

# Child labour in footwear industry: Possible occupational health hazards

## Abstract

The constitution of India, as a part of the fundamental rights, has laid down that the State shall direct its policy towards protection of childhood and youth against exploitation and shall not be employed to work in any factory or mine or engaged in any hazardous employment. India has the largest number of urban and rural child workers in the world. The Government of India acknowledges at least 17.5 million working children.<sup>2</sup> Footwear industry is also one of the major export oriented industry employing a large number of children. The Footwear Industry is a significant segment of the Leather Industry in India. India ranks second among the footwear producing countries next to China. The industry is labour intensive and is concentrated in the small and cottage industry sectors. While leather shoes and uppers are concentrated in large-scale units, the sandals and Chappals are produced in the household and cottage sector. The major production centers India are Chennai, Ranipet, Ambur in Tamil Nadu, Mumbai in Maharashtra, Kanpur and Agra in Uttar Pradesh, Jalandhar in Punjab and Delhi. The processes in the footwear making include last making, pattern cutting, clicking, Sewing, Assembling and Finishing. Children between 10 and 15 years old are mainly employed in assembling shoes. Some 80 percent of the children work for contractors at home. Children work on soling (fixing upper portions of shoes to leather or rubber soles) with glue. Children in cramped poorly lit rooms suffer from continuous skin contact with industrial adhesives and breathing vapors from glues. The children working in the footwear industry are exposed to physical factors like poor illumination, noise and poor ventilation, and chemicals like leather dust, benzene that is used as a solvent in glues and *p*-tert butyl phenols, which is used in neoprene adhesives. Thus most children suffer from respiratory problems, lung diseases and skin infections through constant exposure to glue and fumes. They are also exposed to risk of nasal cancer, neurotoxicity and adverse physical factors. It is recommended to stop child labour and let the child be bread eater rather than bread earner.

**Key Words:** Child labor, Footwear industry, Occupational Cancer, Neurotoxicity

## INTRODUCTION

The Constitution of India, as a part of the fundamental rights, has laid down that the State shall direct its policy towards protection of childhood and youth against exploitation and shall not be employed to work in any factory or mine or engaged in any hazardous employment.

India has the largest number of urban and rural child workers in the world.<sup>1</sup> The Government of India acknowledges at least 17.5 million working children.<sup>2</sup> The Operations Research Group-Baroda, a social research organization in India, conducted a national survey published in 1983 of 40,000 households and concluded that approximately 44 million children work in India<sup>3</sup> while The Center for Concern for Working Children, a non-governmental organization in Bangalore, approximated the number of children who are not attending school, and put the figure of working children at 100 million.<sup>4</sup> However, the exact number of child workers in India's export industry is not known. Major export industries which utilize child labor include hand-knotted carpets, gemstone polishing, brass and base metal articles, glass and glassware, textiles and silk, and fireworks. Footwear industry is also one of the major export oriented industry employing a large number of children.

## FOOTWEAR INDUSTRY IN INDIA

The Footwear Industry is a significant

**Rajnarayan R. Tiwari**

Occupational Medicine Division, National Institute of Occupational Health, Ahmedabad, India

### For correspondence:

Dr. Rajnarayan R Tiwari, Senior Research Officer, Occupational Medicine Division, National Institute of Occupational Health, Meghani Nagar, Ahmedabad - 380016, India.

E-mail:

rajtiwari2810@yahoo.co.in



segment of the Leather Industry in India. India ranks second among the footwear producing countries next to China. The industry is labour intensive and is concentrated in the small and cottage industry sectors. While leather shoes and uppers are concentrated in large-scale units, the sandals and *chappals* are produced in the household and cottage sector. India produces more of gents' footwear while the world's major production is in ladies footwear. In the case of *chappals* and sandals, use of non-leather material is prevalent in the domestic market.

The major production centers India are Chennai, Ranipet, Ambur in Tamil Nadu, Mumbai in Maharashtra, Kanpur and Agra in Uttar Pradesh, Jalandhar in Punjab and Delhi. Table 1 shows the concentration of footwear units in different parts of country.

## PROCESSES IN FOOTWEAR INDUSTRY

The processes in the footwear making include *Last* making, pattern cutting, clicking, Sewing, Assembling and Finishing. In the process of Last making, the lasts are made either of wood or plastics according to the shape and comfort of the footwear required. Once the desired Last is ready, the desired pattern is selected and then the leather is cut with special scissors and this cutting process is also known as "clicking". Similarly, the sole for footwear is also cut. Then the upper part of the footwear is assembled to the sole by using adhesives or glues. Finally, the finishing touch is given by polishing and the footwear is ready for marketing. Each of these processes is associated with certain type of hazard (Figure 1), and workers especially child-workers are more prone for hazards.

## CHILDREN IN FOOTWEAR INDUSTRY

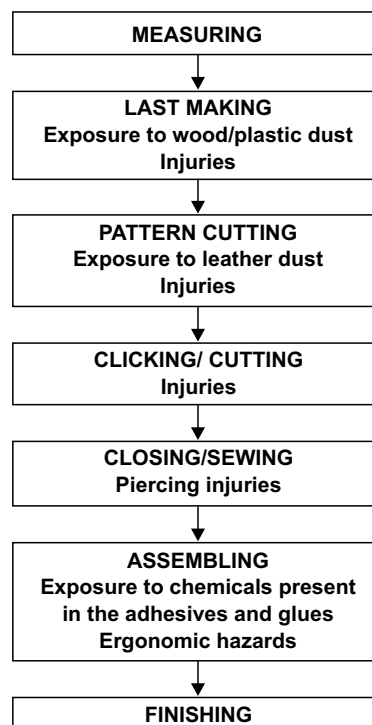
Children are employed in the manufacture of shoes, particularly in the Agra. It is estimated that as many as 25,000 children may be involved in shoe making, both for the domestic and international markets.<sup>[5]</sup>

Children between 10 and 15 years old are mainly employed in assembling shoes.<sup>[6]</sup> Some 80 percent of the children work for contractors at home. Children work on soling (fixing upper portions of shoes to leather or rubber soles with glue). Children in cramped poorly lit rooms suffer from continuous skin contact with industrial adhesives and breathe vapours from glues.

These child workers are exposed to physical factors like poor illumination, noise and poor ventilation, and chemicals like leather dust, benzene (used as a solvent in glues) and *p*-tert butyl phenols (used in neoprene adhesives). Thus, most children suffer from respiratory problems, lung diseases and skin

**Table 1: Concentrations of footwear units in different parts of country**

Region	Large and Medium scale	SSI	Household
Tamil Nadu	64	31	7
Delhi and Up North	4	8	2
Agra, Kanpur	9	34	14
Kolkata	1	3	19
Mumbai	3	11	-
Others (includes Chhatisgarh, Rajasthan)	13	10	3



**Figure 1: Flow diagram of processes in footwear industry with associated hazards**

infections through constant exposure to glue and fumes.

## OCCUPATIONAL HEALTH HAZARDS IN FOOTWEAR INDUSTRY

### Occupational cancers

Worldwide epidemiological studies provide evidence that the employment in the shoe production and repair plants is associated with an enhanced risk for cancer (primarily nose and nasal sinuses).<sup>[7,8]</sup> According to the majority of studies, it is induced by exposure to leather dust, which contains numerous chemicals acquired during the process of leather tanning and finishing (chromium salts, vegetable dye extracts, mineral oils). Some of these compounds exert carcinogenic effect.<sup>[9]</sup> In a study, the exposure-related excess mortality in footwear industry was found to be due to malignant neoplasms of larynx and lung in men, and malignant neoplasms of gallbladder and lung in women. For these neoplasms, the values of observed risk among those exposed

were significantly higher than among the non-exposed.<sup>[40]</sup> In a study among Chinese footwear workers it was reported that these workers were exposed to high levels of benzene, toluene, and other toxic solvents contained in the adhesives used in the shoe-making process and many workers have been afflicted with aplastic anemia, leukemia, and other health problems.<sup>[41]</sup>

### Neurotoxicity

The organic solvents present in the adhesives and glues are mostly neurotoxic, causing shoemaker's paralysis<sup>[42]</sup> that manifests as a more or less severe form of paralysis. The shoemaker's paralysis is of the flaccid type; it is localized in the limbs (pelvic or thoracic) and gives rise to osteotendinous atrophy with areflexia and no alteration in superficial or deep sensitivity. Clinically, it is a syndrome resulting from functional inhibition or injury of the lower motor neurons of the voluntary motor system. The common outcome is the neurological regression with extensive proximo-distal functional recurrences. An Italian study reported that Italian shoe workers exposed to n-hexane, with methyl ethyl ketone and cyclo-hexane, had decreased motor nerve conduction velocities in upper and lower limbs and an increased prevalence of symptoms of early narcosis, as compared to controls.<sup>[43]</sup>

### Injuries

The children employed in the footwear industry usually carry out the sewing process manually. During this they are susceptible to injuries from sharp special needles. Though these injuries may be trivial, there is always a risk of wound contamination because of poor knowledge of wound care and neglect of trivial injuries. Similar studies in other sectors employing child labour have also revealed poor wound care among children.<sup>[44-45]</sup>

### Exposure to adverse physical factors

About 80% of the child labourers work on contract basis and carry raw material to their homes, where they work. Working in houses with poor illumination and ventilation results in symptoms like eye-strain, headache and communicable diseases.

### Skin ailments

Footwear workers may develop dermatitis due to exposure to chemicals present in the additives used in processing of leather and rubber footwear.<sup>[46]</sup> Occupational vitiligo can result from contact with the glue, which contains *p*-tert butyl phenols.<sup>[42]</sup>

### Miscellaneous

One study has reported higher prevalence (16.6%) of carpal tunnel syndrome among footwear workers, as compared to

the general population.<sup>[47]</sup> It was observed that the rapid trigger movements of the fingers were predictive of Carpal Tunnel syndrome. Psychological distress due to high level of physical exposure and psychological demand was also observed.

## CONCLUSION

Footwear workers are exposed to a plethora of occupational hazards and child workers among them; if exposed to such hazards, will develop cancers and neurologically disabling conditions, affecting quality of life. Thus it is recommended that child labour be stopped and allow the child be a bread eater rather than a bread earner.

## REFERENCES

1. Fyfe A. Child Labor Policy and the Role of Education in India. Geneva: International Labor Organization [unpublished manuscript]; 1994.
2. Child Labor in India (1993). Trading Away the Future: Child labor in India's Export Industries. International Labor Rights Education and Research Fund, 1994.
3. Khatu K, Tamang AK, Rao CR. Working Children in India. Baroda: Operations Research Group; 1993.
4. International Child Labor Hearing. U.S. Department of Labor, April 12, 1994. (Statement of South Asian Coalition on Child Servitude (SACCS), India.
5. Piers Import database. J Commerce 1994.
6. American Embassy, New Delhi: Unclassified Telegram No. 7883, April 22, 1992.
7. Cecchi F, Buiatti E, Kriebel D, Nastasi L, Santucci M: Adenocarcinoma of the nose and paranasal sinuses in shoemakers and wood workers in the province of Florence, Italy (1963-77). *Brit J Ind Med* 1980;37:222-5.
8. Olsen JH. Occupational risks of sinonasal cancer in Denmark. *Brit J Ind Med* 1988;45:329-35.
9. Szadkowska-Stanczyk I, Wozniak H, Stroszejn-Mrowca G. Health effects of occupational exposure among shoe workers: A review. *Med Pr* 2003;54:67-71.
10. Szymczak W, Sobala W, Wilczynska U, Szeszenia-Dabrowska N. Assessment of risk of death due to malignant neoplasms induced by occupational exposure in a rubber footwear plant. *Med Pr* 2003;54:221-8.
11. Chen MS, Chan A. China's "market economics in command": Footwear workers' health in jeopardy. *Int J Health Serv* 1999;29:793-811.
12. International Labour Organization: Encyclopaedia of Occupational Health and Safety. Volume I. 2<sup>nd</sup> Ed. Geneva: ILO; 1983. p. 906-8.
13. Dyro FM. Methyl ethyl ketone polyneuropathy in shoe factory workers. *Clin Toxicol* 1978;13:371-6.
14. Tiwari RR, Rajmohan HR, Dave SK, Saiyed HN. Care of burns: A knowledge, attitude and practice study among match industry workers. *Ind J Med Sci* 2001;55:600-3.
15. Tiwari RR, Saha A, Parikh JR, Saiyed HN. Injuries and injury care among child labourers of gem polishing industries of Jaipur, India. *Jour Occ Health* (in press).
16. Olumide YM. Contact dermatitis in Nigeria. *Contact Dermatitis* 1985;12:241-6.
17. Roquelaure Y, Mariel J, Dano C, Fanello S, Penneau-Fontbonne D. Prevalence, incidence and risk factors of carpal tunnel syndrome in a large footwear factory. *Int J Occup Med Environ Health* 2001;14:357-67.