect, if any, in the brick industry in that the families were working together in the kilns (again, with the exception of Afghanistan, which did not allow girls of post-puberty age to work there). In other words, they were bringing all of their children to work without apparent distinction.

2.3.8 Module 8. Decisions and solutions

Once the preliminary results were available, the research teams were asked to convene a “tripartite meeting” either at the administrative or the kiln level with the kiln owners (employers), brick kiln workers and a government representative to discuss them.

The group was urged to “draw a red line” between the tasks that are too dangerous for **anyone** under 18 years to do or to be around and must be reserved only for adults, and those that do not pose undue risk which adolescents above legal working age (14 or 15) may do. While outsiders can advise and there are national laws to be taken into account, it is the community which must draw the line with regard to specific tasks and conditions and decide to adhere to it. And it is they who must agree to keep children below 14 in school rather than at the kilns at all.

The group was also expected to look at the various options for reducing risks in the brick kilns and to identify one action that it will take. Risk reduction would benefit all workers, and have an indirect effect on protection of children.

Post-research analysis

Nepal has completed this step, choosing to have a tripartite meeting at national level with representatives of the communities concerned, and has produced a report of the decisions. Brick kilns are now slated for legislation as part of the national hazardous child labour list. Pakistan conducted meetings at the kilns as did Bangladesh.

There was a tendency for the research teams to focus on the analysis of the research findings and the write-up of the reports rather than the discussion and communication with the communities. Future work must find a way to more effectively embed this step in the research and require its documentation.



3. Theoretical discussion

Children's occupational health' is not a recognized term, most likely because it is assumed that children do not work, or if they are, it is illegal and they should be removed from work. Yet given that 264,427 million children are engaged in economic activities,²⁸ a third of whom are above minimum employment age and working legally, and given that children's vulnerabilities are different from that of adults, it is an area that warrants attention in its own right.

Children's occupational health is an area of work at the interface between (a) work and child illnesses/ injuries, (b) work and children's psychological functioning, and (c) work and children's physical or emotional development. In this section we review some of the research on this interface that has been specifically used in the design of this study. (A fuller review of this literature can be found in two recent ILO publications, "Compendium of Current Knowledge on Hazardous Child Labour," ILO-IPEC 2011 and "Children in Hazardous Work: What we know. What we need to do," ILO-IPEC 2011.)

While most papers that deal with the subject of child labour note the likelihood of health impacts (in addition to educational and economic impacts), the vast majority speak about the injuries and illnesses that **could** occur, basing their statements on general observation or on known risks to adults. Those which more explicitly look at health, tend to confine themselves to documenting exposures. Reasons for not going further into the exposure-response relationship are presented in the 2008 paper by Dorman, "Child labour, education and health: A review of the literature"²⁹ which outlines seven factors which make it difficult to accurately measure the relationship between child work and child health. These include the virtual impossibility of finding adequate controls due to the healthy worker effect ("the tendency for the healthiest, most robust individuals to be selected or self-select for work, particularly physically demanding work"),³⁰ the tangle of multiple factors surrounding a child's particular job (such as parents' presence and health, the family's socio-economic status, housing and water supply, the child's other jobs including housework) which can cause or compound a health condition, the lag between exposure and onset of symptoms which necessitates a longitudinal perspective, and so on. Research which may be less prone to such difficulties, he suggests, are occupation-specific studies which examine the relationship between particular stressors in the work environment and reported or measured symptoms.

Taking account of Dorman's concerns, the brick kiln study attempted to reduce contamination due to other sources of risk by inquiring into the types of work that children did in the periods when they were not working in the brick factories, particularly during the

²⁸ ILO-IPEC. (2013). Marking progress against child labour : Global estimates and trends 2000-2012, p.27.

²⁹ Dorman. (2008). Child Labor, Education and Health: A Review of the Literature, ILO.

³⁰ ILO-IPEC. (2011).

off-season, so that cases engaged in other forms of hazardous work could be eliminated from the pool.

It also chose to focus on a single industry -- brick kilns -- rather than other forms of work that children were doing in the same geographical area or even in the same family, and is the rationale behind selecting children as the unit of study rather than the household as is more commonly done.

Finally, while some questions and measurements on general health were included, the study chose to focus on five conditions that are particularly salient to brick manufacturing and where the occupational connection is more easily determined. These are: injuries, musculo-skeletal impairment, respiratory impairment, stunting, and selected aspects of psychological functioning. A brief summary of the knowledge pertaining to these five conditions follows.

3.1 Injuries

In looking for a connection between children's work and their health, researchers have looked at a number of conditions but those which show the best and clearest link are injury rates. Injuries are the "safest" health outcome to measure because they are memorable (for the child), observable (by others), and recordable.³¹ NIOSH describes acute or traumatic injuries as resulting from a sudden event, such as slips, trips or falls, or being hit by an animal, vehicle, or other machine. Typically, such injuries are cuts or lacerations, blisters, burns, abrasions and contusions, broken or crushed parts of the body³² and less typically concussions or other serious head injuries.

Many of the studies on injuries have taken advantage of large datasets derived from national health surveys, workers' compensation records, hospital emergency rooms and other required reporting structures in the U.S. and the European Union, and now increasingly in states such as Brazil and Chile with good reporting systems. Examples of these analyses include those conducted by Castillo³³, EU-OSHA³⁴, Fassa (2000)³⁵, ILO (2012)³⁶ and Runyon³⁷. Trends have been consistent for well over the last decade (occupational injuries for children

³¹ There is some debate about whether children can accurately lodge injuries in time: one side contends they will tend to suppress the memory of a serious injury resulting in under-reporting, the other side holds that children remember a serious injury as occurring more recently than in fact it has thus leading to over-reporting for a given period of time. However, if both are true, they have a tendency in fact to cancel out each other. (WHO, personal communication).

³² Waters, T., "Preventing Work-related Musculoskeletal Disorders for Youth Working on Farms" in Lueder, R. and Berg Rice, V. (2008). *Ergonomics for Children*, Taylor & Francis, NY.

³³ CDC. "Occupational injuries and deaths among younger workers – United States, 1998-2007, in *Morbidity and Mortality Weekly Report* (MMWR) (23 April 2010), Vol. 59, No.15, pp. 449-455.

³⁴ EU-OSHA. *Young workers – Facts and figures*, Institute for Occupational Safety and Health for the European Agency for Safety and Health at Work, 2006.

³⁵ A.G. Fassa, I.A. Facchini, M.M. Dall'Agnol, D.C. Christiani. "Child labour and health: Problems and perspectives. *International Journal of Occupational and Health*, 2000.

³⁶ F. Mehran, P.Dorman, M. De Cock, "A Global Estimate of the Number of Work-Related Injuries Among Children in 2008", (2013) ILO unpublished manuscript.

³⁷ C.W. Runyan, R.C. Zakocs. (2000). Epidemiology and Prevention of Injuries among Adolescent Workers in the U.S. *Annual Review of Public Health*, 21:247-269.

are both poorly recorded and tend not to be differentiated from non-occupational causes prior to that). These studies show, for example, in the U.S., the fatality rate for children in the 15-17 year old age group (i.e. those above minimum employment age) is 2.9 per 100,000 full time equivalents (FTEs) and the non-fatal injury rate (defined as serious enough to require medical care) is 4.2 per 100,000 FTEs, which is nearly twice that of workers 25 years and older.³⁸ This same pattern carries through at lower administrative levels.³⁹ In the EU, the situation is similar with younger workers (those age 15-24) exhibiting an injury rate with more than three days lost worktime as 4.7 compared with older workers of 3.3 leading EU-OSHA to conclude that *“young workers are at least 50 per cent more likely to be hurt at work than older people...”*⁴⁰ Again, at a more local level, a study in Denmark found that the incidence of work-related injuries among younger workers was nearly twice that of adults.⁴¹ This same pattern is seen in Brazil and Chile.⁴²

Because they offer useable data, we rely on studies from North America and Europe to draw attention to the magnitude of child occupational injuries and to some of the associated factors, but they by no means reflect the situation in non-industrial countries and can only suggest lines of inquiry to be pursued. One of these factors is the matter of legality. A paper reporting on US data estimates that *“at least 70 per cent of work-related injuries are concentrated among the approximately 1 million children who are working illegally (20 per cent of the workforce). The remaining 30 per cent of injuries occur among the 4 million children (80 per cent of the total workforce) who are employed under legal conditions. The risk of injury is therefore almost ten times greater among children who are employed under illegal conditions than among those working in compliance with the law.”*⁴³ This suggests that work which is unregistered, unregulated, and not respected by society – which is the case with brick manufacturing – is likely to have high rates of injury.^{44 45}

Another factor to consider when comparing industrial with non-industrial countries is the very definition of injury for research purposes, e.g. a condition is defined as an injury if it is requiring medical care or incurring loss of work-time. This may not be valid for developing countries due to the fact that medical facilities may be inaccessible due to distance or cost, or a child may feel compelled to work even though injured, or may have become accustomed to a level of pain or discomfort than what his/her developed country

³⁸ CDC. “Occupational injuries and deaths among younger workers – United States, 1998-2007, in *Morbidity and Mortality Weekly Report* (MMWR) (23 April 2010), Vol. 59, No.15, pp. 449-455.

³⁹ K.J. Rauscher et al. (2011). “Work-related fatalities among youth ages 11-17 in North Carolina, 1990-2008” in *American Journal of Industrial Medicine*, Vol. 54, pp. 136-142.

⁴⁰ EU-OSHA. *Young workers – Facts and figures*, Institute for Occupational Safety and Health for the European Agency for Safety and Health at Work, 2006.

⁴¹ K. Rasmussen et al. (2000). “Incidence of work injuries amongst Danish adolescents and their association with work environment factors”, in *American Journal of Industrial Medicine*, Vol. 54, pp. 143-152.

⁴² IPEC. *Crece protegido. Manual para la proteccion del adolescente trabajador* (Santiago, ILO, 2009), p.18.

⁴³ Landrigan P and Belville R (1993) “The dangers of illegal child labour”, in *American Journal of Disabled Children*, Vol. 147, pp. 1029-1030.

⁴⁴ Castillo, D., Davis, D. and Wegman, D.H. (1999). “Young workers”, in *Occupational Medicine*, Vol. 14, pp. 519-536.

⁴⁵ Fassa, A.G. (2003). *Health benefits of eliminating child labour*, ILO-IPEC, p.15.

counterparts would tolerate. These would thus yield lower rates of injury than what is being measured in developed countries.

Despite these reservations, the brick kiln study used the current definitions of injury (requiring medical care and obstruction of normal activities) in order to remain as consistent as possible with other research. It also tried to reduce the effects of illegality and of ‘work while injured’ by giving the interviewers license to explain to the respondents what was meant and that confidentiality would be maintained rather than limiting themselves to only reading the questions.

3.2 Musculoskeletal strain and injury

The work of the child brick workers involves repeatedly (and often rapidly) lifting, carrying and putting down a substantial load, carrying the load in their arms or on their heads (as well as sometimes in wheelbarrows or on donkeys), working in a squatted or bent position, and doing so in an environment which may, not infrequently, be extremely hot or cold, dry or wet. Even very young children (e.g. from age 3 on) may roll, push or pull bricks whose individual weight is 1-2 kilos. Given this, it would seem that musculoskeletal disorders (MSDs) would be a likely health complaint given that the risk factors that are frequently cited in connection with MSDs are: “rapid work pace; repetitive motion; insufficient recovery time; heavy lifting and forceful manual exertions; non-neutral body postures (either dynamic or static); ... local or whole-body exposure to cold; and any of these in combination with each other or with undesirable features of the psychosocial work environment like high demands and low degree of control over one’s own work”⁴⁶ as well as direct pressure on the soft tissues of the body and static hold of long duration.⁴⁷ MSDs are problems associated with the bones, muscles, tendons, joints, nerves, ligaments, cartilage, and other supporting structures of the body⁴⁸ and usually evidenced by pain, tingling or numbness.

Epidemiological research has determined that “MSDs are the single largest category of work-related illness, representing a third or more of all registered occupational diseases in the United States, the Nordic countries, and Japan.”⁴⁹ Great caution is required when comparing the types and rates of occupation-related MSD of adults with that of children, or comparing child rates of MSD from countries where many injuries are due to sports (as in a German study of 2368 school-attending adolescents which found that 62.4% were suffering from musculoskeletal pain, much of which was sports-related)⁵⁰ with those where children work, either in the home or outside.

⁴⁶ Punnett, L. and Wegman, D.H. (2004), “Work-related musculoskeletal disorders: the epidemiologic evidence and the debate,” *Journal of Electromyography and Kinesiology* 14, pgs 13–23.

⁴⁷ Waters, T., “Preventing Work-related Musculoskeletal Disorders for Youth Working on Farms” in Lueder R and Berg Rice V (2008) *Ergonomics for Children*, Taylor & Francis, NY.

⁴⁸ NIOSH (1997).

⁴⁹ Ibid. p. 13.

⁵⁰ Spahn, G., Schiele, Langlotz, A., Jung, R. (2004). “Prevalence of functional pain of the back, the hip and the knee in adolescents. Results of a cross-sectional study” in *Dtsch Med Wochenschr.* Oct 22;129 (43):2285-90. [Article in German].

Many assume that it is primarily very young children who are at greatest risk because their muscles are weak and their bones are still soft, yet a substantial body of research shows that it is the high growth periods following the onset of puberty which are of particular concern due to the rapid gain in size and weight which is occurring. “Children gain 50% of their adult weight, 15% of the stature, and 45% of their skeletal mass in adolescence.”⁵¹ In early and middle adolescence, the bones, particularly the growth plates, and spine are weak and vulnerable because they are lengthening without adding mass; it is not until late adolescence when growth slows that the spine adds mass.⁵² Similarly, tendons, ligaments, and muscles are still developing. The implications are obvious: even a child in mid to late teens risks damage if s/he carries more weight than the spine can bear or undertakes tasks that involve repeated pounding – even if the traumatic forces are small – as it can injure the fragile growth plates on the bones. Based on the evidence, one review concluded: “injuries may be more severe than they appear; injuries may be quite different than they seem; injuries may have greater consequence than may immediately be apparent; and pain may indicate abnormalities rather than injuries.”⁵³

For studies of MSD involving working children, a premier one due to the size of the sample and rigour of the analysis, was conducted in Brazil (Fassa, et al.). This study of musculoskeletal pain, involving over 3,000 working children and controls from a low-income area, found that two-thirds of the child workers experienced pain and those working in manufacturing and as domestic servants had significantly higher rates of pain than nonworking children; 41.8% of this pain was back pain and 41.5% of those experiencing pain had limitations as a result of the pain. The study recognized that contextual (family situation) and physical factors (height, weight, etc.) could be a factor but was unable to explore the degree due to the nature of the survey.⁵⁴

A study of construction apprentices found that symptoms of MSD start early in a young person’s career, and have a deleterious effect for years to come.⁵⁵ The respondents identified ‘working in the same position for long periods’, ‘bending or twisting the back awkwardly’, and ‘working in an awkward or cramped position’ as the three top contributing factors to their back pain. A Danish study of adolescents age 13-16 found that 59% had experienced back pain at some time, 51% within the last year. Unlike most child MSD studies, this one examines work as a possible factor, and indeed finds that heavy work, along with gender (female), daily smoking, and intensive sports are positively associated with severe recurrent or continuous back pain.⁵⁶

⁵¹ Spear, B.A. (2002). “Adolescent growth and development” in *J. Am. Diet. Assoc.*, March, pg 22-29.

⁵² Leuder, R. and Berg Rice, V. (2008). *Ergonomics for Children*, p. 194.

⁵³ Ibid, p.202.

⁵⁴ Fassa, A.G., Facchini, L.A., Dall’Agnol, M.M. and Christiani, D.C. (2005). Child labour and musculoskeletal disorders: the Pelotas (Brazil) epidemiologic survey, *Public Health Reports*, 120 pp 665-573.

⁵⁵ Merlino, L.A. et al. (2003). “Symptoms of musculoskeletal disorders among apprentice construction workers”, in *Applied Occupational and Environmental Hygiene*, Vol. 18, No. 1, pp. 57–64.

⁵⁶ Harreby, M., Nygaard, B., Jessen, T., Larsen, E., Storr-Paulsen, A., Lindahl, A. (1999). “Risk factors for low back pain in a cohort of 1389 Danish school children” *Eur Spine J.* 8(6), 439-443.

For studies of adult MSD specific to brick work, one particularly relevant and stringent study conducted with adult women brick kiln workers in India found a high level of self-reported pain, most commonly in the lower back (90%), neck (72%) and wrist (62%). It reported that “72% of workers had a pain of >20 in the pain scale,” likely due to compression of spinal nerves from repeatedly lifting bricks over and above the Recommended Weight Limit, and was expressed in terms of reduced grip strength. There was an association between the pain and absenteeism (average of 4.5 days per month).⁵⁷ Another study of brick factory workers focused on outcomes associated with molding the bricks (in which many children are engaged in most areas) and found that the high rate of repetitive movement (13 s cycle time), poor standing posture, undesirable wrist positions, and significant force loadings, was associated with problems in both the upper limbs and back. Another brick study looked particularly at the tasks involved in placing and stacking the bricks, finding that “the high prevalence of occupational locomotor and peripheral nervous diseases among the workers” was related to the physical strain involved.⁵⁸ A third study of brick workers in southern India, which also used the Modified Nordic Questionnaire, found that a majority of workers (87%, $n = 269$) were currently experiencing pain, the most common being chronic low back ache (1 year prevalence -59%) and acute (1 week prevalence-33%) followed by chronic knee pain. More than 10 years of work was significantly associated ($P < 0.05$) with acute lower back pain and acute and chronic knee pain. Severity of the pain was also significantly (t statistic 2.476, $P < 0.05$) associated with job dissatisfaction.”⁵⁹

The literature emphasizes the fact that MSDs are frequently multi-factorial, where stress on the musculo-skeletal system may arise from several sources (tasks, conditions and positions), all of which can interact and compound each other. In this respect, it is no different for children than for adults. What is different is that child workers are likely to endure a longer period of exposure and to suffer permanent malformation as a result of the stress occurring while the bones and musculature have not yet fully developed. In addition, psychosocial factors have been shown to be associated with different types of musculo-skeletal pain in adults, with low decision-making authority (as would be common in the case of child workers) being predictive of total musculo-skeletal pain as well as specifically low back pain and neck pain. This suggests that psycho-social factors need to be considered in assessing MSD.⁶⁰ In addition, there has been a call for more research to be done on the MSD implications for the specific types of work activities that young people routinely engage in as well as setting age-appropriate limits so that MSD can be reduced or prevented.⁶¹ Lee et al. (2005) also reported the prevalence of musculoskeletal disorders (over one year) arising

⁵⁷ Chauduri, S.S.R., Biswas, C. (2012). “A Subjective and Objective Analysis of Pain among Female Brick Kiln Workers in West Bengal, India”, *International J. of Occ Safety & Health*, Vol2, No.2, pps. 38-43.

⁵⁸ Boikov, I.V. (1992). “Effect of working conditions on health status of employees in the clay brick industry” *Meditsina truda i promyshlennaia ekologiia* 02 (11-12):22-4.

⁵⁹ Inbaraj, L.R., Haebbar, O.J., Saj, F., Dawson, S., Paul, P., Prabhakar, A.P., Mohan, V.R., Alex, R.G. Prevalence of musculoskeletal disorders among brick kiln workers in rural Southern India. *Indian J Occup Environ Med* 2013;17:71-5.

⁶⁰ Torp, S., Riise, T. and Moen, D.E. (2001). “The Impact of “Psychosocial Work Factors on Musculoskeletal Pain: A Prospective Study” *J Occup Environ Med*. 2001 Feb; 43(2):120-6.

⁶¹ Miller, M.E. (2008). “Ergonomics and Young Workers: A Case for Recommendations to Reduce Workplace Musculoskeletal Injuries” (unpublished manuscript).

from strenuous working environments. Overall the prevalence of neck (14.8%), shoulder (16.6%), and hand (12.4%) disorders were higher than those of the upper back (7.1%) and elbow (8.3%) among those who sought medical treatment due to the complaint. Workers in construction and agriculture-related industries showed a higher prevalence of upper extremity disorders. After adjusting for confounding variables, job content, physical working condition, a harmonious interpersonal relationship at the workplace and organizational problems were found to be significant determinants of upper extremity disorders in manufacturing and service industries.

The choice of an appropriate method for measuring work-related MSDs for child brick workers was informed by the debate over whether it is better to use self-reported symptoms or clinical examination, as well as the concern that pain may be experienced and expressed differently by different cultures or age groups. In that “self-reported ergonomic exposures, in general, appear to be adequate for many epidemiologic purposes”⁶² this study chose to use a recognized instrument (the Standardized Nordic questionnaire)⁶³ accompanied by a drawing of a human figure to show the location of pain, and to couple this with observation of the tasks the children were carrying out, differentiated by age, sex, duration, etc. Studies show that age is not necessarily the best variable for comparison as children vary so much; instead, they suggest that a better predictor may be an assessment of a child’s sexual maturity. A study in boys indicates, for example, that the peak growth period with its corresponding high output of energy and high demand for nutrient intake is associated with a “faint but noticeable mustache at the corners of the lip.”⁶⁴

Although the literature does not seem to comment on this fact, there is wide variability in the reported percentages of younger and older children suffering low back pain. This disparity begs the question as to whether confounding factors such as activity levels may be playing a larger role than assumed, or that standardized tools are not being used for assessing pain.

Another factor to consider in analysis is that the high levels of low back pain that are being reported by working children must be analyzed in light of the rather high levels found among non-working children. Joint pain, on the other hand, is not normal, and may be a useful indicator.⁶⁵ There has been quite some discussion in the literature of children’s experience and expression of pain. Location of pain, for example, may not be precise in children as it is often referred (hip pain signifying back problems).

⁶² Rosecrance, J.C.; Ketchen, K.J.; Merlino, L.A.; Anton, D.C.; Cook, T.M. (2002). “Test-Retest Reliability of a Self-Administered Musculoskeletal Symptoms and Job Factors Questionnaire Used in Ergonomics Research’ *Appl Occup Environ Hyg* 17(9):613–621.

⁶³ Kuorinka, I., Jonsson, B., Kilbom, A., Vinterberg, H., Biering-Sorensen, F., Andersson, G., Jorgensen, K. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. *Appl Ergon.*1987;18:233–7. [PubMed].

⁶⁴ Spear. (2002). “Adolescent growth and development” in *J. Am. Diet. Assoc.*, March, pg 22-29.

⁶⁵ Bass and Bruce (2000).

3.3 Respiratory disease

Air-borne dust is common in brick manufacturing sites and is associated with a number of pulmonary and systemic illnesses (pneumoconioses). Numerous studies have observed that “production of brick results in environmental degradation due to emissions of significant quantities of particulates and gaseous pollutants. Dust was the major air pollution problem in the study area released from brick kiln activity.”⁶⁶

While there appear to be no studies of children’s occupational exposures to dusts, there are many for non-occupational exposures. A WHO report (2006)⁶⁷ states: “... *new data and methodologies have emerged, indicating that children are a vulnerable population subgroup with special susceptibilities and unique exposures to environmental factors that have important implications for public health practices and risk assessment approaches....*”. A 2007 report from Australia⁶⁸ explained this vulnerability in that “*children inhale and retain larger amounts of air pollutants than adults, have developing immune systems and therefore cannot detoxify and excrete toxins as well as do adults.*” Existing occupational standards are thus hardly relevant where children are concerned in part because of this increased vulnerability but also because the assumptions upon which the standards are based, e.g. 40 hour work week, work beginning at age 20, are at variance with patterns in developing country contexts.

While we have no studies on child brick workers, there have been studies of the impacts of brick kiln work on the pulmonary capacity of adult workers. A small cross-sectional study (31 subjects, 32 controls) found a significant correlation between oxidative stress parameters and pulmonary dysfunction, which they attributed to the silica content in the soil being used for bricks.⁶⁹ Another, from Vietnam, demonstrates how length of exposure – which increases when a person starts work as a child rather than as an adult – affects pneumoconioses. “Pneumoconiosis prevalence increased from 0% in workers employed < 10 years at the plant to 18% for workers employed > 20 years (trend test P = 0.01 for each year increment after adjusting for gender and tobacco use).”⁷⁰ While lung cancer has also been demonstrated at elevated levels in brick kiln workers, another adult study reminds us that “high prevalences were noted for upper respiratory tract symptoms (e.g., dry throat,

⁶⁶ Bhanarkar, A.B., Gajghate, D.G., Hasan, M.Z. “Assessment of Air Pollution from Small-Scale Industry”, [Environ Monit Assess.](#) 2002 Dec;80(2):125-33.

⁶⁷ WHO (GOHNET). *The Global Occupational Health Network*. (2007) WHO Issue 12.

⁶⁸ Dept of Environment and Heritage (DEH). (2007). Technical Report No7: Air quality and child health - Current evidence and priorities for Australia, Commonwealth of Australia (quoted in Bridge, I. 2009).

⁶⁹ Kaushik, R., Khaliq, F., Subramanayaan, M., Ahmed, R.S. (2012). “Pulmonary dysfunctions, oxidative stress and DNA damage in brick kiln workers.” [Hum Exp Toxicol](#). 2012 Nov; 31(11):1083-91.

⁷⁰ Vien Chinh Chien, Sanders, K.C., Doan, N.H., Takaro, T., Checkoway, H., Keifer, M., Phan Hong Son, Le Van Trung, Barnhart, S. “Pneumoconiosis Among Workers in a Vietnamese Refractory Brick Facility”, *American Journal of Industrial Medicine* 42:397–402 (2002).

eye irritation, throat irritation) and observed a “significant effect between exposure and FVC.”⁷¹

It was suspected at the outset of the study that the soil being used for bricks at some of the study sites was likely to contain crystalline silica. The standards for ambient air quality recommended by the World Health Organization (WHO) note the fact that children and other vulnerable groups have a heightened risk of silicosis.⁷² Onset of silicosis can be affected by both the intensity and the duration of exposure⁷³ (as well as characteristics of the particles themselves.) While chronic silicosis is mainly the result of long term exposure; accelerated silicosis can develop after five to ten years exposure; and acute silicosis can occur very rapidly (from a few months to less than five years) following significant exposure.⁷⁴ Children can have over a decade of exposure before they reach age 18 if their worklife starts at five. In addition, “...some data suggest that subjects without silicosis but with long exposures to silica dust have an excess risk of developing tuberculosis compared with the non-exposed population...”⁷⁵

Silicosis is one of the “silent” risks to child workers because symptoms may not emerge until much later in life, such that families do not associate it with the children’s work. It is particularly insidious because it can appear and progress even after the exposure has ceased and there is no possibility of regression. There is research evidence that the risk of silicosis can be increased by smoking and it would seem likely, as well, that the risk would be further compounded by exposure to smoke and fumes from the kilns, exposure to cold and wind at the kiln sites, and living conditions that foster and transmit infectious disease (e.g. many people sharing the same small living space, having inadequate clothing and bedding).

What this study did not adequately take into account in selecting control groups was that the communities from which control groups were drawn were living immediately adjacent to peak sites and so were probably exposed (although to a lesser extent than the working children) to dust and to elevated concentrations of respirable crystalline silica if it existed in the dust. A study conducted in Nepal found that “the health status of the school children attending the school close to the vicinity of the brick kilns was worse compared to the

⁷¹ Zuskin, E., Mustajbegovic, J., Schachter, E.N., Kern, J., Doko-Jelinic, J., Godnic-Cvar, J. “Respiratory findings in workers employed in the brick-manufacturing industry” *Journal of Occupational & Environmental Medicine*: September 1998 - Volume 40 - Issue 9 - pp 814-820.

⁷² Bridge, Ian. (2009). “Crystalline Silica: A review of the dose response relationship and environmental risk,” *Air Quality and Climate Change 2009 vol 43 [1] pp17-23 1*.

⁷³ Silicosis can arise from long duration exposures at low concentrations (either as simple chronic silicosis or complicated chronic silicosis), from shorter exposure at higher concentrations (accelerated silicosis) and as acute silicosis (very short duration exposure to very high concentration). (National Institute for Occupational Safety and Health (NIOSH) 2002, Health Effects of Occupational exposure to respirable crystalline silica. Dept Health & Human Services.

⁷⁴ Republic of South Africa Department of Labour (RSA). (2006). Silica Exposure and its effect on the physiology of workers.

⁷⁵ American Thoracic Society (ATS). (1997). Adverse effects of crystalline silica exposure. *American Journal of Respiratory and Critical Care Medicine*, 155 pp 761 – 765.

students attending the school away from the brick kilns.”⁷⁶ This could account for the study finding less variability between the study and control groups in respiratory disease than was expected, for example, in the case of Nepal. The study was also unable to consider other potential health effects that can be associated with exposure to crystalline silica such as tuberculosis due to the fact that testing would require medical personnel to administer the test and a repeat visit to read the results.

3.4 Stunting

Adolescence is a period of intense physical and mental growth. During this time, 20% of final adult height and 50% of adult weight are attained.⁷⁷ Lower than average height and body mass index (BMI) can be indicators of poor health and inadequate nutrition. It would seem likely that strenuous work would have a negative influence on growth or BMI given the increased caloric requirements. A study among child porters in Nepal, (Doocy, 2007) showed indeed that the child porters had a significantly lower body mass index and higher rates of anemia than the control group, along with numerous negative nutrition and behavioural issues (e.g. alcohol use). In general, however, the child labour research has not been able to consistently demonstrate a relationship between nutrition and work. There are several possible reasons for this. One is the ‘healthy worker effect’ where a family selects the child who is most robust to engage in work, and/or ensures that the working child is fed as well as possible. Another is that the child’s earnings may enable her/him to eat better or, in the case of restaurant work for example, there is food available as part of the work. Finally, it is difficult to distinguish whether reduced height and BMI is due to work or poverty. Studies which have looked for a possible correlation between children’s work and body size -- Graitcer and Lerer (2000-Egypt) and Nuwayhid (2005- Lebanon) which focused on child workers in small urban enterprises, Ambadekar et al (1999-India) and Hawamdeh and Spencer (2003-Jordan) which studied children from a variety of occupations, and Yamanaka and Ashworth (2002-Nepal) which looked at agricultural work--were all unable to find significant differences between working and non-working children in terms of height or weight and no consistent difference in caloric intake. In some cases, simple comparisons between sample means showed a negative effect of work on height and/or weight, sometimes for a specific age, but either there were no controls for other factors (e.g. parental size) or the differences were of borderline statistical significance.⁷⁸

Nevertheless, there continue to be anecdotal reports that children working in brick kilns tend to be smaller than their non-working counterparts and at least one study which conducted clinical tests of child workers in brick kilns (Kishk et al. 2004) in a small village in Egypt, showed stunting. Although this was not a controlled study, it suggests that stunting may be a result of brick kiln work in certain circumstances. In that height and weight measurements are comparatively easy to perform, and easy to perform correctly in the

⁷⁶ Joshi SK, Dudani I. (2008). “Environmental health effects of brick kilns in Kathmandu valley”, *Kathmandu University Medical Journal* (2008), Vol. 6, No. 1, Issue 21, 3-11.

⁷⁷ DiMeglio, G. Nutrition in adolescence. *Pediatr Rev.* 2000 Jan;21(1):32-33.

⁷⁸ Dorman. (2008).

context of survey research, it was decided to include these tests for both working children and controls in the current study.

3.5 Psychological effects

The effect of work on children's psychological functioning was officially raised as an issue by the World Health Organization (WHO) in 1972 in a special report which noted that rapid technological changes, particularly mechanization in developing countries, were having an adverse effect on child workers' psychosocial health.⁷⁹ The 1984 meeting of the Joint ILO/WHO Committee on Occupational Health raised the issue again and initiated a series of descriptive studies of psychological factors associated with child work in four occupational sectors: domestic services,⁸⁰ agriculture,⁸¹ street-based trades, and factory work. The latter, which has similarities with brick factories, was described as creating a great deal of stress for the child worker. "Long hours and days of uninterrupted work have a stultifying effect on the child, narrowing his horizons and often crippling him emotionally. Since a child working full time with potentially dangerous machines cannot afford to imagine or fantasize, as most children do, the child's creativity and ability to transcend reality are blunted and his whole mental world becomes impoverished as a result."⁸²

A number of seminal works on child labour subsequently called for more attention to be drawn to the issue,⁸³ but the little which was done in the decades prior to 2000 focused largely on the relatively small proportion of child workers engaged in armed conflict or sex-related occupations, and was concerned more with addressing the problem than diagnosing it.^{84 85 86 87}

⁷⁹ World Health Organization. (1987). *Children at work: Special Health Risks*. Report of a WHO Study Group, Geneva.

⁸⁰ Onyango P and Kayongo-Male, D. (1982). *Psychological effects of child labour*, University of Nairobi, Nairobi.

⁸¹ Taylor, R.B. (1973). *Sweatshops in the sun: child labour on the farm*. Beacon Press, Boston.

⁸² Mendelievich, E. (1979). *Children at Work*. International Labour Office, Geneva.

⁸³ Forssman, S. and Coppee, G.H. (1973). *Occupational Health Problems of Young Workers*, Occupational Safety and Health Series, No. 26, International Labour Office, Geneva; Greenberger E and Steinberg L (1986) *When Teenagers work: The psychological and social costs of adolescent employment*, Basic Books, New York; Forastieri, V. (1997). *Children at work: health and safety risks*, International Labour Organization, Geneva.

⁸⁴ Zimmerman, C., Hossain, M., Yun, K., Roche, B., Morison, L. and Watts, C. (2006). *Stolen Smiles: A summary report on the physical and psychological health consequences of women and adolescents trafficked in Europe*, London School of Hygiene & Tropical Medicine, London.

⁸⁵ Tanzania Media Women's Association (TAMWA). (2004). *A Report on the Assessment of Child Sexual Abuse and Exploitation*, (unpublished paper) Dar es Salaam.

⁸⁶ Betancourt, T.S. and Khan, K.T. (2008). "The mental health of children affected by armed conflict: protective processes and pathways to resilience." *International Review of Psychiatry*; Betancourt, T.S. and Williams, T., (2008). "Building an evidence base on mental health interventions for children affected by armed conflict", War Trauma Foundation; Betancourt, T.S. et al. (2008). "Psychosocial adjustment and social reintegration of children associated with armed forces and armed groups: the state of the field and future directions" *Psychology Beyond Borders* (accessed at: <http://psychologybeyondborders.com/Publications.aspx>).

⁸⁷ Wessels, M. (2008). "Do No Harm: Challenges in Organizing Psychosocial Support to Displaced People in Emergency Settings", *Refuge* 25(1) pp. 6-14.

One reason that routine child labour studies (e.g. project assessments, baselines, evaluations) may have been hesitant to include psychosocial health is because the drafters did not feel they had the tools to measure it, interpret it, or act on the results. To address this, the joint UNICEF, ILO, and World Bank *Understanding Child Work* programme commissioned Martin Woodhead in 2003, to prepare a theoretical paper that would help to guide and stimulate more work.⁸⁸ Dr. Woodhead has been the leading thinker on this issue and his work has encouraged a growing number of specialized field studies in low and medium income countries which have investigated the impact of intimidation, isolation, violence, lack of stimulation and harassment on children's psychosocial development. These include the following:

- *Ethiopia.* A study of public perceptions of child labour, which found that beating, neglect and emotional abuse were viewed as the most frequently occurring types of abuse in child labour,⁸⁹ and led to an in-depth study of 1,000 randomly selected children, aged 5-15, of whom 528 were domestics, street-workers and private enterprise workers and 472 were controls. Over twice as many child labourers as controls exhibited anxiety disorders.⁹⁰
- *Bangladesh.* A study of 900 children who were working over 4 hours a day (within a larger study sample of 4,643 village children, aged 5-15) which found that 12 per cent had experienced being beaten at work.⁹¹
- *Jordan.* In a study of 103 boys, aged 11-16 years, working as mechanics, 61% reported physical abuse and 27% reported sexual abuse.⁹²
- *Nepal.* A study of 249 child porters (aged 5 to 14 years) which confirmed that they were at increased risk of sexual assault, general emotional distress, and early consumption of alcohol when compared to a group of 262 controls.⁹³
- *Brazil.* A cross-sectional study of 3,139 children and adolescents from poor areas of the city of Pelotas which determined that behavioural problems were particularly associated with starting work at an early age.⁹⁴
- *Philippines.* A small study of child scavengers, aged 7 to 15 years, which demonstrated that the work was having a measureable effect on the children's

⁸⁸ Woodhead, M. (2004). "Psychosocial impacts of child work: a framework for research, monitoring and intervention", *Understanding Child Work Working Paper*.

⁸⁹ Fekadu, D. and Alem, A., (2001) "Child labour and emotional disorders in an urban district in Ethiopia: A rapid assessment on community perceptions of child labour" (unpublished paper).

⁹⁰ Fekadu, D., Alem, A., Hagglof, B. (2006). "The prevalence of mental health problems in Ethiopian child laborers", *Journal of Child Psychology and Psychiatry*, 47, pp. 954-959.

⁹¹ Hadi, A. (2000). "Child abuse among working children in rural Bangladesh: Prevalence and determinants", in *Public Health*, 114:380-84 (quoted in Dorman (2008) *Child Labour Education and Health: A Review of the Literature*, Understanding Child Work, Geneva.

⁹² Gharaibeh, M. and Hoeman, S. (2003). "Health Hazards and risks for abuse among child labor in Jordan", *Journal of Pediatric Nursing*, Vol. 18, Issue 2, pp. 140-147.

⁹³ Doocy, S., Crawford, B., Boudreaux, C., Walla, E. (2007). "The Risks and Impacts of Portering on the Well-Being of Children in Nepal", *Journal of Tropical Pediatrics* 2007 53: 165-170.

⁹⁴ Benvegno, L.A., Fassa, A.G., Facchini, L.A., Wegman, D.H. and Dall'Agnol, M.M. (2005). Work and behavioural problems in children and adolescents *Int. J. Epidemiol* 34(6):1417 – 1424.

intellectual development. Evaluated using a battery of psychosocial assessment tests especially validated for marginalized children (e.g. child prostitutes), the results showed that while dexterity and social intelligence were shown to be similar for the two groups, the intellectual functioning of the child scavengers showed a progressive decline with age compared to the control group. The decline started at the age of 7 with the difference becoming most marked in those aged 11 to 13 years, not coincidentally the age when most child scavengers dropped out of school.⁹⁵

Following a review of these and other health-related studies on child labour, Dorman concludes that: “enough is known at this point to indicate that child labour could interfere with the process of psychological and social development.”⁹⁶

For those areas where research on child workers’ psycho-social functioning and development is still very inadequate, one must turn to general child psychology, child development or adult occupational psychology. Despite the fact that they do not address child labour per se, they can suggest lines of inquiry.

Stress is one such area. Some relevant material is emerging from those studies of adult occupational health being conducted in the U.S. and Europe⁹⁷ which cover young workers in the age group 15-18.⁹⁸ Although still very limited, studies indicate that work intensity (i.e. the number of work hours per day) and late night work by children have an impact on both their physical health, due to exhaustion and sleep deprivation, and on their psychosocial health.^{99 100} There is also a demonstrable effect of child labour on intellectual development. Studies have shown that, with increased work hours, there is a decrease in school achievement, increased school drop-out rates, and disruption of family relationships.¹⁰¹ Adult studies also show that when high work demands are combined with low decision latitude (as is frequently the case in children’s work), this can generate a very high degree of work stress.¹⁰² Besides lack of opportunity to influence their situation, low job control includes lack of chances to learn new skills and the possibility of a different future that these skills might bring.

⁹⁵ Torres, E.B., Subida, R.D. and Rabuco, L.B. (1991). “The profile of child scavengers in Smokey Mountain, Balut, Tondo, Manila”. *University of Philippines, College of Public Health Working Paper*. Manila. Also, Gunn, S.E. (1992). “Helping the hard ones” ILO-IPEC, Geneva.

⁹⁶ Dorman, P. (2008). *Child Labour Education and Health: A Review of the Literature*, Understanding Child Work, Geneva, p.44.

⁹⁷ EU OSHA, (2012). *Management of Psychosocial Risks at Work: An analysis of the findings of the European Survey of Enterprises on the New and Emerging Forms of Risk*. Bilbao.

⁹⁸ Copsey, S. (2009). *Preventing Risks to young workers: Policy, programmes and workplace practices*, European Agency for Safety and Health at Work, Working Environment Information, Luxembourg.

⁹⁹ Carskadon, M. (1990a). “Patterns of sleep and sleepiness in adolescents”. *Pediatrician*, 17, 5-12.

¹⁰⁰ Dornbusch, S.M. (2004). “Sleep and adolescence: A social psychologist’s perspective” in Carskadon MA, ed. *Adolescent sleep patterns: Biological, social, and psychological influences*. Cambridge University Press, Cambridge, UK, pp. 1-3.

¹⁰¹ National Research Council. (1998). *Protecting Youth at Work: Health, Safety, and Development of Working Children and Adolescents in the United States*. Institute of Medicine, National Academy Press, Washington, DC.

¹⁰² See Karasek’s Demand/Control Model in <http://www.ilo.org/oshenc/part-v/psychosocial-and-organizational-factors/theories-of-job-stress/item/12-psychosocial-factors-stress-and-health>.

An important area that is still not being researched at present is the psychosocial health impacts of injuries incurred by children at work.

Studies have also underscored the importance of certain factors, e.g. “resilience”, which seems to have a protective effect on some children. Resilience is often linked to early support and close ties with family and peer group.¹⁰³ This and other potentially protective factors deserve much more attention. Although they do not negate psychosocial or developmental risks, they help mitigate their impact and facilitate development of intervention strategies.

An entirely different area that has implications for child labour is that of brain function. New research is showing that while infancy is indeed a critical period, the development of neural pathways and of “executive function” skills continues into young adulthood, with a period of rapid increase in the ages 14-19.¹⁰⁴ Executive function, seated in the prefrontal cortex, involves the ability to retain and use new information, focus attention, control impulses, and be mentally flexible, and creates the “scaffolding” upon which adult decision-making rests. Its development can be hindered by prolonged and toxic stress, exposure to violence and uncertainty, and in that the brain regions and circuits associated with executive functioning have extensive interconnections with deeper brain structures, can contribute to disruption of the development of other organ systems and lifelong impairments in mental and physical health, including heart disease.¹⁰⁵ On the other hand, a web of supportive relationships within and outside the family, and attentive individual coaching helps to strengthen these executive skills. Thus, the degree to which brick kiln work itself or the lifestyle of brick kiln families facilitates the development of close relationships or, alternatively, generates fear, worry and insecurity will determine whether the result for adult functioning is positive or negative -- but what is clear is that, even in an adolescent child worker, the work is indeed having a psychological and developmental effect.

3.6 Other health effects

Chemicals are an important consideration in brick kiln work, either because of their presence or their absence. A grim picture is emerging from current studies on chemical exposures that is, as yet, poorly communicated to the public and poorly regulated by policymakers. For a child, toxic substances have the capacity to disrupt the proper development of all organ systems but particularly that of the brain. “The striking finding from extensive research on neurotoxins is the magnitude of devastation and lifelong impacts they can have on human brain development”¹⁰⁶ when exposure occurs in childhood. There are two main sources of potentially toxic substances for child brick workers – the soil and the air. Both not

¹⁰³ Caffo, E., Belaise, C. (2003). “Psychological aspects of traumatic injury in children and adolescents”. *Child Adolesc Psychiatr Clin N Am.* Jul;12(3):493-535.

¹⁰⁴ Center on the Developing Child. (2011). *Building the brain’s “Air Traffic Control” System: How early experiences shape the development of executive function.*

¹⁰⁵ Shonkoff, Jack. (2011). *The Biology of Adversity and the Roots of Lifelong Impairments in Learning, Behaviour, and Health*, U.S. Government Evidence Summit on Protecting Children Outside of Family Care.

¹⁰⁶ National Scientific Council on the Developing Child. (2006). *Early Exposure to Toxic Substances Damages Brain Architecture*, Working Paper #4.

infrequently contain heavy metals or metalloids such as lead, mercury and arsenic. But in addition to these naturally-occurring neurotoxins, thousands of new chemical substances are appearing on the market as additives to other products such as oil and plastics which are burned as fuel in the kilns. For the heavy metals, the effects on children's brain development is known (disrupting neurotransmitters, inhibiting creation of synapses and neurons), but not at all for the latter as only an estimated 7% are studied prior to being released for sale.¹⁰⁷

The absence of certain elements can also have a negative effect. Iron requirements escalate rapidly during adolescence because of an expansion in hemoglobin and muscle mass and, in girls, menarche.¹⁰⁸ Consequently, children and youth in the age range 13-19 are especially vulnerable to anemia. Research in the United States has shown that an adolescent girl is 10 times more likely to develop anemia than a boy.¹⁰⁹ While for girls, this higher risk extends throughout their adolescent and childbearing years due to menstruation, boys are at risk principally during their adolescent growth spurt. As the highest percentage of brick kiln workers are in their teen years, anemia needs to be taken into consideration as a possible health threat.

In addition, the risk factors for anemia include infrequent consumption of meat, which is typical in lower-income families, strenuous activity, which is inherent in some of the brick manufacturing tasks and bacterial and parasitic infections which are common in areas with only rudimentary or non-existent latrines as is the case in virtually all of the brick kiln communities. A study of a brick-making community showed an extremely high prevalence rate of parasitic infection which was associated with two factors: their current hygiene and living conditions, and the fact they were migrants from areas where these parasites were abundant.¹¹⁰ Both of these conditions obtain in the brick kiln communities under study.

Another factor increasing the likelihood of anemia is the fact that iron absorption is known to be inhibited by consumption of black tea – a common beverage in the countries in this study. In fact, it has been shown to inhibit 79-94% of non-haemic iron in a bread meal.¹¹¹

Anemia is of particular concern because of the effect it can have on learning and development. Studies have shown that adolescents with anemia have decreased verbal learning, memory, and computational skills.¹¹² Even before anemia might develop, iron

¹⁰⁷ Ibid.

¹⁰⁸ Pasricha, S-R., Drakesmith, H., Black, J. Hipgrave, D., Biggs, B-A. (2009). Control of iron deficiency anemia in low- and middle-income countries, *Blood* April 4, 2013 vol. 121 no. 14, p. 2607-2617.

¹⁰⁹ Centers for Disease Control and Prevention. Recommendations to Prevent and Control Iron Deficiency in the United States. *MWR* 1998; 47(No. RR-3):25.

¹¹⁰ Pezzani, B.C., Minvielle, M.C., De Luca, M.M., Radman, N., Iacoy, P., Basualdo Farjat, J.A. (1996).

¹¹¹ Hurrell, R.F., Reddy, M., Cook, J.D. "Inhibition of non-haem iron absorption in man by polyphenolic-containing beverages. *Br J Nutr.* 1999 Apr; 81(4):289-95.

¹¹² Alton, I. Iron Deficiency Anemia. In: Stang M, Story M, eds. *Guidelines for Adolescent Nutrition Services*. Minneapolis, MN: Center for Leadership, Education and Training in Maternal and Child Nutrition, Division of Epidemiology and Community Health, School of Public Health, University of Minnesota; 2005:101-08.

deficiency can cause shortened attention span, alertness, and learning in adolescents.¹¹³ In short, elevated levels of iron deficiency anemia can have a long-term negative effect on the ability of young brick workers to be physically and mentally able to escape from this industry.

In this study, the four countries were encouraged to conduct a hemoglobin test on all subjects and controls, using a Haemocue 201® to identify anemia. This was not required, as it was an invasive procedure that required experienced personnel and specialized equipment and because it involved blood, which might be of cultural concern. Not surprisingly, Afghanistan elected to not conduct the test, whereas the three other countries did so.

3.7 Social and cultural factors

Although brick kiln technology is remarkably similar as far as children's work is concerned, there may be a number of ways that culture mediates who is at risk and how. First among these considerations is gender.

3.7.1 Gender

There is a small literature on the differential effects on men and women of work in a hot dusty environment. A Russian study confirmed that, for women, respiratory conditions were the primary impacts on health but, in addition, that "clinical studies established the correlation between the work conditions and gynecologic morbidity, occurrence of complicated pregnancy and delivery, impaired physical development and health status of newborns and children."¹¹⁴ A more subjective study looking specifically at the situation of female brick kiln workers in India, where half of the workforce is said to be women, confirmed that the women were carrying a double burden of work in the brick factories and family care which made them particularly susceptible to exhaustion. Since they were not paid directly, they had little ability to exert control over their situation.¹¹⁵

Chronic low back pain among female brick workers has been shown in another Indian study¹¹⁶ to be associated with absenteeism and thus reduced productivity, and the level of pain (pain score >20 in 90% of affected individuals) to be associated with accidents (broken bricks are usually to the account of the worker). One of the reasons cited for these higher rates is the weight of and distribution of the loads (Lifting Index is 1.8 vs 1). "Body Mass Index was also found to be lower in the female workers than the control women which makes the job more stressful and adds to the menace of work related musculoskeletal disorders. The impact of WMSD can be felt in that the measured hand grip strength were

¹¹³ Zlotkin, S. Clinical nutrition: 8. The role of nutrition in the prevention of iron deficiency anemia in infants, children and adolescents. CMAJ. 2003 Jan 7;168(1):59-63.

¹¹⁴ Kverenchkhiladze, R.G., Saakadze, V.P. (1993). Working conditions and health status of women employed in clay brick industry (in subtropical climate) Med Tr Prom Ekol. 1993 ; (11-12):16-8.Rekhviashvili VA. [Article in Russian].

¹¹⁵ Singh, D.P. (2005). Women workers in the brick kiln industry in Haryana, India. Indian J of Gender Studies, Vol12, Issue: 1, pps. 83-97, Jan-Apr. 2005.

¹¹⁶ Chauduri, S.S.R., Biswas, C. (2012). "A Subjective and Objective Analysis of Pain among Female Brick Kiln Workers in West Bengal, India" *International J. of Occ Safety & Health*, Vol2, No.2, pps. 38-43.

much lower in female workers than their predicted values which might cause difficulty in load lifting, decreased productivity and even cause accidental slippage.”

Most relevant to the current study is field research carried out at 35 brick kilns in Pakistan to explore the gender dimensions of work through Focus Group Discussion and key informants.¹¹⁷ Like the children, women were engaged in the most labour-intensive and least remunerative aspects of work, which meant that, where they were not part of bonded families (where the family is treated as a unit for payment) they received substantially less than male workers. In this regard, the prevalence of low weight among girls was found to be double that of boys, indicating possibility of poorer health and nutrition status of females in the brick making families. There were some cases of harassment of women which was by the community, owner or by husbands but women were not very vocal about it. An important finding of this study was that “women were generally found to be handicapped due to social restrictions to move about in the community and had to take someone with them for going to markets, religious places and even to visit someone in the neighborhood. Women were found to be reluctant participants in the FDGs even when only females were involved.”

These studies suggest that the health impacts on girls and women may be significantly greater than for males and yet the evidence of these differential rates may be camouflaged in certain countries by their reticence in being involved in studies.

3.7.2 Migrant status

Some interesting sidenotes in the literature on other health topics indicate that migrant brick kiln workers, i.e. migrant status, per se, can be associated with increased risk of illness. A study in India looked at malaria incidence, for example, finding that, while malaria was adequately controlled among the resident populations, the migrant brick kiln workers who lived in makeshift shelters at the brick kilns for the brick-making season and then returned to their place of origin was over 50% and remained uncontrolled. Some of this higher rate is due to the conditions in the temporary encampments where brick workers live and some due to lack of followup treatment, but of particular concern is the finding that malaria prevalence was significantly higher in children under 14.¹¹⁸

3.7.3 Economic factors

The brick industry in many Asian countries is infamous for using bonded labour, a state of chronic indebtedness to a kiln owner or labour contractor which obligates a family to return to the same site year after year and to employ all its members to service the debt. A study carried out in the brick kiln industry in Tamil Nadu, India, explains that “in the interlinked credit-labour market, employers do not directly employ children, but they have implemented a system that constrains parents to use their children to improve their

¹¹⁷ Awan, S.A. (2010). “Gender Dimensions of Bonded Labour in Brick Kilns in Punjab Pakistan: Report of a research and analytical study” (unpublished report).

¹¹⁸ Srivastava, H.C., Chandrashekar Pant, Kurien, G., Sreehari, U., Yadav, R.S. (2011). “Malaria in seasonal migrant population in Southern Gujarat, India.” *Tropical Biomedicine* 28(3): 638–645 (2011).

productivity. In such an environment, parents use child labour to improve their bargaining power.”¹¹⁹

A study of bonded labour in the brick kilns in Afghanistan found that one of the two main reasons that families took out loans was to pay for medical care.¹²⁰

¹¹⁹ Bhukuth, A. (2005). Child Labour and Debt Bondage: A Case Study of Brick Kiln Workers in Southeast India, *Journal of Asian and African Studies* 2005 40:287.

¹²⁰ ILO. (2011). Buried in Bricks: A Rapid Assessment of Bonded Labour in the Brick Kilns in Afghanistan. ILO Kabul.



4. All country results

Are young brick kiln workers more at risk of injury and illness than their non-working peers? Is their emotional and intellectual health and development impaired or strengthened by their work?

To answer these questions, four countries with large and growing brick industries agreed to participate in a cross-sectional study that would speak to policy and practical concerns peculiar to each of the countries but that, collectively, would contribute to our understanding of health impacts associated with undertaking this form of work at an early age. To this end, all four countries used the same research protocol -- a risk assessment, questionnaire-based interviews, focus group discussions, and clinical exams – that had been specially adapted from standard instruments to take into account the unique vulnerabilities of young people to workplace hazards. Sampling was purposive for children working in kilns and the comparison populations. The study focused on five dimensions which previous research had indicated might be relevant to manual brick manufacturing: musculoskeletal disorders, respiratory problems, skin conditions, stunting and emotional problems.

The first part of this chapter reports on the combined four country data with respect to selected indicators within these five dimensions. Where the data permit, bivariate odds ratios were computed to test whether working children were, on the whole, more at risk of a negative health outcome than the controls.

In the second part of the chapter are more detailed tables and analyses of the individual country data. Cross-tabulations comparing working and non-working children were generated for each country. This part demonstrates more clearly the variability occasioned by differences in culture, technology, and environment.

Note on tables and graphs

Although in some respects this resembles a case-control study, it is not appropriate to use the terms “cases” and “controls” for, respectively, the children working in the brick kilns and the comparison group. And it would also not be appropriate to label them “working” and “non-working”, as children in the comparison group are also engaged in economic or non-economic work (household chores) to some degree ... it is just not hazardous work. Therefore for ease of reference, an abbreviation has been used in the tables and graphs: “Brick children” for the study population of children who work in the brick kilns, and “control” for the comparison group.

Column totals may not sum to 100% due to missing responses.

4.1 Analysis

The quantitative data were analyzed using STATA and, in some cases, SPSS software. The data were cleaned and only the “valid cases” were included where respondents gave an

answer to a question. The “missing cases” were removed, i.e. where there was no answer or where the cases were coded as an “interviewer mistake”. Many questions were answered by fewer than the target number of respondents, partly because of the missing cases, but also because some questions were not relevant to the control group.

There are a number of items in the entire protocol (observations, measurements, interviews, FGDs) which were not included by one or another country – the reasons vary but usually had to do with weather or some other environmental constraint that was beyond the capacity of the teams to influence. For this reason, not all data from the four countries can or should be pooled. Nevertheless, it is also important to see the broad outlines and trends, where these exist, that are independent of the specific political or cultural context of a single country in that artisanal brick making is a remarkably uniform technology in most of the countries where it occurs.

Descriptive statistics were reported as percentages; the Pearson’s chi-squared test and Fisher’s exact test were used to calculate the statistical significance of differences between groups. The chi-square test evaluates the probability of independence of the distribution of data across categorical groups and can be used to evaluate whether a null hypothesis is true. This probability is noted “p” and is fixed at 5% ($p=0.05$). In the few cases where a higher probability threshold was used, this value is noted.

For injury outcomes (minor injury in the last month, serious injury in the last year, and “very serious injury” ever), country data were stratified and analyzed separately. For Pakistan, analyses excluded Sindh and KPK due to the lack of comparison subjects from these regions. Modified Poisson regression with robust standard errors was used to estimate the relative risk of each injury type among brick children compared to the control group. Unadjusted analyses including only the exposure (brick or control group) and outcome (self-reported injury). Adjusted analyses controlled for age and sex. Estimate results from these regression models should be interpreted as the risk of self-reported injury among brick children compared to comparison children of the same age and sex. Additional analyses evaluating the relationship between injury risk (1-month recall horizon) and self-reported fatigue or exhaustion and decreased sleep duration were conducted.

The psychological data were subjected to a more strenuous analysis. Three of the countries (Afghanistan, Nepal, and Pakistan) carried out a factor analyses of their own psychological data to construct scales, for example, of psychological distress, exposure to violence, social support and social integration. These results are reported in the psychosocial summary tables below. The pooled data were then analyzed. They were first subjected to a Principle Component Analysis (PCA) which yielded twelve factors using Varimax rotation (Kaiser’s system of normalization). A general assessment of feasibility was conducted for each country, seeking the best Cronbach’s alpha to measure the internal coherence of the instrument. The Cronbach’s alpha on all children showed that the 38 items of the psychosocial portion of the questionnaire had a high internal consistency (.808) thus showing that it was coherent and fully capable of measuring the psychosocial well-being of children in this part of the world, particularly those who work. Of the original twelve factors, the six which had the highest level of coherence scales were selected for further analysis;

these were: stress, maltreatment, self-esteem, security, supervision, and emotional wellbeing. Three of these pertained to all children; three were relevant only to the working children. Some worked better in some countries than others. An Anova test was then undertaken which compared the means of the child workers and controls on the three scales that they had in common (maltreatment, security, and emotional well-being), and the respondents were regrouped by these categories. A multinomial logistic regression was then done to determine the effect of work on each of these three groups of children.

4.2 Methodological considerations

4.2.1 Confounding factors

The major concern is the selection of the control groups. Although an attempt was made to match children by sex, age and socio-economic status, the fact that most of the comparison children were attending school suggests that there is some factor which is different between the brick kiln families and those of the communities near the kilns. In some cases we know that it was a natural disaster or the conflicts in Afghanistan and Pakistan which forced families to leave their land, business, and in some cases, country but they are otherwise of the same language, religion and ethnicity. (This was not necessarily the case in Nepal.) Possible factors pushing families into brick kiln work may be changes in land ownership, family crises requiring them to incur debt, a larger family size or some other reason which was forcing them into a greater degree of poverty. As brick kiln work has low entry requirements, it easily becomes the resort of those who have no other options.

Another source of possible bias is the “healthy worker effect” (HWE), a factor which would make the child worker population **more healthy** and less likely to contract illnesses than their siblings who are otherwise exposed to the same environmental and living conditions. The HWE refers to the fact that those children who are more robust may be selected for work and the working children may be given more and better nourishment than their siblings. There appears to be a low probability that HWE is a major factor in that families brought virtually all of their children over a certain age to work. The only country wherein there seem to be a significant number of siblings of brick kiln children who do not work in the kilns was Afghanistan. A large proportion of the non-working siblings are adolescent girls who, for cultural reasons, are not allowed to work in the kilns after puberty. Nonetheless we cannot discount that HWE may have been a selective factor.

Many of the brick kiln families are migrants – either from one region to another or one country to another. This injects an additional stress factor that may compound and increase the effects of occupational stressors for the brick kiln children, thereby making them **less healthy**. Migrants in any case are a difficult population to study either in a longitudinal or cross-sectional study because the migrant workers may have a number of differences that distinguish them from people from their place of origin or in their place of work who do not migrate. In addition, as noted earlier, many families in Afghanistan, Pakistan and Nepal brick kilns are bonded workers. This also may inject some bias vis-à-vis non-bonded families.

The instruments used in the study may also inject a bias in that most, such as the Roland Morris scale and the Nordic questionnaire, were developed for use with either adults or in

industrialized countries and have not been validated, for example for Asian child populations who undertake heavy physical labour. It is possible that brick kiln children are reporting less pain and discomfort than would their peers in industrialized countries because they have had to suppress the pain (having no other alternatives) or because it has become normal for them. There is some research to this effect. This would be another factor making the child appear *more healthy* than s/he really is.

While this study asked the children about any previous work they had done (a) in occupations other than brick kilns, (b) any secondary work (after/before daily work in the kilns), and (c) any off-season work, to explore this properly would have required a much longer interview as well as some study of the children at those times and situations. Therefore, both in the case of the children in the brick factories and the controls, the main object had to be simply to determine if the respondents in either group at any time had undertaken other hazardous work, the effects of which would compound or add to the brick kiln exposures. As this “other work” profile was difficult to obtain accurately and its degree of hazard being a subjective determination we cannot say with surety that the control group has the same profile as the kiln children; if so, it would have been less of a problem.

Similarly, it proved more difficult than expected to distinguish between effects due to the work environment (e.g. air pollution) and those due to the home environment because in most cases, the homes were very close to the kilns. Because of this and the fact that the homes, including water and lavatory facilities, of those families who were seasonal migrants were provided by the kiln owners, it makes sense to treat them as a unit.

4.2.2 Sampling issues

Although there were registries or lists of brick kiln factories in at least some administrative units in all four countries, the fact that this is a largely informal industry (i.e. unregulated) means that there are probably many kilns which are not included in these lists. Each country research team made an attempt to list or crosscheck the list of kilns in the area it was sampling, but under the conditions obtaining, we cannot be entirely sure they were able to capture all.

Moreover, there is some indication that the requested procedure (see Annex 4) for selecting the kilns, and the children for interview and measurement was fully followed by all four research teams. The sampling method used by Pakistan was the one best documented and consistent with instructions; again, Afghanistan was least so, in part because of security considerations.

In conclusion, given the limited sample size and the variability in the research teams’ adherence to the sampling protocol, the results of this study are by no means conclusive. Nonetheless, it represents a first step towards building measurement tools that would be useful to provide decision-makers with the evidence needed to take appropriate action.

4.3 Demographic profile

Table 1 summarizes demographic data for child respondents from the brick kilns and from the control groups in nearby communities. It is presented for each country, by site, age, and sex. While the commonly accepted international definition of a child is any person under 18 years of age, this study is limited to adolescent working children in two age groups: a) 11 through 14 years (those who are under the legal age to work) and b) between ages 15 and 18 (who may be legal or not, depending on degree of hazard present).

Table 1. Demographic overview of study population

	Total						Children 11-14 yrs				Children 15-17 yrs			
	Brick			Controls			Brick		C	Total	Brick		C	
	Total	M	F	Total	M	F	Total	M	F		Total	M	F	Total
Afghanistan														
Nangarhar	174	148	26	227	161	66	106	82	24	206	68	66	2	69
Kabul	225	177	48	325	223	102	137	91	46	158	88	86	2	119
Total	399	325	74	552	384	168	243	173	70	364	156	152	4	188
Bangladesh														
Ashulia	20	19	1	20	20	0	13	12	1	8	7	7	0	12
Jinaidah	50	50	0	20	20	0	13	13	0	7	37	37	0	13
Total	70	69	1	40	40	0	26	25	1	15	44	44	0	25
Nepal														
Bhaktahar	101	62	39	64	27	37	59	35	24	48	42	27	15	16
Sarlahi	97	26	71	43	19	24	67	16	51	23	30	10	20	20
Total	198	88	110	107	46	61	126	51	75	71	72	37	35	36
Pakistan														
Rawalpindi (Punjab)	50	31	19	30	18	12	23	14	9	12	27	17	10	18
Okara (Punjab)	50	32	18	28	16	12	19	12	7	12	31	20	11	16
Bahawal (Punjab)	50	30	20	31	18	13	21	10	11	12	29	20	9	19
Sindh	50	50	0	NS	NS	NS	15	15	0	0	35	35	0	0
KPK	49	45	4	NS	NS	NS	19	17	2	0	30	28	2	0
Total	249	188	61	89	52	37	97	68	29	36	152	120	32	53
Total respondents	917			639										

In addition to the working children, three countries also interviewed youth, 18-24 years old, who had worked in the brick kilns for at least two years prior to the age of 15 in order to provide comparative data on two conditions with longer latency periods: respiratory disorders and musculoskeletal disorders.

Table 2. Respondents age 18-24

	Youth brick workers			Youth controls	
	Total	M	F	Total	
Afghanistan					
Total	127	120	7	151	
Bangladesh					
Ashulia	25	25	0	NS	
Jinaidah	25	25	0	NS	
Total	50	50	0	NS	
Pakistan-Punjab					
- Rawalpindi	25	13	12	NS	
- Okara	26	15	11	NS	

	Youth brick workers			Youth controls
	Total	M	F	Total
- Bahawal	25	13	12	NS
Sindh	23	23	-	NS
KPK	25	22	3	NS
Total	124	86	38	-

While many children younger than 10 years also work in the brick factories, there was concern that both the length and nature of their work experience and their ability to understand and respond accurately to questions would be so different from that of older children as to inject an unnecessary bias into the data. For example, their work tends to be less regular, of shorter duration, involving simpler tasks. It is more difficult for them to place and describe health events accurately, and the psychological questions would need to be formulated differently to be geared to their level of understanding and language. Nepal chose, however, to include a group of younger children (5-10 years old) as there were a significant number of working children in this age group. Afghanistan also chose to interview non-working (generally younger) siblings of the brick kiln child respondents for comparison purposes. These younger children were not included in the computations in this summary report.

To recap, the core study population is girls and boys, age 11 through 17 years, who work in the brick kilns and selected controls from the surrounding communities who do not work in the brick kilns or perform any other fulltime or potentially dangerous work. The calculations in the following tables are made on the basis of this population.

4.4 Environmental risks

The section begins with a comparison of the countries with respect to environmental and occupational risks to which the working children might be exposed, either at home or at the brick kilns. These data result from the observational risk assessments, conducted as the first part of the country studies.

Table 3. Overview of risks from work and working conditions (all countries)

Category	Hazards in kiln work environment	Afgh	Bgd	Nepal	Pak
Air	Dust or sand is visible in the air	OK	X	X	X
	Workers put kerchiefs over nose or mouth to protect themselves from dust	OK	no data	X	no data
	Smoke is visible and smelled at ground level	OK		OK	
	Kiln is being fired with plastics, old tires, or other potentially toxic materials			X	
Temp.	Temperature at the hottest part of the day at present	no data	no data	no data	no data
	Temperature at the coldest part of the night at present	no data	no data	no data	no data
	Workers (any age) are working during the hottest part of the day		OK	X	
	Natural shade (e.g. trees) is absent or non-existent	OK		X	
	Sheds or sunbreaks are not provided over the work areas			X	
	Wind is constantly blowing (exposure risk)	OK	no data	Often	
	Windbreaks are not provided for wind protection	OK		no data	
Land-scape	Ground is dry and dusty			X	
	Holes have been dug in the ground near the working area (fall risk)		no data	no data	
	Cliffs or steep places are present near the work area (slide risks)		no data	no data	no data
	Unsecured piles, unstable walls or stacks of materials exist (fall risks)			X	

Category	Hazards in kiln work environment	Afgh	Bgd	Nepal	Pak
Water	Water for the bricks comes from an open source (drowning risk)			X	no data
	Animals drink from this source (donkeys, cows, camels) (biological risk)		no data	no data	
	Stagnant water exists in pools, puddles, or containers (disease risk)			X	no data
	No source of pure drinking water exists near the work areas	OK	OK	OK	
	Latrines do not exist close to the site or are unsafe or unclean			X	
Place	Site is near an urban area (violence risk)	OK	one	OK	Some
	Site is an isolated area, distant from schools and health clinics	no data		1 site	
	Site is closed and not visible or accessible to outsiders (maltreatment risk)		some	X	Some
	Distance from health care facilities	no data		no data	
	Distance from schools	no data	no data	no data	no data
	Short distance between the work area and the living area (pollution risk)	no data	no data	no data	no data
	Short distance between the kiln and where most children are working	OK	no data	no data	no data
	Children are seen within 10 meters of a burning kiln		no data	no data	no data
Animals	Poisonous animals (snakes, scorpions, etc) live in this area (biological risk)		no data	no data	
	Soil or water near work or living site contains parasites, infectious agents		no data	no data	no data
Equip- ment	Motor vehicles are moving around the area that can hit a worker			X	
	Equipment at the site is powered by a motor (gas or electric)		Pugmill	1 site	no data
	Equipment makes noise that inhibits conversation 2 m. away	Some	no data	X	no data
	Equipment has moving parts that can trap a hand or garment		no data	X	no data
Light	Glare from the sun makes it difficult to see well	No data	no data	no data	no data
	Some work is done at night (fall risks)		no data	1 site	no data
	Electricity is used on site (cords for electric lamps or tools) (electrocution)			1 site	no data
Personal care	There are no private areas for women workers at the site		no data	no data	
	Children at or near the site do not wear shoes or other foot protection		no data	OK	no data
	Workers take less than 2 rest breaks during the day	OK	no data	OK	no data
	Workers take less than a 1 hour lunch break	OK	no data	OK	no data
Hazards in home environment					
Air quality	Are there windows to let in light and air?	OK	no data	no data	
	Is there a cooking stove inside that gives off smoke or fumes?		no data		
Water quality	Is there a source of clean water (a well or piped-in water supply)?	OK	OK	OK	
	Is the water boiled, filtered, or chemically cleaned?				
Toxics	Are there strong cleaning products?	OK	no data	no data	no data
Nutrition	Do working children (age 5-17) get more food than non-working siblings?	OK	no data	no data	no data
	Do all children (age 5-17) eat the same types of food?	OK	no data	no data	no data

Legend: **X** = Item was identified as a potential risk; **OK** = Item was not identified as a risk at this time/this place; **No data** = no observations were made or reported.

4.5 Social characteristics

Do the children who are working in the brick kilns have a different socio-cultural profile from those who live in the villages surrounding the kilns? Are the social characteristics of the brick kiln children and their environment likely to make them more vulnerable to work stresses than the non-brick kiln children? A number of factors contribute (or not) to a child's vulnerability in the work environment. The literature suggests that a stable home environment and secure social relationships can be protective factors for a developing child.

The study measured social vulnerability in terms of three variables: migrant status, minority status (ethnic/religious), and residential status.

- *Migrant status.* Where were you born? Do you always live here or do you move from time to time? If so, how many times have you moved in the last 2 years?
- *Ethnicity.* What is your ethnic group/first language that you learned to speak? What is your religion?
- *Family.* Who do you live with now? (If not with parents) Why is it that you are not living with your parents?

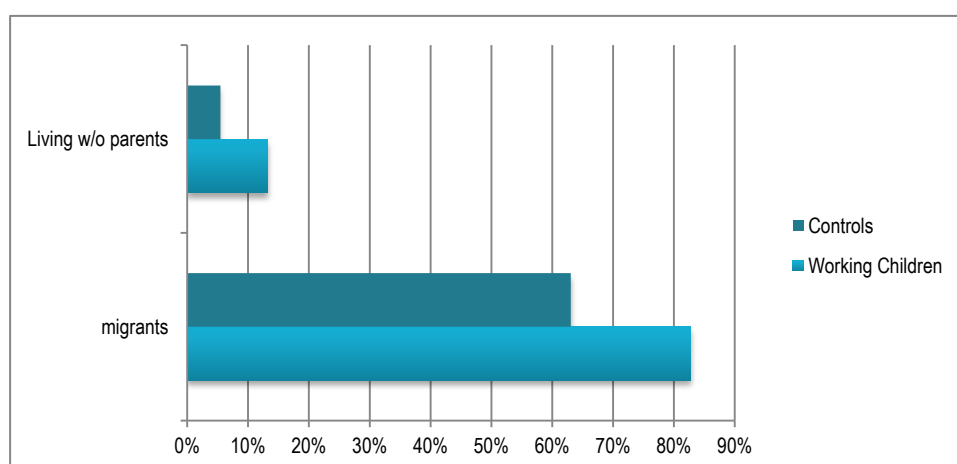
The results of the study show that the social profile of the working children vis-à-vis the controls is one of much greater instability. A high proportion of the children in all four countries are migrants. Most migrate with their families although in Bangladesh many children migrate from the countryside to the cities or kiln locations by themselves or in the company of “guardians”, thus living without direct family protection and support. On these two variables – migrant status and residential status -- the difference between brick kiln children and controls is significant at 0.99%. See Figure 3.¹²¹

Moreover, the Focus Group Discussions indicate that the relations between the kiln families and the surrounding community are distant, if not strained. In other words, the lives of the working children are subject to periodic upheaval with little compensatory support from the larger social environment. This social instability may be one of the factors contributing to the sense of insecurity that is reflected to a highly significant degree in findings from the psychological portion of the study.

While this study is organized around countries -- a conventional and convenient category -- the respondents may have more of a cultural identity than an identity as “citizens” of a particular country. This is especially the case with Pakistan and Afghanistan where the brick kiln populations are intermingled due to extensive cross-border migration generated by conflict. For certain calculations, it makes more sense to treat Pakistan as two separate units, with the two western Pakistani provinces – Sindh and KPK – as one unit and the large province of Punjab as another; some tables reflect this division. (See a more detailed description of the differences under the data tables in the Pakistan section.) There is a similar cross-border phenomenon between India and Nepal.

¹²¹ Two districts in Pakistan – Sindh and KPK – were removed from this table as they were unable to interview a control group due to civil unrest.

Figure 3. Measures of social insecurity of brick kiln children



4.6 Educational characteristics

Schooling can provide external social support and intellectual stimulation. In addition, it can offer a sense of hope; a child may be able to endure current drudgery if s/he believes there may be a pathway out in the future. How do the brick kiln children compare with children in the local community as to their enrolment, persistence, and achievement in education?

The children were asked this set of questions regarding their school experience:

- Have you ever attended school?
- If so, are you attending school right now?
- If so, did you miss any school day during the past week?
- Do you attend school when the brick kilns are closed for the season?
- During this school year (or the last school year you attended) what level or grade were you attending?

The results vary by country and area, but are almost uniformly disturbing. In one site in Nepal where most of the child brick kiln workers are not migrants but live in a settled community, the children are attending school. In virtually all the rest, although they may enrol for a time, the children generally have less than a primary education.

Figure 4. Children with less than 5 years of school

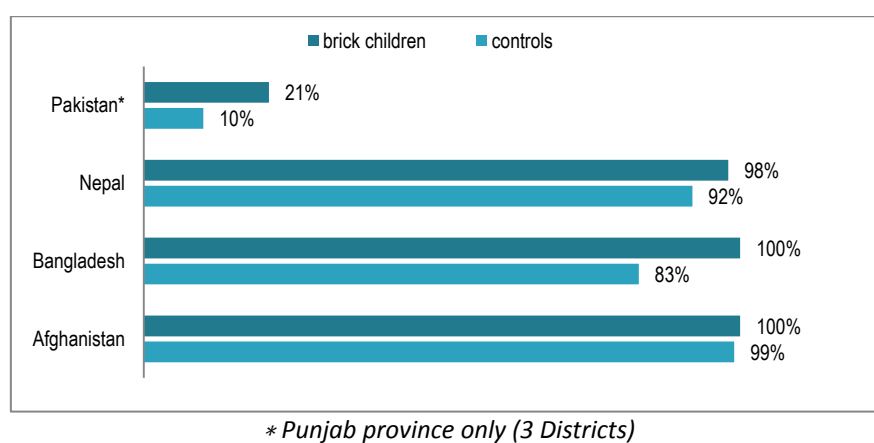
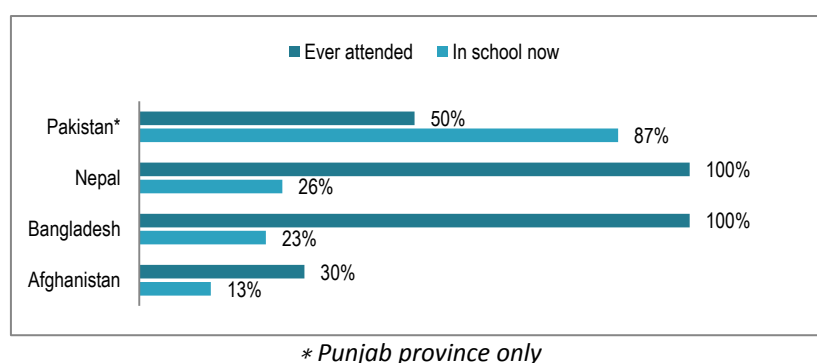


Figure 5. Percentage of child workers currently in school (all countries)



4.7 Work characteristics

There is a natural tendency to focus on the types of hazards to which workers are exposed, but the literature reminds us that the likelihood of injury or illness occurring is also a function of the length and the intensity of exposure to these hazards. Therefore, the age at which a child begins work, the number of years that s/he has been working at the time when the study takes place, and the number of hours a day s/he works are important factors to consider when calculating relative risk.

The study documented the children's work exposure with these questions:

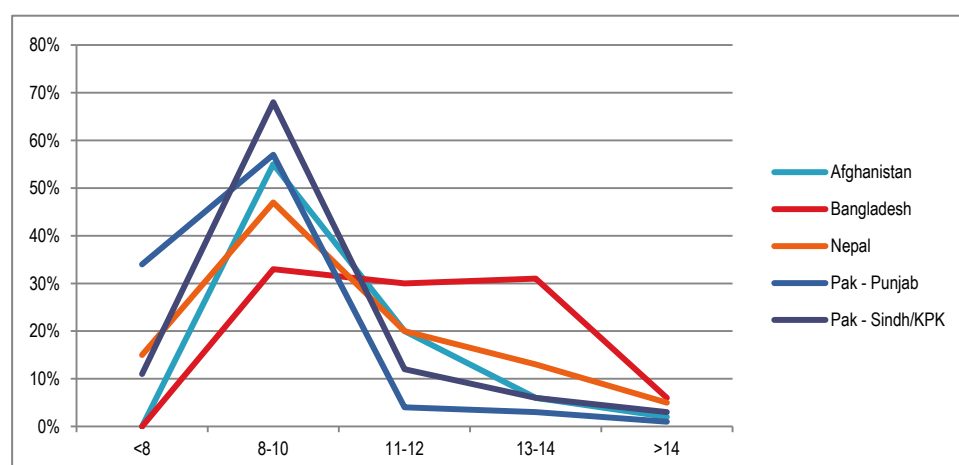
- When/at what age, did you start working or helping out in the brick kilns?
- How many days do you work in the kiln per week?
- How many hours per day do you usually work at the kiln?

But it is not sufficient to only inquire about the brick-related work. Children, especially girls, often perform household chores or additional economic activities before or after their brick kiln work, thus adding to the total hours of work. Two additional sets of questions were asked in order to determine the total amount of time children worked; the first asked about "other work" and the second asked about "household work (chores)." The questions were similar in other respects:

- In addition to your work in the kilns, did you do any other work (or household work) this past week?
- During the past week, did you do any of the following activities, even for only one hour (a list was provided for the “other work” that included agricultural work, fetching wood and water, and home-based occupations; and a list was also provided for the “household work” that included shopping, child/elder care, cooking, cleaning, and washing).
- When/how old were you when you started doing this other work (or household work)?
- When you are doing that work, how many hours a day do you do it?
- How many days each week do you do this work?

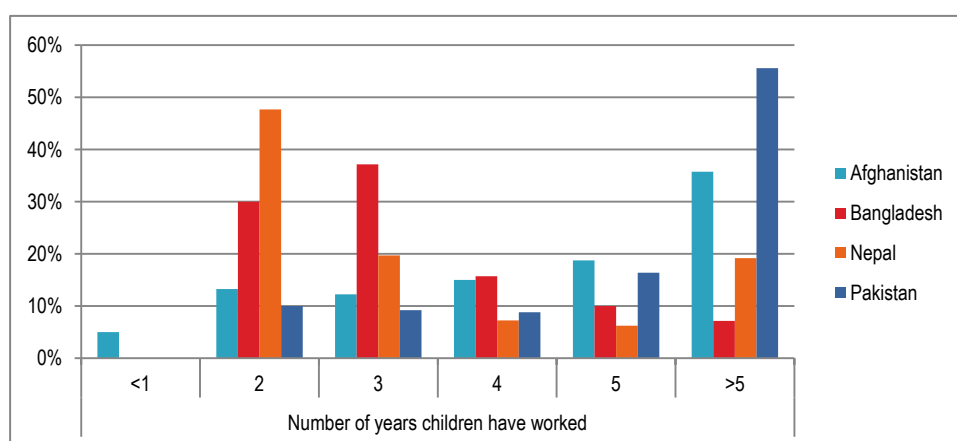
Estimating hours is not an easy task in societies that do not live by the clock or for children who may be doing a myriad of things and not necessarily think of them as work. It was the responsibility of the interviewers to probe for responses to these important questions and, on the basis of the answers, to calculate the total number of hours per week of work in which the respondents were engaged.

Figure 6. Starting age of Work (Brick children)



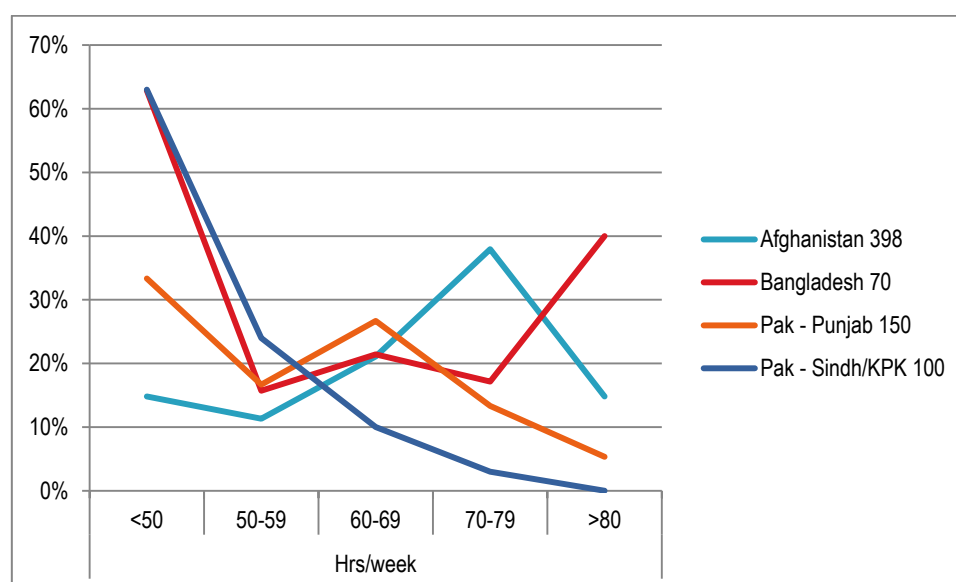
All four countries are consistent in showing that, while children ‘help out’ at younger ages, most can be said to be working regularly at the brick kilns by age 8 or 9.

Figure 7. Duration of employment (all countries)



The above figure (Figure 7) confirms that almost all the respondents have been working at least two years by the time of the study, and their patterns of work and amount of exposures have presumably had a chance to settle.

Figure 8. Number of hours employed per week by country



The above graph demonstrates a considerable variation between countries in terms of the number of hours of work per week. Children in both Afghanistan and Bangladesh are working over 60 hours per week – almost 75% and 80% respectively – and in the latter, 40% of the children are working over 80 hours per week.

4.8 Injuries

Do brick kiln children suffer more injuries than children who are not working or who do other kinds of work? Are their injuries more serious? To ascertain whether the child has experienced an injury related to her/his work, the questionnaire used three time periods by which to assist the child respondents in recalling their injuries:

- Minor injury in the last month.
- Serious injuries in the last year.
- Very serious injuries ever experienced.
- Knowledge of any child who has ever been killed at work.

While these were qualified by the ICLS standard of “requiring medical care or interruption of normal activities for at least 1 day”, it appeared that children generally continued to come to the worksite in spite of an injury, with the possible exception of broken leg bones. Therefore, this measure of seriousness (interruption of normal activities) has not been found to be useful in the case of brick kiln children. Similarly, the fact that the kilns are generally located far from medical facilities makes this measure also less indicative of serious injury. In fact, the questions with regard to treatment:

- what did you do to take care of this injury? (did nothing, took care of it myself, kiln owner/parent/other gave first aid, went to a local healer, went to a clinic or hospital); and
- who paid for your treatment or medicine? (parent, kiln owner, self);

resulted in higher use of medical care and longer convalescence (interruption of normal activities) among the comparison group than among the brick kiln children.

Figure 9. Care for injury (Comparison group)

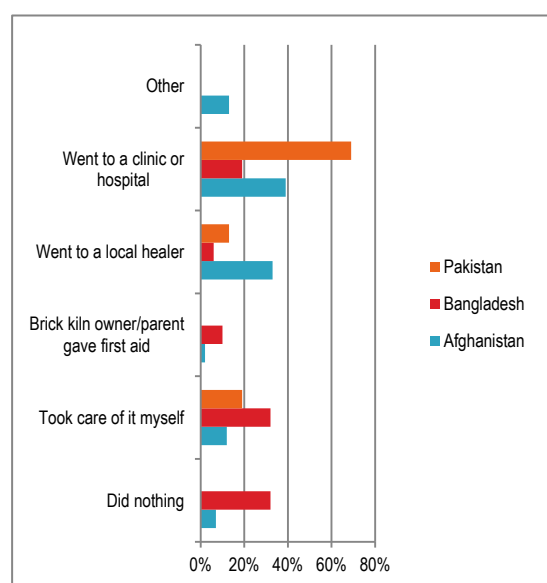
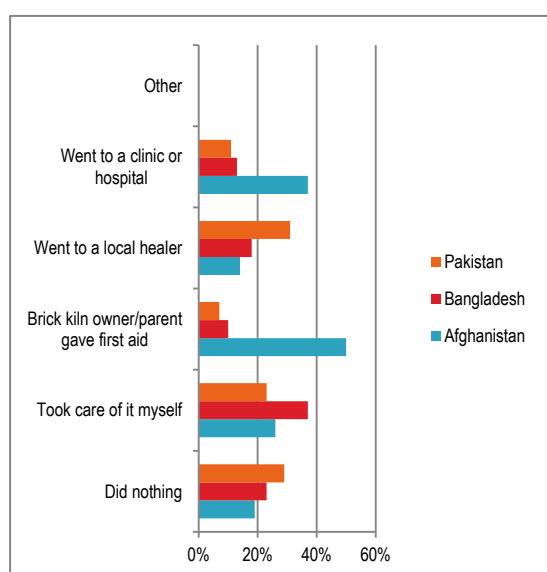


Figure 10. Care for injury (Brick children)

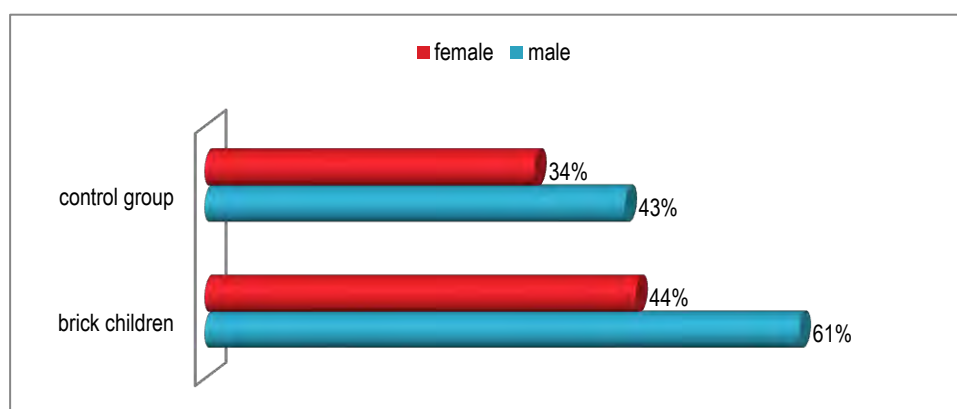


To reduce the abstraction of asking the child whether this was an occupational injury, the child was instead asked where the injury occurred (at home or at the kiln) and what s/he was doing when it occurred.

Brick kiln child workers, both boys and girls, suffer high rates of injury. Within a one month period, the combined data of all four countries show that over twice as many children working in brick kilns (65.1%) experienced some kind of injury than did controls (29.5%). The estimated odds ratio (OR) of recent injury was 3.60 (95% Confidence Interval: 2.84-4.56) comparing working children to controls (adjusted for age category and sex). Within the last year, nearly half (48.8%) of the brick kiln children suffered at least one serious injury (e.g. a broken bone).

There are marked gender differences in the types of injury. For example more girls report burns, which is likely due to the fact they are obliged to combine brick work with chores at home.

Figure 11. Injuries by gender (all children, all countries)



The results of these studies indicate that younger children tend to have more injuries than older children in spite of the fact that the latter are often doing more strenuous or more hazardous work. This may be linked to their inexperience and the fact that they feel that they receive relatively little training and preparation (see psychological results).

Figure 12. Brick children injured by age group and seriousness of injury (all countries)

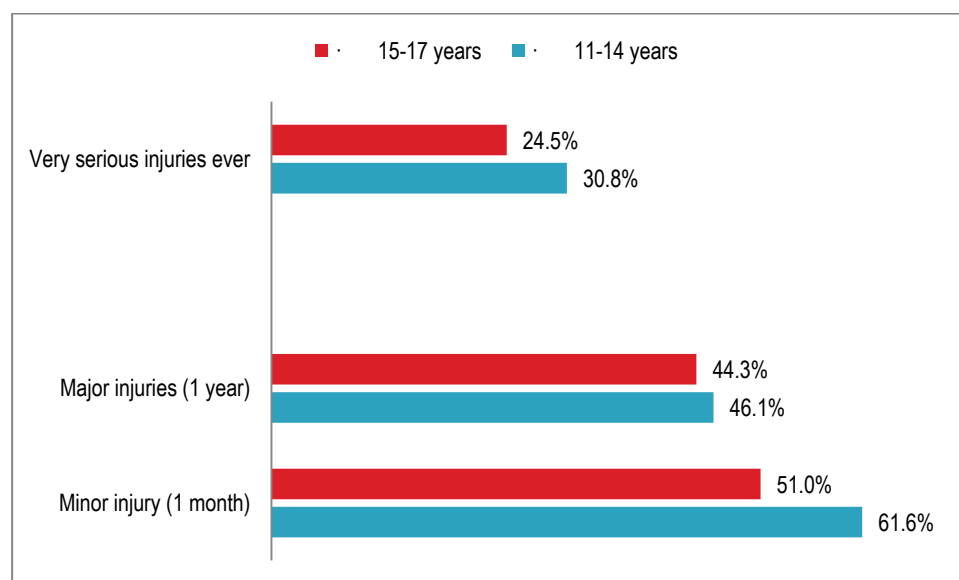
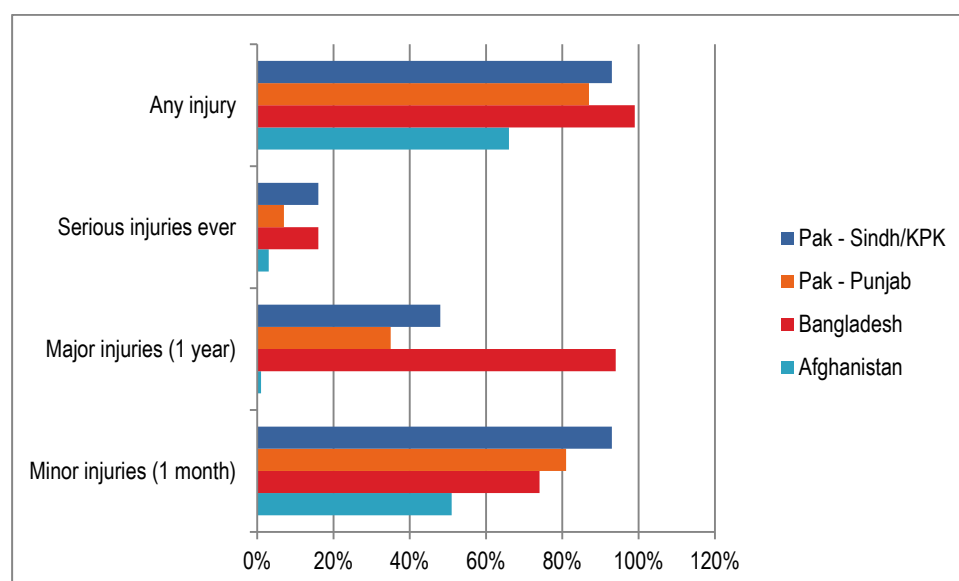
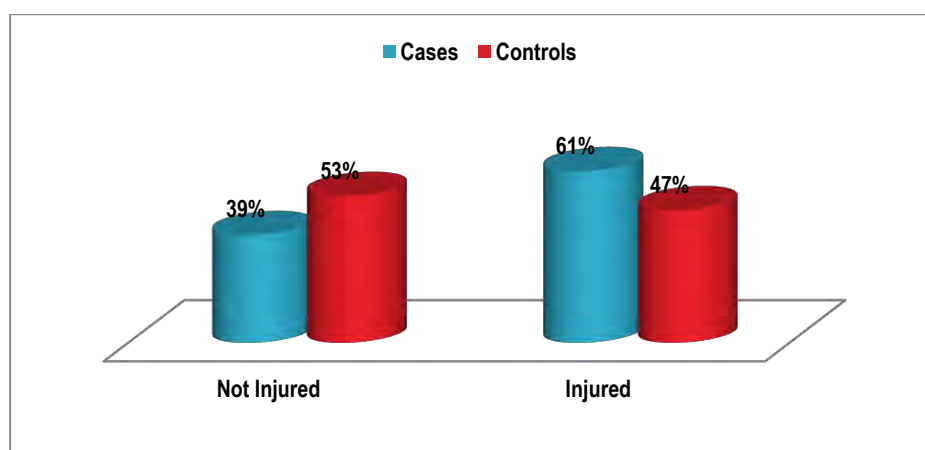


Figure 13. Injuries of brick children by country (per cent)



The following table explores the possible link between fatigue and lack of sleep and injury risk. The period under examination is one month.

Figure 14. Children injured among children experiencing fatigue (all countries)



In summary:

- Child workers had an estimated twice the risk of suffering minor cuts and bruises in a one month period than the comparison group (Afghanistan and Pakistan),
- The risk of having had a serious injury in the last year ranged from 25 to 109% higher in child workers in Afghanistan, Bangladesh, and Pakistan.
- Self-reported fatigue/exhaustion or lack of sleep did not result in a statistically significant higher risk of minor injury (Afghanistan, Bangladesh, & Pakistan).

4.9 III health

Do brick kiln children suffer more than non-working children feelings of general disability such as weakness, fatigue, feeling overall unwell -- a sense of “malaise”? These conditions are examined in more detail in specific tables later on, but a cumulative index can be constructed of the following variables which may signal chronic or underlying problems that would otherwise not be captured.

- Experience of fatigue or exhaustion.
- Feeling weak or feeling bad all over.
- Feeling tension in your body.
- Feeling dizzy.

The data from Afghanistan and Pakistan were used as examples to illustrate this. The numbers on the horizontal axis (0 -5) refer to the number of indicators of “unwellness” which the respondents acknowledge. At least 85% of the Afghan brick kiln children report three or more of these symptoms of being unwell, and there are no children who report not feeling any symptoms of being unwell. The situation is even more stark in the case of Pakistan.

Figure 15. Percentage of children who feel unwell (Afghanistan)

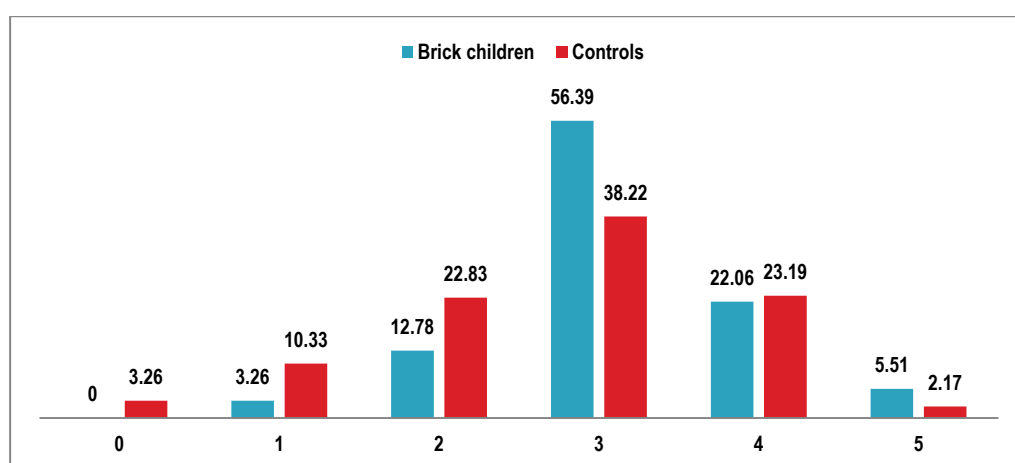
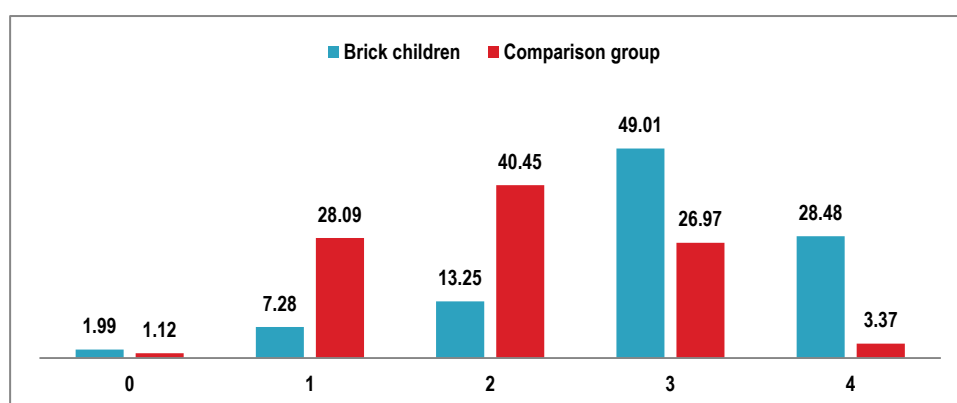


Figure 16. Percentage of children who feel unwell (Pakistan)



On the scatter plots below, note that the distribution of comparison children is asymmetric with more reporting a few symptoms (i.e. low grade malaise) whereas the brick children report many symptoms of high grade malaise.

Figure 17. Distribution of brick and control children by number of symptoms of malaise (Afghanistan)

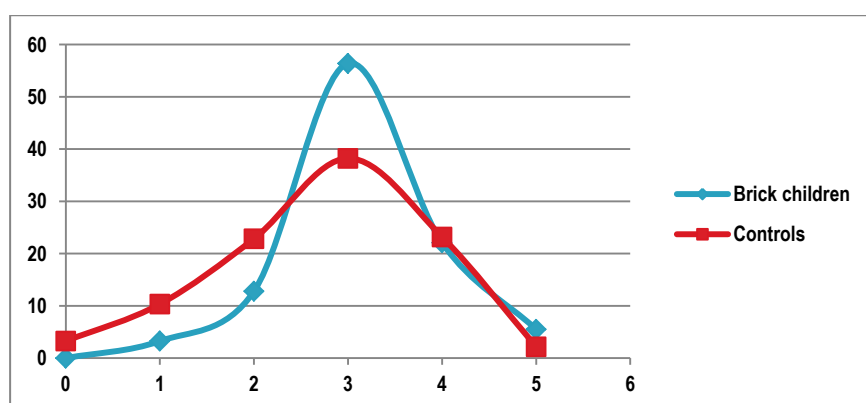
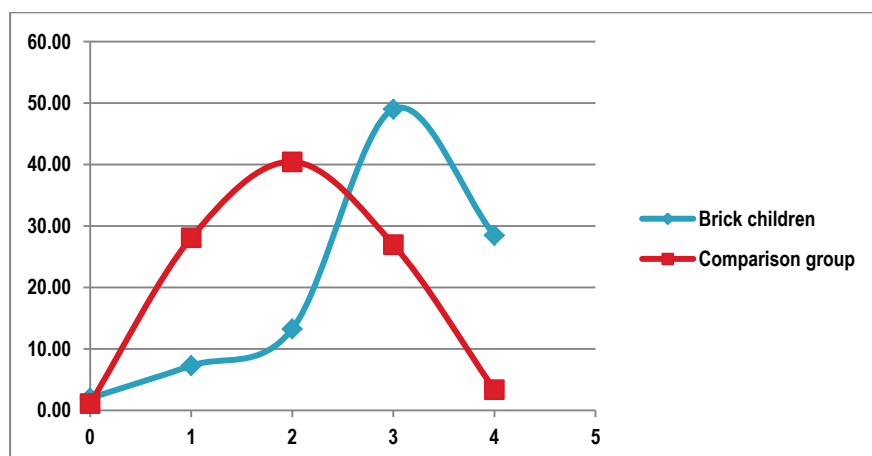


Figure 18. Distribution of brick and control children by number of symptoms of malaise (Pakistan)



Fatigue, in particular may lead to increased risk of illness or injury.

Figure 19. Percentage of all children, age 11-17, experiencing fatigue

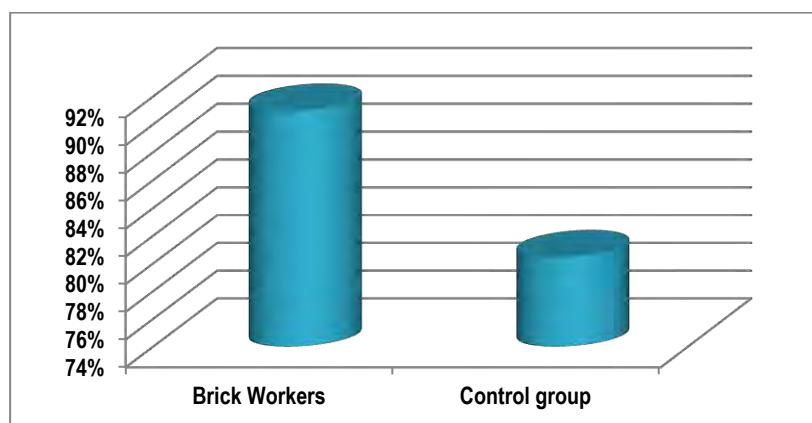
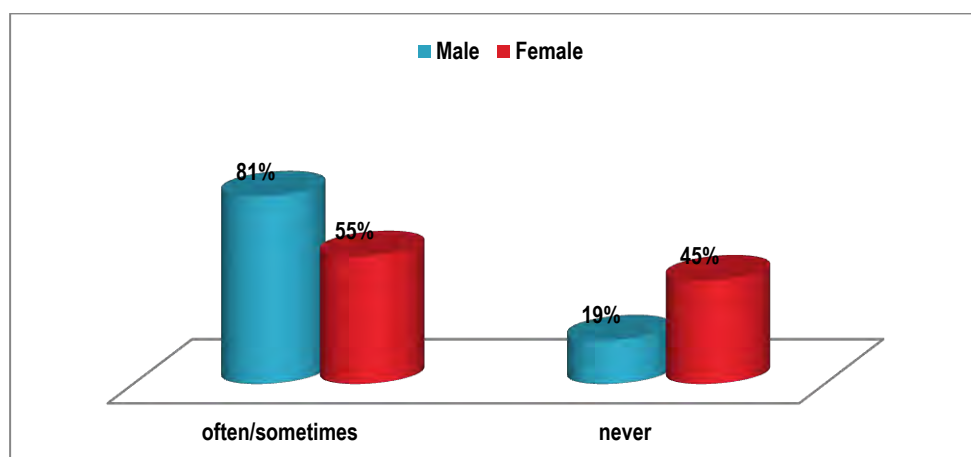


Figure 20. Children experiencing fatigue by gender (all respondents)



4.10 Musculoskeletal problems

One of the main health impacts that we would expect to find among young brick kiln workers given the loads they transport is damage to the musculoskeletal system.

Table 4, drawn from the Risk Assessment portion of the study, compares the posture and activities of children working in the brick kilns as observed by the researchers against a standard list of musculoskeletal risk factors. From this, it is evident that the children's exposure to such risks is substantial. In the table below, red indicates exposure exists, blue indicates that no such exposure was reported (but this should not be taken to imply that it does not exist, only that it was not observed during the study.)

Table 4. Musculoskeletal risks from work and working conditions (all countries)

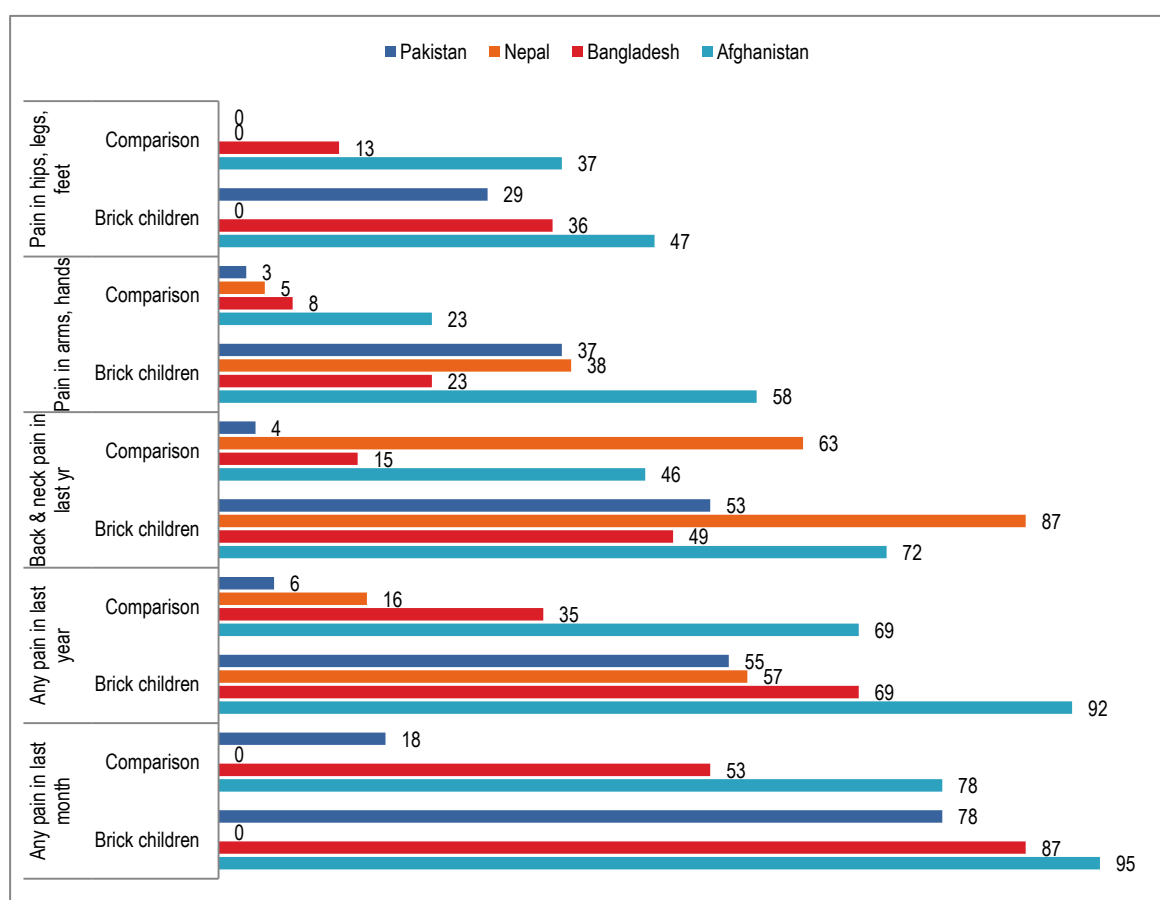
Category	Hazards in kiln work environment	Afg	Bgd	Nep	Pak
Awkward Posture - Strain on back, neck shoulders	Does the child work with the hand(s) above the head, or lift objects above the shoulders?	No	No data	No data	
	Does the child work with the neck bent more than 45° for more than 10 minutes at a time?				
	Does the child work with the back bent forward more than 45° for more than 10 minutes at a time?				
	Does the child squat, crouch or kneel while working for more than 10 minutes at a time?				
	Does the child push, pull, roll, or carry a load?				
Strain on hands / wrists	Does the child carry loads on the head?	No	No data		No data
	Does the child carry loads in the arms?			No	
Repetitive Motion & Impact	Does the work require a highly repetitive motion of the hands and wrists?				
	Does the work the child does require pinching with the fingers?	No	No	No	No
	Does the work involve forceful gripping with the hand(s)?				
	Does the child do the same task all day?				
	Does the child make the same movement over 10 times in succession?				
	Does the child use the hand (heel/base of palm, fist) as a hammer to pound the clay or other substance?				
	Does the child repeatedly use the knee or foot as a hammer?	No	No	No	No

The following photos illustrate activities in which the children are engaged that can result in musculoskeletal strain or damage.



Turning then to evidence of the health outcomes associated with the above exposures, Figure 16 presents the responses of the children with regard to one indicator of musculoskeletal distress or disorder: pain. Only a few cases of visible structural deformity were observed (Nepal and Pakistan) but since the children have been working for a short time compared to adults, they may be experiencing muscle strain but have not yet incurred any observable damage. Questions were included concerning undifferentiated pain, and lists of where in the body such pain might occur.

Figure 21. Location of musculoskeletal pain (all countries)



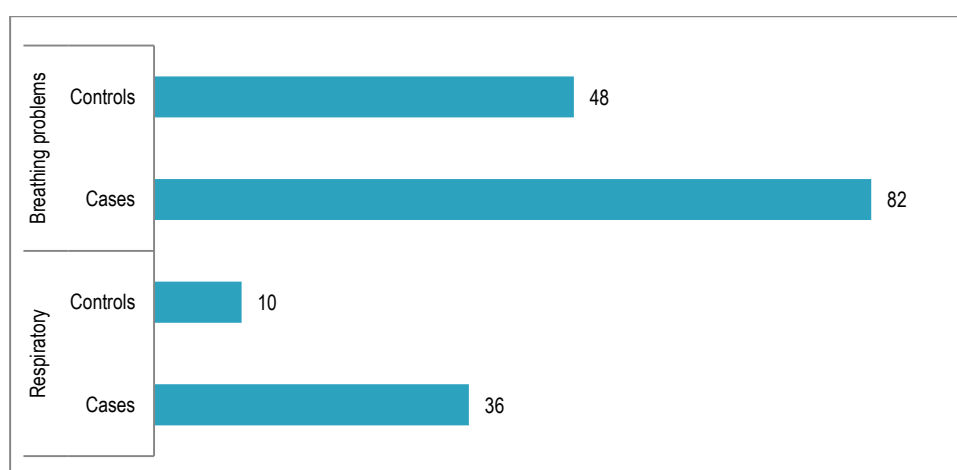
The findings on musculo-skeletal distress are consistent and strong among all four countries.

- Brick kiln children in all four countries report joint and muscle pain during the last month and over the last year.
- Brick kiln children report significantly more pain than does the comparison group (confidence level of <0.01).
- Both age groups (11-14 years and 15-17 years) report pain.
- Brick kiln children all countries report pain in the back and neck, and in arms and hands.

4.11 Respiratory problems

Respiratory problems are one of the expected health outcomes associated with brick kiln work. Therefore several measures were used including perception of disability and measurement of disability using a spirometric test to examine this health outcome and to ascertain the degree of disability in comparison with controls.

Figure 22. Brick kiln children suffering from respiratory problems (All countries)



Note: In the figure above, “breathing problems” are perceived respiratory issues (self-reported) while “poor lung function” is derived from objective spirometric examinations of conditions which have reached a clinically observable stage of impairment.

In Pakistan, a more detailed analysis of self-reported respiratory symptoms from Punjab Province showed significant differences between brick children and the comparison group ($p < 0.01$) for individuals aged 11-17 years old. Quantitative analysis of respiratory function tests (FEV1 based on spirometric readings of brick children and comparison groups) suggested significantly poorer lung functioning among brick children compared to the comparison group (independent samples t-test, $p < 0.01$).

In summary, its findings were:

1. Lung function of child workers in the brick industry was significantly impaired compared to the control group
2. Impaired lung function was not significantly related to respirable silica exposure, but there was a confirmed relationship with cumulative dust exposure.¹²²
3. Gender disparity exists: females showed more profound effects

4.12 Stunting

The results of underweight are derived from the Body Mass Index (BMI) of the brick kiln children, measured by weight for height using a standard scale and measuring stick. The anemia results are measured by a fingerprick test (due to cultural concern this was not conducted in Afghanistan).

¹²² Cumulative dust exposure was presumed from present exposed levels and exposure is so varied that accurate cumulative evaluation was a limitation.

Figure 23. Percentage of brick kiln children with low BMI and anemia

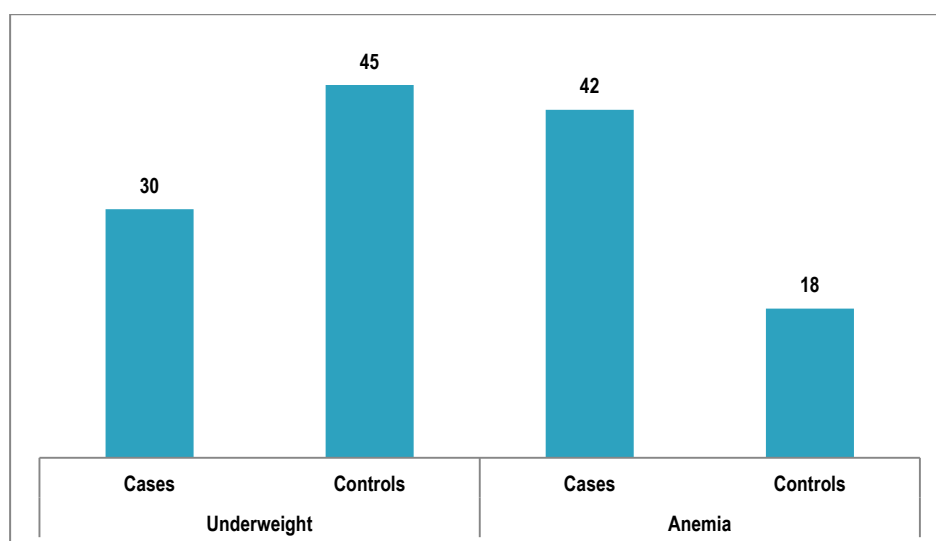
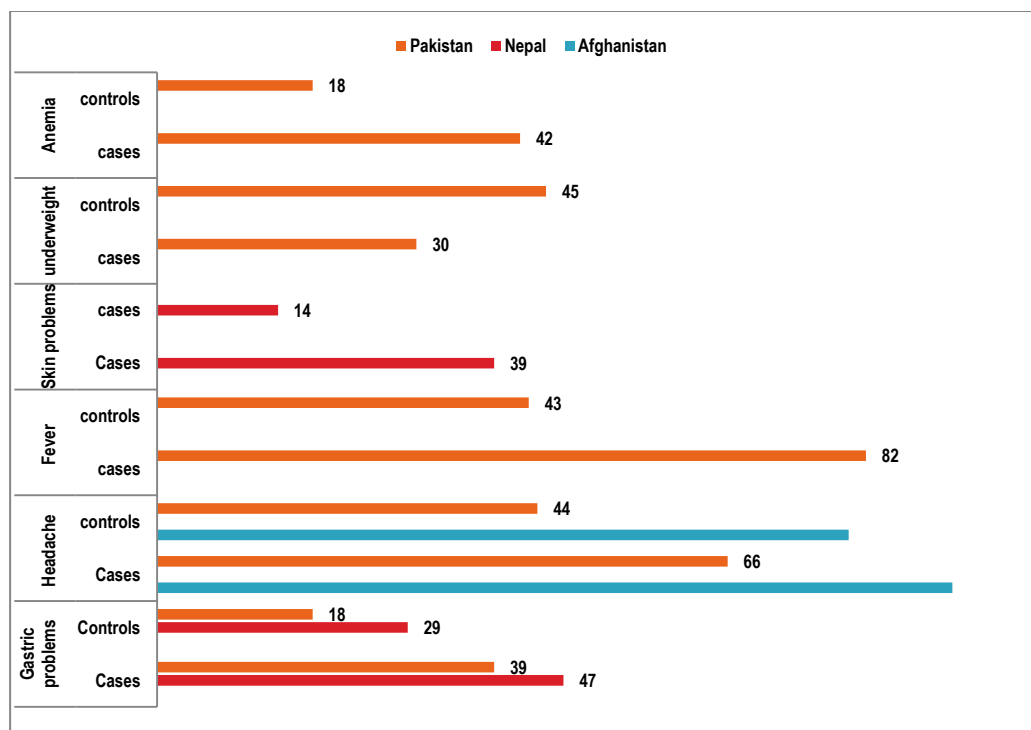


Figure 24 looks at a variety of health conditions which are less clearly associated with work, i.e. they could be attributed to a variety of factors such as poverty. However, comparison with a control group of the same socio-economic status is helpful in indicating where work may be having an effect over and above other factors. Pre-tests indicated that brick kiln children had higher rates of stomach problems perhaps due to impure drinking water at the kiln sites.

Figure 24. General health of child workers (all countries)



4.13 Psychological functioning – all countries

Is there evidence that work at an early age has a deleterious effect on psychological functioning or development? Are there not positive effects as well?

The brick kiln study finds that children who work are seven times more likely to feel mistreated than children who do not do this work. In addition, they have six times higher risk of feeling insecure.

The psychosocial well-being of 1608 children was measured using the 48 item questionnaire that was developed for this purpose based on the work of Martin Woodhead and the contributions of Stavroula Leka, Aditya Jain, Martijn Hofmann, and Mark Jordans as well as a number of others.¹²³ The questionnaire was translated into the dominant language in each country, back-translated, and then administered by an interviewer fluent in that language. The interviews took place in a secluded area near the worksite but out of earshot of others.¹²⁴ The children's responses as to the frequency in which they felt or acted in a certain way were tabulated on a Likert scale; they were aided in conceptualizing these different frequencies through the use of a glass of water filled to varying levels: full to express "always", two-thirds full to represent "often", one third full to reflect "sometimes", and empty to represent "never".¹²⁵ The psychometric analysis of this questionnaire showed that it possessed good internal coherence (alpha of Cronbach =.808) and that it functioned well for this group of four study countries (alpha Pakistan =.738, alpha Afghanistan =.840, alpha Nepal =.707, alpha Bangladesh =.867).

The raw results describe a very worrying situation:

In the domain "**self-esteem**", nearly 80% of the children speak of never feeling proud of their work, 73% say that do not have the skills required to work well, and nearly 70% think that others do not appreciate the work that they do. This trend is clear and homogeneous for all four countries.

¹²³ The design benefited from the inputs of a group of specialists who had previously conducted research on psychosocial aspects of child labour. These included: Theresa Betancourt (Harvard University), Daniel Fekadu Wolde-Giorgis (Kings College-London), Valentina Forastieri (ILO-Safework), Jenny Gamlin (University College-London), Audrey Guichon (Anti-Slavery International), Aditya Jain and Stavroula Leka (University of Nottingham), Virginia Morrow (University of Oxford), and Aline Ndayisaba (HealthNet, Burundi). Dr. Pellenq undertook the statistical analysis.

¹²⁴ Except in the case of Afghanistan and the Pakistani provinces that border it (KPK and Sindh) where certain families refused to allow their daughters to be interviewed unless a male family member was present.

¹²⁵ Because of coding problems in one country, the two categories "never" and "sometimes" have been combined.

Table 5. Measurement of self-esteem (all countries)

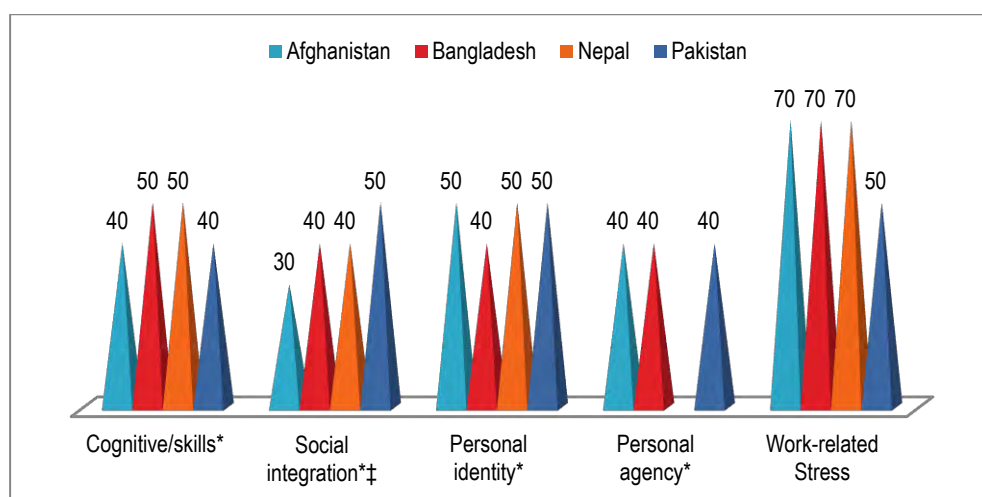
Questions		Combined Countries	Pakistan	Afghanistan	Nepal	Bangladesh
Are you proud of your work?	Never	79,3%	86.6%	79%	65.3%	80%
	Often	12,6%	12.8	8.1	22.8	8.6
	Always	8,1%	0.5	12.9	11.9	11.4
Do you feel like you have the skills needed to do your job well?	Never	72,9%	77.3	69.4	70.3	75.7
	Often	18,5%	21.7	13.1	26.6	10
	Always	8,6%	1.1	17.4	3.1	14.3
Do you think others appreciate the work you do?	Never	68,3%	66.6	68.9	68.6	72.9
	Often	24,3%	29.1	19.7	26.6	18.6
	Always	7,4%	4.3	11.4	4.8	8.6

In the domain of **stress**, 52% said that the environment in which they live and work demands too much from them, either “often” or “always”, 60% get bored at work (often or always) doing the same thing for many hours in a row or feel tired because of the long working hours or heavy work load. This is a general trend but is not exactly the same for each country.

Table 6. Measures of stress among working children (all countries)

Questions	Scale	Combined Countries	Pakistan	Afghanistan	Nepal	Bangladesh
Does your family, employer or others ask too much of you?	Never	48,0	44.1	43	55	77.1
	Often	32,5	45.2	26.3	26.5	15.7
	always	19,6	10.7	30.6	18.5	7.1
Do you get bored at work doing the same thing for many hours in a row?	Never	40,0	16	45.3	70.2	55.7
	Often	43,7	71.7	29.5	24.6	25.7
	always	16,3	12.3	25.2	5.2	18.6
Do you feel tired because of the long working hours or heavy work load?	Never	39,7	28.1	41.8	57.1	42.9
	Often	41,6	60.7	29.6	33	30
	always	18,7	11.2	28.6	9.9	27.1

Figure 25. Psychological functioning – selected domains (percentages)



With regard to **support and training**, the huge majority of children do not feel supervised, taught or trained by the people they work with, whichever the country.

Table 7. Measures of support and training among working children (all countries)

Questions	Scale	Combined Countries	Pakistan	Afghanistan	Nepal	Bangladesh
At work, do you feel that people watch over you to make sure you don't get hurt?	Never	71.4	84.8	58.3	76	61.4
	Often	15.8	10.4	17.9	20.8	18.6
	always	12.8	4.8	23.7	3.1	20
Do people at work teach you what to do and how to do it?	Never	68.4	86.4	50	77.1	52.9
	Often	18.7	9.6	26.3	21.4	17.1
	Always	12.9	4	23.7	1.6	30

In the domain of **social relations**, the majority of children working in brick kilns do not feel at all accepted by the other families around them nor do they feel that they have good friends who will support them; 70% say they never play games or sports with friends. This is a general trend but also differs by country.

Table 8. Measure of social relationships among working children (all countries)

Questions	Scale	Combined Countries	Pakistan	Afghanistan	Nepal	Bangladesh
Do you feel accepted by the other families around here?	Never	52.3	75.8	46.6	35.1	37.3
	Often	28.9	20.1	28.8	44.8	23.6
	Always	18.8	4.1	24.6	20.1	39.1
Do you have one or more good friends that support you?	Never	58.8	71.9	64.9	34	30
	Often	25.8	23.1	16.1	54	23.6
	Always	15.5	5	19	12	46.4
Do you play games or sports with friends?	Never	69.9	65.2	83.5	57.2	33.6
	Often	20.8	27.2	9.5	36.5	25.5
	Always	9.4	7.6	7	6.4	40.9

In the domain of “**personal agency**” (**locus of control**) two-thirds of the working children as a whole feel that they never have the chance to choose what to do and what not to do. (The situation is less worrying in Pakistan.)

Table 9. Measure of personal agency (all countries)

Questions	Scale	Combined Countries	Pakistan	Afghanistan	Nepal	Bangladesh
Do you feel that, if you wanted to, you could choose what to do and what not to do?	Never	66.2	36.1	89.6	76.6	60
	Often	25.9	48.7	8.3	16.7	28.6
	always	7.9	15.2	2	4.7	11.4

Similarly, over 80% of working children say they **never** have free time each day (the situation is less of a concern in Bangladesh.)¹²⁶

¹²⁶ There are no data for Nepal.

Table 10. Measure of leisure time among working children (all countries)

Questions	Scale	Combined Countries	Pakistan	Afghanistan	Nepal	Bangladesh
Do you have free time each day to do just what you want?	Never	81.5	74.7	91.3	.	45.5
	Often	13.6	23.3	4.3	.	34.5
	Always	4.8	1.9	4.4	.	20

Table 11. Measure of fatalism among working children (all countries)

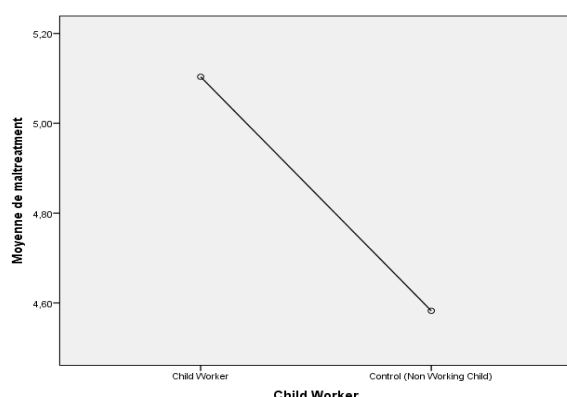
Questions	Scale	Combined Countries	Pakistan	Afghanistan	Nepal	Bangladesh
Do you think your life will get better some day?	Never	56.3	63.7	57.1	49.7	38.2
	Often	26.2	25.7	20.2	42.3	24.5
	Always	17.4	10.6	22.7	8.1	37.3

Over half of brick kiln children say that they think life will **never** get better. The concern is a bit less in Bangladesh.

The above presentation of results describes certain characteristics of the sample. In order to study each item independently from the others, however, it is necessary to conduct a principal component analysis (PCA) and logistic regressions. The following section reports on these findings.

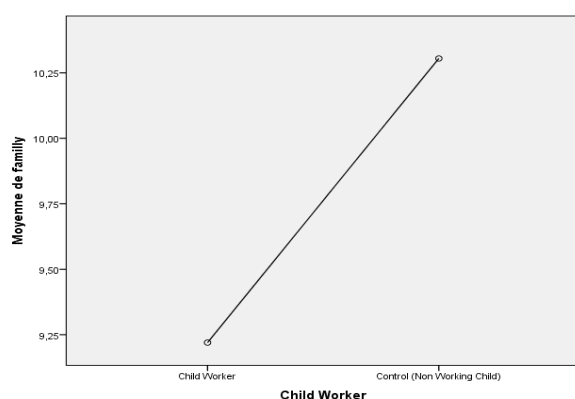
Through the PCA, it was possible to regroup the items in six different psychosocial sub-domains; three of these were specific to children who worked in the brick kilns and three which concerned all children studied. Those which are particular to the working children are: self-esteem, supervision, and stress at work ; the three which are relevant to all children are : sense of security, feeling of mistreatment, and emotional well-being.

The analyses of variance show that the children who work are **different** from those who do not work on the three domains which they share (maltreatment, insecurity, and emotional well-being).

Figure 26. Comparison of means on mistreatment (brick and control children, all countries)

Thus, the children who work have a sense of mistreatment that is significantly higher than that of children who are not working in the kilns. $F(1, 1469) = 44,78$; $p < .000$.

Figure 27. Comparison of means for insecurity (brick and control children all countries)



In terms of a sense of security, the children who work feel significantly less secure than children who do not work. $F(1,1455) = 87,13; p<.000$.

Figure 28. Comparison of means on emotional problems (brick and control children all countries)

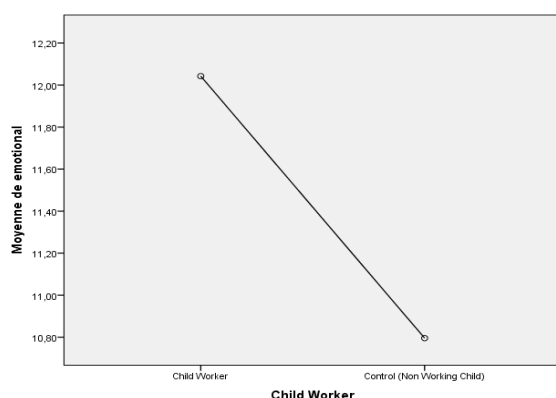
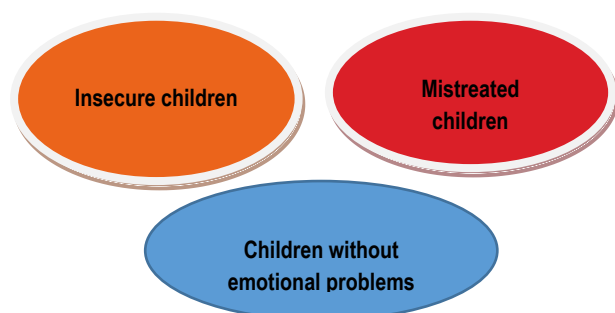


Figure 28 shows that children who are working in the brick kilns have a significantly higher level of emotional problems than do the non-working children. $F(1, 1448) = 64,33 ; p<.000$.

These results are quite interesting, providing evidence of the effect of work on psychosocial well-being, but they do not take into account the effects of other variables. The logistical regression analysis below is able to add important information.

Using the statistical device of categorizing the study population into dynamic clusters, it was possible to extract sub-groups from among the population of working and non-working children on the basis of the three scales they have in common (maltreatment, security, emotional problems). Children in each sub-group have common characteristics which cluster or act in a similar way. It was possible to isolate, therefore, one cluster of children who express no psycho-social problems, a second cluster who feel mistreated, and a third which have a sense of social and family insecurity. Visually, it might look like this:



A multinomial logistical regression makes it possible to evaluate the effect of work on each of these three groups of children holding other factors constant. This model predicts that, controlling for gender and country, the fact of work alone significantly increases the risk of being in one of the subgroups of children who feel mistreated or insecure over those who have no evident psychosocial problems.

In other words, for a child, the fact of working is not necessarily associated with psychosocial problems (because there is a cluster of children without such problems) but it considerably increases the risk of two conditions:

- A child who works has seven times the chance of being in the “mistreated” group than in the group without psychosocial problems, controlling for country and sex.
- A child who works has six times the chance of being in the “insecure” group than in the group without psychosocial problems, controlling for country and sex.

In addition, there is also an effect based on related to the country concerned: controlling for sex and work, the Afghan children feel both more mistreated and insecure; the Nepali children feel more insecure.

There is also a difference related to gender: controlling for country and work, girls on the whole are more likely to feel they are victims of mistreatment and to experience a sense of insecurity:

- Girls have 4.4 times more chance of being in the group of mistreated children than in the group of children without evident emotional problems.
- Girls have 1.3 times more chance of being in the group of children who feel insecure as being in the group without emotional problems (at a confidence level of .07).

In summary, it is clear that work is the major factor determining whether a child feels mistreated, and it is also the major factor in determining whether s/he feels insecure. Thus, for the children in this study, work is often having a negative effect on their psychosocial development and well-being. It also considerably increases their sense of mistreatment and insecurity in their social and family context.

This first quantitative research on the effect of work on the psychosocial development and well-being of the children who work in brick kilns in Asia validates the instrument used to measure the phenomenon and the methods of collecting the information. Most important, it offers an evidence-based argument showing that children's work in these kinds of situations has a significantly negative effect on their psychological well-being.



5. Country-specific results

This section provides a brief summary of the brick industry and conditions in each of the study countries. The full reports from each country are printed separately.

5.1 Results from Afghanistan

Brick production is a traditional industry in Afghanistan, the kilns being operated by brick maker dynasties and/or landlords. The work is considered low prestige to which those who are displaced or without cultivable land are forced to resort. The industry is currently growing rapidly. New brick kilns are appearing in the periphery of urban areas in response to the demand for fired bricks for public and private post-war construction projects.¹²⁷ In Kabul alone, for example, 50 new kilns were established within the course of one year.¹²⁸

Children form a substantial portion of the brick industry workforce--over 50% according to a recent study.¹²⁹ Particularly worrisome is that this is not only child labour, but bonded labour, in which families take advances in the off-season that obligate them to work in the kilns for the rest of the year and to use their children in an attempt to meet the quotas. Since the families find it difficult to pay off the loan in one year, it continues to grow, leaving them indebted to the same owner for years and years. Child labour "is so pervasive in the brick kiln industry ... that bricks for any project in Afghanistan, large or small, are *de facto* coming from kilns that utilise child bonded labour."¹³⁰ Consequently this became a concern for NATO forces in Afghanistan.¹³¹

In addition, there are allegations of trafficking in children. The International Organization for Migration (IOM) reported in 2006 that Afghan children are trafficked within the country to work as bonded labourers in brick kilns¹³². This was corroborated by a recent report published by the U.S. State Dept. Afghan refugees who have migrated to neighbouring Iran and Pakistan face a similar situation vis-à-vis debt bondage in the brick kilns.

Workers' accommodation is located in a compound surrounded by high mudwalls next to the kilns themselves. The compound is divided into mud huts, each with one very small window and "toshaks" for people to sleep on. Toilets consist of a small, roofless brick hut

¹²⁷ Swiss Resource Center and Consultancies for Development. January 25, 2012. <http://www.skat.ch/activities/prarticle.2005-09-20.1264594682/skatactivity.2005-11-24.5605239928/prarticle.2009-05-27.0062811336> (accessed January 25, 2012).

¹²⁸ Ibid.

¹²⁹ International Labour Organization. *Buried in bricks: a rapid assessment of bonded labour in brick kilns in Afghanistan*. Kabul: International Labour Organization, 2012. p.2.

¹³⁰ Op cit.. p.2.

¹³¹ The New York Times. March 15, 2011.

<http://www.nytimes.com/2011/03/16/world/asia/16kiln.html?pagewanted=all> (accessed January 27, 2012).

¹³² United Nations Children's Fund. September 04, 2006. http://www.childtrafficking.org/cgi-bin/ct/main.sql?file=view_document.sql&TITLE=-1&AUTHOR=-1&THESAURUS=-1&ORGANIZATION=-1&TOPIC=-1&GEOG=-1&YEAR=-1&LISTA=No&COUNTRY=-1&FULL_DETAIL=Yes&ID=2688 (accessed January 27, 2012).

with a hole in the ground. The huts vary in size and number of rooms: the smallest ones house a family of 6 and the largest ones, with 3 or 4 rooms, can house up to 25 people.¹³³

Brick kilns were selected for the study from two provinces based upon a rapid assessment which was conducted in 2011. Although there are reports of brick kilns in other provinces, this has not been confirmed. Selection of the study districts within these two provinces was necessarily influenced by security concerns and accessibility. The provinces selected are Kabul and Nangarhar, and within these, the districts of Deh Sabz and Surkhroad respectively.

The kilns have a similar design and layout. The kilns are made in the “bullring” style, and are fired with coal and, less commonly, cut up tires, which are fed by workers standing on the top of the kiln through 15-20 cm. holes. Smoke is evacuated through a chimney, with relatively little smoke at ground level.

There is a black smoke from the kiln chimneys, which is sometimes diverted towards the workers when there is a gust of wind (witnessed about once a day). There is a constant faint smell of burning coal however.

The work areas around the kilns are rectangular and delineated by 50-75cm. high mounds of clay on two or three sides. Water arrives at the work area through a small canal system, where it is diverted into pools made of dry clay. This water is used for making the bricks. The rest of the area is used for drying the freshly made bricks in the sun. There are a few trees, also there is shade behind shed walls and at the bottom of cliffs. The ground is dusty.

Periodically, when there is a gust of wind or more frequently, when a transportation truck passes by, a cloud of dust is sent into the air for about half a minute. Visibility is still OK at this point though. The rest of the time, visibility is perfect ... but once one leaves the kilns, the nose feels clogged up with dust.

The tasks in which both boys and girls, engage and the equipment they use are:

1. Preparing clay for mixing, using shovels.
2. Hauling water to mix with the clay using buckets or water channels.
3. Mixing clay with water, using shovels.
4. Kneading the clay, using hands and feet.
5. Rolling the clay into balls, using hands.
6. Packing the clay into molds, using hands.
7. Emptying the wet brick from the mold, using hands and arms.
8. Arranging bricks to dry in the sun, using hands.
9. Turning the bricks so as to dry evenly on all sides, using hands.
10. Lifting bricks onto a cart for transport to/from the kiln, using hands, arms, and back.

¹³³ Occupational Safety Hazards Faced by Children Working in Brick Kilns in Afghanistan: Field Report, 2013.

The youngest children, age 4-7, are mostly engaged in the preliminary phases. Adults say that they keep children away from the burning kiln itself, and this was observed when a child began to get too close. Behind the kiln however, in the area where the bricks are, several little girls were seen digging for coal. The weight of the clay being hefted by children under 10 years old was 3.5 to 4 kilos, and by children 11-14 was 4.0 to 4.2 kilos; the weight of the mold was approximately one half kilo. Children commonly moved 3 bricks at a time for a total of 12 kilos. They worked in a crouching or kneeling position and worked fairly rapidly, taking 1.5 to 2.0 minutes to perform the task, e.g. putting the clay into the mold, with 10-15 seconds between tasks. Young boys were also observed herding the donkeys that transported bricks as well as loading clay into a cart (weight of the load approximately 40 kilos). Children also carried water in buckets, a weight averaging about 7 kilos.

Older children were more likely to load the dried bricks into wheelbarrows or onto donkeys to take to the kiln, loading bricks in the kiln and removing them after firing, and stacking bricks that had been fired (bricks at this stage were lighter, averaging 3.2 kilos). Loading required rapid (less than 1 minute per action) bending, turning, and lifting movements.

The only motorized equipment in the area is the trucks transporting the clay and coal to the site, which pass by every 15-20 minutes, and the water pump. The former creates enough noise that it is difficult to hear and may pose some danger of hitting a child, but none has been reported. The latter poses a threat of electrical shock due the state of maintenance of the cords.

Few considerations are made for workers' protection or comfort. For example, child workers do not use gloves, despite the fact that the bricks are rough. About 9 out of 10 children have plastic sandals or shoes for foot protection. The rest are barefoot. To rest, the workers can get out of the sun by sitting in the shade of the cliffs from which the clay is dug and there are a few small and medium-sized mud huts with wooden beds in them where workers can go to rest. They take breaks usually at around 10am and 2pm; the lunch break is usually around 12-12:30 and lasts about an hour. No women were observed working on the actual site where bricks are made. Some were spotted going in and out of the residential areas which are protected by high walls. Latrines were not observed, although, it was reported that makeshift toilets are made by stacking bricks in a specific fashion and burying the contents under sand.

Figure 29. Number of hours of work per week (Afghanistan)

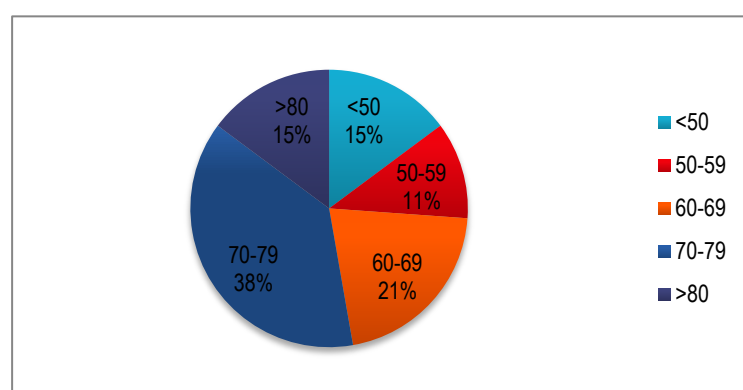
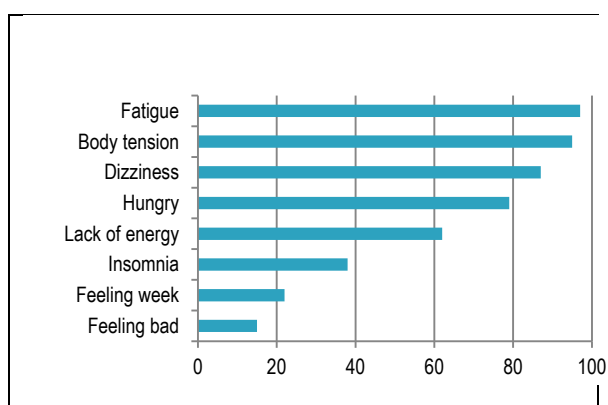


Figure 30. General “malaise” of children age 11-17 working in brick kilns



Note: At the time this report was submitted, the final Afghanistan country report had not yet been submitted by the consultants. Therefore Tables 18-24 could not be completed. The only tabular data to be included in this report are for the psychosocial indicators which were submitted independent of the rest.

Figure 31. Serious injury in the last year by gender and location of occurrence (Afghanistan)

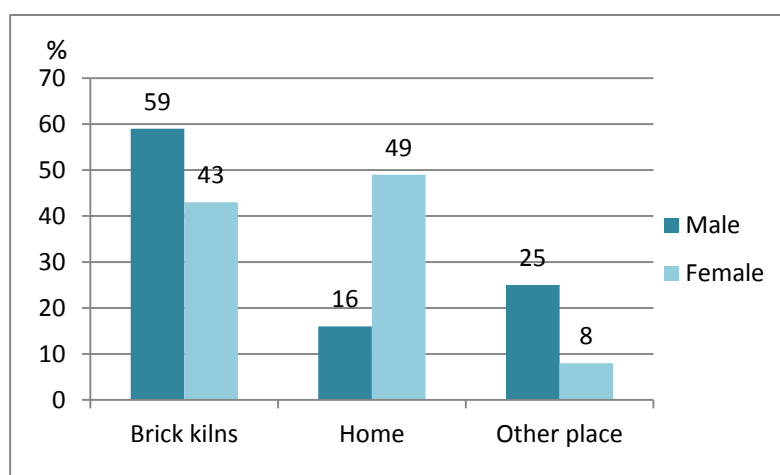


Table 12. Psychosocial characteristics of child workers (Afghanistan, N=401)

	Never or Sometimes		Often		Always	
	N	%	N	%	N	%
Self-Esteem						
Feels proud of work	314	79%	32	8%	52	13%
Feels adequately skilled at work	276	69%	52	13%	70	18%
Feels appreciated at work	274	69%	78	20%	46	12%
Feels looked down upon because of job	300	75%	56	14%	42	11%
Feels that family relies on child's work	125	31%	113	28%	159	40%
Stress						
Feels pressured to work faster and harder	194	49%	98	25%	106	27%
Feels bored because of lack of work	286	72%	60	15%	52	13%
Feels that family, employer, or others ask too much	170	43%	105	26%	122	31%
Feels bored because of repetitive work	180	45%	116	29%	100	25%
Feels tired due to long working hours or heavy work load	166	42%	117	29%	114	29%
Personal agency						
Feels unable to engage in desired activities due to work	213	54%	76	19%	108	27%

	Never or Sometimes		Often		Always	
	N	%	N	%	N	%
Feels autonomy in choosing work	357	90%	33	8%	8	2%
Relationships						
Bothered by work environment	*	*	*	*	*	*
Comfortable with coworkers	198	50%	112	28%	88	22%
Supervision and training						
Feels watched over for safety at work	232	58%	71	18%	95	24%
Receives training at work	198	50%	105	26%	95	24%

All measures are self-reported.
Significance values represent significance test (chi2 or Fisher's exact) comparing working and non-working children.

Table 13. Psychosocial characteristics of brick and control children (Afghanistan)

	Brick Children N=401						Comparison Children N=403						
	Not at all or a little		Quite a bit		A lot		Not at all or a little		Quite a bit		A lot		
	N	%	N	%	N	%	N	%	N	%	N	%	Sig
Free leisure time	388	97%	4	1%	9	2%	361	90%	22	5%	20	5%	<0.01
Emotional													
Energetic	361	90%	10	3%	29	7%	363	90%	17	4%	23	6%	0.29
Confident	277	69%	71	18%	53	13%	128	32%	122	30%	151	38%	<0.01
Sleeping difficulties	322	81%	54	14%	24	6%	367	92%	13	3%	21	5%	<0.01
Concentration difficulties	321	80%	45	11%	35	9%	368	91%	9	2%	26	6%	<0.01
Restlessness	359	90%	18	4%	24	6%	362	90%	11	3%	29	7%	0.03
Sadness	271	68%	57	14%	73	18%	301	75%	35	9%	66	16%	<0.01
Quarrelsome	293	73%	49	12%	59	15%	372	92%	10	2%	21	5%	<0.01
Lonely	331	83%	45	11%	25	6%	372	92%	8	2%	23	6%	<0.01
Angry, short-tempered	286	72%	65	16%	49	12%	343	85%	22	5%	38	9%	<0.01
Low appetite	303	76%	61	15%	37	9%	319	79%	51	13%	33	8%	0.47
Forgetful	255	64%	96	24%	50	12%	323	80%	27	7%	53	13%	<0.01
Somatic	241	60%	100	25%	60	15%	310	77%	27	7%	66	16%	<0.01
Physical tension	212	53%	119	30%	70	17%	323	80%	44	11%	36	9%	<0.01
Dizziness													
Chronic fear & anxiety													
Afraid or nervous	353	88%	22	5%	26	6%	352	87%	16	4%	35	9%	0.32
Worried	79	22%	208	59%	67	19%	342	85%	23	6%	36	9%	<0.01
Rumination about bad things	306	77%	73	18%	20	5%	344	85%	16	4%	43	11%	<0.01
Hopelessness & helplessness													
Optimistic about future	300	75%	66	16%	35	9%	153	38%	87	22%	163	40%	<0.01
Thinks that life is worse	187	47%	144	36%	69	17%	287	72%	26	6%	88	22%	<0.01
Thinks that life is not worth	332	83%	46	12%	21	5%	246	61%	81	20%	76	19%	<0.01
Social factors													
Familial support and love	41	10%	238	60%	121	30%	46	11%	246	61%	111	28%	0.66
Familial conflict	351	88%	20	5%	29	7%	371	93%	8	2%	22	5%	0.04
Feels accepted by nearby	270	67%	53	13%	78	19%	78	19%	186	46%	139	34%	<0.01
Has friendship support	329	82%	54	14%	17	4%	185	46%	66	16%	150	37%	<0.01
Experiences teasing or rejection	282	70%	63	16%	56	14%	361	90%	14	3%	28	7%	<0.01
Engages in games/sports with	376	94%	8	2%	17	4%	302	75%	63	16%	37	9%	<0.01
Feels different from peers	233	58%	129	32%	39	10%	317	79%	8	2%	78	19%	<0.01
Abuse and maltreatment													
Gets scolded, criticized, or	331	83%	34	8%	36	9%	375	93%	4	1%	24	6%	<0.01
Gets beaten at home or work	278	70%	33	8%	89	22%	373	93%	5	1%	25	6%	<0.01
Sexual assault at work	396	99%	4	1%	0	0%	390	97%	2	0%	10	2%	<0.01
Severe punishment for mistakes	335	84%	47	12%	18	5%	346	86%	51	13%	6	1%	0.04
Feels safe in day-to-day life	279	70%	75	19%	46	12%	64	16%	209	52%	130	32%	<0.01

5.2 Results from Bangladesh

Brick is the primary construction material in Bangladesh and the demand has been rising steadily over the past decade. With the current rapid rate of economic and population growth, the construction sector is expected to expand at the rate of 8%-9% per year¹³⁴ with the demand for bricks growing at about 5.6% per year.¹³⁵ A recent study shows that brick making contributes about 1 percent to the country's gross domestic product and generates employment for about 1 million people.¹³⁶ The Bangladesh Brick Makers Owners' Association (BBMOA) estimates that there are around 8 thousand registered and unregistered brick kilns in the country.

Despite the importance of brick making, the vast majority of kilns use outdated, energy-intensive technologies that are highly polluting;¹³⁷ they burn 6 million tons of coal (mostly low-grade) emitting an estimated 9.8 million tons of CO₂ per year. They also emit 28.8% sulfur dioxide, 8.8% nitrogen oxide and high concentrations of carbon monoxide.¹³⁸ In addition to coal, the kilns also burn wood, plastic, and tires. Due to the lack of relevant policy and legislation, the brick sector is also poorly regulated and has notably poor labour standards.

The brick kilns are situated in all of the seven divisions of the country and in almost every district. What is interesting is that the rural kilns use local workers, locally available clay and manual labour only, whereas the kilns around the big cities such as Dhaka use migrant workers (from the countryside), import clay from elsewhere, and have a degree of mechanization. The brick kiln worker population is relatively homogenous, with no significant religious or ethnic minorities.

The "Occupational health and safety survey" of the Bangladesh Institute of Labour Studies (BILS) reported that one brick kiln worker had died in 2002. Another death was reported in 2004,¹³⁹ and in 2012 nine workers were killed in workplace accidents in brick kilns.¹⁴⁰

Two brick kilns were selected for this study, Jhinaidah Sadar, a rural site in southwestern Bangladesh, and Ashulia Savar, an urban site in Dhaka District.

Table 14. Demographics of brick and control children (Bangladesh, N=110)

	Brick Children		Comparison group		Sig
	N	%	N	%	

¹³⁴ World Bank. (2011). Introducing Energy-efficient Clean Technologies in the brick sector of Bangladesh.

¹³⁵ Speech of Dr. Atiur Rahman, Governor, Bangladesh Bank, Workshop on "Business Opportunities to Develop Energy Efficient Brick Kilns in Bangladesh" November 27, 2011.

¹³⁶ Lelia & Maria. (2012).

¹³⁷ World Bank, June 2011.

¹³⁸ "Toxic fumes from brick kilns: A threat to health" available at www.sosarsenic.net accessed on December 09, 2012.

¹³⁹ BILS. "Workplace accident statistics-2004".

¹⁴⁰ BILS Newspaper Survey, 2012.

	N=70		N=40	
ALL CHILDREN				
Age, years				0.97
11-14	26	37%	15	38%
15-17	44	63%	25	63%
Sex				1.00
Female	1	1%	0	0%
Male	69	99%	40	100%
Migrant				<0.01
Yes	35	50%	0	0%
No	35	50%	40	100%
Living situation				<0.01
With parents or relatives	35	50%	40	100%
Other	35	50%	0	0%
CHILDREN AGES 11-14 YEARS		N=26	N=15	
Attends school currently				<0.01
Yes	3	15%	6	35%
No	17	85%	11	65%
Attends school when brick kilns are closed for the season				
Yes	6	35%	n/a	n/a
No	11	65%	n/a	n/a
Class of education currently reading or read before working				
1-5	13	65%	5	33%
6-8	4	20%	7	47%
8-11	3	15%	3	20%
CHILDREN AGES 15-17 YEARS		N=38	N=25	
Attends school currently				<0.01
Yes	1	3%	24	96%
No	37	97%	1	4%
Attends school when brick kilns are closed for the season				
Yes	5	14%	n/a	n/a
No	32	87%	n/a	n/a

Figure 32. Number of hours brick kiln children work per week (percentage)

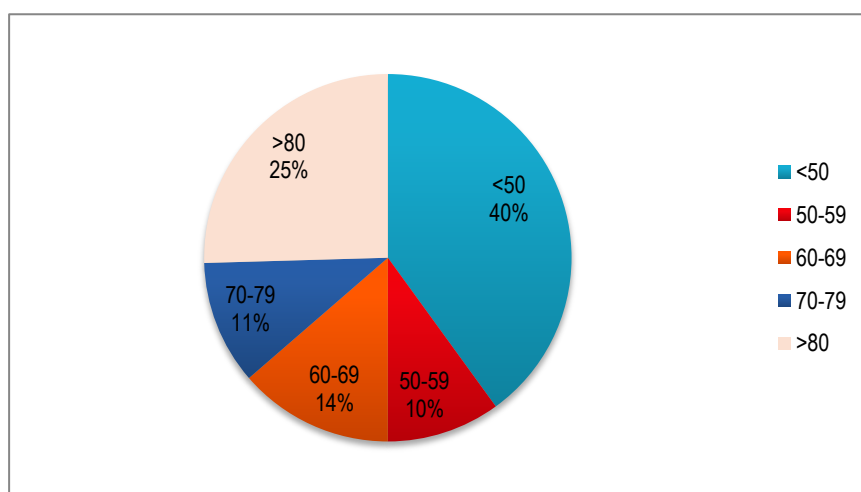


Table 15. General health and nutrition (Bangladesh, N=110)

	Brick Children N=70		Comparison group N=40		Sig
	N	%	N	%	
Usual hours slept per night					0.49
Mean [SD]	8.5	[1.2]	8.6	[1.3]	
SERIOUS HEALTH ISSUES					
Ever had any other injury that was really, really bad at work					0.45†
Yes	11	16%	1	3%	
No	59	84%	17	43%	
Missing response	0	0%	22	55%	
Knows other children who have been hurt very badly at work					0.22†
Yes	15	21%	1	3%	
No	55	79%	0	0%	
Missing response	0	0%	39	98%	
Knows other children who have died because of an injury at the brick kilns					1.00†
Yes	4	6%	0	0%	
No	66	94%	1	3%	
Missing response	0	0%	39	98%	
Knows that young people use drugs or alcohol					1.00†
Yes	27	39%	0	0%	
No	43	61%	1	3%	
Missing response	0	0%	39	98%	
Knows young people use tobacco products					1.00†
Yes	21	30%	0	0%	
No	49	70%	1	3%	
Missing response	0	0%	39	98%	
Nutritional status					
Underweight					
Normal weight					
Overweight					
Anemia					0.06†
Yes	9	13%	11	28%	
No	55	79%	26	65%	
Missing response	6	9%	3	8%	
Pain or distress in back/neck in the last year					<0.01
Yes	34	49%	6	15%	
No	36	51%	34	85%	
Breathing trouble or coughing in the last year					0.19
Yes	24	34%	9	23%	
No	46	66%	31	78%	
Fever experienced in the last year					0.37
Yes	56	80%	29	73%	
No	14	20%	11	28%	
Headache experienced in the last year					0.23
Yes	41	59%	28	70%	
No	29	41%	12	30%	
Weak feeling experienced in the last year					0.11
Yes	39	56%	16	40%	
No	31	44%	24	60%	
Feeling bad all over experienced in the last year					<0.01
Yes	14	20%	0	0%	

	Brick Children N=70		Comparison group N=40		Sig
	N	%	N	%	
No	56	80%	40	100%	
†Significance represents p-value from chi2 or Fisher's Exact test for nonmissing values only					

Table 16. Health events in the last month (Bangladesh, N=110)

	Brick Children N=70		Comparison group N=40		Sig
	N	(%)	N	(%)	
Experienced fatigue or exhaustion					<0.01
Often or sometimes	55	79%	22	55%	
Never	15	21%	18	45%	
Experienced minor cuts or bruises					0.07
Often or sometimes	52	74%	23	58%	
Never	18	26%	17	43%	
Felt pains in body					<0.01
Often or sometimes	61	87%	21	53%	
Never	9	13%	19	48%	
Felt anxiety or fear					0.91
Often or sometimes	36	51%	21	53%	
Never	34	49%	19	48%	

All events are self-reported.

Significance values represent significance test (chi2 or Fisher's exact) comparing working and non-working children.

Table 17. Musculoskeletal pain (Bangladesh, N=110)

	Brick Children N=70		Comparison group N=40		Sig
	N	%	N	%	
IN THE LAST YEAR					
Musculoskeletal pain, ache, or discomfort					
Neck and shoulders	7	10%	0	0%	0.04
Extremities	0	0%	0	0%	-
Back	1	1%	0	0%	0.45
Any musculoskeletal pain that limited normal work (at home or in the brick kilns)					0.67
Yes	13	19%	3	8%	
No	35	50%	11	28%	
Missing responses	22	31%	26	65%	
IN THE LAST 7 DAYS					
Musculoskeletal pain, ache, or discomfort					
Neck and shoulders	6	9%	0	0%	0.21
Extremities	6	9%	0	0%	0.23
Back	2	3%	1	3%	0.29

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

Figure 33. Brick kiln children suffering from fatigue syndrome (Bangladesh)

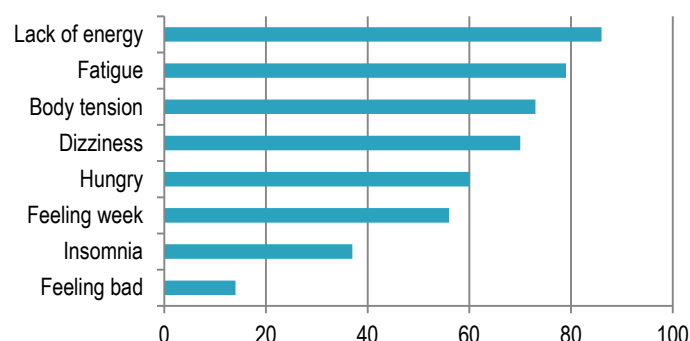


Table 18. Illnesses in the last year (Bangladesh, N=110)

	Brick Children N=70		Comparison group N=40		Sig
	N	%	N	%	
Breathing problems or persistent cough experienced in the last year					0.69
Yes	32	46%	16	40%	
No	38	54%	24	60%	
Eye or ear problem experienced in the last year					0.81
Yes	11	16%	7	18%	
No	59	84%	33	83%	
Skin problems experienced in the last year					0.25
Yes	12	17%	3	8%	
No	58	83%	37	93%	
Stomach problems or diarrhea experienced in the last year					0.18
Yes	30	43%	12	30	
No	40	57%	28	40	

Unless otherwise indicated, values represent N (%).

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls.

Table 19. Serious Injuries in the last year (Bangladesh, N=110)

	Brick Children N=70		Comparison Children N=40		Sig
	N	%	N	%	
BAD CUTS OR BRUISES					
Experienced this injury in the last year					0.01
Yes	60	86%	26	65%	
No	10	14%	14	35%	
Body part					0.06
Lower extremities	45	75%	13	50%	
Upper extremities	13	22%	11	42%	
Head or neck	2	3%	2	8%	
Trunk	0	0%	0	0%	
Other	0	0%	0	0%	
Where occurred					<0.01
Brick kiln	52	87%	0	0%	
Home	8	13%	22	85%	

	Brick Children N=70		Comparison Children N=40		Sig
	N	%	N	%	
Other	0	0%	4	15%	
BROKEN BONE(S)					
Experienced this injury in the last year					0.41
Yes	5	7%	1	3%	
No	65	93%	39	98%	
Body part					1.00
Lower extremities	2	40%	0	0%	
Upper extremities	2	40%	1	100%	
Head or neck	0	0%	0	0%	
Trunk	1	20%	0	0%	
Other	0	0%	0	0%	
Where occurred					1.00
Brick kiln	3	60%	0	0%	
Home	2	40%	1	100%	
Other	0	0%	0	0%	
SPRAINS, STRAINS, DISLOCATIONS					
Experienced this injury in the last year					1.00
Yes	7	10%	4	10%	
No	63	90%	36	90%	
Body part					0.58
Lower extremities	5	71%	2	50%	
Upper extremities	2	29%	2	50%	
Head or neck	0	0%	0	0%	
Trunk	0	0%	0	0%	
Other	0	0%	0	0%	
Where occurred					0.03
Brick kiln	4	57%	0	0%	
Home	3	43%	1	25%	
Other	0	0%	3	75%	
BURNS OR SCALDS					
Experienced this injury in the last year					0.40
Yes	7	10%	0	0%	
No	63	90%	40	100%	
Body part					-
Lower extremities	4	57%	0	0%	
Upper extremities	2	29%	0	0%	
Head or neck	1	14%	0	0%	
Trunk	0	0%	0	0%	
Other	0	0%	0	0%	
Where occurred					-
Brick kiln	5	71%	0	0%	
Home	2	29%	0	0%	
Other	0	0%	0	0%	

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

Table 20. Treatment for illnesses and injuries (Bangladesh, N=110)

	Brick Children		Comparison group		
	N	%	N	%	Sig
HEALTH CONDITIONS IN THE LAST YEAR					
Fever		N=24		N=12	0.28
Did nothing	13	23%	3	10%	
Care by self, brick kiln owner, parents, or other	13	23%	7	24%	
Local healer	6	11%	7	24%	
Clinic or hospital	24	43%	12	41%	
Headache		N=18		N=9	0.08
Did nothing	11	27%	15	54%	
Care by self, brick kiln owner, parents, or other	10	24%	2	7%	
Local healer	2	5%	2	7%	
Clinic or hospital	18	44%	9	32%	
Weak feeling		N=39		N=16	0.31
Did nothing	28	72%	11	69%	
Care by self, brick kiln owner, parents, or other	6	15%	3	19%	
Local healer	1	3%	2	13%	
Clinic or hospital	4	10%	0	0%	
Bad feeling all over		N=14		N=0	-
Did nothing	8	57%	n/a	n/a	
Care by self, brick kiln owner, parents, or other	2	14%	n/a	n/a	
Local healer	2	14%	n/a	n/a	
Clinic or hospital	2	14%	n/a	n/a	
ILLNESSES IN THE LAST YEAR					
Breathing problems or persistent cough		N=32		N=16	0.12
Did nothing	16	50%	5	31%	
Care by self, brick kiln owner, parents, or other	8	25%	5	31%	
Local healer	7	22%	2	13%	
Clinic or hospital	1	3%	4	25%	
Eye or ear problem		N=11		N=7	0.02
Did nothing	8	73%	1	14%	
Care by self, brick kiln owner, parents, or other	2	18%	1	14%	
Local healer	0	0%	2	29%	
Clinic or hospital	1	9%	3	43%	
Skin problems		N=12		N=3	0.23
Did nothing	5	42%	0	0%	
Care by self, brick kiln owner, parents, or other	5	42%	1	33%	
Local healer	1	8%	0	0%	
Clinic or hospital	1	8%	2	67%	
Stomach problems or diarrhea		N=30		N=12	0.44
Did nothing	6	20%	2	17%	
Care by self, brick kiln owner, parents, or other	12	40%	7	58%	
Local healer	11	37%	2	17%	
Clinic or hospital	1	3%	1	8%	
SERIOUS INJURIES EXPERIENCED IN THE LAST YEAR					
Bad cuts or bruises		N=60		N=26	0.15
Did nothing	18	30%	9	35%	
Care by self, brick kiln owner, parents, or other	30	50%	13	50%	
Local healer	8	13%	0	0%	
Clinic or hospital	4	7%	4	15%	

	Brick Children		Comparison group		Sig
	N	%	N	%	
Broken bone(s)		N=5		N=1	1.00
Did nothing	0	0%	0	0%	
Care by self, brick kiln owner, parents, or other	0	0%	0	0%	
Local healer	2	40%	0	0%	
Clinic or hospital	3	60%	1	100%	
Sprains, strains, or dislocations		N=7		N=4	0.82
Did nothing	0	0%	1	25%	
Care by self, brick kiln owner, parents, or other	2	29%	0	0%	
Local healer	3	43%	2	50%	
Clinic or hospital	2	29%	1	25%	
Burns or scalds		N=7		N=0	-
Did nothing	0	0%	n/a	n/a	
Care by self, brick kiln owner, parents, or other	5	71%	n/a	n/a	
Local healer	1	14%	n/a	n/a	
Clinic or hospital	1	14%	n/a	n/a	

Table 21. Psychosocial characteristics of child workers (Bangladesh, N=70)

	Never or Sometimes		Often		Always	
	N	%	N	%	N	%
Self-Esteem						
Feels proud of work	56	80%	6	9%	8	11%
Feels adequately skilled at work	53	76%	7	10%	10	14%
Feels appreciated at work	51	73%	13	19%	6	9%
Feels looked down upon because of job	46	66%	12	17%	12	17%
Feels that family relies on child's work	22	31%	16	23%	32	46%
Stress						
Feels pressured to work faster and harder	46	66%	9	13%	15	21%
Feels bored because of lack of work	40	57%	20	29%	10	14%
Feels that family, employer, or others ask too much	54	77%	11	16%	5	7%
Feels bored because of repetitive work	39	56%	18	26%	13	19%
Feels tired due to long working hours or heavy work load	30	43%	21	30%	19	27%
Personal agency						
Feels unable to engage in desired activities due to work	43	61%	18	26%	9	13%
Feels autonomy in choosing work	42	60%	20	29%	8	11%
Relationships						
Bothered by work environment	40	57%	22	31%	8	11%
Comfortable with coworkers	32	46%	15	21%	23	33%
Supervision and training						
Feels watched over for safety at work	43	61%	13	19%	14	20%
Receives training at work	37	53%	12	17%	21	30%
All measures are self-reported..						

Table 22. Psychosocial characteristics of brick and children (Bangladesh)

	Brick Children - N=70						Comparison Children - N=40					
	Not at all or a little		Quite a bit		A lot		Not at all or a little		Quite a bit		A lot	
	N	%	N	%	N	%	N	%	N	%	N	% Sig
Free leisure time	43	61%	21	30%	6	9%	7	18%	17	43%	16	<0.01
Emotional												
Energetic	35	50%	17	24%	18	26%	15	38%	10	25%	15	0.36
Confident	45	64%	13	19%	12	17%	13	33%	8	20%	19	<0.01
Sleeping difficulties	53	76%	1	1%	16	23%	32	80%	4	10%	4	0.03
Concentration trouble	54	77%	10	14%	6	9%	33	83%	3	8%	4	0.60
Restlessness	41	59%	21	30%	8	11%	33	83%	6	15%	1	0.04
Sadness	46	66%	19	27%	5	7%	34	85%	6	15%	0	0.05
Quarrelsome	60	86%	10	14%	0	0%	34	85%	4	10%	2	0.22
Lonely	47	67%	15	21%	8	11%	37	93%	2	5%	1	0.01
Angry, short-tempered	41	59%	16	23%	13	19%	33	83%	3	8%	4	0.04
Low appetite	42	60%	6	9%	22	31%	31	78%	2	5%	7	0.18
Forgetful	55	79%	8	11%	7	10%	32	80%	5	13%	3	1.00
Somatic												
Physical tension	40	57%	17	24%	13	19%	29	73%	6	15%	5	0.31
Dizziness	51	73%	11	16%	8	11%	34	85%	5	13%	1	0.23
Chronic fear & anxiety												
Afraid or nervous	45	64%	13	19%	12	17%	28	70%	11	28%	1	0.05
Worried	42	60%	17	24%	11	16%	25	63%	6	15%	9	0.42
Rumination about bad things	51	73%	15	21%	4	6%	32	80%	5	13%	3	0.60
Hopeless/ helplessness												
Optimistic about future	33	47%	15	21%	22	31%	9	23%	12	30%	19	0.04
Life is worse than others'	38	54%	26	37%	6	9%	30	75%	7	18%	3	0.08
Life not worthwhile	50	71%	11	16%	9	13%	27	68%	8	20%	5	0.87
Social factors												
Familial support and love	24	34%	13	19%	33	47%	11	28%	6	15%	23	0.58
Familial conflict	62	89%	4	6%	4	6%	33	83%	2	5%	5	0.46
Feels accepted by others	32	46%	17	24%	21	30%	9	23%	9	23%	22	0.20
Has friendship support	26	37%	15	21%	29	41%	7	18%	11	28%	22	0.10
Experiences teasing	61	87%	8	11%	1	1%	39	98%	1	3%	0	0.19
Engages in games/sports	31	44%	17	24%	22	31%	6	15%	11	28%	23	<0.01
Feels different from peers	52	74%	12	17%	6	9%	38	95%	2	5%	0	0.02
Abuse and maltreatment												
Gets scolded, criticized	49	70%	18	26%	3	4%	34	85%	6	15%	0	0.18
Gets beaten	61	87%	9	13%	0	0%	37	93%	3	8%	0	0.53
Sexual assault at work	60	86%	7	10%	3	4%	39	98%	1	3%	0	0.17
Severe punishment at work	58	83%	11	16%	1	1%	37	93%	3	8%	0	0.36
Feels safe in day-to-day life	30	43%	24	34%	16	23%	21	53%	4	10%	15	0.01

5.3 Results from Nepal

A rapid assessment survey of children working in brick kilns estimated that 59,925 children were working in brick factories in 2003.¹⁴¹ Many of the child workers migrate with their families from other areas of Nepal, some come from India, and the rest are locally-resident low income families.¹⁴²

Work in the factories is seasonal, October through May or until the monsoons start. Payment is by piece rate and, in many cases, the children are working under debt bondage where their earnings are deducted by brokers or employers from family debt incurred during the previous year. A rapid assessment conducted in 2012 by two NGOs, Plan and World Education, found that 40% of the families were in debt, having taken advances from the brick kiln owner, and almost 80% of the families were also dependent on the kiln owner for their living quarters ... a simple make-shift hut.

Three types of brick factory are found in Nepal: single chimney, double chimney, and chimneyless. The differences in technology appear to be a major factor in the nature and extent of both occupational and environmental hazards.

Two districts – Sarlahi and Bhaktapur -- were chosen for this study, based upon a previous rapid assessment which indicated a significant difference between the two in terms of brick kiln technology and socio-economic characteristics of the brick kiln worker population. Sarlahi lies in the Terai belt which is a low-lying plain at the foot of the Himālayas abutting India. It is tropical, with temperatures rising to the high 40s in the hot season. It attracts local poor from Madeshi (populations of largely Indian origin) such as Terai Dalit (formerly known as ‘untouchables’) and Taharu, an ethnic minority. The brick manufacturing technology is more primitive, producing larger and heavier bricks which are carried on the head. Sarlahi has a high concentration of kilns and child labour, typical of the Terai. Bhaktapur is located in the hill country with a more temperate climate that is cold in the winter brick season. It attracts mainly seasonal migrants from hill ethnic minorities and hill-based Dalit groups. The technology is more advanced; bricks are carried on the back using a tump line. Bhaktapur has a large concentration of accessible brick factories (64) typical of kilns and conditions in the hill districts.

Table 23. Demographics of brick and control children (Nepal)

N=305	Brick Children		Comparison group		Sig
	N	%	N	%	
ALL CHILDREN		N=198		N=107	
Age, years					0.64
11-14	126	64%	71	66%	
15-17	72	36%	36	34%	
Sex					0.81
Female	110	56%	61	57%	

¹⁴¹ Sainju, B. *Child Labor in Brick Factories in Nepal*, CONCERN-NEPAL, 2003.

¹⁴² World Education International: *Children Working in Brick Factories: child labour status report*, 2009. PLAN and World Educational International: *Children Working in Brick Factories: Research report*, (unpublished) 2012.

N=305	Brick Children		Comparison group		Sig
	N	%	N	%	
ALL CHILDREN		N=198		N=107	
Male	88	44%	46	43%	
Migrant					<0.01
Yes	101	51%	25	23%	
No	97	49%	82	77%	
Living situation					0.06
With parents or relatives	180	94%	99	99%	
Other	11	6%	1	1%	
CHILDREN AGES 11-14 YEARS		N=126		N=71	
Attends school currently					<0.01
Yes	38	30	71	100	
No	87	70	0	0	
Attends school when brick kilns are closed for the season					-
Yes	114	91	n/a	n/a	
No	12	10	n/a	n/a	
Class of education currently reading or read before working					<0.01
1-5	104	88	6	9	
6-8	13	11	32	45	
8-11	1	1	33	47	
CHILDREN AGES 15-17 YEARS		N=72		N=36	
Attends school currently					<0.01
Yes	12	17	36	100	
No	60	83	0	0	
Attends school when brick kilns are closed for the season					-
Yes	40	56	n/a	n/a	
No	32	44	n/a	n/a	

Table 24. General health and nutrition (Nepal)

N=305	Brick Children N=198		Control Children N=107		Sig
	N	%	N	%	
Usual hours slept per night					
Mean [SD]	8.5	[1.7]	8.2	[1.5]	0.19
SERIOUS HEALTH ISSUES					
Ever had any other injury that was really, really bad at work					0.41
Yes	14	7%	3	3%	
No	141	71%	62	58%	
Missing response	43	22%	42	39%	
Know other children who have been hurt very badly at work					0.05
Yes	23	12%	21	20%	
No	167	84%	81	76%	
Missing response	8	4%	5	5%	
Know other children who have died because of an injury at the brick kilns					0.21
Yes	3	2%	4	4%	
No	185	93%	78	73%	
Missing response	10	5%	25	23%	
Knows that young people use drugs or alcohols					<0.01
Yes	48	24%	44	41%	
No	150	76%	63	59%	
Missing response	0	0%	0	0%	
Knows young people use tobacco products					0.07
Yes	70	35%	46	43%	
No	94	48%	38	36%	
Missing response	34	17%	23	22%	

N=305	Brick Children N=198		Control Children N=107		Sig
	N	%	N	%	
Nutritional status					
Underweight					
Normal weight					
Overweight					
Anemia					0.89
Yes	27	14%	14	13%	
No	171	86%	93	87%	
Pain or bother in back/neck experienced in the last week†					<0.01
Yes	149	75%	64	60%	
No	23	12%	37	35%	
Missing response	26	13%	6	6%	
Breathing trouble or coughing experienced in the last week†					<0.01
Yes	139	70%	52	49%	
No	19	10%	47	44%	
Missing response	40	20%	8	8%	
Fever experienced in the last week†					0.01
Yes	56	28%	48	45%	
No	131	66%	59	55%	
Missing response	11	6%	0	0%	
Headache experienced in the last week†					0.96
Yes	85	43%	49	46%	
No	102	52%	58	54%	
Missing response	11	6%	0	0%	
Weak feeling experienced in the last week†					0.15
Yes	45	23%	18	17%	
No	142	72%	89	83%	
Missing response	11	6%	0	0%	
Feeling bad all over experienced in the last week†					0.02
Yes	10	5%	0	0%	
No	177	89%	107	100%	
Missing response	11	6%	0	0%	
†For Nepal, these variables were reported for each week (other countries reported outcomes over the last year)					

†For Nepal, these variables were reported for each week (other countries reported outcomes over the last year)

Table 25. Health events in the last week[†] (Nepal)

N=305	Brick Children N=198		Control Children N=107		Sig
	N	(%)	N	(%)	
Experienced fatigue or exhaustion					0.13
Often or sometimes	160	81%	98	92%	
Never	27	14%	9	8%	
Missing responses	11	6%	0	0%	
Experienced minor cuts or bruises					
Often or sometimes	*	*	*	*	
Never	*	*	*	*	
Felt pains in body					
Often or sometimes	*	*	*	*	
Never	*	*	*	*	
Felt anxiety or fear					
Often or sometimes	*	*	*	*	
Never	*	*	*	*	

†For Nepal, these variables were reported for each week (other countries reported outcomes over the last year). Also this variable was reported as dichotomous (yes/no) for Nepal, whereas other countries reported this variable as often or sometimes and never.

* No responses for this measure (question not asked?)

All events are self-reported.

Significance values represent significance test (chi2 or Fisher's exact) comparing working and non-working children.

Table 26. Illnesses in the last week[†] (Nepal)

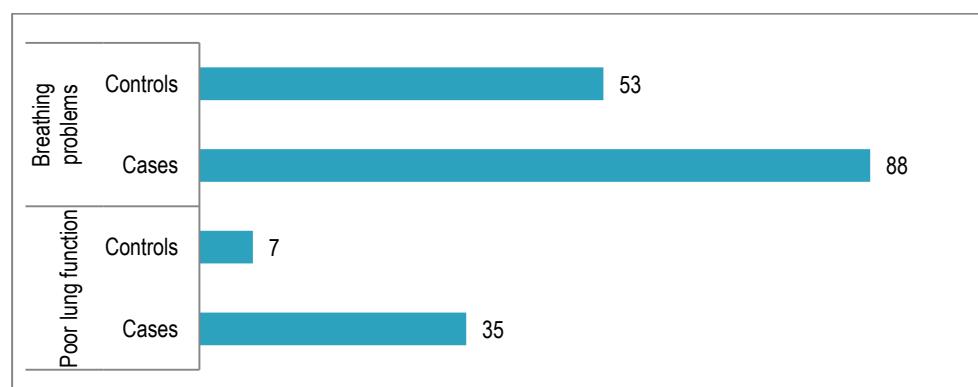
N=305	Brick Children N=198		Control Children N=107		Sig
	N	%	N	%	
Breathing problems or persistent cough experienced in the last week[†]					0.05
Yes	26	13%	7	7%	
No	161	81%	100	93%	
Missing responses	11	6%	0	0%	
Eye or ear problem experienced in the last week[†]					0.03
Yes	52	26%	18	17%	
No	135	68%	89	83%	
Missing responses	11	6%	0	0%	
Skin problems experienced in the last week[†]					<0.01
Yes	72	36%	15	14%	
No	115	58%	92	86%	
Missing responses	11	6%	0	0%	
Stomach problems or diarrhea experienced in the last week[†]					<0.01
Yes	88	44%	31	29%	
No	99	50%	76	71%	
Missing responses	11	6%	0	0%	

[†]For Nepal, these variables were reported for each week (other countries reported outcomes over the last year).

Unless otherwise indicated, values represent N (%).

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls based on non-missing responses only.

Figure 34. Respiratory problems of brick kiln children



Note: In the figure above, “breathing problems” are perceived respiratory issues (self-reported) while “poor lung function” is derived from objective spirometric examinations.

Table 27. Musculoskeletal pain (Nepal)

N=305	Brick Children - N=198		Control Children - N=107		Sig
	N	%	N	%	
IN THE LAST YEAR					
Musculoskeletal pain, ache, or discomfort					
Neck and shoulders	27	14%	0	0%	0.02
Extremities	4	2%	0	0%	1.00
Back	26	13%	0	0%	0.03
Any musculoskeletal pain that limited normal work (at home or in the brick kilns)					1.00
Yes	58	29%	5	5%	
No	16	8%	1	1%	
Missing responses	124	63%	101	94%	
IN THE LAST 7 DAYS					
Musculoskeletal pain, ache, or discomfort					
Neck and shoulders	36	18%	0	0%	<0.01
Extremities	35	18%	0	0%	<0.01
Back	39	20%	0	0%	<0.01
Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.					

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

Table 28. Serious injuries in the last year (Nepal)

N=305	Brick Children N=198		Control Children N=107		Sig
	N	%	N	%	
Bad cuts or bruises					
Experienced this injury in the last year					0.01
Yes	53	27%	18	17%	
No	107	54%	80	75%	
Missing responses	38	19%	9	8%	
Body part					
Lower extremities	*	*	*	*	
Upper extremities	*	*	*	*	
Head or neck	*	*	*	*	
Trunk	*	*	*	*	
Other	*	*	*	*	
Where occurred					
Brick kiln	*	*	*	*	
Home	*	*	*	*	
Other	*	*	*	*	
BROKEN BONE(S)					
Experienced this injury in the last year					0.54
Yes	9	5%	3	3%	
No	151	76%	95	89%	
Missing responses	38	19%	9	8%	
Body part					
Lower extremities	*	*	*	*	
Upper extremities	*	*	*	*	
Head or neck	*	*	*	*	
Trunk	*	*	*	*	
Other	*	*	*	*	
Where occurred					
Brick kiln	*	*	*	*	
Home	*	*	*	*	
Other	*	*	*	*	
SPRAINS, STRAINS, DISLOCATIONS					
Experienced this injury in the last year					<0.01
Yes	44	22%	6	6%	
No	116	59%	92	86%	
Missing responses	38	19%	9	8%	

N=305	Brick Children N=198		Control Children N=107		Sig
	N	%	N	%	
Body part					
Lower extremities	*	*	*	*	
Upper extremities	*	*	*	*	
Head or neck	*	*	*	*	
Trunk	*	*	*	*	
Other	*	*	*	*	
Where occurred					
Brick kiln	*	*	*	*	
Home	*	*	*	*	
Other	*	*	*	*	
BURNS OR SCALDS					
Experienced this injury in the last year					0.17
Yes	9	5%	10	9%	
No	151	76%	88	82%	
Missing responses	38	19%	9	8%	
Body part					
Lower extremities	*	*	*	*	
Upper extremities	*	*	*	*	
Head or neck	*	*	*	*	
Trunk	*	*	*	*	
Other	*	*	*	*	
Where occurred					
Brick kiln	*	*	*	*	
Home	*	*	*	*	
Other	*	*	*	*	

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

* Data not available for this measure (question not asked?)

Table 29. Psychosocial characteristics of child brick workers (Nepal)

N=198	Never or Sometimes		Often		Always	
	N	%	N	%	N	%
Self-Esteem						
Feels proud of work	126	65%	44	23%	23	12%
Feels adequately skilled at work	135	70%	51	27%	6	3%
Feels appreciated at work	129	69%	50	27%	9	5%
Feels looked down upon because of job	173	90%	18	9%	1	1%
Feels that family relies on child's work	121	63%	56	29%	15	8%
Stress						
Feels pressured to work faster and harder	124	65%	62	32%	6	3%
Feels bored because of lack of work	151	79%	37	19%	4	2%
Feels that family, employer, or others ask too much	104	55%	50	26%	35	19%
Feels bored because of repetitive work	134	70%	47	25%	10	5%
Feels tired due to long working hours or heavy work load	109	57%	63	33%	19	10%
Personal agency						
Feels unable to engage in desired activities due to work	156	83%	28	15%	5	3%
Feels autonomy in choosing work	151	79%	32	17%	9	5%
Relationships						
Bothered by work environment	157	83%	30	16%	3	2%
Comfortable with coworkers	121	64%	55	29%	12	6%
Supervision and training						
Feels watched over for safety at work	146	76%	40	21%	6	3%
Receives training at work	148	77%	41	21%	3	2%

All measures are self-reported.

Table 30. Psychosocial characteristics of brick and control children (Nepal)

N=305	Working Children - N=198						Non-Working Children - N=107						Sig
	Not at all or a little		Quite a bit		A lot		Not at all or a little		Quite a bit		A lot		
	N	%	N	%	N	%	N	%	N	%	N	%	
Free leisure time	*	*	*	*	*	*	*	*	*	*	*	*	
Emotional													
Energetic	94	48%	73	37%	22	11%	43	40%	38	36%	26	24%	0.02
Confident	124	63%	56	28%	10	5%	33	31%	57	53%	17	16%	<0.01
Sleeping difficulties	146	74%	39	20%	8	4%	103	96%	2	2%	2	2%	<0.01
Concentration trouble	163	82%	23	12%	6	3%	92	86%	15	14%	0	0%	0.17
Restlessness	166	84%	23	12%	3	2%	85	79%	15	14%	3	3%	0.53
Sadness	165	83%	25	13%	3	2%	97	91%	10	9%	0	0%	0.28
Quarrelsome	177	89%	14	7%	1	1%	85	79%	18	17%	4	4%	<0.01
Lonely	163	82%	28	14%	2	1%	98	92%	5	5%	1	1%	0.02
Angry, short-tempered	153	77%	34	17%	4	2%	83	78%	17	16%	7	7%	0.15
Low appetite	132	67%	29	15%	31	16%	68	64%	26	24%	13	12%	0.12
Forgetful	156	79%	32	16%	5	3%	95	89%	10	9%	1	1%	0.14
Somatic													
Physical tension	146	74%	43	22%	3	2%	95	89%	8	8%	2	2%	<0.01
Dizziness	148	75%	28	14%	17	9%	94	88%	10	9%	1	1%	<0.01
Chronic fear & anxiety													
Afraid or nervous	153	77%	29	15%	8	4%	94	88%	10	9%	3	3%	0.27
Worried	168	85%	19	10%	4	2%	84	79%	17	16%	5	5%	0.11
Rumination about bad things that have happened	161	81%	22	11%	7	4%	85	79%	19	18%	0	0%	0.04
Hopelessness & helplessness													
Optimistic about future	112	57%	72	36%	8	4%	36	34%	54	51%	16	15%	<0.01
Thinks that life is worse compared to other children	151	76%	35	18%	6	3%	89	83%	14	13%	4	4%	0.49
Thinks that life is not worth living	148	75%	27	14%	13	7%	88	82%	14	13%	5	5%	0.72
Social factors													
Familial support and love	71	36%	83	42%	37	19%	15	14%	29	27%	63	59%	<0.01
Familial conflict	160	81%	21	11%	11	6%	82	77%	19	18%	6	6%	0.25
Feels accepted by nearby families	85	43%	94	48%	13	7%	20	19%	40	37%	47	44%	<0.01
Has friendship support	75	38%	102	52%	16	8%	27	25%	60	56%	20	19%	<0.01
Experiences teasing or rejection	149	75%	32	16%	9	5%	93	87%	11	10%	3	3%	0.21
Engages in games/sports with friends	126	64%	58	29%	8	4%	45	42%	51	48%	11	10%	<0.01
Feels different from peers	162	82%	29	15%	2	1%	93	87%	10	9%	2	2%	0.34
Abuse and maltreatment													
Gets scolded, criticized, or belittled	173	87%	12	6%	8	4%	99	93%	3	3%	4	4%	0.48
Gets beaten at home or work	178	90%	12	6%	3	2%	101	94%	5	5%	0	0%	0.53
Sexual assault at work	179	90%	8	4%	4	2%	105	98%	2	2%	0	0%	0.23
Severe punishment for mistakes at work	171	86%	18	9%	4	2%	106	99%	1	1%	0	0%	<0.01
Feels safe in day-to-day life	126	64%	51	26%	13	7%	32	30%	48	45%	27	25%	<0.01

5.4 Results from Pakistan

There are conflicting reports about the number of brick kilns in the country, varying between 8,000 and 15,000 out of which approximately 5,000 are in Punjab province alone. With an annual shortage of 1.5 million housing units per year, and fired clay bricks being the most important construction material in Pakistan, the brick kiln industry has a pivotal role to play in the Pakistan economy.

Most kilns are located in rural areas, and operate on an informal basis, with no government oversight. As they do not accept government support in order to avoid taxation, there has

been little technical progress in production methods,¹⁴³ the “bull trench” kiln being the most common technology used.

In addition to rural landless laborers from Pakistan, the brick kilns have been employing a significant number of refugees from Afghanistan who have migrated there during the periods of insecurity and subsequently fallen into bondage which compels them to stay or at least return year after year.

The full study was carried out in Punjab province, and a corroborating study (no control groups) was carried out in two other provinces, Sindh and Khyber Pakhunkhwa (formerly Northwest Frontier Province). The fourth province of Pakistan, Baluchistan, was also supposed to be included in the study but was dropped due to ongoing political insecurity there. Within Punjab, 3 districts were randomly selected for the study, using listings of brick kilns from previous studies.

5.4.1 Methodology overview

This mixed methodology used in the Pakistan study provides a risk assessment of the health hazards faced by underage brick kiln workers. Triangulating the findings of the quantitative and qualitative analyses allows researchers to identify the health hazards that underage brick kiln workers face and explore their long and short term physical and psychological outcomes. Cross referencing of the findings of quantitative and qualitative analyses allows their corroboration and validation. The methodologies used in this study include:

- Observation research (Module 1)
- Collection of environmental samples (Module 1)
- Surveys and interviews (Module 2)
- Physical examination of respondents (Module 3)
- Focus groups with brick kiln workers (Module 7)

The strategy for sampling brick kilns and selecting respondents in each of the selected sites is provided below.

5.4.2 Sampling plan

The sampling plan entailed extracting samples at two levels. At the first level of extraction, multi-stage cluster sampling was used to identify the kilns in Punjab, KPK and Sindh for the primary study and the conformity study. At the second level of extraction, representative samples from each of the selected kilns were randomly selected. The selection of a control group of non working children of the same age and socio-economic status from the communities surrounding the sampled kilns was also made during that stage. Purposive samples were chosen from the interviewed respondents for ‘dawn to dark’ observation

¹⁴³ Centre for the Improvement of Working Conditions & Environment: *Impact of work on the health, safety and psychosocial well-being of children in brick kilns in Sahiwal and Sukkur Districts*, 2011.

sessions and focus group discussions (FGDs). Lastly, the snowball technique was used to identify rare incidents that resulted in extreme injury or death of underage workers, while working at the selected brick kilns.

The following section provides the detailed sampling plan of the study.

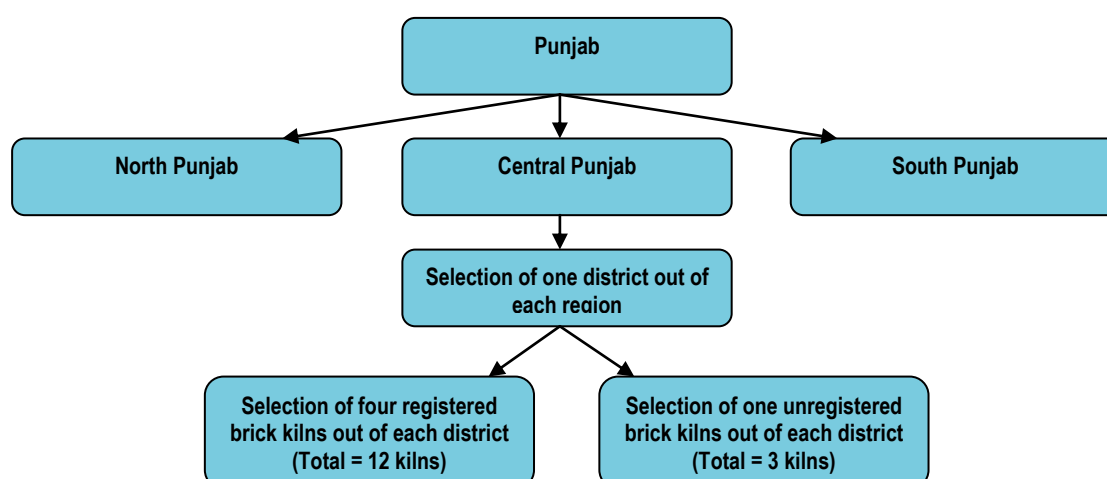
Sampling plan for identifying locations/kilns

The purpose of this study was to gain a cross-sectional perspective of the risks faced by underage brick kiln workers in Pakistan. Since the type of labor performed and consequently the type of risks faced by underage kiln workers may also vary due to social, economic and environmental differences in the areas in which the kilns are located, this study used multi-stage cluster sampling to select a representative cross-section of brick kilns in Pakistan.

Pakistan is divided into four provinces, Punjab, Khyber Pakhtunkhwa (KPK), Baluchistan and Sindh. Punjab was selected as the focal province for this study, with KPK and Sindh selected for the conformity study. Geographically, the province of Punjab is divided into three regions, North Punjab, Central Punjab and South Punjab. All three regions are moderately homogenous in terms of their climate, environment, religion and language. The more urbanized areas of Central Punjab tend to be more ethnically diverse, whereas the ethnic composition in the rural areas is comparatively homogenous. Thus, a randomly selected sample of brick kilns out of each region was expected to present a fair representation of the cross-section of Punjab.

Simple random sampling was used to select one district within each of the three regions of Punjab. A list of registered and unregistered brick kilns located in each of the selected districts was prepared. Random sampling was used to select four registered and one unregistered kiln out of each district producing a total sample of twelve registered and three unregistered brick kilns from Punjab. This sample over-represents unregistered brick kilns, which account for approximately 7.5% of the total number of brick kilns operating in the Punjab province. However, oversampling unregistered brick kilns permits comparisons between the type and intensity of health hazards that children working in registered and unregistered kilns may be exposed to. Figure 2 provides a model representation of this sampling procedure.

Figure 35: Sampling plan for selecting brick kilns in Punjab



Sampling for conformity study

As there had been considerable cross-border migration of kiln workers between Afghanistan and eastern Pakistan during times of economic stress and conflict, it was necessary to explore the degree to which there might be substantial differences between the Punjab and Sindh and KPK, and between Pakistan and Afghanistan in the use of child labour and the risks they were exposed to. However, as funds did not permit a full-scale study, a simpler design called a “conformity study” was undertaken that did not include the full protocol, such as control groups. The comparative sample was selected by preparing a list of all kilns in KPK and Sindh provinces, then randomly selecting one district from each province, and finally selecting four registered and one unregistered brick kiln through random sampling from each district, making a total of eight registered and two unregistered brick kilns from the two provinces.

Sampling plan for selecting respondents from selected kilns

The target sample size of 450 respondents to be interviewed for this study was based on estimations of the available funds and the total cost per interview. The distribution of this sample per district and per focal kiln was as follows. A random sample 75 child brick workers was selected from each district. In addition, in Punjab, a sample of 25 non working children was selected from each of the three districts. Tables 44 displays the sampling plan for individual districts.

Table 31. Sampling plan across districts

Province	Region	District Number	Brick Kiln Workers	Comparison Children	Total
Punjab	North Punjab	1	75	25	100
	Central Punjab	2	75	25	100
	South Punjab	3	75	25	100
KPK		4	75		75
Sindh		5	75		75
Total			375	75	450

Within each district, a sample of 50 male and female brick kiln workers below the age of 18 were selected. Underage workers were categorized into three groups: 10 years or below, 11

– 14 years, and 15 – 18 years. The number of underage workers selected from each category in any focal district was calculated based on the preliminary census of all focal brick kilns. These calculations were used to determine the gender breakdown of the sample within each age category. This procedure is described in the next section.

Similarly, a sample of male and female adult youth (18 – 25 years) working at the focal kilns was selected from each district. The selection of these cases was conditional on the fact that have been working in the brick kiln industry for at least two years.

Lastly, a sample of non-working minors was selected from each of the three Punjab study districts. This control group was selected from the communities surrounding the focal kilns who were of the same economic strata as the brick kiln workers.

Sampling plan for selecting respondents from individual kilns

Prior to selection of respondents at the brick kiln level, a rough census of the workforce in all focal kilns was conducted to determine the sex and age distribution according to the four categories (<11, 11-14, 15-17, 18-24). These proportions were then used to calculate the number of individuals to be sampled within each age group by sex. Since the target number to be selected from each district was 75, pulled randomly out of the 5 focal kilns within each district, a total of 15 workers was selected from each focal kiln. Out of these, a proportionate sample of 10 underage brick kiln workers categorized by age and sex was selected based on the above-noted census distribution.

The field teams used these proportions to randomly select underage workers at the kiln level. During their initial visit at a focal kiln, the team made a list of all underage workers categorized by sex and age. It assigned a unique number to each underage worker and used the random numbers table to extract a proportionate simple random sample for each category. The field teams also prepared a list of all workers between the ages of 18 – 25 years who had been working in that focal kiln for at least two years, and randomly selected 5 individuals for interview.

Interviews and physical examinations of respondents were conducted at the respondents' homes, as it was felt that they would be more comfortable sharing their experiences in privacy.

Selection of a judgment-based sample for observation

During the interviews and physical examination of respondents at each focal kiln, the field teams purposively selected at least one individual from each age and sex category for a 'dawn to dark' observation. The selection of the individuals was based on the judgment of the field team. As a general criterion, underage workers who were performing potentially hard or hazardous duties were preferred for observation research.

Selection of a judgment sample for FGDs

The field teams also selected, based on their own judgment, at least four persons from each focal kiln to participate in a Focus Group Discussion (FGD). As a general criterion, individuals with more years of experience in brick making industry were preferred.

Snowball sampling for identifying rare incidents

During interviews, the respondents were asked to report the occurrence of any rare incidents at the kiln resulting in either serious injury or death. In cases where the respondents reported any such incident, a complete record of the respondents' account of the incident was made. The respondents were also asked the identity of the individual involved in or closely connected with the incident along with their current whereabouts. The field teams then attempted to contact these individuals to record their account of the incident.

Control group

Control groups were selected only for the main study in Punjab, not the conformity studies in Sindh and KPK. The field team visited the communities near the focal kilns and identified households that match the kiln workers' economic status using local indices of wealth like livestock, location of dwelling etc. The field team interviewed a convenience sample of 5 individuals under the age of 18 from these households. Only those children that are in school and not currently employed were interviewed.

Table 32. Demographics of brick and control children (Pakistan)

N=235	Brick Children		Control Group		Sig
	N	%	N	%	
ALL CHILDREN	N=148		N=87		
Age, years					0.94
11-14	62	42%	36	41%	
15-17	86	58%	51	59%	
Sex					0.59
Female	56	38%	36	41%	
Male	92	62%	51	59%	
Migrant					<0.01
Yes	54	36	1	1	
No	94	64	86	99	
Living situation					0.06
With parents or relatives	140	96	85	100	
Other	6	4	0	0	
CHILDREN AGES 11-14 YEARS	N=62		N=36		
Attends school currently					<0.01
Yes	5	14	32	91	
No	1	3	0	0	
Missing	29	83	3	9	
Attends school when brick kilns are closed for the season					-
Yes	7	88	n/a	n/a	
No	1	13	n/a	n/a	
Class of education currently reading or read before working					0.01
1-5	13	87	17	49	
6-8	0	0	12	34	
8-11	2	13	6	17	
CHILDREN AGES 15-17 YEARS	N=86		N=51		
Attends school currently					<0.01
Yes	5	6	48	94	
No	27	32	0	0	
Missing	53	62	3	6	
Attends school when brick kilns are closed for the season					-
Yes	3	60	n/a	n/a	
No	2	40	n/a	n/a	

Figure 36. Number of hours brick kiln children work per week (percentage)

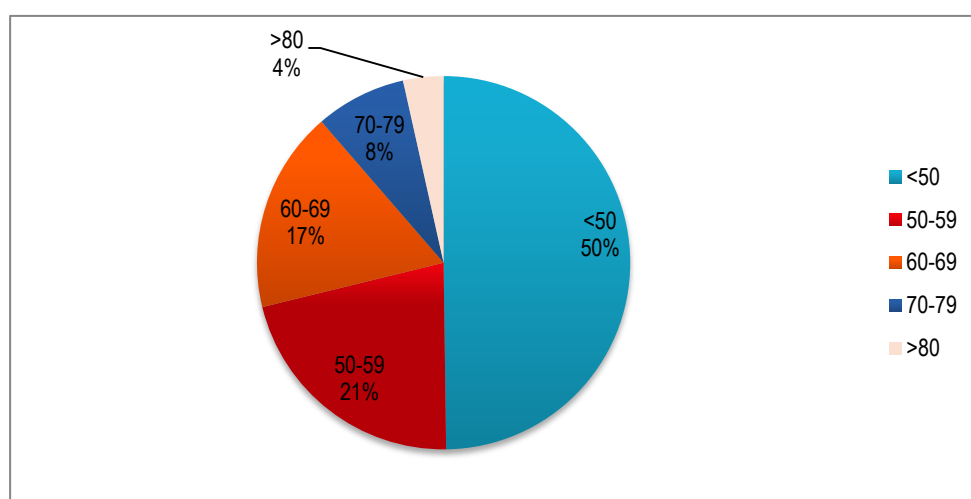


Table 33. Stunting

Age	Males		Females		All	
	Mean Height/weight	N	Mean Height/weight	N	Mean Height/weight	N
7	2.60	2	2.59	1	2.59	3
8	2.03	6	2.10	6	2.07	12
9	2.07	10	2.34	4	2.15	14
10	1.82	21	2.03	7	1.87	28
11	1.89	11	2.08	4	1.94	15
12	1.83	18	1.67	5	1.79	23
13	1.61	10	1.66	6	1.62	16
14	1.29	13	1.26	2	1.29	15
15	1.37	9	1.42	6	1.39	15
16	1.28	10	1.50	3	1.33	13
17	1.22	19	1.47	1	1.23	20
18	1.27	6	1.44	10	1.38	16
TOTAL		135		55		190

Table 34. General Health and Nutrition (Pakistan)

N=235	Brick Children N=148		Control Group N=87		Sig
	N	%	N	%	
Usual hours slept per night					
Mean [SD]	6.4	[4.2]	6.7	[4.1]	0.59
SERIOUS HEALTH ISSUES					
Ever had any other injury that was really, really bad at work					0.54
Yes	9	6%	3	3%	
No	138	93%	84	97%	
Missing	1	1%	0	0%	
Know other children who have been hurt very badly at work					0.87
Yes	16	11%	9	10%	
No	129	87%	78	90%	
Missing	3	2%	0	0%	
Know other children who have died because of an injury at the brick kilns					0.08
Yes	10	7%	12	14%	
No	136	92%	75	86%	
Missing	2	1%	0	0%	
Knows that young people use drugs or alcohols					0.14
Yes	18	12%	17	20%	
No	128	86%	70	80%	
Missing	2	1%	0	0%	
Knows young people use tobacco products					0.10
Yes	67	45%	30	34%	
No	80	54%	57	66%	
Missing	1	1%	0	0%	
Nutritional status					
Underweight	*	*	*	*	
Normal weight	*	*	*	*	
Overweight	*	*	*	*	
Anemia					
Yes	*	*	*	*	
No	*	*	*	*	
Pain or bothersomeness in back/neck experienced in the last year					<0.01
Yes	61	41%	1	1%	
No	64	43%	60	69%	
Missing	23	16%	26	30%	
Breathing trouble or coughing experienced in the last year					<0.01
Yes	88	59%	41	47%	
No	42	28%	45	52%	
Missing	18	12%	1	1%	
Fever experienced in the last year					<0.01
Yes	105	71%	40	46%	
No	11	7%	19	22%	
Missing	32	22%	28	32%	
Headache experienced in the last year					0.14
Yes	79	53%	37	43%	
No	25	17%	20	23%	
Missing	44	30%	30	34%	
Weak feeling experienced in the last year					<0.01
Yes	52	35%	17	20%	
No	24	16%	27	31%	
Missing	72	49%	43	49%	
Feeling bad all over experienced in the last year					0.08
Yes	38	26%	17	20%	
No	52	35%	43	49%	
Missing	58	39%	27	31%	

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

* Data not available for this measure (question not asked?)

Figure 33. Fatigue syndrome of Pakistani children age 11-17 working in brick kilns (percentage)

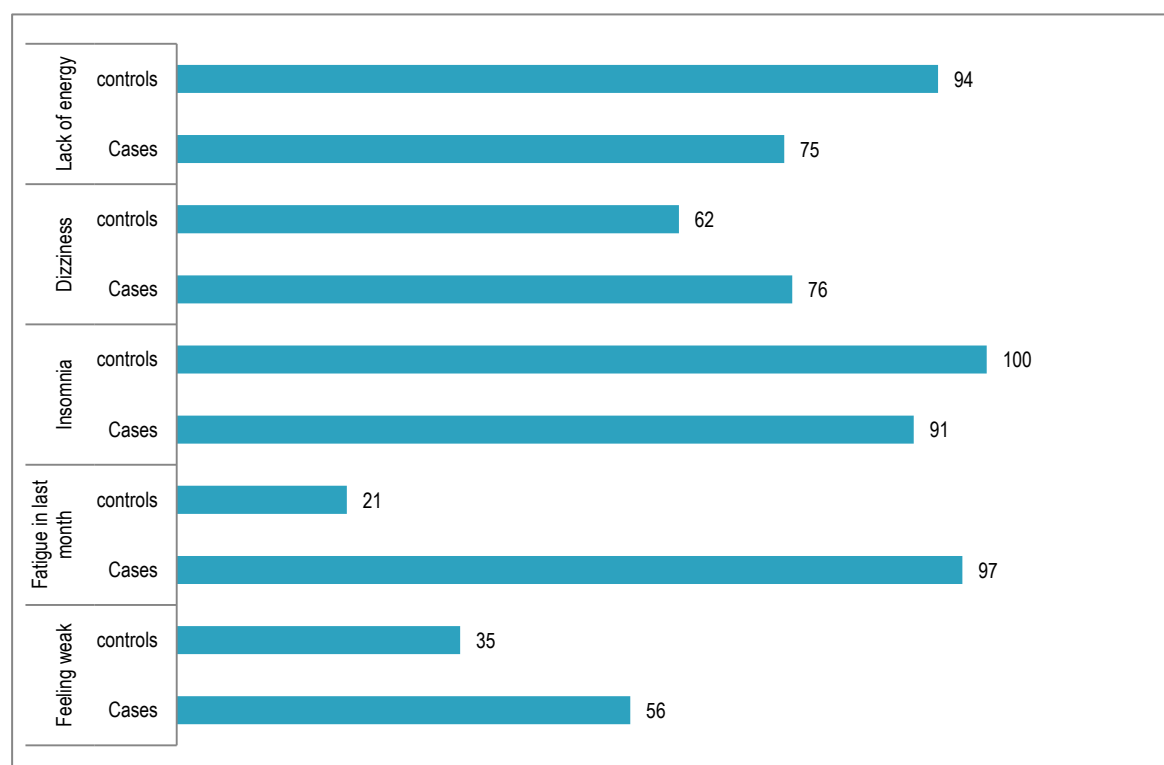


Table 35. Musculoskeletal pain (Pakistan)

N=235	Brick Children - N=148		Comparison children - N=87		Sig
	N	%	N	%	
IN THE LAST YEAR					
Musculoskeletal pain, ache, or discomfort					
Neck and shoulders	46	31%	3	3%	0.15
Extremities	47	32%	0	0%	0.02
Back	21	14%	0	0%	0.05
Any musculoskeletal pain that limited normal work (at home or in the brick kilns)					
Yes	38	26%	1	1%	-
No	0	0%	0	0%	
Missing responses	110	74%	86	99%	
IN THE LAST 7 DAYS					
Musculoskeletal pain, ache, or discomfort					
Neck and shoulders	9	6%	1	1%	-
Extremities	45	30%	0	0%	0.02
Back	6	4%	0	0%	0.14
Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.					

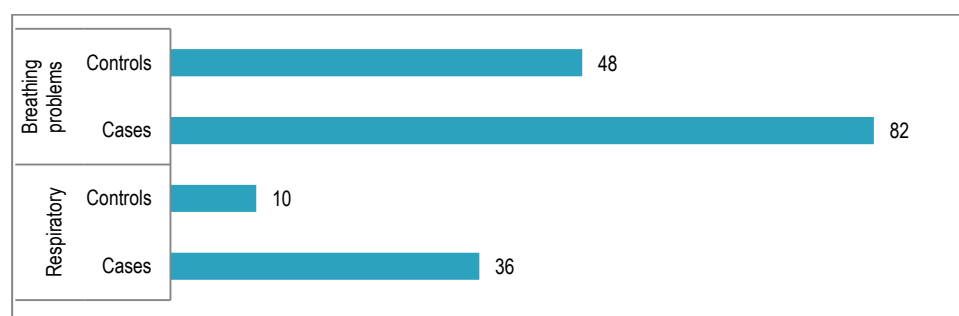
Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

Table 36. Illnesses in the last year (Pakistan)

N=235	Brick Children N=148		Comparison Children N=87		Sig
	N	%	N	%	
Yes	21	14%	5	6%	
No	32	22%	22	25%	
Missing responses	95	64%	60	69%	
Eye or ear problem experienced in the last year					0.49
Yes	10	7%	7	8%	
No	38	26%	18	21%	
Missing responses	100	68%	62	71%	
Skin problems experienced in the last year					0.36
Yes	16	11%	6	7%	
No	39	26%	24	28%	
Missing responses	93	63%	57	66%	
Stomach problems or diarrhea experienced in the last year					0.79
Yes	47	32%	21	24%	
No	35	24%	14	16%	
Missing responses	66	45%	52	60%	

Unless otherwise indicated, values represent N (%).

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

Figure 37. Brick kiln children (Pakistan) suffering from respiratory problems

Note: In the figure above, “breathing problems” are perceived respiratory issues (self-reported) while “poor lung function” is derived from objective spirometric examinations.

Table 37. Serious Injuries in the last year (Pakistan)

N=235	Brick Children N=148		Comparison Children N=87		Sig
	N	%	N	%	
BAD CUTS OR BRUISES					
Experienced this injury in the last year					0.49
Yes	20	14%	11	13%	
No	33	22%	25	29%	
Missing responses	95	64%	51	59%	
Body part					0.10
Lower extremities	14	15%	4	36%	
Upper extremities	3	10%	4	36%	
Head or neck	2	15%	3	27%	
Trunk	0	0%	0	0%	
Other	0	0%	0	0%	
Missing responses	1	5%	0	0%	
Where occurred					-
Brick kiln	16	80%	11	100%	
Home	0	0%	0	0%	
Other	0	0%	0	0%	
Missing responses	4	20%	0	0%	

N=235	Brick Children N=148		Comparison Children N=87		Sig
	N	%	N	%	
BROKEN BONE(S)					
Experienced this injury in the last year					0.65
Yes	4	3%	1	1%	
No	37	25%	20	23%	
Missing responses	107	72%	66	76%	
Body part					
Lower extremities	1	25%	0	0%	
Upper extremities	2	50%	0	0%	
Head or neck		0%	0	0%	
Trunk	0	0%	0	0%	
Other	0	0%	0	0%	
Missing responses	2	50%	1	100%	
Where occurred					
Brick kiln	3	75%	0	0%	
Home	0	0%	0	0%	
Other	0	0%	0	0%	
Missing responses	1	25%	1	100%	
SPRAINS, STRAINS, DISLOCATIONS					
Experienced this injury in the last year					-
Yes	0	0%	0	0%	
No	35	24%	15	17%	
Missing responses	113	76%	72	83%	
Body part					
Lower extremities	*	*	*	*	
Upper extremities	*	*	*	*	
Head or neck	*	*	*	*	
Trunk	*	*	*	*	
Other	*	*	*	*	
Where occurred					
Brick kiln	*	*	*	*	
Home	*	*	*	*	
Other	*	*	*	*	
BURNS OR SCALDS					
Experienced this injury in the last year					0.16
Yes	9	6%	1	1%	
No	72	49%	40	46%	
Missing responses	67	45%	46	53%	
Body part					
Lower extremities	4	44%	0	0%	
Upper extremities	0	0%	0	0%	
Head or neck	0	0%	0	0%	
Trunk	0	0%	0	0%	
Other	0	0%	0	0%	
Missing responses	144	97%	87	100%	
Where occurred					
Brick kiln	0	0%	0	0%	
Home	0	0%	0	0%	
Other	0	0%	0	0%	
Missing responses	148	100%	87	100%	

Unless otherwise indicated, values represent N (%).

Significance values represent significance test (chi2 or Fisher's exact) comparing cases and controls for non-missing responses only.

Table 38. Treatment for illnesses and injuries (Pakistan)

N=235	Brick children		Comparison children		Sig
	N	%	N	%	
HEALTH CONDITIONS IN THE LAST YEAR					
Fever		N=105		N=40	
Did nothing	42	40%	25	63%	
Care by self, brick kiln owner, parents, or other	0	0%	0	0%	
Local healer	0	0%	0	0%	
Clinic or hospital	0	0%	0	0%	
Missing responses	63	60%	15	38%	
Headache		N=79		N=37	
Did nothing	28	35%	24	65%	
Care by self, brick kiln owner, parents, or other	0	0%	0	0%	
Local healer	0	0%	0	0%	
Clinic or hospital	0	0%	0	0%	
Missing responses	51	65%	13	35%	
Weak feeling		N=52		N=17	
Did nothing	27	52%	17	100%	
Care by self, brick kiln owner, parents, or other	0	0%	0	0%	
Local healer	0	0%	0	0%	
Clinic or hospital	0	0%	0	0%	
Missing responses	25	48%	0	0%	
Bad feeling all over		N=38		N=17	
Did nothing	10	26%	2	12%	
Care by self, brick kiln owner, parents, or other	27	71%	15	88%	
Local healer	0%	0	0%	0%	
Clinic or hospital	0%	0	0%	0%	
Missing responses	1	3%	0	0%	
ILLNESSES IN THE LAST YEAR					
Breathing problems or persistent cough		N=21		N=5	
Did nothing	13	62%	3	60%	
Care by self, brick kiln owner, parents, or other	0%	0	0%	0%	
Local healer	0%	0	0%	0%	
Clinic or hospital	0%	0	0%	0%	
Missing responses	8	38%	2	40%	
Eye or ear problem		N=10		N=7	
Did nothing	6	60%	6	86%	
Care by self, brick kiln owner, parents, or other	0%	0	0%	0%	
Local healer	0%	0	0%	0%	
Clinic or hospital	0%	0	0%	0%	
Missing responses	4	40%	1	14%	
Skin problems		N=16		N=6	
Did nothing	5	31%	0	0%	
Care by self, brick kiln owner, parents, or other	0%	0	0%	0%	
Local healer	0%	0	0%	0%	
Clinic or hospital	0%	0	0%	0%	
Missing responses	11	69%	6	100%	
Stomach problems or diarrhea		N=47		N=21	
Did nothing	34	72%	17	81%	
Care by self, brick kiln owner, parents, or other	1	2%	3	14%	
Local healer	1	2%	1	5%	
Clinic or hospital	0%	0	0%	0%	
Missing responses	10	21%	0	0%	
SERIOUS INJURIES EXPERIENCED IN THE LAST YEAR					
Bad cuts or bruises		N=20		N=11	
Did nothing	14	70%	11	100%	
Care by self, brick kiln owner, parents, or other	0%	0	0%	0%	
Local healer	0%	0	0%	0%	
Clinic or hospital	0%	0	0%	0%	
Missing responses	6	30%	0	0%	

N=235	Brick children		Comparison children		Sig
	N	%	N	%	
Broken bone(s)		N=4		N=1	
Did nothing	3	75%	0	0%	
Care by self, brick kiln owner, parents, or other	0%	0	0%	0%	
Local healer	0%	0	0%	0%	
Clinic or hospital	0%	0	0%	0%	
Missing responses	1	25%	1	100%	
Sprains, strains, or dislocations		N=0		N=0	
Did nothing	*	*	*	*	
Care by self, brick kiln owner, parents, or other	*	*	*	*	
Local healer	*	*	*	*	
Clinic or hospital	*	*	*	*	
Missing responses					
Burns or scalds		N=9		N=1	
Did nothing	*	*	*	*	
Care by self, brick kiln owner, parents, or other	*	*	*	*	
Local healer	*	*	*	*	
Clinic or hospital	*	*	*	*	
Missing responses	9	100%	1	100%	

Table 39. Psychosocial characteristics of child workers (Pakistan)

N=145	Never or Sometimes		Often		Always	
	N	%	N	%	N	%
Self-Esteem						
Feels proud of work	107	78%	29	21%	2	1%
Feels adequately skilled at work	94	66%	46	32%	3	2%
Feels appreciated at work	103	70%	33	22%	12	8%
Feels looked down upon because of job	88	60%	42	29%	17	12%
Feels that family relies on child's work	50	34%	65	44%	32	22%
Stress						
Feels pressured to work faster and harder	78	53%	54	37%	15	10%
Feels bored because of lack of work	90	61%	45	31%	12	8%
Feels that family, employer, or others ask too much	71	48%	61	41%	16	11%
Feels bored because of repetitive work	38	26%	94	64%	16	11%
Feels tired due to long working hours or heavy work load	68	47%	60	41%	18	12%
Personal agency						
Feels unable to engage in desired activities due to work	86	59%	45	31%	15	10%
Feels autonomy in choosing work	68	46%	60	41%	19	13%
Relationships						
Bothered by work environment	76	52%	58	40%	12	8%
Comfortable with coworkers	64	44%	60	41%	22	15%
Supervision and training						
Feels watched over for safety at work	123	84%	13	9%	11	7%
Receives training at work	110	87%	12	9%	5	4%
All measures are self-reported.						

These tables do not present the data by province, but the raw data suggest important differences between Punjab, Sindh and KPK due to their cultural composition and proximity of the latter to Afghanistan. In KPK, boys enjoy more personal freedom, have a greater sense of agency and self-respect (honor). This freedom appears to afford them greater protection against exploitation. They tend to be less submissive to authority and less

tolerant of abuse. They also seem to enjoy more freedom within the family. One illustration of this is that, during the interviews when parents were present, some of the KPK respondents admitted to smoking cigarettes, whereas, in Punjab and Sindh, none of the male brick children would admit to doing so in front of their parents but would admit to smoking when they were interviewed alone.

It was the reverse in the case of girls. Compared to Sindh and Punjab, underage female brick kiln workers in KPK enjoyed less freedom and agency. The brick kiln families in KPK, in most cases, did not allow their underage girls to be interviewed alone (even by a female interviewer) and insisted on the presence of a male member of the family. Not surprisingly, female respondents were generally less conversant in the presence of a male relative. In Punjab and Sindh brick kiln families generally allowed their girls to be interviewed by a female interviewer in private.

Table 40. Psychosocial Characteristics of Working and Non-Working Children (Pakistan)

N=235	Brick Children N=148						Comparison Children N=87						Sig
	Not at all or a little		Quite a bit		A lot		Not at all or a little		Quite a bit		A lot		
	N	%	N	%	N	%	N	%	N	%	N	%	
Free leisure time	C	*		*		*		*		*		*	
Emotional													
Energetic	81	55%	60	41%	2	1%	16	18%	37	43%	34	39%	<0.01
Confident	60	41%	76	51%	10	7%	12	14%	31	36%	44	51%	<0.01
Sleeping difficulties	60	41%	67	45%	20	14%	11	13%	57	66%	19	22%	<0.01
Concentration trouble	126	85%	11	7%	10	7%	80	92%	6	7%	1	1%	0.14
Restlessness	122	82%	6	4%	19	13%	72	83%	10	12%	5	6%	0.03
Sadness	106	72%	22	15%	18	12%	78	90%	2	2%	6	7%	<0.01
Quarrelsome	117	79%	21	14%	8	5%	73	84%	3	3%	11	13%	<0.01
Lonely	110	74%	25	17%	12	8%	83	95%	1	1%	3	3%	0.02
Angry, short-tempered	81	55%	54	37%	11	7%	51	59%	24	28%	12	14%	0.16
Low appetite	62	42%	62	42%	18	12%	24	28%	60	69%	3	3%	<0.01
Forgetful	99	67%	37	25%	8	5%	72	83%	5	6%	10	12%	<0.01
Somatic													
Physical tension	76	51%	61	41%	10	7%	65	75%	20	23%	2	2%	<0.01
Dizziness	96	65%	37	25%	12	8%	66	76%	16	18%	5	6%	0.31
Chronic fear & anxiety													
Afraid or nervous	114	77%	19	13%	15	10%	78	90%	6	7%	2	2%	0.02
Worried	102	69%	28	19%	14	10%	44	51%	34	39%	9	10%	<0.01
Rumination about bad things that have	110	74%	26	18%	8	5%	76	87%	7	8%	4	5%	0.10
Hopelessness & helplessness													
Optimistic about future	110	74%	25	17%	9	6%	23	26%	37	43%	27	31%	<0.01
Thinks that life is worse compared to other	105	71%	18	12%	21	14%	74	85%	5	6%	8	9%	0.09
Thinks that life is not worth living	68	46%	15	10%	65	44%	26	30%	1	1%	60	69%	<0.01
Social factors													
Familial support and love	66	45%	22	15%	58	39%	6	7%	5	6%	76	87%	<0.01
Familial conflict	121	82%	14	10%	8	5%	77	89%	4	5%	6	7%	<0.01
Feels accepted by nearby families	123	83%	11	7%	9	6%	28	32	50	58	9	10%	<0.01
Has friendship support	119	80%	15	10%	7	5%	24	28	54	62	9	10%	<0.01
Experiences teasing or rejection	115	78%	16	11%	12	8%	64	74	6	7	17	20%	0.04
Engages in games/sports with friends	100	68%	35	24%	10	7%	31	36	38	44	18	21%	<0.01
Feels different from peers	118	80%	18	12%	9	6%	73	84	8	9	6	7%	0.75

N=235	Brick Children N=148						Comparison Children N=87						Sig
	Not at all or a little		Quite a bit		A lot		Not at all or a little		Quite a bit		A lot		
	N	%	N	%	N	%	N	%	N	%	N	%	
Abuse and maltreatment													
Gets scolded, criticized, or belittled	99	67%	29	20%	19	13%	78	90	6	7	3	3%	<0.01
Gets beaten at home or work	104	70%	31	21%	11	7%	53	61	33	38	1	1%	<0.01
Sexual assault at work	136	92%	6	4%	3	2%	84	97	3	3	0	0%	0.62
Severe punishment for mistakes at work	101	68%	36	24%	9	6%	85	98	1	1	1	1%	<0.01
Feels safe in day-to-day life	48	32%	30	20%	16	11%	6	7	9	10	72	83%	<0.01

Conclusion

The aim of this study has been to draw more attention to the psychological and physical cost of child labour. By demonstrating the damage of hazardous child labour in this one industry, it hopes to enhance the chances of more research being conducted as well as galvanizing more action to benefit the children whose lives are at risk.

But the job is only half done if we stop there. It is easier to enumerate all the possible dangers than it is to suggest a way out. While the study can give policy-makers the justification for designating aspects of this work off-limits for children, it is another matter altogether to remove them from this work.

Knowing the dangers, we must also know the benefits, and take an additional step of balancing the one against the other. Cost vs. benefit is the way those most directly involved – the parents and the children – look at the issue, therefore to achieve their acquiescence in effecting a change requires more than legal action. A fuller understanding of the dangers to their children may be the ‘missing piece’ that enables the adults to give greater weight to the advantages of education over the possible disadvantages of lifetime disability.

If, in addition, this study is able to demonstrate how to create opportunities for safe youth employment by illuminating the risks and impacts, it can enable those directly concerned to make informed judgments about what work is safe enough for children over minimum working age.

Changes can be made in the brick industry to render the danger less great to younger workers, but there are cautions. We are cautioned that while “recommendations can be made to begin to address injury control and reduction of ergonomic exposures ... there are needs to address broader issues that perpetuate the cycle of poverty, illiteracy, and child labour.”¹⁴⁴ One of these broader issues is the brick industry’s payment practices. A recent study concluded that “an important contributory factor [to worker exploitation] was ... the piecework system”. It warned that trying to achieve “increased productivity within heritage industries may be injurious to worker health. Problems can be difficult to resolve due to deep-rooted organisational culture, combined with traditional working practices” and must be approached with great sensitivity and must be implemented in full to achieve the desired improvement in health risks.¹⁴⁵ Thus a piecemeal approach is not recommended.

We can also look at the challenges faced by this study and its results from a larger perspective. It has struggled with the reality that, currently, the disciplines of child health and development, social and child welfare, occupational safety and health, occupational psychology, and labour policies and laws operate in discrete universes. If we could conceive

¹⁴⁴ Lipscomb, H. (2014). *Review comments*.

¹⁴⁵ Trevelyan, F.C. and Haslam, R.A. (2000). “Musculoskeletal disorders in a handmade brick manufacturing plant” in *International Journal of Industrial Ergonomics*, Vol.27(1).

of an “integrated science of healthy child development”¹⁴⁶, both research and action would benefit from a wide range of synergies, complementarities, and efficiencies.

¹⁴⁶ A term coined by Jack Shonkoff, M.D., Director of the Center on the Developing Child at Harvard University.

Bibliography

- Achkazai, A. "Annotated Bibliography: Health of Brick Kiln Workers.
- Ahmad, M.N.; van den Berg, L.J.L.; Shah, H.U.; Masood, T.; Buker, P.; Ashmore, M. (2011). "Hydrogen-fluoride damage to vegetation from peri-urban brickkilns in Asia: A growing but unrecognised problem?" *Environmental Pollution* Volume 162, March 2012, Pages 319–324.
- Alton, I. Iron Deficiency Anemia. In: Stang, M.; Story, M.; eds. Guidelines for Adolescent Nutrition Services. Minneapolis, MN: Center for Leadership, Education and Training in Maternal and Child Nutrition, Division of Epidemiology and Community Health, School of Public Health, University of Minnesota; 2005:101-08.
- American Thoracic Society (ATS). (1997). Adverse effects of crystalline silica exposure. *American Journal of Respiratory and Critical Care Medicine*, 155 pp 761 – 765.
- Awan, S. (2010). "Impact of work on the Health, Safety and Psychosocial well-being of children in Brick Kilns in Sahiwal and Sukkur Districts", Center for the improvement of Working Conditions & Environment, Lahore, Pakistan.
- Awan, S.A. (2010). "Gender Dimensions of Bonded Labour in Brick Kilns in Punjab Pakistan: Report of a research and analytical study" (unpublished report).
- Awan, S.A. (2008). "Occupational Health and Safety Hazards of brick kiln workers: Report of a research study" (unpublished).
- Baum, Ellen (2010). "Black Carbon from Brick Kilns" Clear Air Task Force, April 11, 2010.
- Benvegna, L.A; Fassa, A.G.; Facchini, L.A.; Wegman, D.H. and Dall'Agnol, M.M. (2005). Work and behavioural problems in children and adolescents *Int. J. Epidemiol* 34(6):1417 – 1424.
- Betancourt, T.S. and Khan, K.T. (2008). "The mental health of children affected by armed conflict: protective processes and pathways to resilience." *International Review of Psychiatry*; Bhanarkar AB, Gajghate, DG, Hasan, MZ. "Assessment of Air Pollution from Small-Scale Industry", [Environ Monit Assess](#). 2002 Dec;80(2):125-33.
- Bhukuth, A. (2005). Child Labour and Debt Bondage: A Case Study of Brick Kiln Workers in Southeast India, *Journal of Asian and African Studies* 2005 40:287.
- Bureau of International Labour Studies (BILS). (2004). "Workplace accident statistics-2004".
- BILS Newspaper Survey. (2012).

- Boiko, I.V. (1993). "Effect of working conditions on health status of employees in the clay brick industry" *Meditsina truda i promyshlennaia ekologiia* 02/1993 (11-12):22-4 [Article in Russian].
- Bridge, Ian. (2009). "Crystalline Silica: A review of the dose response relationship and environmental risk," *Air Quality and Climate Change 2009 vol 43 [1] pp17-23 1*.
- Bruck, C. and Dr Yi Kannitha, "Assessing the occupational health and safety issues for children aged 15-17 years working in the brick factories in Cambodia", Research Report by ILO-IPEC Cambodia, November 2008.
- Caffo, E.; Belaise, C. (2003). "Psychological aspects of traumatic injury in children and adolescents". *Child Adolesc Psychiatr Clin N Am*. Jul;12(3):493-535.
- Carskadon, M. (1990a). "Patterns of sleep and sleepiness in adolescents". *Pediatrician*, 17, 5-12.
- Castillo, D.; Davis, D. and Wegman, D.H. (1999). "Young workers", in *Occupational Medicine*, Vol. 14, pp. 519-536.
- Center on the Developing Child. (2011). *Building the brain's "Air Traffic Control" System: How early experiences shape the development of executive function*.
- Chauduri, .S.S.R.; Biswas, C. (2012). "A Subjective and Objective Analysis of Pain among Female Brick Kiln Workers in West Bengal, India" *International J. of Occ Safety & Health*, Vol2, No.2, pps. 38-43.
- Centers for Disease Control. (23 April 2010). "Occupational injuries and deaths among younger workers – United States, 1998-2007, in *Morbidity and Mortality Weekly Report* (MMWR), Vol. 59, No.15, pp. 449-455.
- Centers for Disease Control and Prevention. Recommendations to Prevent and Control Iron Deficiency in the United States. MWR 1998; 47(No. RR-3):25.
- Copsey, S. (2009). *Preventing Risks to young workers: Policy, programmes and workplace practices*, European Agency for Safety and Health at Work, Working Environment Information, Luxembourg.
- Croitoru, L.; Sarraf, M. (2012). "Benefits and Costs of the Informal Sector: The Case of Brick Kilns in Bangladesh, *Journal of Environmental Protection*, 2012, 3, 476-484. <http://dx.doi.org/10.4236/jep.2012.36058> Published Online June 2012 (<http://www.SciRP.org/journal/jep>).
- Dept of Environment and Heritage (DEH). (2007). Technical Report No7: Air quality and child health - Current evidence and priorities for Australia, Commonwealth of Australia (quoted in Bridge, I. 2009).

- Diallo, Y.; Etienne, A. and Mehran, F. (2013). *“Global Child Labour Trends, 2008-20012”*, ILO, Geneva.
- DiMeglio, G. (2000). Nutrition in adolescence. *Pediatr Rev.* 2000 Jan;21(1):32-33.
- Doocy, S.; Crawford, B.; Boudreaux, C.; Walla, E. (2007). “The Risks and Impacts of Portering on the Well-Being of Children in Nepal”, *Journal of Tropical Pediatrics* 2007 53: 165-170.
- Dorman. (2008). *Child Labor, Education and Health: A Review of the Literature*, ILO.
- Dornbusch, S.M. (2004). “Sleep and adolescence: A social psychologist’s perspective” in Carskadon MA, ed. *Adolescent sleep patterns: Biological, social, and psychological influences*. Cambridge University Press, Cambridge, UK, pp. 1-3.
- EU OSHA. (2012). *Management of Psychosocial Risks at Work: An analysis of the findings of the European Survey of Enterprises on the New and Emerging Forms of Risk*. Bilbao.
- EU-OSHA. (2006). *Young workers – Facts and figures*, Institute for Occupational Safety and Health for the European Agency for Safety and Health at Work.
- Fassa, A.G.; Facchini, L.A.; Dall’Agnol, M.M. and Christiani, D.C. (2005). Child labour and musculoskeletal disorders: the Pelotas (Brazil) epidemiologic survey, *Public Health Reports*, 120 pp 665-573.
- Fassa, A.G. (2003). *Health benefits of eliminating child labour*, ILO-IPEC, Geneva.
- Fassa, A.G.; Facchini, I.A.; Dall’Agnol M.M.; Christiani, D.C. (2000). “Child labour and health: Problems and perspectives. *International Journal of Occupational and Health*.
- Fekadu, D. and Alem, A. (2001). “Child labour and emotional disorders in an urban district in Ethiopia: A rapid assessment on community perceptions of child labour” (unpublished paper).
- Fekadu, D.; Alem, A.; Hagglof, B. (2006). “The prevalence of mental health problems in Ethiopian child laborers”, *Journal of Child Psychology and Psychiatry*, 47, pp. 954-959.
- Gharaibeh, M. and Hoeman, S. (2003). “Health Hazards and risks for abuse among child labor in Jordan”, *Journal of Pediatric Nursing*, Vol. 18, Issue 2, pp. 140-147.
- Forastieri, V. (1997). *Children at work: health and safety risks*, International Labour Organization, Geneva.
- Forssman ,S. and Coppee, G.H. (1973). *Occupational Health Problems of Young Workers*, Occupational Safety and Health Series, No. 26, International Labour Office, Geneva.
- Greenberger, E. and Steinberg, L. (1986). *When Teenagers work: The psychological and social costs of adolescent employment*, Basic Books, New York.

- Hadi, A. (2000). "Child abuse among working children in rural Bangladesh: Prevalence and determinants", in *Public Health*, 114:380-84 (quoted in Dorman (2008) *Child Labour Education and Health: A Review of the Literature*, Understanding Child Work, Geneva).
- Harreby, M.; Nygaard, B.; Jessen, T.; Larsen, E.; Storr-Paulsen, A.; Lindahl, A. (1999). "Risk factors for low back pain in a cohort of 1389 Danish school children" *Eur Spine J.* 8(6), 439-443.
- Hofman, M. (2012). *Psycho-social Impact of Child Labour: An Annotated Bibliography*, ILO Geneva.
- Hofman, M. (2012). *The Evidence Base for the Psychosocial Assessment Instrument for Child Labour*, ILO Geneva.
- Hurrell, R.F.; Reddy, M.; Cook, J.D. "Inhibition of non-haem iron absorption in man by polyphenolic-containing beverages. *Br J Nutr.* 1999 Apr; 81(4):289-95.
- ILO. (2013). Occupational Safety Hazards Faced by Children Working in Brick Kilns in Afghanistan: Field Report, 2013.
- ILO-IPEC. (2013). *Marking progress against child labour : Global estimates and trends 2000-2012*, ILO Geneva.
- ILO-IPEC. (2012). "Background Paper: Child labour in brick kilns in Afghanistan, Bangladesh, Egypt. Iran, Nepal, Pakistan, and Paraguay.
- ILO-IPEC. (2012). "Workshop Report: Research on Health of Children Working in Brick Kilns, ILO Regional Office, Bangkok, 10-12 October 2012.
- ILO-IPEC. (2011). "Compendium of Current Knowledge on Hazardous Child Labour," ILO, Geneva.
- ILO-IPEC. (2011). "Children in Hazardous Work: What we know. What we need to do," ILO Geneva.
- ILO-IPEC. (2009). *Crecer protegido. Manual para la proteccion del adolescente trabajador*, ILO Santiago.
- ILO-IPEC. (2008) "Assessing the occupational health and safety issues for children aged 15-17 years working in the brick factories in Cambodia," *Research Report by ILO-IPEC Cambodia, November 2008.*
- ILO-IPEC. (2008). "Occupational Health and Safety Hazards of brick kiln workers" *Report of a research study by Centre for the Improvement of Working Conditions & Environment, Lahore, Pakistan, September 2008.*

- Inbaraj, L.R.; Haebbar, O.J.; Saj, F.; Dawson, S.; Paul, P.; Prabhakar, A.P.; Mohan, V.R.; Alex, R.G. (2013). Prevalence of musculoskeletal disorders among brick kiln workers in rural Southern India. *Indian J Occup Environ Med* 2013;17:71-5.
- Joshi, S.K.; Dudani, I. (2008). "Environmental health effects of brick kilns in Kathmandu valley", *Kathmandu University Medical Journal* (2008), Vol. 6, No. 1, Issue 21, 3-11.
- Kaushik, R.; Khaliq, F.; Subramanayaan, M.; Ahmed, R.S. (2012). "Pulmonary dysfunctions, oxidative stress and DNA damage in brick kiln workers." [Hum Exp Toxicol](#). 2012 Nov; 31(11):1083-91.
- Kuorinka, I.; Jonsson, B.; Kilbom, A.; Vinterberg, H.; Biering-Sorensen, F.; Andersson, G.; Jorgensen, K. (1987). "Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms." *Appl Ergon*;18:233–7. [[PubMed](#)].
- Kverenchkhiladze, R.G.; Saakadze, V.P. (1993). Working conditions and health status of women employed in clay brick industry (in subtropical climate) *Med Tr Prom Ekol*. 1993 ;(11-12):16-8.Rekhviashvili VA. [Article in Russian].
- Landrigan, P. and Belville, R. (1993). "The dangers of illegal child labour", in *American Journal of Disabled Children*, Vol. 147, pp. 1029-1030.
- Leka, S. and Jain, A. (2011). *Assessing Psycho-social concomitants of Child Labour*, ILO, Geneva.
- Lueder, R. and Berg Rice, V., eds. (2008). *Ergonomics for Children: Designing products and places for toddlers to teens*, Taylor & Francis, NY & London.
- Mehran, F.; Dorman, P.; De Cock, M. (2013). "A Global Estimate of the Number of Work-Related Injuries Among Children in 2008", ILO unpublished manuscript.
- Mendelievich, E. (1979). *Children at Work*. International Labour Office, Geneva.
- Merlino, L.A. et al. (2003). "Symptoms of musculoskeletal disorders among apprentice construction workers", in *Applied Occupational and Environmental Hygiene*, Vol. 18, No. 1, pp. 57–64.
- Miller, R.C.W. (2014). "Work or Starve: Child labour in Pakistan's brick kilns, Action Aid, 30 Jan 2014.
- Miller, M. E. (2008). "Ergonomics and Young Workers: A Case for Recommendations to Reduce Workplace Musculoskeletal Injuries" (unpublished manuscript).
- National Institute for Occupational Safety and Health (NIOSH). (1997). "Musculoskeletal disorders and workplace factors: A critical review of epidemiologic evidence for work-related disorders of the neck, upper extremities, lower back", ed Bruce Bernard, DHHS, Cincinnati, Ohio.

- National Institute for Occupational Safety and Health (NIOSH). (2002.) "Health Effects of Occupational exposure to respirable crystalline silica." Dept Health & Human Services, Cincinnati, Ohio.
- National Research Council. (1998). Protecting Youth at Work: Health, Safety, and Development of Working Children and Adolescents in the United States. Institute of Medicine, National Academy Press, Washington, D.C.
- National Scientific Council on the Developing Child. (2006). *Early Exposure to Toxic Substances Damages Brain Architecture*, Working Paper #4.
- Onyango, P. and Kayongo-Male, D. (1982). *Psychological effects of child labour*, University of Nairobi, Nairobi.
- Pasricha, S-R.; Drakesmith, H.; Black, J.; Hipgrave, D.; Biggs, B-A. (2009). Control of iron deficiency anemia in low- and middle-income countries, *Blood* April 4, 2013 vol. 121 no. 14, p. 2607-2617.
- Pezzani, B.C.; Minvielle, M.C.; De Luca, M.M.; Radman, N.; Iacoy, P.; Basualdo Farjat, J.A. (1996). "Intestinal parasite infections in a periurban community from the Province of Buenos Aires, Argentina" [*in Spanish*] *Boletín chileno de parasitología* 51:1-2 pg 42-5.
- Punnett, L. and Wegman, D. H. (2004). "Work-related musculoskeletal disorders: the epidemiologic evidence and the debate," *Journal of Electromyography and Kinesiology* 14, pgs 13–23.
- Rasmussen, K. et al. (2000). "Incidence of work injuries amongst Danish adolescents and their association with work environment factors", in *American Journal of Industrial Medicine*, Vol. 54, pp. 143-152.
- Rauscher, K.J. et al. (2011). "Work-related fatalities among youth ages 11-17 in North Carolina, 1990-2008", in *American Journal of Industrial Medicine*, Vol. 54, pp. 136-142.
- Republic of South Africa Department of Labour (RSA). (2006). "Silica Exposure and its effect on the physiology of workers."
- Rosecrance, J.C.; Ketchen, K.J.; Merlino, L.A.; Anton, D.C.; Cook, T.M. (2002). "Test-Retest Reliability of a Self-Administered Musculoskeletal Symptoms and Job Factors Questionnaire Used in Ergonomics Research' *Appl Occup Environ Hyg* 17(9):613–621.
- Runyan, C.W.; Zakocs, R.C. (2000). Epidemiology and Prevention of Injuries among Adolescent Workers in the U.S. *Annual Review of Public Health*, 21:247-269.
- Sachar, R.K.; Verma, J.; Prakash, V.; Sehgal, R. (1991). "Family planning, immunisation and nutritional status of brick kiln workers in some areas of rural Punjab" *Indian J Public Health*. 1991 Jan-Mar;35(1):21-2.
- Sainju, B. (2003). *Child Labor in Brick Factories in Nepal*, CONCERN-NEPAL.

- Shonkoff, Jack. (2011). *The Biology of Adversity and the Roots of Lifelong Impairments in Learning, Behaviour, and Health*, U.S. Government Evidence Summit on Protecting Children Outside of Family Care.
- Singh, D.P. (2005). "Women workers in the brick kiln industry in Haryana, India." *Indian J of Gender Studies*, Vol 12, Issue: 1, pps. 83-97, Jan-Apr. 2005.
- Spahn, G.; Schiele; Langlotz, A.; Jung, R. (2004). "Prevalence of functional pain of the back, the hip and the knee in adolescents. Results of a cross-sectional study" in *Dtsch Med Wochenschr.* Oct 22;129 (43):2285-90. [Article in German].
- Spear, B.A. (2002). "Adolescent growth and development" in *J. Am. Diet. Assoc.*, March, pg 22-29.
- Srivastava, H.C.; Chandrashekar, Pant; Kurien, G.; Sreehari, U.; Yadav, R.S. (2011). Malaria in seasonal migrant population in Southern Gujarat, India. *Tropical Biomedicine* 28(3): 638–645 (2011).
- Tanzania Media Women's Association (TAMWA). (2004). *A Report on the Assessment of Child Sexual Abuse and Exploitation*, (unpublished paper) Dar es Salaam.
- Taylor, R.B. (1973). *Sweatshops in the sun: child labour on the farm*. Beacon Press, Boston.
- Torp, S.; Riise, T. and Moen, D.E. (2001). "The Impact of "Psychosocial Work Factors on Musculoskeletal Pain: A Prospective Study" *J Occup Environ Med.* 2001 Feb; 43(2):120-6.
- Torres, E.B.; Subida, R.D. and Rabuco, L.B. (1991). "The profile of child scavengers in Smokey Mountain, Balut, Tondo, Manila". *University of Philippines, College of Public Health Working Paper*. Manila.
- Trevelyan, F.C.; Haslam, R.A. (2000). "Musculoskeletal disorders in a handmade brick manufacturing plant" *International Journal of Industrial Ergonomics*, Vol.27(1).
- Vien Chinh Chien; Sanders, K.C.; Doan, N.H.; Takaro, T.; Checkoway, H.; Keifer, M.; Phan Hong Son; Le Van Trung; Barnhart, S. (2002). "Pneumoconiosis Among Workers in a Vietnamese Refractory Brick Facility", *American Journal of Industrial Medicine* 42:397–402.
- Wainwright, O. (2014). "Blood bricks: How India's urban boom is built on slave labour", *The Guardian*, 8 Jan.2014.
- Wessels, M. (2008). "Do No Harm: Challenges in Organizing Psychosocial Support to Displaced People in Emergency Settings", *Refuge* 25(1) pp. 6-14.
- Woodhead, M. (2004). "Psychosocial impacts of child work: a framework for research, monitoring and intervention", *Understanding Child Work Working Paper*.

- World Bank. (2011). "Introducing Energy-efficient Clean Technologies in the brick sector of Bangladesh".
- World Education International. (2009). *Children Working in Brick Factories: child labour status report*.
- World Educational International/PLAN. (2012). *Children Working in Brick Factories: Research report*, (unpublished).
- World Health Organization. (1987). *Children at work: Special Health Risks*. Report of a WHO Study Group, Geneva.
- WHO (GOHNET). (2007). *The Global Occupational Health Network*. WHO, Issue 12, Geneva.
- Zimmerman, C.; Hossain, M.; Yun, K.; Roche, B.; Morison, L. and Watts, C. (2006). *Stolen Smiles: A summary report on the physical and psychological health consequences of women and adolescents trafficked in Europe*, London School of Hygiene & Tropical Medicine, London.
- Zlotkin, S. (2003). "Clinical nutrition: 8. The role of nutrition in the prevention of iron deficiency anemia in infants, children and adolescents". CMAJ. 2003 Jan 7;168(1):59-63.
- Zuskin, E.; Mustajbegovic, J.; Schachter, E.N.; Kern, J.; Doko-Jelinic, J.; Godnic-Cvar, J. (1998). "Respiratory findings in workers employed in the brick-manufacturing industry" *Journal of Occupational & Environmental Medicine*: September 1998 - Volume 40 - Issue 9 - pp 814-820.

Annex 1. Pre-research problem identification

The following chart lists the health conditions and their likely cause that have been reported in previous studies of brick kiln child workers.

Table 41. Brick industry health problems from the literature

Negative health conditions		
Classification	Health conditions	Exposures/Risk factors
Skin	Dermatitis	Handling wet clay
	Abrasion	Abrasive minerals in the clay
	Blisters	Long use of tools, materials
	cracked skin	Handling wet clay
	Burn	Hot ash, hot bricks, hot kiln
		Sun
	cuts, scratches	Rough materials (bricks, fuel, etc)
	Bruises	Stepping on broken bricks
Eyes	Burns	Flying ash
	Injury	Dust and other particles
	Infection	Flies, contaminated water/dust/hands
	Strain	Glare from sun/kilns
Respiratory system	lung damage	Blowing dust (high silicate level in earth)
	- asthma	Toxic smoke from kilns burning tires, plastics, oil
	- silicosis	
	lung infection	Smoke from wood-burning kilns
	- cough	Exposure
	- pneumonia, tuberculosis	
Musculo-skeletal system	muscle strains or sprains cartilage damage	Digging clay
	repetitive strain injury	Transporting heavy loads of clay, brick, fuel
	lower back pain	Working in a crouched position for long periods of time
	wrist and hand joint pain	
	other joint pain	
	poor bone development	
	early onset arthritis	
	skeletal deformation	
	broken bones	Falling from kilns or clay pits
	head injuries	Bricks falling on head
	bruises, broken bones	Bricks falling on feet, etc.
		Violence (co-workers, employers, others)
	increased vulnerability to adverse physical events	Working long hours a day
	increased vulnerability to adverse psychological events	High intensity work
Fatigue	increased risk of injury	Inadequate sleep
	negative self-concept	Low value work
	intellectual stunting	lack of stimulation
	stress	high production demands
	lowered self-concept	Harassment, intimidation, beating
		Sexual exploitation
	lowered aspirations	No access to school, bondage,
	insecurity	Migration
Nutrition	anemia and micro-nutrient malnutrition	Parasitic infection
	physical stunting	Nutritionally inadequate food
	caloric malnutrition	Insufficient food
Exposure	heat stress, sunstroke, dehydration	Sun
	Headache	Heat
	increased vulnerability to infectious disease	Rain & cold
	increased vulnerability to infectious disease	Cold weather

Negative health conditions		
Classification	Health conditions	Exposures/Risk factors
General health.	gastro-intestinal infections and parasites	Poor water quality
	fever, colds,	Temporary/sub-standard housing
Health behaviours	Addictions	Drug use
	smoking, alcohol use	Peer pressure, exposure to adult activity
Positive health conditions		
Physical well-being	strength	Exercise
	coordination	Muscle conditioning
	healthy worker syndrome; higher weight	larger amount of food vis a vis siblings
	more nutrients	More/better food due to added money
Psychological well-being	positive self-concept	Contributing to welfare of family
	sense of accomplishment	Making money
	family cohesiveness	Working with family

The following chart lists the health conditions that have been reported at various times by child brick kiln workers themselves.

Table 42. Brick industry health problems identified by children

Illnesses	Fever
	Headache
	cough/colds
	Backache
	stomach problems (diarrhea), intestinal pain
Injuries	chest pains
	cuts from stepping on broken bricks
	bruises from bricks falling on foot or other part of body
	concussion or bruise from bricks falling on head
	burns from flying ash
	burns from touching hot bricks
	broken bones from kicks from donkeys
	injuries (all types) from getting hit or run over by carts

Annex 2. Observation tool

The Hazard Observation checklist has three parts.

1. The first part shows what to look for in the **general environment**, the **work environment** at the brick kilns, and the work environment at the home. The reason for looking at the environment is because we want to see what factors other than the work itself might be affecting the health of the working children. There are measurements to be taken as part of the environmental study.
2. The second part shows what to observe about the **work** the children do and the way it is being carried out.
3. The third part is a more detailed guide to detect strain or stress on the musculoskeletal system.

Instructions

Part 1

Observe the environment in and around the kilns and the living quarters of the families, at the height of the day and preferably also at either the beginning or end of the day. Note the measurements to be taken.

Part 2

The format is organized according to the known tasks or work processes in which child brick kiln workers are engaged. Consequently it does NOT include all work processes that take place at the kiln and in the home and which are undertaken only by adults (persons over 18 years of age). This is a study of what children of all ages (up to 18 years) are doing.

The procedure for filling out this form is as follows:

1. Explain to workers (parents and children), supervisors, or others as necessary that you will be watching the work throughout the day, and to please continue to perform their regular work activities. Explain that you are not judging, but just want to understand what they do. Thereafter try to be as inconspicuous as possible. If they are curious or concerned, show them the form that you are filling out.
2. Observe all of the tasks that children under 18 do by walking around the area. If, at any point, you see that there is a task that is not listed on the form, **please add it** to the blank sheets provided.
3. Identify 6 child workers to observe: a girl and a boy in each of the three age groups (< 10 years, 11-14 years, 15 up to 18 years). Observe only. Don't ask questions (e.g. about their age) just guess.
4. Note on the form who is doing what task, and how it is being done according to the categories listed.

5. When work at the kilns is finished for the day, ask to accompany one or more children to their homes.
6. Observe and note characteristics of the journey back to the home, especially the distance.
7. Observe and note characteristics of the work, if any, the children do before going to sleep.

Part 3

1. Place a checkmark in the box corresponding to the hazard described. Where appropriate, indicate the age and sex of the child undergoing this stress.

Hazard observation checklist (Part I - Environment)

General Environment				
Main areas	Observe	y	n	Comment
Air	Is there visible dust, sand or smoke in the air?			
	Do you see some workers with masks or kerchiefs over their nose or mouth?			
Temp.	Do you see workers working during the hottest part of the day?			
	Is there any shade? Are there trees?			
	Are there sheds over the work areas?			
	Is there a constant wind blowing?			
	If so, are there windbreaks to protect the workers from the wind?			
Landscape	Is the ground dry and dusty?			
	Are there holes in the ground where soil has been taken out for bricks?			
	Are there cliffs or steep places where soil is being taken out for bricks?			
Water	Does the water for the bricks come from a stream or other open source?			
	Are there animals which drink from this source (donkeys, cows, camels)?			
	Is there stagnant water sitting around in pools, puddles, or containers?			
Location	Is the site near an urban area?			
	Is the site visible and/or accessible to outsiders?			
	Is the living area within the range of smoke from the kiln			
Biologic	Are there known to be snakes, scorpions or other dangerous animals or insects?			
	Are there known to be parasites, mosquitoes, water-borne diseases?			

Measurement guide – General environment				
Main areas	Detail	Measure	Write in	Comment
Temp.	Temperature at the hottest part of the day at present	Thermometer	___ (degrees)	
	Temperature at the coldest part of the night at present	Thermometer	___ (degrees)	
Access	Distance to the nearest clinic	Speedometer	___ (kms)	
	Distance to the nearest school	Speedometer	___ (kms)	
Location	Distance between the work area and the living area	Estimate	___ (meters)	
	Distance between the kiln and the area where children are working	Estimate	___ (meters)	

Brick-making Environment				
Main Areas	Observe	y	n	Comment
Fall risks	Are there stacks of bricks, piles of coal/wood, etc. that can fall on the workers?			
	Are there holes in the ground that the worker can fall into?			
	Are there open wells or water sources that a worker can fall into?			
Equipment risks	Are there motor vehicles moving around the area that can hit a worker?			
	Is there any equipment that is powered by a motor (gas or electric)?			
	Is there any equipment that is noisy?			
	Is there any equipment that has moving parts that can trap a hand or garment?			
	Is there any electricity at the site (e.g. cords for electric lamps or tools)?			
Air Quality	Is there low visibility on the site due to dust in the air?			
	Is there smoke at ground level?			
	Is the kiln being fired with plastics, old tires, and other toxic materials?			
	Are children seen within 10 meters of a burning kiln?			
Worker needs	Do you observe anyone working here at night?			
	Is there a source of abundant clean water for drinking at the site?			
	Are there latrines for the workers at the site?			
	Are there private areas for women workers at the site?			
	Do most children wear some sort of shoes to protect their feet?			
	Do the workers take at least 2 rest breaks during the day?			
	Do the workers take at least 1 hour lunch breaks?			

Home Work Environment				
Main Areas	Observe	y	n	Comment
Air quality	Are there windows to let in light and air?			
	Is there a cooking stove inside that gives off smoke or fumes?			
Water quality	Is the source of water, a well or piped-in water supply?			
	Is the water boiled, filtered, or chemically cleaned?			
Chemicals	Are there strong cleaning products?			
Nutrition	Do all children eat the same amount of food?			
	Do all children eat the same types of food?			

Hazard observation checklist (Part II - Work processes)


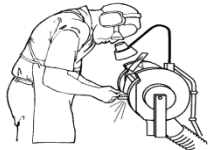
Work processes – Kilns							
How the work is done →	Tool	Weight	Position	Speed	Duration	#children	Comments
<i>Instruction →</i>	<i>describe the tool used for this task</i>	<i>weigh the load being carried (mud, water)</i>	<i>describe the way the child moves or sits</i>	<i>Time the number of movements in 10" &/or 60"</i>	<i>Time how long the task takes to perform</i>	<i>How many in each category</i>	
Task: Digging out clay							
Girls							
Under 10							
11-14							
15-17							

Work processes – Kilns							
How the work is done →	Tool	Weight	Position	Speed	Duration	#children	Comments
<i>Instruction →</i>	<i>describe the tool used for this task</i>	<i>weigh the load being carried (mud, water)</i>	<i>describe the way the child moves or sits</i>	<i>Time the number of movements in 10" &/or 60"</i>	<i>Time how long the task takes to perform</i>	<i>How many in each category</i>	
Boys							
Under 10							
11-14							
15-17							
Task: Hauling clay							
Girls							
Under 10							
11-14							
15-17							
Boys							
Under 10							
11-14							
15-17							
Task: Hauling water to make mud							
Girls							
Under 10							
11-14							
15-17							
Boys							
Under 10							
11-14							
15-17							
(use same format for additional tasks undertaken by children)							
How the work is done →	Tool	Weight	Position	Speed	Duration	Number	Comments
Task: Mixing soil with water							
Task: Kneading clay							
Task: rolling clay into balls							
Task: Packing clay in molds							
Task: Emptying brick from mold							
Task: Arranging bricks to dry							
Task: Turning bricks as they dry							
Task: Herding animals that transport bricks							
Task: Sprinkling sand over bricks							
Task: Lifting bricks onto cart/animal							
Task: Transporting bricks to kiln							
Task: Filing off the sharp edges							
Task: Stacking bricks							
Task: Placing bricks in the kiln							
Task: Taking bricks out of the kiln							

Insert here additional sheets for each of the tasks associated with the brick kiln work that were not listed above

Work processes – Home							
How the work is done →	Tool	Weight	Position	Speed	Duration	Number	Comments
<i>Instruction →</i>	<i>describe the tool used for this task</i>	<i>weigh the load being carried (mud, water)</i>	<i>describe the way the child moves or sits</i>	<i>Time the number of movements in 10" &/or 60"</i>	<i>Time how long the task takes to perform</i>	<i>How many in each category</i>	
Task: Carrying water or fuel							
Girls							
Under 10							
11-14							
15-17							
Boys							
Under 10							
11-14							
15-17							
Task: Tending crops							
Girls							
Under 10							
11-14							
15-17							
Boys							
Under 10							
11-14							
15-17							
Task: Care/herding of animals							
Girls							
Under 10							
11-14							
15-17							
Boys							
Under 10							
11-14							
15-17							

Hazard observation checklist (Part III - Ergonomic hazards)

DETAILS AND OBSERVATIONS											
Awkward Posture - Strain on back, neck shoulders			✓	Note number of children affected by age group (a,b,c) & sex (M, F)	M a	M b	M c	F a	F b	F c	Measure
			1. Does the child work with the hand(s) above the head, or lift objects above the shoulders?	<input type="checkbox"/>	Measure height lifted.						
			2. Does the child work with the <u>neck</u> bent more than 45° for more than 10 minutes at a time?	<input type="checkbox"/>							

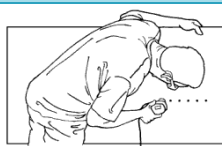
DETAILS AND OBSERVATIONS

Awkward Posture - Strain on back, neck shoulders



Note number of children affected by age group (a,b,c) & sex (M, F)

M a M b M c F a F b F c Measure



3. Does the child work with the **back** bent forward more than 45° for more than 10 minutes at a time?

☐


4. Does the child squat, crouch or kneel while working for more than 10 minutes at a time?

☐

5. Does the child push, pull, roll, or carry a load?

☐

Weigh the load.
Weigh the child.
Calculate % body weight being carried.

____ kgs
____ %

6. Does the child carry loads on the head?

☐

7. Does the child carry loads in the arms?

☐

8. (additional)

9. (additional)

Strain on hands and wrists



Comments/Observations

Measurement



1. Does the work require a highly repetitive motion of the hands and wrists?

☐


2. Does the work the child does require pinching with the fingers?

☐


3. Does the work involve forceful gripping with the hand(s)?

☐

Highly Repetitive Motion (Using the same motion with little or no variation every few minutes)

1. Does the child do the same task all day?

☐


2. Does the child make the same movement over 10 times in succession?

☐

DETAILS AND OBSERVATIONS

Awkward Posture - Strain on back, neck shoulders



Note number of children affected by age group (a,b,c) & sex (M, F)

M	M	M	F	F	F	Mea
a	b	c	a	b	c	sure

Repeated impact



1. Does the child use the hand (heel/base of palm, fist) as a hammer to pound the clay or other substance?

☐


2. Does the child repeatedly use the knee or foot as a hammer?

☐

Annex 3. Questionnaires and interview guides

Child Information

C 1. Reference number for child _____ C 2. Child's first name _____

Location Information

L1. Name of kiln/community: _____ L2. GPS &/or Address: _____

L 3. Place of interview
 Home 1
 Worksite 2
 Other(write in)..... 3

L 4. Region/Province/District etc.:
 Region..... 1
 Region..... 2
 Region..... 3

Interviewer Information

I 1. Interviewer name: _____ I 2. Supervisor name _____

I 3. Field edited by: _____ I 4. Data entry by _____

Interview Information

II 1. Day / Month / Year of interview: _____ / _____ / 2013

II 2. Time started: II 3. Time ended:

II 4. Result of household interview:
 Completed 1
 Refused 2
 Incomplete 3
 No household member or no competent respondent at home at time of visit 4
 Other (specify) 5

II 5. Other persons present during the interview:
 (first name and relationship to child)

Hello. My name is _____. I am working for the (organizational affiliation). We are studying the health of children who are working here so that we can see if something needs to be done to improve their health. I would like to ask you some questions and take some health measurements. The questions usually take about 15 to 20 minutes.

We can share the results with you after we finish, but we will not share anything that you say or anything about you personally with others outside our team. All of the answers you give will be confidential.

Your views are important and so we hope you will participate in the study. However, you are not obliged to do this. If there is any question that you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

May I start now?

☐ Yes, permission is given ⇒ Go to II 2 to record the time and then begin the interview.

☐ No, permission is not given ⇒ Complete II 4. Discuss this result with your supervisor.

Section I. Socio-demographic background information			
Indicator	Question	Coding	Interviewer Instruction
Information	First, I would like to know a little bit about you. Can you please tell me your first name (if not already asked before)		
Age	D 1 What is your age?	_____ age	Calculate birth year from the age cited. Write in the birth year. If child does not know, ask mother to try to estimate based on events. If mother does not know, try to estimate based on child's size, etc. (see References: Guide for estimating age)
		MICS _____ birth year	
	D 2. How do you know your age?	1 = documented (Birth record/Registration) 2 = estimated by events 3 = estimated by parent(s)/other person 4 = unsure/not reliable	Optional This is to determine degree of reliability of reported age
Sex	D 3 (do not ask)	1 = Female 2 = Male	Observation only
Migrant status	D 4 Where were you born?	1 = Within this district/general area 2 = Outside this district, but same country 3 = in _____ (name country)	Change name of administrative units to conform to local terminology. Add provincial level or request name of district or province if desired Purpose: To determine vulnerability due to migration
	D 5 Do you always live here or do you move from time to time?	1 = live here always 2 = move	If answered "2", ask D 6
	D 6 How many times have you moved in the last 2 years?	1 = once 2 = twice 3 = (exact number)	Purpose: To determine vulnerability due to frequent dislocation.
Ethnicity	D 7 What is your ethnic group / caste / first language you learned to speak / religious group?		Optional. Adapt to whatever is the common or polite way of referring to ethnic status. Code accordingly (see Nepal) Purpose: to determine vulnerability due to social status
Schooling	D 8 Have you ever attended school?	1 = yes 2 = no	If yes, go to D 8a. If no, go to D 10
	D 8a Are you attending school right now?	1 = yes 2 = no	If yes, go to D 8b If no, go to D 8c
	D 8 b Did you miss any school day during the past week?	----- (exact number)	Note explanation if any
	D 8 c Do you attend school when the brick kilns are closed for the season?		
	D 9 During this school year (or, the last school year you attended), what level and grade were you attending?	----- exact level/grade	

Section I. Socio-demographic background information			
Indicator	Question	Coding	Interviewer Instruction
Family	D 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. If the child answers yes 2 – 5, ask D 10a
	D 10a Why is it that you are not living with your parents?	1= Married and living with spouse 2= Death of parent or parents 3= Long term sickness of father/mother 4= Debt 5= Parental conflicts 6= Scolded by parents 7=Others (Specify.....)	Optional

Section II. Work history			
Indicator	Question	Coding	Interviewer Instruction
Now, I want to ask you about the work that you do. We will start with the work you do at the brick kilns. We will call that the “brick kiln work”			
Work duration	W 1. When / at what age, did you start working or helping out in the brick kilns? LFS	_____ (age started work in kilns)	Critical question. Try to get an accurate answer. If the child (or other family member) cannot remember, interviewer should prompt using events. E.g. <i>Was it before or after the time that X occurred?</i>
	W 1a. How many days do you work in the kiln per week?	_____ # days worked per week	
	W 1b. How many hours per day do you usually work at the kiln?	_____ # hours worked per day	
	W 1c. (do not ask)	_____ # hours worked per week	Multiply the answers in W1a and W 1 b to determine the hours per week spent in brick kiln work
Now I want to ask you about other kinds of work that you might be doing. Let's call this the “other work”			
Other work	W 2. In addition to your work in the kilns, did you do any other work this past week?	1 = <i>yes</i> 2 = <i>no</i>	Prompt if “no”: Explain that this can be just “helping out” and read the list in W 2a. If still no, go to question W 3
	W 2a. During the past week did you do any of the following activities, even for only one hour?	1= Any work for payment for someone else? e.g.: a regular job, casual or piece work for pay, work in exchange for food or housing. 2 = Any paid domestic work for other people? 3 = Help out in a family business? (e.g. sell things, make things for sale (carpets), get inputs needed	(Read each of the items and circle all that apply)
	LFS		Purpose of these questions is to see if other kinds of work may be contributing to the disease/injury profile other than brick kilns.

Section II. Work history			
Indicator	Question	Coding	Interviewer Instruction
		4 = Agricultural work or taking care of livestock? 5 = Fetch water or collect firewood for the family? 6 = Produce any other good for this household use? e.g. clothing, furniture, clay pots, bricks, etc.	
	W 2b. When/how old were you when you start doing this other work?	_____ (age started other work)	
	W 2c. When you are doing that work, how many hours a day do you do it?	_____ # hours worked per day	For W2 b, c, and d, we are looking at the 'other work' in aggregate as an indicator of total time spent work in addition to brick kilns
	W 2d. How many days each week do you do this other work?	_____ # days worked per week	
	W 2z. (do not ask)	_____ # hours worked per week	Multiply the answers in W 2a and W 2b to determine the total number of hours per week spent in non-brick kiln work.
	Now we will talk about work that you do here in the place where you live. Let's call it household chores		
	W 3. During the past week did you do any of these tasks for the household where you are living? LFS	1. = Shopping for household.... 2. = Repairing any household equipment 3. = Cooking..... 4. = Cleaning utensils/house..... 5. = Washing clothes..... 6. = Caring for children/old/sick..... 7. = Other household tasks..... (specify)	Read each of the options and circle all activities undertaken
	W 3a. How many hours per day do you usually do this work?	_____ # hours worked per day	
	W 3b. How many days a week do you usually do this work?	1 = every day 2 = _____ (specify)	Combine all of the tasks in W3 to estimate number of hours per day spent in household tasks.
	W 3z (do not ask)	_____ # hours worked per week doing household chores	Multiply the responses in W 3a and W 3b to know the total number of hours per week doing household chores
	W 4z	_____ total # hours worked per week	On the basis of the answers in W 1z, W 2z and W 3z, calculate the TOTAL number of hours of work that the child works per week.
	W 5. Do you do any kinds of work in the off-season (when you are in your other place)?	1 = yes 2 = no	Purpose: to identify other possible sources of serious illness or injury.
	W 5a. Tell me what kinds of work do you do in the off-season?	1 = brick work in another place 2 = agriculture (including livestock) 3 = housework 4 = work for pay or in kind payment	

Section II. Work history			
Indicator	Question	Coding	Interviewer Instruction
		5= Study 6 = other (specify.....)	
	W 6. Tell me about all the other kinds of work you have ever done in your life	1 = agriculture (including livestock) 2 = housework 3= work for pay or in kind payment 4= Study 5 = other (specify.....)	

Section III. Health history																										
Indicator	Question	Coding	Interviewer Instruction																							
Now we are going to talk about your health and about how you feel in general. Do you have any questions?																										
Recent health events	H 1 Have you ever experienced fatigue or exhaustion in the last 4 weeks (1 month)? LSMS	1 = often 2 = sometimes 3 = never	Note: as health events are hard to recollect accurately and may be emotional, this section starts with very recent, minor events, a warm-up for the more detailed questions later.																							
	H 2 Have you experienced minor cuts or bruises in the last 4 weeks (1 month)? LSMS	1 = often 2 = sometimes 3 = never																								
	H 3 Have you ever felt pains in your body during the last 4 weeks? LSMS	1 = often 2 = sometimes 3 = never																								
	H 4 Have you ever felt anxiety or fear during the last 4 weeks? LSMS	1 = often 2 = sometimes 3 = never	Optional																							
Injuries	H5. Since this time last year, have you experienced any of these injuries?	1 = Bad cuts or bruises 2 = Broken bone 3 = Sprains, strains or dislocations 4 = Bad burns or scalds	Read each of the options. Circle all those that pertain. (Do not ask the respondent to try to attribute these to work.) Use the following chart for questions H 5a, H 5b, and H 5c																							
	H 5a. What part of your body was injured?	1 = leg or foot 2 = arm or hand 3 = head 4 = neck 5 = back 6 = eyes or ears	<table> <tr> <th>Cuts/bruises</th><th>Bones</th><th>Sprains</th><th>Burns</th></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> </table>	Cuts/bruises	Bones	Sprains	Burns																			
Cuts/bruises	Bones	Sprains	Burns																							

Section III. Health history						
Indicator	Question	Coding	Interviewer Instruction			
		7 = abdomen 8 = shoulder 9 = hip				
			Cuts/bruises	Bones	Sprains	Burns
			If more than one injury occurred in a category, ask the child to remember the worst one in answering the following questions:			
	H 5b. Where were you when this happened?	1 = brick kilns 2 = home 3 = other place (write in on the chart)				
	H 5c. What were you doing when this happened?	(write in the activity)				
	H 5d. Did this injury keep you from your normal activities (e.g. work, school, chores) for at least 3 days?	1 = yes 2 = no				
	H 5e. What did you do to take care of this injury?	1 = did nothing 2 = took care of it myself 3 = kiln owner/parent/other gave 1 st aid 4 = went to a local healer 5 = went to a clinic or hospital 6 = other (Specify.....)				
	H 5. Did you or your relative/parents pay for the treatment or medicine?	1 = yes 2 = no				
Specific illnesses	H 6. Since this time last year, have you had any of these illnesses?	1 = Breathing problems or persistent cough 2 = Eye or ear problems 3 = Skin problems 4 = Stomach problems / diarrhea	breathing	Eye/Ear	Skin	Stomach
	H 6a. Did this sickness keep you from your normal activities (e.g. work, school, home chores) for at least 3 days?	1 = yes 2 = no				
	H 6b. What did you do to take care of this illness?	1 = did nothing 2 = care by self or family member 3 = went to a local healer 4 = went to a clinic or hospital				
	H 7a. Since this time last year, have you had any of these health problems?	1 = Fever 2 = head ache 3 = feeling weak		Headache	Weak	bad

Section III. Health history			
Indicator	Question	Coding	Interviewer Instruction
		4 = <i>feeling bad all over</i> 5 = <i>Others, Specify</i>	
	H 7b. Did this health problem keep you from your normal activities (e.g. work, school, home chores) for at least 3 days?		
	H 7c. What did you do to take care of this illness or pain?		
	H 8. Since this time last year, have you been troubled by insomnia?	1= Yes 2=No	
	DHS		
	H 8a. How many hours of sleep do you usually get every night?	_____ 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?
	H 8b. Do you have a nap or rest during the day?	1 = yes 2 = no	
	H 9. Do you feel hungry a lot of the time?	1= Yes 2 =No	
	Now think back over all the time that you have been working		
	H 10. Besides what you have mentioned before, have you ever had any other injury that was really, really bad at work?	1= Yes 2 =No	Note what the child says. Parent may assist. Prompt: Was there any other injury that was really bad? If no, go on to MS 1
	H 10a. Please tell me all about the injury. What was it? When did it occur? How did it happen? How did you feel?		Open- ended question. Try to write down all the child says. Parent may assist. If work-related, note the activity, tool, or other circumstance.
	H 10b. Do you know of any other children who have been hurt very very badly at work?	1 = yes 2 = no	Open-ended question for snowball sampling. If yes, get the name of the child, age, sex, and contact information (where to find her/him). Any circumstances about the injury.
	H 10c. Do you know of any child who has ever died because of an injury at work?	1 = yes 2 = no	Sensitive question. Skip if child seems reluctant. Otherwise, try to obtain names and information (age/sex/nature of the incident)
	H 11. Do you know of any young people here that use drugs or alcohol?	1 = yes 2 = no	
	H 12. Do you know of any young people here that use tobacco products?	1 = yes 2 = no	Sensitive questions. To be handled with great care, using euphemisms and locally acceptable terminology.
	H 13. 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	Purpose: to determine if deeper study needed in this area.

Serious health issues

Section III. Health history			
Indicator	Question	Coding	Interviewer Instruction
Focal health issues: Musculo-skel.	Now I have some questions particularly about your back and neck.		
	MS 1. Since this time last year, have you noticed that your neck or back has been bothering you or hurting you?	1= Yes 2=No	Purpose of these questions are to explore further the extent of musculo-skeletal pain that may, or may not have been mentioned earlier. If yes, ask MS 1a. If no, go to MS 2
	MS 1a 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 = <i>very bad (Red Colour)</i> 2 = <i>medium (orange Colour)</i> 3 = <i>not bad (yellow Colour)</i>	Add specific Musculo-skeletal module here
	MS 2. Have you at any time during the last 12 months had trouble (ache, pain, discomfort) in:	1 = neck 2= shoulders 3=elbows 4= wrists/hands 5= upper back 6= lower back 7= hips 8= thighs 9= ankles 10= feet	Numbered columns are codes for parts of the body. Use this chart for questions MS 2, MS 2a, MS 2b.
			1 2 3 4 5 6 7 8 9 10
	Nordic		
	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? Nordic	1 = yes 2 = no	
	Have you had trouble at any time during the last 7 days? Nordic	1 = yes 2 = no	
I would like to ask you some questions about your breathing as well.			
	R 1. Since this time last year, have you been having trouble breathing such that it is hard for you to run or talk. Or do you find you cough a lot?		Purpose of this question is to explore further the extent of respiratory distress that may, or may not have been mentioned earlier. If yes, ask R 1a
	R 1a Show me on this same scale, how bad it is	1= <i>very bad (Red Colour)</i> 2= <i>medium (Orange colour)</i> 3= <i>not bad (Yellow Colour)</i>	

Section IV. Psycho-social functioning						
Indicator	Question	Coding				Interviewer Instruction
		1= Never	2= Sometimes	3= Often	4= Always	Explain to the child how to answer the questions. Show them the pictorial scale in Annex 2. Ask her/him to think of the “main” job s/he does when answering these questions
Now we are going to talk about your feelings about your work and yourself. Do you have any questions?						
Note: This section is for WORKING CHILDREN only						
Self-esteem	PS 1. I would like to ask you some questions about how you feel about your work. First, are you proud of your work?					
	PS 2. Do you feel like you have the skills needed to do your job well?					
	PS 3. Do you think others appreciate the work you do?					
	PS 4. Do you feel that some people look down on this kind of work or on you because of the work you do?					
	PS 5. Do you feel that your family relies on you and needs your help					
Stress	PS 6. Do you feel under pressure to work faster and harder?					
	PS 7. Do you feel bored because there is not enough to do?					
	PS 8. Does your family, employer or others ask too much of you?					
	PS 9. Do you get bored at work doing the same thing for many hours in a row?					
	PS 10.Do you feel tired because of the long working hours or heavy work load?					
Personal agency	PS 11.Do you feel like your work is prevents you from doing things you would like to do?					If yes, what do you think you are missing?
	PS 12.Do you feel that, if you wanted to, you could choose what to do and what not to do?					
Relationships	PS 13.Does the environment in which you are working bother you at all?					Can probe with non-leading categories, e.g. temperature, sounds, smells, materials, tools
	PS 14.Are you comfortable with the people you work with?					Can probe, e.g. supervisor, co-workers
Supervision & Training	PS 15.At work, do you feel that people watch over you to make sure you don't get hurt?					
	PS 16.Do people at work teach you what to do and how to do it?					

Indicator		Question	Coding				Interviewer Instruction
			1= Not at all	2= A little	3= Quite a bit	4= A lot	Explain to the child how to answer the questions. Show them the pictorial scale in Annex 2. Ask her/him to think of the "main" job s/he does when answering these questions
This section is for all children (working and non-working)							
Leisure	PS 17.	do you have free time each day to do just what you want?					
	PS 18.	Do you have lots of energy?					
Emotional	PS 19.	Do you generally feel pretty confident?					
	PS 20.	Do you have any difficulty sleeping?					
	PS 21.	Do you have trouble concentrating?					
	PS 22.	Do you feel restless and cannot stay still very long?					
	PS 23.	Do you feel sad and like crying?					
	PS 24.	Do you get into fights or quarrels easily?					
	PS 25.	Do you feel lonely?					
	PS 26.	Do you get very angry and often lose your temper?					
	PS 27.	Do you have little appetite or interest in food?					
	PS 28.	Do you find that you forget things?					
Somatic	PS 29.	Do you feel tension in your body?					
	PS 30.	Do you feel dizzy?					
Chronic fear & anxiety	PS 31.	Do you feel afraid or nervous?					
	PS 32.	Do you worry and think a lot?					
	PS 33.	Do you think back about all the bad things that have happened to you?					
Hopelessness & helplessness	PS 34.	Do you think your life will get better some day?					
	PS 35.	Do you think your life is worse than that of other children?					
	PS 36.	Do you think life isn't worth living?					
Social factors	PS 37.	Do you feel supported and loved by your family?					
	PS 38.	Is there conflict in your family?					Alternate: Do you worry about your family?
	PS 39.	Do you feel accepted by the other families around here?					
	PS 40.	Do you have one or more good friends that support you?					
	PS 41.	Do you people reject or tease you or call you names?					
	PS 42.	Do you play games or sports with friends?					
	PS 43.	Do you feel very different from other children your age?					

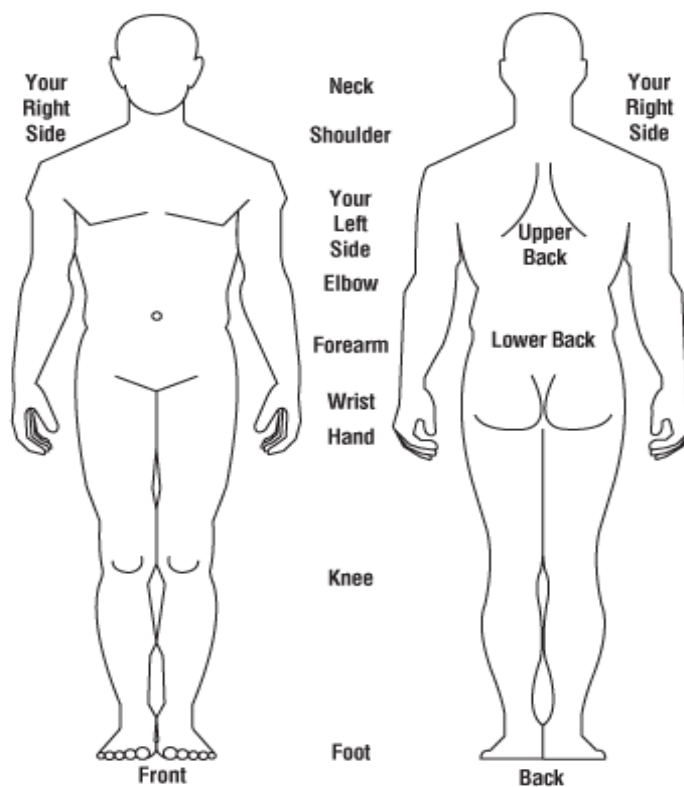
Indicator	Question	Coding				Interviewer Instruction
		1= Not at all	2= A little	3= Quite a bit	4= A lot	Explain to the child how to answer the questions. Show them the pictorial scale in Annex 2. Ask her/him to think of the “main” job s/he does when answering these questions
This section is for all children (working and non-working)						
Abuse and maltreatment	PS 44. Do you get scolded, or criticized or made to feel small or stupid?					
	PS 45. Do you get beaten at home or work?					
	PS 46. Has anyone at work tried to touch you in a bad way?					
	PS 47. Have you been severely punished for mistakes made at your work?					
	PS 48. In your day-to-day life do you feel safe?					

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

Figure 38. Diagrams for likert scale responses



Figure 39. Illustrations for demonstrating location of pain



Module 3. Measurements

Health study of children working in brick kilns in (Country)				
Section I. Child clinical exam				
CE 1. Reference number (Target Child #) _____		CE 2. Child's age _____		
Main areas	Detail	Measuring device	Scale	Comment
Nutritional status	CE 2. Height	rod	___ cms.)	
	CE 2a. Height for age ratio			
	CE 2b. anemia	fingerprick		
		Conjunctive pallor		
Respiratory disease	CE 3. Weight	scales	___ kilos)	Calculate BMI
	CE 3a. Body Mass Index			
Injuries	CE 4. Lung function	Spirometer		
	CE 4a. Tuberculosis	Tuberculin test		
Musculo-skeletal	CE 5. Scars (burns, cuts)	Observation		
	CE 5a. dislocations	Observation		
	CE 5b. amputations	Observation		
	CE 6. Deformity	Observation		
Skin	CE 6a. – neck	Observation		
	CE 6b. – back	Observation		
	CE 6c. – fingers/hands	Observation		
	CE 6d. – knees/ankles	Observation		
Hearing	Watch ticking			
Eyes				

Section II. Environmental measures

EM 1. Locality _____ (region, district)

EM 2. Kiln site _____ (kiln name, community)

Main Areas	Detail	Code	Measuring device	analysis	Comment
Air quality	EM 1. Does the soil used for brickmaking contain free silica?	1 = Yes 2 = no	bulk samples	ICP	If yes, carry out EM 1a If no, carry out EM 2.
	EM 1a. Are the workers exposed to respirable crystalline silica (known to cause lung damage – silicosis)?	1 = yes 2 = no	Sample respirable dust using PVC filters, blanks	NIOSH 7500	
	EM 2. Are the workers exposed to high levels of respirable dust?	1 = yes 2 = no	Multiple tests using personal sampling device	NIOSH 0600	
Toxic substances	EM 3. Are there heavy metals in the soil used for brickmaking? (lead, arsenic,)	1 = yes 2 = no	bulk samples	XRF, XRD	If yes, carry out EM 3a
	EM 3a. Is concentration high enough to create contamination?	1 = yes 2 = no		NIOSH 7301	
	EM 3b. Do the fumes from kiln firing contain PCBs, other carcinogens?	1 = yes 2 = no			
Water	EM 4. Is drinking water contaminated with	1 = yes 2 = no			
Weights	EM 5. How heavy are the loads carried by children?	___ kgs	Scales		For raw bricks: Weigh one brick. Afterwards it is easy to estimate the load each person is carrying by counting the number of bricks.
Temp	Temperature at the hottest part of the day at present	___ degr	Thermometer		
	Temperature at the coldest part of the night at present	___ degr	Thermometer		
Access	Distance to the nearest clinic	___ kms	Speedometer		
	Distance to the nearest school	___ kms	Speedometer		
Location	Distance between the work area and the living area	___ kms	Estimate		
	Distance between the kiln and the area where most children are working	___ kms			

Module 7. FGD discussion guide

Health study of children working in brick kilns in (Country)

Location information

L1. Name of kiln/community: _____ L2. GPS &/or Address: _____

L 3. Place of interview	L 4. Region/Province/District etc.:
Common area.....1	Region.....1
Worksite2	Region.....2
Other(write in).....3	Region.....3

Interviewer information

I 1. Facilitator (name) _____ I 2. Notetaker (name) _____

I 3. Field edited by: _____ I 4. Data entry by _____

Interview information

II 1. Day/Month of interview: ____ / ____ II 3. Time started:

II 2. Outcome:	II 4. Time ended:
FGD undertaken.....1	
FGD delayed2	
FGD refused altogether3	
Other5	

II 5. Names of all persons involved and/or present in the FGD:
(first name and role: parent, adult worker, child worker, supervisor, visitor, etc.)

Name	Role

Focal issue	Question	Coding	Facilitator instructions
Risk Assessment	FGD 1. What do you think might be the dangers associated with this task?		
	FGD 1a. How severe <u>could be</u> the injury or illness that occurs as a result of doing this task?	5 = Catastrophic may cause death, permanent disability, or loss of a facility 4 = Critical may cause serious injury or severe occupational illness requiring expert medical attention 3 = Substantial injury or illness likely to result in lost work days 2 = Minor injury or illness requiring, at most, rest or first aid on the spot 1 = Negligible probably would not affect personal safety or health	Read out, one by one, the identified tasks in the brick kiln work, and in the home-based work. Ask the members to collectively rate each risk as to its severity and likelihood of occurring according to the chosen 5 point scale where 1 is lowest and 5 is highest.
	FGD 1b. How likely is it that this injury or illness would occur to a young child (under 14)?	1 Extremely unlikely to occur. Remote chance only. 2 Unlikely. Not likely to occur. 3 Possible. Could occur at some point in time. 4 Likely. Reasonably probable that it will occur 5. Almost certain.	
	FGD 1c. How likely is it that this injury or illness would occur to an older child (15-17)?	1 Extremely unlikely to occur. Remote chance only. 2 Unlikely. Not likely to occur. 3 Possible. Could occur at some point in time. 4 Likely. Reasonably probable that it will occur 5. Almost certain.	Optional
Healthy Worker Effect	FGD 2. Do families bring all of their children to work with them, or are some left behind?		
	FGD 2a. How do families decide which of their children to bring to work with them?	Open-ended questions. No coding	If some children are brought to work and not others, ask FGD2b
	FGD 2b. Do the children who work get more to eat? Different kinds of food? More sleep?		

Children's risk assessment tool for brick kilns (CRAT-BK)

Work Process	Hazards in the process	Consequences for child	Likelihood					Seriousness					Comments
			1	2	3	4	5	1	2	3	4	5	
1. Digging soil	Lifting heavy loads												
2. Hand molding of bricks	Long work hours > 6 hours												
3. Turning of bricks	Long work hours > 6 hours												
4. Carrying green bricks to kiln	Bricks falling on body												
5. Stacking of bricks in kiln	Falling bricks												
6. Carrying coal/ fuel for kiln	Coal dust exposure												
7. Firing of kiln	Burns												
8. Removing baked bricks from kiln	Injuries from falling bricks												

Module 8. Tripartite meeting guide

Health study of children working in brick kilns in (Country)

Location information

L2. GPS &/or Address: _____

L 4. Region/Province/District etc.:

Region.....1

Region.....2

Region.....3

Researcher information

12. Notetaker (name) _____

4. Data entry by _____

II 3. Time started:

II 4. Time ended:

..1

..2

..3

..5

etc.)

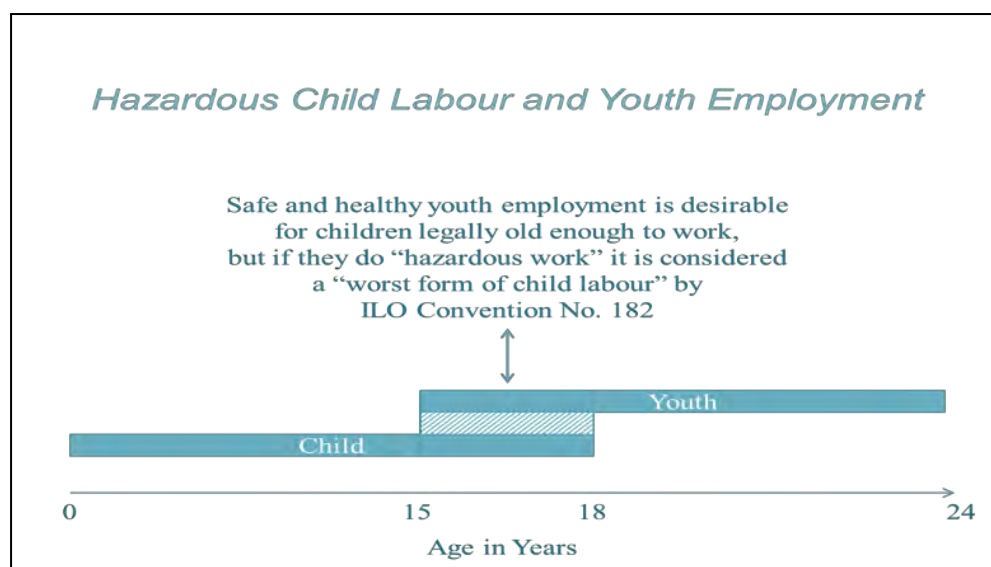
Role

Focal issue	Question	Comments
Risk Assessment	dangers perceived as compared with checklist of known hazards	

To be determined by FGD discussion of improvements made, not made, and could be made. The objective is to “draw a line” between hazardous child labour and safe youth employment. The aim is to optimize opportunities for children to work who are above the legal age for employment while still protecting them from hazardous tasks and conditions. This is a fine line and, thus, the importance of having a separate module devoted to this subject.

Discussion question: Why are adolescents special?

Adolescents are at the hinge between childhood and adulthood. If they are between 15 and 18 years (sometimes 14 or 16 because national laws vary), they can be either child labour or legally employed youth, depending upon whether the work they do and the conditions they work in are hazardous. Because they are neither adults nor school-age children, older adolescents all too often fall between the cracks.



Discussion question: How do you protect youth who are old enough to work legally?

No young person below age 18 should be exposed to work hazards. For youth above the minimum working age, rescue from hazardous work may mean the removal of hazards from the workplace and/or strict regulation of working conditions ... or removal of the child from the workplace altogether.

- This means no overtime, no night work, and limited work during the week if still attending school.

- Due to the variation in risks by sectors, risk assessment must be done by sub-sectors, activities, or tasks.
- Adult limits will give a clue as to what is dangerous for youth – if it is hazardous for adults, it is definitely off-limits for youth – but these are not sufficient to indicate what is safe for youth because adolescents have the added risk of being in a rapid stage of development.
- Research and guidelines from other countries can also give a clue. If the work is dangerous in one country, it will likely be dangerous in other countries as well.

Annex 4. Sample design

Following are the instructions given to the research teams on how to draw the sample of kilns for observation, and of children for interview and measurement.

Initial intensive study

Objective: To obtain a sample that is representative of the larger population (i.e. this approach does not attempt to ascertain prevalence).

1. Identify the number of provinces in the country which have brick kilns.
2. Determine the degree of homogeneity of the kiln provinces in terms of geography, ethnic composition, brick kiln technology, registered/unregistered establishments.
3. If homogeneous, select one province for intensive study; if not homogeneous, map the pattern of kilns and select one province which is representative of each type.
4. Identify the number of brick kilns in the focal province(s) (*through administrative records*).
5. Select kilns from the focal province(s) for intensive study that singly or together will provide the target number of subjects required for the study (as determined by step 3 in previous section, "Preparation for the Study").
6. Conduct a rough census of the workers in the focal kiln(s), by sex and estimated age, to confirm that there are at least enough to reach the target number of adolescent child workers (11-17). (If not enough, then add kilns until the target number is reached).
7. Calculate the proportion of child to adult workers in the kiln worker population.
8. Calculate the proportion of girls and of boys in each of 3 age groups (< 10, 11-14, 15-17).
9. To prepare the sample, create a table of 4 cells showing the percentages of girls and boys in the 11-14, and 15-17 age groups found in the focal kiln populations being studied:

Age	Girls	Boys	Total
11-14	___%	___%	___%
15-17	___%	___%	___%
Total			100%

- Take the total target number of working children (e.g. 100) and non-working children serving as controls (e.g. 50) and break it down, allocating it according to the actual percentages in the focal kiln populations being studied:

Age	Girls	Boys	Total
11-14	___% = ___(#)	___% = ___(#)	___% = ___(#)
15-17	___% = ___(#)	___% = ___(#)	___% = ___(#)
			100% = 100+

- Randomly select the children to be interviewed from the census list according to these numbers. These are the respondents or “target children”.
- Interview the target children & conduct measurements on them.
- Interview **all their siblings** age 11-17, working and non-working. Those who have not worked in the brick kilns can serve as part of the control group.
- Based on the results of the interviews, calculate the rate of all injuries/all illnesses (1 year period) and the rate of serious injury/serious illness (entire working period).

Confirmation study

Objective: To make most efficient use of scarce resources and to enable inclusion of areas which are less accessible due to political insecurity, terrain, distance, or time constraints.

- Select additional provinces from among the list of brick-producing provinces developed above (*number based on funds available*).
- Select the same number of children in the same categories as in #11 above or oversample according to the calculated rates of injury/illness.
- Interview & conduct measurements using a shortened form of questionnaire and measurements limited to those which have shown significant differences between working children and controls in the initial study.

Snowball component

Objective: To obtain a profile of rare incidents (serious injuries, deaths).

- Ask each respondent if they know of another child worker (5-17 yrs) who has either (a) been very seriously injured at work or (b) who has died.
- Get the name of the child (so as to avoid double counting).
- Identify and interview the child identified in “a”. This is wave #1.
- Conduct a second wave (asking the interviewed child to identify other children fitting the same criteria...).

Youth component

Objective: To obtain a profile of rare incidents (illnesses with a long latency period).

Note: There may be enough young adults who are siblings of the working children to reach the target number, but if not, identify other young adults from the brick kiln community. If funds permit, ***interview all adults in the household of the target working child who fit criterion “b” below.***

1. Identify young adults from among the brick kiln worker families who:
 - a) are in the age cohort 18-24+/- (old enough for latent conditions to manifest but not so old that years of work mask child-onset conditions);
 - b) worked in the brick kilns for at least 2 years prior to the age of 15+/- (before puberty).
2. Interview and conduct clinical assessment re sentinel conditions

Sampling plan: Control group

Objective: To differentiate occupational health outcomes from other factors (especially poverty).

1. Identify a community or neighborhood in the district which is similar to the brick kiln workers in:
 - a) economic level (e.g. nature of the house, key asset);
 - b) migration status;
 - c) ethnic, social or linguistic mix or group.
2. identify a sample of children from this community in the same proportions (by age group and sex) as the respondent brick kiln working children, e.g. randomly selected from a school roster, who fit these two criteria:
 - a) have never worked in the brick kilns;
 - b) are not now and have never worked in a hazardous occupation (to be locally determined).
3. interview (using short form) & conduct clinical exam of controls focusing on:
 - a) work history (detailed, to avoid confounding results);
 - b) injuries in the past 2 years;
 - c) sentinel conditions.
4. interview parent or older sibling (18-24 yrs) of the respondent children focusing on:
 - a) work history;
 - b) sentinel conditions;
 - c) serious injuries ever occurred.

Annex 5. Data tables

Table 43. Social factors affecting children's vulnerability

Country	Social minority			Religious minority			Living w/o parents			Migrant		
	N	%	Sig	N	%	Sig	N	%	Sig	N	%	Sig
Afghanistan												
Brick children	41	10%		NS	NS	NS	20	5%		364	91%	
Comparison	208	38%		NS	NS	NS	22	4%		259	47%	
Total	249	27%	<0.01	NS	NS	NS	42	4%	0.45	623	66%	<0.01
Bangladesh												
Brick children	NS	NS		NS	NS		39	56%		69	99%	
Comparison	NS	NS		NS	NS		1	3%		40	100%	
Total	NS	NS		NS	NS		40	36%	<0.01	109	99%	1.00
Nepal												
Brick children	NS	NS		49	40%		40	20%		143	72%	
Comparison	NS	NS		8	1%		12	11%		102	95%	
Total	NS	NS		57	41%	0.08	52	17%	0.05	245	80%	<0.01
Pakistan												
Punjab												
Brick children	NS	NS		14	6%		9	4%		101	45%	<0.01
Comparison	NS	NS		28	32%		0	0		2	2%	
Sindh/KPK												
Brick children	2	1%		NS	NS		2	1%		36	24%	
Comparison	NS	NS		NS	NS		NS	NS		NS	NS	
Total				36	8%		11	2%		138	30%	<0.01

Table 44. Educational status

Country	Not now in school			No previous schooling			1-5 yrs school only		
	N	%	Sig	N	%	Sig	N	%	Sig
Afghanistan									
Brick children	246	87%		278	70%		393	99%	
Comparison	223	40%		179	32%		552	100%	
Total	569	60%	<0.01	457	48%	<0.01	945	99%	<0.01
Bangladesh									
Brick children	54	77%		0	0		58	83%	
Comparison	1	3%		0	0		40	100%	
Total	55	50%	<0.01	0	0	NA	98	89%	<0.01
Nepal									
Brick children	147	74%		0	0		182	92%	
Comparison	0	0%		0	0		105	98%	
Total	147	48%	<0.01	0	0	NA	287	94%	0.03

Country	Not now in school			No previous schooling			1-5 yrs school only		
	N	%	Sig	N	%	Sig	N	%	Sig
Pakistan									
Punjab									
Brick children	29	13%	0.6	114	50%	<0.01	22	10%	<0.01
Comparison	5	6%		2	2%		19	21%	
Sindh/KPK									
Brick children	12	8%		83	56%		8	5%	
Comparison	NS	NS		NS	NS		NS	NS	
Total	46	10%	0.13	313	68%	<0.01	48	11%	<0.01

Table 45. Factors contributing to insecurity of brick kiln children (all countries)

	Brick children N=817	Comparison children N=788
Currently attends school	14%	71%
Migrant	89%	62%
Not living with parents	13%	5%

Note: Pakistan Punjab only (Sindh and KPK provinces have been omitted as they do not have comparison groups).

Table 46. Injuries

Country	Injuries in last month		Injuries in last year		Serious injuries ever		Any injury	
	Brick children	Comparison	Brick	Comparison	Brick	Comparison	Brick	Comparison
Afghanistan								
11-14 years	121 (50%)	100 (28%)	113 (47%)	101 (28%)	6 (2%)	5 (1%)	151 (62%)	157 (43%)
15-17 years	80 (51%)	42 (22%)	92 (59%)	61 (32%)	4 (3%)	8 (4%)	113 (72%)	80 (43%)
Total	201 (50%)	142 (26%)	205 (51%)	162 (29%)	10 (2%)	13 (2%)	264 (66%)	237 (43%)
Bangladesh								
11-14 years	15 (58%)	7 (47%)	26 (100%)	11 (73%)	3 (12%)	0 (0%)	26 (100%)	12 (80%)
15-17 years	37 (84%)	16 (64%)	40 (91%)	19 (76%)	8 (18%)	1 (8%)	43 (98%)	22 (88%)
Total	52 (74%)	23 (58%)	66 (94%)	30 (75%)	11 (16%)	1 (6%)	69 (99%)	34 (85%)
Nepal								
11-14 years	NS	NS	49 (39%)	24 (33%)	8 (8%)	3 (6%)	49 (39%)	24 (34%)
15-17 years	NS	NS	27 (38%)	8 (22%)	6 (10%)	0 (0%)	27 (38%)	8 (22%)
Total	NS	NS	76 (38%)	32 (30%)	14 (9%)	3 (5%)	76 (38%)	32 (30%)
Pak: Punjab								
11-14 years	53 (84%)	13 (36%)	23 (37%)	5 (19%)	6 (10%)	2 (6%)	56 (89%)	18 (51%)
15-17 years	69 (79%)	23 (43%)	29 (33%)	11 (17%)	4 (5%)	1 (2%)	74 (85%)	30 (57%)
18-24 years	66 (87%)	NS	26 (34%)	NS	3 (4%)	NS	69	NS
Pak: Sindh/KPK								
11-14 years	30 (88%)	NS	12 (35%)	NS	7 (21%)	NS	30	NS
15-17 years	63 (97%)	NS	36 (55%)	NS	9 (14%)	NS	63	NS
18-24 years	44 (92%)	NS	22 (46%)	NS	5 (10%)	NS	44	NS
Total	325 (87%)	36 (40%)	148 (40%)	16 (18%)	34 (9%)	3 (3%)	336 (90%)	48 (53%)

Given the low number of cases of “very serious injuries ever”, those totals have been added to the column on serious injuries ever experienced.

Table 47. Minor, major, and very serious injuries (all countries)

	Brick children	Comparison group
All countries:	N=817	N=718
Minor cuts & bruises (1 month)	61%	30%
Major injuries (1 year)	49%	30%
Very serious injuries (ever)	6%	3%
Afghanistan	N=399	N=552
Minor cuts & bruises (1 month)	201 (50.4)	142 (25.7)
Major injuries (1 year)	205 (51.4)	162 (29.4)
Very serious injuries (ever)	10 (2.5)	13 (2.4)
Bangladesh	N=70	N=40
Minor cuts & bruises (1 month)	52 (74.3)	23 (57.5)
Major injuries (1 year)	66 (94.3)	30 (75.0)
Very serious injuries (ever)	11 (15.7)	1 (5.6)
Nepal	N=198	N=107
Minor cuts & bruises (1 month)	No data	No data
Major injuries (1 year)	75 (38.4)	32 (29.9)
Very serious injuries (ever)	14 (9.0)	3 (4.6)
Pakistan	N=150	N=89
Minor cuts & bruises (1 month)	122 (81.3)	36 (40.5)
Major injuries (1 year)	52 (34.7)	16 (18.0)
Very serious injuries (ever)	10 (10.4)	3 (5.0)

Notes: Values indicate the count (N) and percent (%) of children reporting the listed injury. Data on minor cuts and bruises in the last month are not available for Nepal. Serious injury in the last year includes bad cuts, broken bones, sprains, or burns. Differences between groups (within each country) were evaluated using chi-squared or Fisher's exact tests. * $p<0.05$; ** $p<0.01$. Sindh and KPK (Pakistan) were excluded from this analysis due to lack of control groups.

Table 48. Risk of injury among brick children and comparison group

	Unadjusted RR (95% CI)	Adjusted ¹ RR (95% CI)
Afghanistan (N=951)		
Minor cuts or bruises in the last month	1.95 (1.64-2.33)**	1.95 (1.64-2.32)**
Serious injury in the last year	1.75 (1.49-2.06)**	1.76 (1.49-2.08)**
Bad injury ever that required medical attention	1.06 (0.47-2.40)	0.99 (0.42-2.29)
Bangladesh (N=110)		
Minor cuts or bruises in the last month	1.29 (0.96-1.75)	1.24 (0.94-1.65)
Serious injury in the last year	1.26 (1.04-1.52)*	1.25 (1.04-1.52)*
Bad injury ever that required medical attention	2.83 (0.39-20.73)	2.93 (0.40-21.64)
Nepal (N=305)		
Minor cuts or bruises in the last month	-	-
Serious injury in the last year	1.28 (0.91-1.80)	1.27 (0.90-1.79)
Bad injury ever that required medical attention	1.96 (0.58-6.60)	1.88 (0.56-6.26)

	Unadjusted	Adjusted ¹
	RR (95% CI)	RR (95% CI)
Pakistan (N=239)		
Minor cuts or bruises in the last month	2.13 (1.64-2.75)**	2.06 (1.59-2.65)**
Serious injury in the last year	2.23 (1.39-3.56)**	2.09 (1.31-3.36)**
Bad injury ever that required medical attention	2.65 (0.83-8.48)	2.87 (0.90-9.19)

Notes: Data on minor cuts and bruises in the last month are not available for Nepal. Serious injury in the last year includes bad cuts, broken bones, sprains, or burns.

¹ Adjusted for sex and age. Significance based on Wald tests. * $p < 0.05$; ** $p < 0.01$

Table 49. Relationship between low sleep and risk of injury among child workers

	Unadjusted	Adjusted ¹
	RR (95% CI)	RR (95% CI)
Afghanistan (N=399)		
Low sleep		
No	1.00 [Ref]	1.00 [Ref]
Yes	0.85 (0.68-1.06)	0.82 (0.65-1.06)
Bangladesh (N=70)		
Low sleep		
No	1.00 [Ref]	1.00 [Ref]
Yes	0.93 (0.60-1.44)	0.83 (0.54-1.28)
Pakistan (N=150)		
Low sleep		
No	1.00 [Ref]	1.00 [Ref]
Yes	0.87 (0.73-1.02)	0.85 (0.72-1.01)

Notes: Data on minor cuts and bruises in the last month are not available for Nepal.

¹ Adjusted for sex and age * $p < 0.05$; ** $p < 0.01$

Table 50. General disabilities

Country	Feeling bad		Feeling weak		Body tension		Dizziness		Lack of energy	
	Brick	Controls	Brick	Controls	Brick	Controls	Brick	Controls	Brick	Controls
Afghanistan										
11-14 yrs	36 (15%)	36 (10%)	58 (24%)	88 (24%)	214 (88%)	287 (79%)	207 (85%)	239 (66%)	150 (62%)	250 (69%)
15-17 yrs	25 (16%)	30 (16%)	31 (20%)	67 (36%)	151 (97%)	160 (85%)	141 (90%)	143 (76%)	99 (63%)	144 (77%)
Total	61 (15%)	66 (12%)	89 (22%)	155 (28%)	365 (95%)	447 (81%)	348 (87%)	382 (69%)	249 (62%)	394 (71%)
Bangladesh										
11-14 yrs	4 (15%)	0 (0%)	10 (38%)	7 (47%)	16 (62%)	6 (40%)	18 (69%)	8 (53%)	20 (77%)	14 (93%)
15-17 yrs	10 (23%)	0 (0%)	29 (66%)	9 (36%)	35 (80%)	16 (64%)	31 (70%)	15 (60%)	40 (91%)	21 (84%)
Total	14 (20%)	0 (0%)	39 (56%)	16 (40%)	51 (73%)	22 (55%)	49 (70%)	23 (58%)	60 (86%)	35 (88%)
Nepal										
11-14 yrs	6 (5)	0 (0%)	23 (19%)	12 (17%)	70 (56%)	39 (55%)	77 (61%)	33 (46%)	115 (91%)	65 (92%)
15-17 yrs	4 (6%)	0 (0%)	22 (32%)	6 (17%)	47 (65%)	20 (56%)	43 (60%)	26 (72%)	69 (96%)	34 (94%)
Total	10 (5%)	0 (0%)	45 (24%)	18 (17%)	117 (59%)	59 (55%)	120 (61%)	59 (55%)	184 (93%)	99 (93%)
Pak: Punjab										
11-14 yrs	0	0	35 (56%)	13 (36%)	52 (83%)	29 (81%)	49 (78%)	25 (69%)	53 (84%)	33(94%)
15-17 yrs	3 (3%)	1 (2%)	47 (54%)	18 (34%)	69 (79%)	46 (87%)	44 (51%)	30 (51%)	64(74%)	51(96%)

Country	Feeling bad		Feeling weak		Body tension		Dizziness		Lack of energy	
	Brick	Controls	Brick	Controls	Brick	Controls	Brick	Controls	Brick	Controls
Pak:Sindh/KPK										
11-14 yrs	6 (18%)	NS	20 (59%)	NS	29 (85%)	NS	30 (88%)	NS	25(71%)	NS
15-17 yrs	19 (29%)	NS	38 (58%)	NS	52 (80%)	NS	60 (92%)	NS	49(75%)	NS
Total	40 (11%)	1 (1%)	208 (56%)	31 (35%)	298 (80%)	75 (84%)	285 (76%)	55 (62%)	281(75%)	84(94%)

Table 51. Fatigue and hunger

	Fatigue in last month		Insomnia		Hungry	
	Brick children	Comparison group	Brick children	Comparison group	Brick children	Comparison group
Afghanistan						
11-14 yrs	239 (98%)	296 (81%)	71 (29%)	114 (32%)	187 (77%)	259 (72%)
15-17 yrs	150 (96%)	168 (89%)	82 (53%)	93 (50%)	127 (82%)	147 (78%)
Total	389 (97%)	464 (84%)	153 (38%)	207 (38%)	314 (79%)	406 (74%)
Bangladesh						
11-14 yrs	21 (81%)	11 (73%)	5 (19%)	4 (27%)	11 (42%)	10 (67%)
15-17 yrs	34 (77%)	11 (44%)	21 (48%)	7 (28%)	31 (70%)	14 (56%)
Total	55 (79%)	22 (55%)	26 (37%)	11 (28%)	42 (60%)	24 (60%)
Nepal						
11-14 yrs	15 (13%)	6 (8%)	NS	NS	NS	NS
15-17 yrs	12 (18%)	3 (8%)	NS	NS	NS	NS
Total	27 (14%)	9 (8%)	NS	NS	NS	NS
Pak: Punjab						
11-14 yrs	58 (92%)	5 (14%)	61 (97%)	36 (100%)	50 (79%)	17 (47%)
15-17 yrs	85 (98%)	14 (26%)	70 (80%)	53 (100%)	26 (30%)	21 (40%)
Pak:Sindh/KPK						
11-14 yrs	34 (100%)	NS	34 (100%)	NS	27 (79%)	NS
15-17 yrs	65 (100%)	NS	59 (91%)	NS	57 (88%)	NS
Total	363 (97%)	19 (21%)	338 (91%)	89(100%)	161 (43%)	38 (43%)

Table 52. Musculo-skeletal health impacts (all countries)

Country	Any pain in last month			Any pain in last year			Back/neck pain			Pain in arms, hands		
	Brick	Cont	Sig	Brick	Cont	Sig	Brick	Contr	Sig	Brick	Contr	Sig
Afghanistan												
11-14 years	231 (95%)	274 (76%)	<0.01	223 (92%)	235 (65%)	<0.01	165 (68%)	148 (41%)	<0.01	147 (60%)	83 (23%)	<0.01
15-17 years	147 (95%)	151 (82%)	<0.01	145 (93%)	144 (77%)	<0.01	123 (79%)	106 (56%)	<0.01	83 (53%)	46 (24%)	<0.01
Total	378 (95%)	425 (78%)	<0.01	368 (92%)	379 (69%)	<0.01	288 (72%)	254 (46%)	<0.01	230 (58%)	129 23%)	<0.01
Bangladesh												
11-14 years	19 (73%)	5 (33%)	0.02	21 (81%)	4 (27%)	<0.01	11 (42%)	2 (13%)	0.08	5 (19%)	1 (7%)	0.39
15-17 years	42 (95%)	16 (64%)	<0.01	27 (61%)	10 (40%)	0.09	23 (52%)	4 (16%)	<0.01	11 (25%)	2 (8%)	0.11
Total	61 (87%)	21 (53%)	<0.01	48 (69%)	14 (35%)	<0.01	34 (49%)	6 (15%)	<0.01	16 (23%)	3 (8%)	0.06

Country	Any pain in last month			Any pain in last year			Back/neck pain			Pain in arms, hands		
	Brick	Cont	Sig	Brick	Cont	Sig	Brick	Contr	Sig	Brick	Contr	Sig
Nepal												
11-14 years	NS	NS		66 (52%)	13 (18%)	<0.01	94 (89%)	45 (65%)	<0.01	44 (35%)	4 (6%)	<0.01
15-17 years	NS	NS		47 (65%)	4 (11%)	<0.01	55 (83%)	19 (59%)	0.01	31 (43%)	1 (3%)	<0.01
Total	NS	NS		113 (57%)	17 (16%)	<0.01	149 (87%)	64 (63%)	<0.01	75 (38%)	5 (5%)	<0.01
Pak: Punjab												
11-14 years	43 (68%)	6 (17%)	<0.01	30 (48%)	2 (6%)	<0.01	29 (46%)	2 (6%)	<0.01	18 (29%)	2 (6%)	<0.01
15-17 years	49 (56%)	10 (19%)	<0.01	51 (59%)	3 (6%)	<0.01	49 (56%)	2 (4%)	<0.01	32 (37%)	1 (2%)	<0.01
Pak:Sindh/KPK												
11-14 years	32 (94%)	NS	NA	16 (47%)	NS	NA	15 (44%)	NS	NA	14 (41%)	NS	NA
15-17 years	65 (100%)	NS	NA	41 (63%)	NS	NA	38 (58%)	NS	NA	33 (51%)	NS	NA
Total	189 (76%)	16 (18%)	<0.01	138 (55%)	5 (17%)	<0.01	131 (53%)	4 (4%)	<0.01	97 (39%)	3 (3%)	<0.01

Table 53. Respiratory disability

Country	Respiratory			Poor lung function			Breathing problems		
	Brick	Controls	Sig	Brick	Controls	Sig	Brick	Controls	Sig
Afghanistan									
11-14 yrs	96 (40%)	124 (34%)	0.17	NS	NS	NA	87 (36%)	105 (29%)	0.07
15-17 yrs	57 (37%)	65 (35%)	0.70	NS	NS	NA	50 (32%)	57 (30%)	0.73
Total	153 (38%)	189 (34%)	0.19	NS	NS	NA	137 (34%)	162 (29%)	0.10
Bangladesh									
11-14 yrs	13 (50%)	7 (47%)	0.84	NS	NS	NA	9 (35%)	4 (27%)	0.73
15-17 yrs	19 (43%)	9 (36%)	0.56	NS	NS	NA	15 (34%)	5 (20%)	0.28
Total	32 (46%)	16 (40%)	0.56	NS	NS	NA	24 (34%)	9 (23%)	0.19
Nepal									
11-14 yrs	15 (13%)	5 (7%)	0.33	47 (39%)	4 (6%)	<0.01	88 (89%)	36 (53%)	<0.01
15-17 yrs	11 (16%)	2 (6%)	0.21	20 (29%)	3 (9%)	0.02	51 (86%)	16 (52%)	<0.01
Total	26 (14%)	7 (6%)	0.06	67 (35%)	7 (7%)	<0.01	139 (88%)	52 (53%)	<0.01
Pak: Punjab									
11-14 yrs	13 (21%)	3 (9%)	<0.01	22 (35%)	11 (31%)	0.65	52 (83%)	16 (44%)	<0.01
15-17 yrs	18 (21%)	6 (11%)	<0.01	31 (36%)	8 (15%)	0.09	63 (72%)	27 (51%)	<0.01
18-24 yrs	20 (26%)	NS	NA	19 (25%)	NS	NA	61 (80%)	NS	NA
Pak:Sindh/KPK									
11-14 yrs	14 (40%)	NS	NA	3 (9%)	NS	NA	23 (68%)	NS	NA
15-17 yrs	37 (57%)	NS	NA	9 (14%)	NS	NA	63 (97%)	NS	NA
18-24 yrs	23 (48%)	NS	NA	10 (21%)	NS	NA	45 (94%)	NS	NA
Total	125 (36%)	9 (10%)	<0.01	94 (25%)	19 (21%)	0.41	307 (82%)	43 (48%)	<0.01

Table 54. Stunting

Country	Underweight		Anemia	
	Brick children	Comparison	Brick children	Comparison
Afghanistan				
11-14 yrs	NS	NS	NS	NS
15-17 yrs	NS	NS	NS	NS
Total	NS	NS	NS	NS
Bangladesh				
11-14 yrs	NS	NS	22 (88%)	11 (80%)
15-17 yrs	NS	NS	33 (85%)	15 (65%)
Total	NS	NS	55 (86%)	26 (70%)
Nepal				
11-14 yrs	NS	NS	20 (16%)	10 (14%)
15-17 yrs	NS	NS	7 (10%)	4 (11%)
Total	NS	NS	27 (14%)	14 (13%)
Pakistan: Punjab				
11-14 yrs	24 (38%)	16 (44%)	27 (43%)	7 (19%)
15-17 yrs	27 (31%)	24 (45%)	35 (40%)	9 (17%)
18-24 yrs	28 (37%)	NS	46 (61%)	NS
Pakistan: Sindh/KPK				
11-14 yrs	10 (29%)	NS	11 (32%)	NS
15-17 yrs	10 (15%)	NS	6 (9%)	NS
18-24 yrs	14 (29%)	NS	30 (63%)	NS
Total	113 (30%)	40 (45%)	155 (42%)	16 (18%)

Psychosocial data tables

This section compares the four countries in terms of composite indicators of psychological well-being. The first seven domains or categories for analysis are based on the general typology developed by Martin Woodhead:¹⁴⁷ a) cognitive ability and skills, b) social integration and support, c) personal identity and value, d) personal agency, e) emotional health, f) somatic health, and g) violence. Some of these are protective factors, such as skill development, and support from friends and co-workers; others are destabilizing factors, such as lack of stimulation and abuse. The eighth domain—work-related stress—was drawn primarily from the work of Leka and Jain.¹⁴⁸ The questionnaire was divided into two parts: the first part was administered to the brick kiln children only as it pertained to their perceptions of the work and work environment; the second was administered to both the brick kiln children and the control groups. The following list identifies the questions in the instrument which pertain to these domains.

¹⁴⁷ Woodhouse, M. (2004). "Psychosocial impacts of child work: a framework for research, monitoring and intervention", Understanding Children's Work Programme.

¹⁴⁸ Leka, S. and Jain, A. (2010). "Assessing Psychological Concomitants of Child Labour", ILO, Geneva.

Domain and variable	Indicators
1. Cognitive ability & skills:	Level of schooling achieved
• Practical skills	Do you feel like you have the skills needed to do your job well?
• Culturally valued characteristics	Do you think others appreciate the work you do?
	Do you feel bored because there is not enough to do?
	Do people at work teach you what to do and how to do it?
2. Social integration/support:	Do you feel supported and loved by your family?
• Family relationships	Is there conflict in your family?
• Peers	Do you feel accepted by other families around here?
• Community	Do you have one or more good friends that support you?
	Do people reject or tease you or call you names?
	Does the environment in which you are working bother you?
	Do you play games and sports with friends?
	Do you feel very different from other children your age?
	Are you comfortable with the people you work with?
	At work do people watch over you to make sure you don't get hurt?
3. Personal identity/value:	Do you generally feel pretty confident?
• Self-esteem	Do you think your life is worse than that of other children?
• Pride	Do you get scolded, criticized or made to feel small or stupid?
• negative social comparisons	
• shame	
• failure/worthlessness	
4. Personal agency:	Do you have free time each day to do just what you want?
• Responsibility	Do you think your life will get better some day?
• Positive outlook	Do you think life isn't worth living?
• Motivation	Do you feel your family relies on you and needs your help?
• Helplessness and hopelessness	Do you feel your work prevents you from doing things you would like to do?
• Confusion	Do you feel if you wanted to, you could choose what to do and what not to do?
• Apathy, fatalism	
5. Emotional health:	Do you have any difficulty sleeping?
• Sense of well-being	Do you have trouble concentrating?
• Stress, trauma	Do you feel restless and cannot stay still very long?
• Fear, anxiety	Do you feel sad and like crying?
• Distress, despair	Do you get into fights or quarrels easily?
• Anger, fighting	Do you feel lonely?
• Disturbed sleep/eating	Do you have lots of energy?

• Substance abuse	Do you get very angry and lose your temper often?
	Do you have little appetite or interest in food?
	Do you find that you forget things?
	Do you feel afraid or nervous?
	Do you worry and think a lot?
	Do you think back about all the bad things that have happened to you?
	Have you ever felt anxiety or fear during the last month?
	Do you know of any young people here who use drugs or alcohol?
6. Somatic health:	
• General physical well-being	Since this time last year have you felt weak or bad all over?
• Discomfort	Do you feel dizzy sometimes?
7. Violence:	
• Verbal	Do you get beaten at home or at work?
• Physical	Has anyone ever tried to touch you in a bad way?
• Intimidation	Have you ever been severely punished for mistakes made at work?
• Insecurity	In your day-to-day life do you feel safe?
8. Work-related stress:	
• intensity/pace of work	Do you feel under pressure to work faster and harder?
• duration of work	Does your family, employer or others ask too much of you?
• time pressure	Do you get bored at work doing the same thing many hours in a row?
• repetitive/boring/monotonous	Do you feel tired because of the long hours and heavy workload?
• Workload	
• isolation/constraint	
• noise/vibrations	
• protected/trained/supervised	

The following tables describe the results vis-à-vis these eight domains, i.e. prior to the more detailed analyses. Table 15 reports on the indicators which are relevant to both working and non-working children.¹⁴⁹ Table 16 selects those indicators which are relevant to only working children i.e. which pertain to the work, the workplace, or the conditions or manner in which the work is carried out.

¹⁴⁹ The first domain, cognitive functioning, was not tabulated for all children due to the difficulty in measuring it accurately.

Note: The interviewers observed that many of the underage workers, especially those who were illiterate, were not aware of or sensitized to the issues that the psychosocial questions inquired about. The interviewers found it necessary to spend a considerable amount of time explaining them.

Table 55. General psychological functioning

Country	Social integration		Personal identity		Personal agency		Emotional health		Somatic health		Violence	
	Brick	Con	Brick	Contr	Brick	Contr	Brick	Contr	Brick	Contr	Brick	Contr
Afghanistan												
11-14 yrs	2.5 (0.3)	2.9 (0.4)	2.6 (0.5)	3.0 (0.6)	2.2 (0.4)	2.6 (0.5)	2.9 (0.5)	3.2 (0.4)	2.6 (0.8)	3.1 (0.6)	3.0 (0.5)	3.4 (0.5)
15-17 yrs	2.6 (0.3)	2.9 (0.5)	2.6 (0.5)	3.0 (0.6)	2.2 (0.5)	2.7 (0.5)	2.9 (0.4)	2.9 (0.5)	2.4 (0.7)	2.7 (0.8)	3.1 (0.6)	3.4 (0.5)
Total	2.5 (0.3)	2.9 (0.4)	2.6 (0.5)	3.0 (0.6)	2.2 (0.4)	2.6 (0.5)	2.9 (0.4)	3.1 (0.5)	2.5 (0.7)	2.9 (0.7)	3.1 (0.6)	3.4 (0.5)
Bangladesh												
11-14 yrs	3.0 (0.4)	3.4 (0.5)	2.5 (0.5)	3.4 (0.6)	2.8 (0.5)	3.1 (0.6)	2.9 (0.5)	3.3 (0.5)	2.9 (0.9)	3.3 (0.6)	3.2 (0.4)	3.3 (0.4)
15-17 yrs	3.0 (0.4)	3.4 (0.4)	2.7 (0.5)	3.2 (0.5)	2.7 (0.6)	3.1 (0.7)	2.9 (0.5)	3.1 (0.4)	2.7 (0.8)	3.0 (0.6)	3.2 (0.5)	3.4 (0.5)
Total	3.0 (0.4)	3.4 (0.4)	2.6 (0.5)	3.3 (0.5)	2.7 (0.6)	3.1 (0.6)	2.9 (0.5)	3.2 (0.4)	2.8 (0.9)	3.2 (0.7)	3.2 (0.5)	3.3 (0.4)
Nepal												
11-14 yrs	2.7 (0.4)	3.2 (0.5)	2.9 (0.5)	3.2 (0.5)	NS	NS	3.2 (0.4)	3.3 (0.3)	3.1 (0.8)	3.4 (0.6)	3.1 (0.5)	3.5 (0.3)
15-17 yrs	2.8 (0.4)	3.1 (0.4)	3.1 (0.5)	3.2 (0.4)	NS	NS	3.1 (0.4)	3.3 (0.3)	3.3 (0.6)	3.2 (0.6)	3.3 (0.5)	3.6 (0.4)
Total	2.8 (0.4)	3.1 (0.4)	2.9 (0.5)	3.2 (0.5)	NS	NS	3.2 (0.4)	3.3 (0.3)	3.1 (0.8)	3.3 (0.6)	3.1 (0.5)	3.5 (0.3)
Pak: Punjab												
11-14 yrs	2.5 (0.4)	3.2 (0.4)	2.9 (0.5)	3.5 (0.6)	2.4 (0.7)	3.0 (0.7)	2.6 (0.4)	2.8 (0.4)	2.4 (0.5)	2.5 (0.4)	3.0 (0.5)	3.7 (0.3)
15-17 yrs	2.6 (0.4)	NS	3.0 (0.5)	NS	2.1 (0.5)	NS	3.0 (0.3)	NS	2.3 (0.5)	NS	3.2 (0.5)	NS
Pak:Sindh/KPK												
11-14 yrs	2.7 (0.4)	NS	3.0 (0.3)	NS	1.9 (0.5)	NS	2.9 (0.3)	NS	2.0 (0.5)	NS	3.3 (0.4)	NS
15-17 yrs	2.6 (0.4)	NS	3.2 (0.3)	NS	2.1 (0.6)	NS	3.1 (0.3)	NS	2.0 (0.5)	NS	3.5 (0.4)	NS
Total	2.6 (0.3)	3.1 (0.4)	2.8 (0.5)	3.3 (0.6)	1.9 (0.5)	2.7 (0.7)	3.0 (0.3)	2.9 (0.3)	2.3 (0.5)	2.5 (0.5)	3.1 (0.5)	3.5 (0.4)

Unless otherwise indicated, these tables report mean composite scores and standard deviations, ranging 1-4 with 1 as worse; 4 as better. Highlighted cells indicate significant differences between cases and controls within each age group or within the “total” category.

Table 56. General psychological functioning (work-relevant variables)

These are calculated as mean composite scores, ranging 1-4; 1 is worse; 4 is better.

Country	Cognitive/skills*	Social integration*‡	Personal identity*	Personal agency*	Work-related Stress
Afghanistan					
11-14 yrs	2.5 (0.4)	2.5 (0.3)	2.5 (0.5)	2.1 (0.4)	2.3 (0.7)
15-17 yrs	2.5 (0.5)	2.6 (0.3)	2.5 (0.4)	2.1 (0.4)	2.2 (0.7)
Total	2.5 (0.4)	2.5 (0.3)	2.5 (0.5)	2.1 (0.4)	2.2 (0.7)

Country	Cognitive/skills*	Social integration*‡	Personal identity*	Personal agency*	Work-related Stress
Bangladesh					
11-14 yrs	2.3 (0.5)	3.2 (0.4)	2.4 (0.5)	2.5 (0.4)	2.6 (0.6)
15-17 yrs	2.2 (0.4)	3.2 (0.4)	2.5 (0.4)	2.5 (0.4)	2.6 (0.7)
Total	2.3 (0.5)	3.2 (0.4)	2.5 (0.4)	2.5 (0.4)	2.6 (0.7)
Nepal					
11-14 yrs	2.4 (0.5)	2.9 (0.3)	2.8 (0.5)	NS	2.8 (0.7)
15-17 yrs	2.3 (0.4)	3.0 (0.4)	2.9 (0.4)	NS	2.7 (0.6)
Total	2.3 (0.5)	3.0 (0.4)	2.9 (0.5)	NS	2.7 (0.7)
Pakistan: Punjab					
11-14 yrs	1.7 (0.4)	2.5 (0.4)	2.6 (0.5)	2.7 (0.4)	2.7 (0.5)
15-17 yrs	1.8 (0.5)	2.1 (0.5)	2.4 (0.5)	2.5 (0.5)	2.6 (0.6)
Pakistan: Sindh & KPK					
11-14 yrs	1.4 (0.4)	2.3 (0.5)	2.5 (0.3)	2.4 (0.3)	2.5 (0.5)
15-17 yrs	1.4 (0.3)	2.2 (0.5)	2.5 (0.3)	2.5 (0.3)	2.4 (0.5)
Total					

* These variables differ from those in the preceding table in that their composite score includes variables that are relevant only to working children (i.e. which pertain to the work, the workplace, or the conditions or manner in which the work is carried out). No significance testing was conducted in this table because questions PS1-16 (which are used to generate these work-related composite scores) were not administered to controls (except in Afghanistan, where they were administered but not supposed to be.).

‡ Afghanistan did not report PS13, so it is not included in the social integration measure in table 9B.

The following tables present the data in more detail, but categorizing it differently.

Table 57. Psychosocial characteristics of child brick workers (all countries)

	Never or Sometimes		Often		Always	
	N	%	N	%	N	%
Self-Esteem						
Feels proud of work	603	75%	111	14%	85	11%
Feels adequately skilled at work	558	69%	156	19%	89	11%
Feels appreciated at work	557	69%	174	22%	73	9%
Feels looked down upon because of job	607	75%	128	16%	72	9%
Feels that family relies on child's work	318	39%	250	31%	238	30%
Stress						
Feels pressured to work faster and harder	442	55%	223	28%	142	18%
Feels bored because of lack of work	567	70%	162	20%	78	10%
Feels that family, employer, or others ask too much	399	50%	227	28%	178	22%
Feels bored because of repetitive work	391	49%	275	34%	139	17%
Feels tired due to long working hours or heavy work load	373	46%	261	32%	170	21%
Personal agency						
Feels unable to engage in desired activities due to work	498	62%	167	21%	137	17%
Feels autonomy in choosing work	618	77%	145	18%	44	5%

	Never or Sometimes		Often		Always	
	N	%	N	%	N	%
Relationships						
Bothered by work environment	273	67%	110	27%	23	6%
Comfortable with coworkers	415	52%	242	30%	145	18%
Supervision and training						
Feels watched over for safety at work	544	67%	137	17%	126	16%
Receives training at work	493	63%	170	22%	124	16%
All measures are self-reported.						

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