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Children at work: special health risks

Report of a
WHO Study Group

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**WHO STUDY GROUP ON SPECIAL RISK FACTORS OF
CHILDREN AT WORK**

Geneva, 10–16 December 1985

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CHILDREN AT WORK: SPECIAL HEALTH RISKS

Report of a WHO Study Group

A WHO Study Group on Special Risk Factors of Children at Work met in Geneva from 10 to 16 December 1985.

Dr Lu Rushan, Assistant Director-General, welcomed the participants and opened the meeting on behalf of the Director-General. Outlining the history of the efforts of the United Nations system to combat child labour and expressing WHO's concern about the health of working children, he said that the main purpose of this Study Group was to make a serious attempt to identify the special health risks to which children at work are subject, by reviewing the information available on the health of working children and any other relevant information. He pointed out that these special risks differentiate the occupational health hazards faced by children from those faced by adults, and thus call for special measures. He requested the Study Group, in its conclusions and recommendations, to take into consideration the international labour standards on child employment established by ILO over the years and the commitment of WHO to the primary health care approach as the means of achieving health for all by the year 2000.

1. INTRODUCTION

1.1 Definition of the problem

In the course of human history, human societies have undergone several changes. These changes are often referred to in such terms as "the agricultural revolution", "the urban revolution", "the industrial revolution", "the technological revolution", etc. The effect of such changes on children is a matter of great concern, in view of their particular vulnerability.

In 1959, the General Assembly of the United Nations issued the Declaration of the Rights of the Child. Stressing that "mankind owes to the child the best it has to give", it affirmed "the rights of the child to enjoy special protection, to be given opportunities and

facilities to enable him to develop in a healthy and normal manner, to enjoy the benefits of social security including adequate nutrition, housing, recreation and medical services; to receive education, and to be protected against all forms of neglect, cruelty and exploitation” (40). On the subject of the employment of children in various occupations, the Declaration stated:

“The child shall not be admitted to employment before an appropriate minimum age; he shall in no case be caused or permitted to engage in any occupation or employment which would prejudice his health or education, or interfere with his physical, mental or moral development.”

This statement highlights the universal concern that exists about the problem of child labour; yet, few countries or communities have reached a stage of development that no longer requires an economic contribution from children. All children have a right to education, backed by a social security system guaranteeing a basic living standard and by labour laws prohibiting employment under a stipulated minimum age. However, there are many countries where the socioeconomic conditions require the employment of children in various types of occupation. The ILO estimated that the overall number of children under 15 years who were “economically active” at the beginning of the 1980s was around 50 million, and commented that this estimate might be on the conservative side as estimates by other agencies went as high as 75 million or even 100 million (19). Virtually all “economically active” children (98%) are found in the developing world (19). However, there is evidence that even in a developed country like the United States of America some 800 000 children are engaged annually in harvesting crops with their families (39).

There is no consensus on what is the upper limit of childhood. In this report, we follow the current international labour standards adopted over the years by the Governing body of the International Labour Organisation, and refer to children as those who are under 15 years of age.

In an ILO publication, “paid child labour” is defined as “the systematic exploitation of children by employers outside the child’s family” (26). This definition contains three elements: (1) children working; (2) employment outside the family; and (3) systematic exploitation of the children employed.

In an industrialized economy, employment concerns two parties: that which offers labour, and that which hires labour. In an open labour market, the two parties are supposed to operate on equal terms by supply and demand. Children are not normally supposed to offer their labour in the market and are not able to negotiate their terms of employment, with trade union backing. Child employment is thus quite different from adult employment. Employed children are therefore in a vulnerable position, in which they can readily be exploited.

Economically, children are exploited because they are invariably paid much less than adults. From the health point of view, children at work may be either overtly or covertly exploited. They are overtly exploited when they are asked or forced to do jobs that are known to be hazardous or unsafe for adults.

On the other hand, children may be asked or forced to do jobs that are generally considered to be safe for adults, but which are not necessarily safe for children because they are still in the period of growth and development. For example, their toxicological reactions cannot be regarded as the same as those of adults, and their working capacity and limitations cannot be taken as proportional to those of adults. Moreover, children may react differently from adults to certain psychosocial factors at work. Neither the children nor the people they are working for may know of the existence of these risks.

1.2 Statistical information on “economically active” children

It is possible to give only a brief summary of statistical information on economically active children here, because of the diversity of such information, and the difficulty of obtaining it.

According to the *ILO Year Book of Labour Statistics*, 1985, the meaning of “economically active” varies from country to country. The sources of the statistical information also vary; they may be: (1) census, total count; (2) census, sample tabulation; (3) labour force sample survey; (4) household survey; or (5) “official” estimate.

Computations of “economically active” rates for children are generally done either for the age group 10–14 years (Table 1) or the age group 0–14 years (Table 2). The rate is computed as follows:

$$\text{Percentage of economically active children} = \frac{\text{Children of the specified age group classified as economically active by the particular definition in use}}{\text{All children of that specified age group}} \times 100$$

Table 1. The percentage of economically active children (10-14 years) in some countries, 1980-1984^a

Country or territory	Year	No. of children	Percentage economically active	Source	Remarks
Argentina	1983	198 034	8.1	official estimate	provisional figures
Bangladesh	1981	6 057 256	52.0	census	1% sample only
Botswana	1981	12 947	10.8	census	sample only (size not specified)
Brazil	1980	1 922 218	14.2	census	figures rounded to nearest 100
Ecuador	1982	64 957 ^b	6.3	household survey	figures rounded to nearest 100
El Salvador	1980	85 727	13.6	official estimate	figures rounded to nearest 100
Ethiopia	1980	1 599 200	42.1	labour force sample survey	2.5% sample only
Greece	1982	9 800	1.3	labour force sample survey	2.5% sample only
Guatemala	1981	78 878	10.4	census	2.5% sample only
Haiti	1982	188 823	24.0	census	2.5% sample only
Honduras	1983	78 755	14.8	official estimate	2.5% sample only
Hungary	1980	3 185	0.5	census	2.5% sample only
Indonesia	1980	1 958 156	11.1	census	2.5% sample only
Korea, Republic of	1983	25 000 ^c	0.5	labour force sample survey	2.5% sample only
Malaysia	1980	125 789	7.7	census	2.5% sample only
Mexico	1980	1 121 816	12.1	labour force sample survey	2.5% sample only
Nepal	1981	972 698	7.7	census	2.5% sample only
Pakistan	1981	2 143 904	57.0	census	2.5% sample only
Panama	1980	9 572	20.4	census	2.5% sample only
Paraguay	1982	45 140	4.2	census	2.5% sample only
Peru	1981	124 231	11.8	census	2.5% sample only
Portugal	1981	85 000	5.7	labour force sample survey	2.5% sample only
Samoa	1981	355	9.3	labour force sample survey	2.5% sample only
Sao Tome & Principe	1981	265	1.5	census	2.5% sample only
Senegal	1983	382 000	2.2	census	2.5% sample only
Seychelles	1981	75 ^a	50.1	official estimation	2.5% sample only
Singapore	1983	2 095	1.0	labour force sample survey	2.5% sample only
Syrian Arab Republic	1983	41 163	2.9	labour force sample survey	2.5% sample only

^aSource: ILO year book of labour statistics, Geneva, International Labour Office, 1980, 1981, 1982, 1983.

^bFigure relates to persons 12-14 years of age.

^cFigure relates to persons 14 years of age only.

Table 2. The percentage of economically active children (0-14 years) in some countries 1980-1984^a

Country or territory	Year	No. of children	Rate	Source	Remarks
Cameroun	1982	215 500	5.7%	official estimate	-
Colombia	1980	92 435	1.0%	household survey	-
Egypt	1980	1 102 300 ^b	6.5%	labour force sample survey	-
India	1981	13 592 366	5.2%	census	sample tabulation, 5% size
Sri Lanka	1981	85 749	1.7%	labour force sample survey	-
Thailand	1980	1 024 200	4.9%	labour force sample survey	excluding some unpaid family workers
Togo	1980	86 413	7.8%	official estimate	-
Turkey	1980	1 346 819 ^c	7.8%	census	sample tabulation, 1% size

^aSource: *ILO year book of labour statistics*, Geneva, International Labour Office, 1980, 1981, 1982.

^bFigure relates to persons 6-14 years of age.

^cFigure relates to persons 12-14 years of age.

Even then, there are variations in some of the countries reporting to ILO. For example, in Botswana, Ecuador, Seychelles, and Turkey, the numerator relates to persons aged 12–14 years, while in the Republic of Korea, it relates only to persons aged 14 years.

In a situation where figures for the number of children under 15 in employment are largely based on estimates, it is understandable that no published national statistics on the occupational diseases and injuries of children at work are available.

2. INTERNATIONAL LABOUR STANDARDS RELATING TO CHILD EMPLOYMENT

2.1 The traditional approach to the control of child labour

Until recently, most experts took it for granted that, if child employment were prohibited by law, child labour would no longer exist. Should child labour exist in spite of the law, they believed, it was either because the labour law was not comprehensive enough or because the machinery for its enforcement was inadequate. Attempts to perfect international labour standards on child employment over the years have not succeeded in most cases, because of the fact that child labour is primarily a socioeconomic problem that mere legislation is incapable of controlling.

There are 27 ILO Conventions (Annex 1) and 14 ILO Recommendations (Annex 2) relevant to the employment of children. Of these, 11 Conventions and 5 Recommendations deal primarily with the issue of minimum age for employment. These Conventions and Recommendations reflect developments over the years since 1919, during which coverage has been extended and standards tightened up. The present position is summed up in the Minimum Age Convention (No. 138) and the Minimum Age Recommendation (No. 146) adopted in 1973.

The minimum age for employment stipulated in the current ILO international labour standards is 15. Between 15 and 18 years of age, a person is considered to be a “young person” and special standards apply to this group. Some standards for “young persons” even apply up to the age of 21.

The international labour standards permit children between the ages of 13 and 15 years to do “light work”. The term “light work” has been defined rather loosely as work that (*a*) is not likely to be

harmful to the children's health or development, and (b) will not prejudice their attendance at school, their participation in vocational orientation and training programmes approved by the competent authority, or their capacity to benefit from the instruction received.

The concept of light work obviously takes the health and education of children into consideration. There has, however, been no serious attempt or genuine effort to implement the relevant standard. In subsequent chapters it will be shown that it is not easy to decide what constitutes "light work" for children.

The international labour standards stipulate three situations in which no absolute minimum age is required to be fixed by national legislation. The first is when the children are involved in public performances. At present, exemption may be granted in individual cases "for such purposes as participation in artistic performances", the hours and the conditions of work to be prescribed in each case.

The second is when children are employed in family undertakings, provided that the work "is not harmful, prejudicial or dangerous".

The third situation is when the children are pupils in schools for vocational and technical education. No absolute minimum age is required here because the work done by the children is in fact part of their education and is under the supervision of the educational authorities. For work in industrial and other undertakings as part of vocational training, ILO Convention No. 138 sets 14 years as the minimum age.

2.2 The influence of international labour standards

As at 1 January 1985, 31 countries had ratified the consolidated Minimum Age Convention (No. 138, 1973) (20). With respect to the other minimum age conventions covering certain sectors of economic activity, it seems that there were more ratifications of the conventions governing the formal sectors, than of those governing the informal sectors. International labour standards are persuasive only, not obligatory. On the other hand, national labour laws are authoritative and infringements of them are punishable by fines or imprisonment.

In 1981, ILO conducted an analysis of 107 reports on the application of Convention No. 138 and Recommendation No. 146 concerning minimum age. It appeared that, although the reports from some countries were very detailed, they gave an imperfect view of the situation. However, all the reporting countries seemed to have

taken at least some steps towards fixing a minimum age for employment and applying it in as many economic sectors as possible (18).

Although legislative and administrative practice with respect to child labour in individual countries is outside the scope of this report, it may be appropriate to give an example of the considerable time that may elapse between the discovery of a health risk to children and the passage of protective legislation. In 1785, scrotal cancer in young English chimney-sweeps was shown by Percival Pott to be occupational in origin; exactly a century later, in 1885, the British Parliament passed a law to regulate the trade of chimney-sweeping, particularly with respect to taking "apprentices" (17). Furthermore, any labour law that is passed to comply with international labour standards will be extremely difficult to enforce if it does not reflect the socioeconomic realities of the community concerned (28).

3. INFORMATION ON THE HEALTH OF CHILDREN AT WORK

3.1 Health studies of children at work

In the report of a study by the Anti-Slavery Society it was noted that very few studies on child labour had been undertaken and the report urged that "the World Health Organization and other medical bodies make a systematic study of the harmful effects of child labour" (6).

In recent years, there have been several reports containing information on the health of children at work (14, 26, 27, 29, 30). In an intensive study on child labour and health now in progress in Greater Bombay, 1600 children in five types of establishment (production units, repair shops, construction sites, hotels and restaurants, and homes) are being followed up.¹

To provide material for the Study Group, WHO requested occupational health experts in a number of developing countries to conduct field studies dealing specifically with the health of children

¹ NAIDU, U.S. & PARASURAMAN, S. *Child labour and health: a study in Greater Bombay*. Geneva, 1984, unpublished WHO document (a copy of this document may be obtained on request to: Maternal and Child Health, World Health Organization, 1211 Geneva 27, Switzerland).

at work. They were given very general guidelines and allowed flexibility in planning their field studies. In some cases, despite a genuine effort, the studies ran into difficulties. Others were carried out successfully, and reports have been received from Malaysia, Nigeria, the Republic of Korea, Sudan, and Turkey.

The Study Group recognized that these studies are open to criticism on methodological grounds. The findings should therefore be interpreted with due caution. However, because of the extreme scarcity of any reliable information in this field, the Study Group presents the studies as examples of the type of investigation that can be attempted.

3.2 A register of children at work

In Malaysia, the records of a group of 210 children at work in Peninsular Malaysia were studied, the sources being welfare agencies, the police, the health authorities, and social workers (R. Mahathevan, unpublished observations, 1985). All the children were between 7 and 15 years of age; 155 were boys, and 55 girls. Each child was referred to the nearest health clinic for history-taking and clinical examination.

The places and types of employment of the 210 children are indicated in Table 3. It shows that the children worked mainly in informal sectors and that boys and girls worked in different industries. Twelve of the children stated that their work consisted of blending chemical fertilizers.

Among these 210 children, the average duration of employment was 3 years. The average number hours worked per day was 10. Thirty-eight children claimed that they worked 7 days a week, and 13 said that they had leave only when strictly necessary, as decided by the employer. Another 132 children had one half-day off per week, and 21 had one day off per week. Only 6 had more than one day off per week.

Nine children stated that they worked for their parents, while 30 worked for relatives, 22 for family friends, and 149 for other employers.

Only 117 out of the 210 children had had formal schooling. The reasons given by these 117 children for leaving school were: financial problems (69), no interest in continuing (19), having to look after young siblings (17), and unable to cope with school work (12). No explanation was given for the fact that 93 of the children had had no

Table 3. Types of employment of children in Peninsular Malaysia

Place or nature of employment	Male	Female	Total
<i>Food processing/service</i>			
prawn factory	2	—	2
palm oil refinery	1	—	1
bakery	3	1	4
shop	10	—	10
manufacture of soft drinks	7	20	27
restaurant	15	10	25
<i>Agriculture</i>			
rice-growing	3	—	3
poultry-farming	9	—	9
palm-oil mill	5	—	5
<i>Domestic service</i>			
baby-sitting	—	8	8
hairdressing	—	14	14
<i>Small industry</i>			
motor repairs	30	—	30
metal engineering/casting	12	—	12
manufacture of furniture	3	1	4
manufacture of tin cans	4	1	5
<i>Other</i>			
blending of chemical fertilizers	12	—	12
construction work	39	—	39
total	155	55	210

formal schooling. It was stated by 136 boys and 48 girls that they would go to school instead of working if they were given the opportunity, while 19 boys and 7 girls stated that they would not.

Meals were provided at the place of work for 172 of the children, while 40 had lodgings provided as well; 142 children stated that medical facilities were available at the work-place and that they were granted medical benefits by their employers.

The health status of the children at work (the study group) was compared with that of schoolchildren of similar age, sex, ethnic group, and socioeconomic status (the control group). Questionnaires asking for common signs and symptoms indicative of diseases of various systems of the body, were completed for each child by health professionals; these suggested that the study group had many more health problems than the control group (Table 4). The health status of the children in the study group was further ascertained by clinical examination. The various conditions found

Table 4. Health problems indicated by 210 children at work in Peninsular Malaysia

Health problem indicated	Study group		Control group	
	yes	no	yes	no
cardiovascular diseases	12	198	8	202
asthma	19	191	2	208
other respiratory diseases	28	184	14	196
eczema	44	166	3	207
gastrointestinal disorders	189	21	17	193
mental disorders/epilepsy	7	203	—	210
faints/blackouts	82	127	7	203
migraine/headache	201	9	19	191
endocrine (diabetic/thyroid)	6	204	—	210
total	586	1304	70	1820
average number of health problems per person	2.79	—	0.33	—

(Table 5) were indicative of a general nutritional problem in the group.

In the study group, 81 children (38.4%) had been hospitalized, compared with 13 (6.2%) in the control group. Of the children in the study group, 32 had been hospitalized 3 or more times, 23 twice, and 26 only once. The reasons for hospital admission are presented in Table 6 for both the study group and the control group. Only in the study group had children been admitted for asthma and swelling of face and legs, not to mention accidents at work.

Because of the high incidence of accidents at work among the children hospitalized, all episodes of work-related injury and disease that had ever occurred among the 210 children were investigated. Altogether, 703 conditions were recorded (Table 7). Most of these conditions were the result of physical injuries, but there were 58 cases of illness due to poisoning.

In reply to the question whether they liked working in their places of employment, 43 (20.5%) of the children said that they did and 159 of them (75.7%) said that they did not. Eight children refused to answer this question. The reasons given for liking the place of employment were: opportunity to acquire skill, opportunity to make friends, being treated well, having a nice boss, having a good income, and working near home. The reasons given for not liking the place of employment were: very tiring work, very strict rules, low wages,

Table 5. Conditions found in medical examinations of 210 children at work in Peninsular Malaysia

Condition	Male	Female	Total
anaemia	59	29	88
xerosis conjunctivitis	6	6	12
Bitot's spots	13	10	23
angular stomatis	39	19	58
bleeding gums	27	7	34
enlarged thyroid	1	3	4
enlarged liver	35	14	49
enlarged spleen	40	19	59
knock knees/bow-legs	4	2	6
ankle oedema	15	8	23
underweight	69	32	101
total	308	149	457
average number of conditions per person	1.99	2.71	2.18

Table 6. Reasons for hospital admissions among 210 children at work in Peninsular Malaysia

Reason	Study group	Control group
fever (for investigation)	25	6
respiratory tract infection	21	4
swelling of face and legs	3	-
urinary tract infection	12	1
asthma	16	-
motor vehicle accident	11	4
accident at work	21	-
general surgery	13	3
total	122	18

Table 7. Work-related conditions among 210 children at work in Peninsular Malaysia

Condition	Male	Female	Total
fracture	40	11	51
sprain	53	38	91
cramp	80	44	124
internal injury	-	1	1
contusion	103	53	156
haematoma and bruise	78	46	124
burns	42	27	69
effect of poisons	34	24	58
other	17	12	29
total	447	256	703

too much work, too far from home, and bad food. These reasons are given in descending order of frequency.

A study was carried out of the working environment in 13 factories where children were employed. Altogether 50 locations were evaluated with respect to heat stress, thermal comfort, noise, and lighting. It was found that 20% of the locations monitored were above the exposure limit value for heat stress (WBGT Index).¹ As regards thermal comfort, 64% of the locations were found to have a corrected effective temperature beyond the recommended comfort zone (22.7°C–26.7°C). Of the locations monitored for noise, 40% had excessive levels (greater than 85 dBA), and in 30% of the locations monitored for lighting, it was inadequate for the tasks undertaken in them.

Although the results of this kind of study cannot be analysed statistically, the figures give an idea of some of the problems experienced by children at work and indicate the type of information that can be obtained by primary health care workers, particularly those who work in the informal sectors. With this information a health status register of children at work could be set up. By analysing the information contained in the register, health workers could tackle specific risk factors and a number of control measures could be introduced.

3.3 A cross-sectional survey of child workers in industry

In the Republic of Korea, an entirely different approach was followed in the field study. As the basic minimum age for employment prescribed in the country's labour law was 13 years, a health survey of all female workers under 18 years of age was carried out in 9 factories: 2 textile factories, 6 electronics factories, and 1 factory producing rubber shoes. In addition, it was possible to make a number of environmental measurements and evaluations of levels of noise, dust, and chemical contaminants in the nine factories (S.H. Lee, unpublished observations, 1985).

Table 8 shows the age-distribution of the 593 female workers under 18 years of age in the three types of factory. Eight of them (1.3%) were 13 years old, and 48 (8.1%) 14 years old. Table 9 contains data on the socioeconomic and employment situations of the workers surveyed. Their average age at employment was 14.7

¹ Wet bulb globe temperature index.

Table 8. Age distribution of female workers under 18 years of age employed in some industries in the Republic of Korea

Age (years)	Nature of employment			Total
	textiles	electronics	rubber-shoe manufacture	
13	2	6	—	8
14	32	14	2	48
15	87	44	3	134
16	139	75	13	227
17	72	87	17	176
total	332	226	35	593

Table 9. Socioeconomic and employment data on female workers under 18 years of age employed in some industries in the Republic of Korea^a

Item	Nature of employment			Total
	textiles	electronics	rubber-shoe manufacture	
age at employment (years)	14.6±1.3	14.9±1.1	14.7±0.9	14.7±1.2
duration of employment (years)	1.7±1.2	1.5±0.9	1.8±0.9	1.6±1.1
education (years)	8.9±0.4	9.0±1.3	9.3±0.9	8.9±0.9
family size (no. of persons)	6.8±1.4	6.6±1.7	6.5±1.6	6.7±1.5
monthly income ^b	103.4±10.1	91.8±19.2	79.2±14.0	97.8±16.2
family monthly income per person ^b	29.3±25.1	34.5±32.1	20.1±31.7	30.7±28.5

^a Mean ± standard deviation.

^b In thousands of Korean won.

years, varying little from one industry to another. The average number of years of schooling was 8.9, and the average family size was 6.7 persons. The average monthly income was highest in the textile factory and lowest in the rubber-shoe factory. The incomes of these workers made up a substantial part of their family incomes, and they often worked long hours in order to earn more.

Data on the physical measurements of the female workers (the study group), including average heights and weights for each age category and body mass indices (calculated from the height and weight readings), were compared with similar data on 109 girls in the same age group who were looking for work in the 9 factories (the control group). It appeared that, among the girls under 15 years of

age, those who were employed were taller and heavier than those applying for work. One possible explanation is that this was due to better nutrition after employment.

In Table 10, health-related data on the study and control groups are presented. The high prevalence of hearing impairment,

Table 10. Data relating to the health of girls under 18 years of age working in certain industries in the Republic of Korea

	Nature of employment				Control group (work applicants)
	textiles	electronics	rubber-shoe manufacture	Total	
haemoglobin (gm/dl)*	12.9±0.9	12.8±0.8	13.0±0.6	12.9±0.8	13.0±0.8
myopia (0.6)	57 (17.2%)	42 (18.6%)	7 (20.0%)	106 (17.9%)	19 (17.4%)
hearing impairment (35dB)	15 (4.4%)	1 (0.3%)	1 (2.9%)	17 (2.9%)	— (0.0%)
proteinuria (positive)	15 (4.4%)	6 (2.7%)	1 (2.9%)	22 (3.7%)	3 (2.8%)
pulmonary tuberculosis	6 (1.8%)	1 (0.4%)	— (0.0%)	7 (1.2%)	— (0.0%)
respiratory symptoms	228 (68.7%)	133 (58.8%)	24 (68.6%)	385 (64.9%)	61 (56.0%)
gastrointestinal symptoms	225 (67.8%)	163 (72.1%)	26 (74.3%)	414 (69.8%)	71 (65.1%)
neuromuscular symptoms	276 (83.1%)	190 (84.1%)	33 (94.3%)	499 (84.1%)	89 (81.7%)
general menstrual abnormality	190 (57.2%)	153 (67.7%)	23 (65.7%)	366 (61.7%)	67 (61.5%)

*Mean±standard deviation.

particularly in the textile industry (4.4%), among young workers with an average duration of employment of around 1.7 years was a matter of concern. The prevalence of pulmonary tuberculosis also required further investigation.

A survey of respiratory, gastrointestinal, and neuromuscular symptoms in the two groups (Table 10) showed that 64.9% of the girls in the study group had one or more respiratory symptoms, as compared with 56.0% of those in the control group. The symptoms that were statistically significant¹ were coughing, sputum production, and dyspnoea. In the study group, 69.8% of the girls had one or more gastrointestinal symptoms, as compared with 65.1% of those in the control group, the symptoms that were statistically significant¹ being diarrhoea, constipation, and anal

¹ P<0.05.

bleeding. As for neuromuscular symptoms, 84.1% of the workers in the study group had one or more such symptoms, as compared with 81.7% of those in the control group, the symptoms that were statistically significant¹ being headache, muscle pain, anorexia, and dizziness. The percentages of workers with general and menstrual abnormalities among the workers and applicants were similar (61.7% and 61.5%, respectively).

The environmental measurements and evaluations (Table 11) confirmed that the noise problem in the textile industry was one

Table 11. Working environments of some industries in the Republic of Korea in which girls under 18 years of age were employed

Industry	Measurement	Number of locations	Assessment ^a		
			good	fair	poor
textiles	noise	11	2	2	7
	dust	11	7	2	2
electronics	noise	48	45	3	—
	dust	13	13	—	—
	lead	19	19	—	—
	toluene	13	12	—	1
	xylene	11	10	1	—
	methylethylketone	1	1	—	—
	acetone	1	1	—	—
	methanol	8	6	—	2
	ethanol	1	1	—	—
rubber-shoe manufacture	trichloroethylene	3	3	—	—
	noise	7	4	2	1
	dust	1	1	—	—
	toluene	8	2	5	1
	methylethylketone	3	—	2	1
	methanol	2	1	—	1
	ammonia	5	4	—	1

^aEach measurement was based on three samples, using the criteria: good—below TLV; fair—around TLV; and poor—above TLV (threshold limit value).

requiring immediate remedial action. In the textile industry, the problem of dust also required special attention. In some locations in the electronics and rubber-shoe industries, the chemical contaminants were high enough to justify a review of the control measures.

If carried out periodically, health surveys of this type could form the basis of a systematic study of work-related health problems in children. Such studies would inevitably involve intervention, where necessary, ultimately affecting the health of those concerned for the better. Thus their importance will reside not just in demonstrating a causal relationship between risk factors and health effects, but in

¹ P < 0.05.

demonstrating, in the course of time, an absence of work-related health problems among the workers studied.

3.4 Examples of other types of health study

In Nigeria the risk factors for two groups of children at work: street hawkers and soap-factory workers—were investigated (S.E. Asogwa, unpublished observations, 1984). The first group consisted of 400 children aged from 5 to 14 years: 279 males and 121 females. Many of them (68.5%) combined schooling with hawking. Of these 400 hawkers, 42 (10.5%) indicated that they worked 7 days a week while 308 (77.0%) worked 6 days a week. As for the number of hours worked each day, 132 (33%) indicated that they worked more than 6, in addition to the time they spent on schoolwork and homework. Nigeria had recently abolished compulsory free education for children, after having provided it for ten years.

The second group consisted of 8 boys and 6 girls from 6 to 14 years of age working in a soap factory. They all combined work with attending school. They all worked 6 days a week (Sunday being the exception) for around 3.5 hours a day. Their work was to separate oil-palm fruit from the husk, a task considered by the employer to be particularly "suitable" for children, who stooped or sat to perform it.

An attempt was made to compare these two groups of working children with their counterparts at school as regards general physique, skin condition, and haemoglobin concentration. In each case the data indicated that the children at work compared unfavourably with the children at school. Not surprisingly, the children at work came from lower social classes and larger families than the children at school.

In Sudan the risk factors for two groups of children at work were observed: one group from a village and the other in an urban area (Y. Osman, unpublished observations, 1985). The first group, consisting of 38 children from 6 to 14 years of age, worked in the fields doing jobs similar to those of their parents or employers, such as shovelling, controlling water in the canals, digging on the land, harvesting, curing and grading produce, etc. Twenty-eight of them (73.6%) worked more than 8 hours a day; one worked more than 12 hours a day. The second group, consisting of 62 children from 7 to 14 years of age, worked in 40 small workshops in Khartoum City. Their occupations included carpentry, machine repair, car-painting,

and blacksmith work. Their working day was usually from 8.00 h to 17.00 h with half an hour's "rest" for food and refreshment. All except one worked more than 8 hours a day, and 4 worked more than 12 hours a day.

The mean income for children working in the village was 10.6 Sudanese pounds a week as compared with 24.4 Sudanese pounds a week for adults. The mean income for children working in the urban area was 9.5 Sudanese pounds a week compared with 31.5 Sudanese pounds a week for adults.

In Turkey, several studies were conducted to explore risk factors pertaining to children at work (A.G. Fisek, unpublished observations, 1985). One of them dealt with children working in agriculture. The investigator used a retrospective method, asking 1765 workers whether they had ever done any agricultural work in their childhood. To this question, 352 workers gave a positive reply (19.9%), and some of them indicated that they had engaged in more than one type of agricultural activity when they were under 15.

The average age for starting work was 8.9 years among 263 workers who stated they had engaged in animal-grazing as family labour in their childhood, 9.6 years among 215 workers who stated that they had done agricultural work on family land, and 14 years among 106 workers who stated that they had worked as paid agricultural labourers for others. In addition, 14 workers reported that they had been employed in mixing pesticides for pest control and 17 workers that they had been employed in pesticide spraying, when they were under 15 years of age.

Among 39 workers who had done construction work in their childhood, the average age for commencing work was 13.5 years. Twenty-two of those workers mentioned that they had had to work at heights of more than 10 m, and 20 of them that they had to work more than 8 hours a day, when they were child workers in the construction industry.

In the following three chapters, three broad groups of risk factors will be presented and discussed. They are: (1) exposure to environmental agents; (2) factors relating to working capacity and limitations; and (3) psychosocial factors.

4. EXPOSURE TO ENVIRONMENTAL AGENTS

4.1 Exposure to chemicals

Since, in certain occupations, children might be exposed to chemical and physical health hazards, it may be asked whether they are particularly susceptible to these hazards. It is well known that, in pharmacology and therapeutics, doses for children are adjusted per kg of body weight in order to avoid toxic effects and overdoses. It follows that children occupationally exposed to toxic chemicals may be more readily affected than adults by the same concentrations of these chemicals in the working environment.

There have, however, been very few real-life studies to determine whether this is actually the case. Logically, children would probably be at a higher risk than adults, because of their lower body weights and the resulting higher levels of absorption per weight for the same concentrations. Factors other than simple weight and body size may be involved, including mechanisms for the detoxication of chemicals which may not be fully developed in children.

While many of the animal studies on age-dependent toxicity concern therapeutic chemicals, some recent studies deal with industrial chemicals or work-place contaminants such as trichloroethylene (36). In the case of therapeutic chemicals, the incentive to explore the influence of age on toxicity is always present, but in that of industrial chemicals, such research seldom has high priority. In some countries, it is considered that there is no need for it, since only adults would be allowed to handle or be exposed to the toxic substances in the work-place anyway. In others, attempts have been made to explore age-related differences in toxicity in a limited number of chemicals in order to recommend special exposure limits for young workers between 15 and 21 years of age (T. Vergieva, unpublished observations, 1985). The exposure limits recommended by WHO Study Groups for persons working with chemicals are certainly not intended to apply in the case of child workers.

In a recent review of animal studies undertaken to elucidate the toxicological problems of children and adolescents exposed to industrial chemicals at work, 13 substances are included (T. Vergieva, unpublished observations, 1985). They are benzene, cadmium, carbon disulfide, carbon tetrachloride, hexachloro-1, 3-butadiene, hydrazin, lead, nitrates and nitrites, nitrogen oxides, nitrosoamines, triadimefon, trichloroethylene, and volatile polymer

components. What we now know is that there are differences between young and adult animals with respect to the toxicity of chemicals. These differences can generally be explained by either a difference in the detoxication process or a difference in the absorption and clearance of the toxic agent (4). In addition, it has also been suggested that the higher basal metabolic rate in young animals may play a part (23).

An example of the research being conducted on age-related differences in toxicity is the study by Gadaskina et al. (12) on young rabbits that have undergone subacute exposure to benzene. Young rabbits (1.5 months old) oxidize benzene into phenol as intensively as adult rabbits (5–6 months old) do, but the next step in the detoxification process, the conjugation of phenol up to organic sulfates and glucuronides, does not occur in the young rabbits.

The authors point out that in the young of a number of species, the activity of the enzyme glucuronyl transferase is very low.

Though such studies are informative, their practical value is limited, for the following reasons (T. Vergieva, unpublished observations, 1985).

- The exposure parameters (doses, routes of entrance, etc.) in animal studies do not correspond to those of children at work.
- Animal experiments are usually carried out with animals at a very early stage of life, i.e., neonates, sucklings, etc., but the children exposed to toxic chemicals are usually in the age group 10–14 years.
- In chronic toxicity studies, the animals actually become adults while the exposure is continuing in the course of the experiments.
- Other biochemical and metabolic differences have to be taken into account.

4.2 Evidence from epidemiological studies

While there are very few epidemiological studies demonstrating differences between children and adults at work in susceptibility to toxic substances, there has been some research on young workers and children exposed to air pollutants in the general living environment. Much of this research has been on exposure to lead (24, 25). At the same level of exposure, children tend to absorb higher amounts of lead than adults do (1). Children are more liable to develop irreversible neurological complications following lead intoxication than adults are, and it has been reported that those with

blood lead levels above 120 µg/100 ml have nearly always developed lead encephalopathy (15).

As regards silicosis, a recent study shows that, among workers in the slate-pencil industry who develop conglomerate silicosis, those who started work at younger ages have a higher mortality rate (33). Kruglova et al. (22) found that among girls employed in spinning and weaving in a viscose fibre factory, those who started work at the age of 17 showed unfavourable changes in the cardiovascular and muscular systems at the end of the first year, as well as a higher general morbidity rate, by comparison with those who started similar work at the age of 18. In an epidemiological study on benzene exposure among 365 workers divided into three age groups, Doskin (9) found that with respect to haematological changes, the youngest group (18–21 years) contained not only the highest percentage of persons affected but also those with the worst changes induced by benzene, as compared with the other two (22–25 years and 26–35 years).

A field study in the Republic of Korea draws attention to a potential problem of noise exposure among young workers (S.H. Lee, unpublished observations, 1985). There have been reports demonstrating that young workers are more susceptible to noise-induced hearing loss than adults (13), suggesting that noise exposure limits set for adults may not be valid for young persons and children.

A number of studies on children from residential areas with air polluted by sulfur dioxide, nitrogen dioxide, carbon monoxide, and dust from nearby factories have demonstrated higher rates of respiratory disease, as well as significant changes in haematological indices and physical development, among these children, as compared with children from pollution-free residential areas (5, 10, 35). Reduced mean values for forced expiratory volume among schoolchildren living in the vicinity of a cement plant have been reported by Hrustic et al. (16).

The paucity of epidemiological studies on work-related damage to children's health is understandable. Because of the legal restrictions on child labour, it is not possible to undertake follow-up observations. In addition, there is a higher turnover of children in different jobs, as they do not usually enjoy the privilege of a labour contract.

5. WORKING CAPACITY AND LIMITATIONS

5.1 Work design and occupational health problems

Broadly speaking, work design includes the following: the selection and training of operators; the design of tools and machines; the design of work-stations; the adoption of working procedures and working postures; the prescription of working hours and rest periods; the design of personal protective equipment; and the control of physical factors in the working environment.

In the past work design was achieved by empirical means. However, industrialization has made an empirical approach seem too slow and grossly inadequate. It has been replaced by a scientific approach based on ergonomics, i.e., anatomical, physiological, and psychological considerations of human capacities and limitations, in order to: (a) ensure maximum efficiency of operation; (b) minimize the possibilities of human error; (c) reduce fatigue; and (d) eliminate any risk to the operator as far as possible (34).

The Study Group reviewed the present situation as regards the elimination among children at work of occupational fatigue, occupational trauma, and other occupational health problems related to work design or the lack of it.

The difficulty about the concept of occupational fatigue is that, although it covers a wide range of phenomena, there is still no exact definition of it. In the ILO publication *Occupational Health Problems of Young Workers*, four types of fatigue are described: local muscular fatigue; cardiorespiratory fatigue; sensory (visual or aural) fatigue; and general fatigue (11).

Occupational traumas are conventionally divided into overt trauma and cumulative trauma. Overt trauma, or acute injury, is the result of an accident. It may be due to an accidental exposure to mechanical energy, resulting in contusions, sprains, abrasions, lacerations, dislocations, fractures, crushing injuries, amputations, impacted foreign bodies, etc. Or it may be due to accidental exposure to thermal energy, resulting in burns, heat stress, or cold stress; to chemical energy, resulting in chemical burns or asphyxiation; to electrical energy, resulting in electrical burns, shocks, or electrocution; or to nuclear energy, resulting in radiation burns.

Accident investigation aims at identifying unsafe acts and unsafe conditions. Some compensation officers tend to overemphasize the importance of unsafe acts, and some safety engineers tend to

overemphasize the importance of unsafe conditions, as the cause of accidents. To the ergonomist, both are important, because he looks at the person and the work together and tries to maximize safety at work by concentrating on the interrelationship.

Cumulative trauma is also known as chronic repetition strain injury or chronic soft tissue trauma. It includes back problems, tendonitis, bursitis, tenosynovitis, carpal tunnel syndrome, epicondylitis, degenerative joint disorders, and vibration-induced white finger. It is not associated with a specific accident or event but rather with repeated minor insults to a part of the body. Because of differences in individual tolerance to low levels of stress, only a fraction of workers on a particular job may actually suffer a given type of injury, and that only after the lapse of a certain period of time.

5.2 Basic biological information for work design

Work design requires information on human working capacity and limitations. Such information is obtained from six main subdisciplinary areas. Anthropometry provides information on the dimensions of the body and ranges of movement. Biomechanics provides information on the application of forces at work. Work physiology provides information on the expenditure of energy at work and fitness for effort. Environmental physiology provides information on the effects of the physical environment and limits for stress as well as for optimal working. Skill psychology provides information on information-processing and decision-making in operators. Occupational psychology provides information on individual differences in aptitudes, motivation, and training.

When work design is carried out in the absence or ignorance of appropriate information on human working capacity and limitations, the workers are at risk.

Though the principles of ergonomic practice are of universal application, the data on human working capacity and limitations are not, since people tend to vary from place to place. In developing countries, there are very few research institutions, such as the Central Labour Institute in Bombay, that are capable of producing relevant local information (31, 32). Moreover, even if such information is available, there are very few trained ergonomists in developing countries to use it. Both WHO and ILO are trying hard to promote the practice of ergonomics in developing countries.

To identify and eliminate risks related to work design is possible, but difficult, even in the case of adults. It is particularly difficult where children are concerned, because they are in a period of growth and development, the rates of which vary from individual to individual. With adults, it is possible to assess working capacity and limitations on a group basis, but it is not easy to do so with children. In other words, the range of variations within each age group is so wide that each child has to be assessed individually, with respect to the work he or she has to do. The few research data available on the so-called "physical working capacity" of children were produced for use in connection with physical education and athletic training (3). In sports, the weakest are eliminated and ignored, but at work, the weakest have to be identified and protected.

5.3 Evidence from health studies

It is reported that children handling microscopically fine wire develop marked visual impairment within 5–8 years (14), while children using hand tools designed for adults are said to have a higher risk for fatigue and injury (S.K. Chatterjee, unpublished observations, 1985). It appears, too, that children using seats and work-benches designed for adults have more problems in the musculoskeletal system (S.K. Chatterjee, unpublished observations, 1985). When children find that the items of personal protective equipment, such as respirators, available at the work-place do not fit them properly, they have no choice but to work without them or use makeshift devices of no protective value such as putting handkerchiefs over their noses and mouths (19).

The field study conducted in Malaysia (R. Mahathevan, unpublished observations, 1985) drew attention to the risk of heat stress at work (see page 17). An epidemiological study published in 1973 concluded that young workers had lower heat tolerance than adults and recommended modification of maximum permitted heat loads (37).

The high prevalence of anaemia and undernutrition among children in some developing countries makes the appropriate assessment of possible risks to children as a result of work design even more cogent (A. Manuaba, unpublished observations, 1985). These nutritional health problems were observed in both the Malaysian study (R. Mahathevan, unpublished observations, 1985) and the Nigerian study (S.E. Asogwa, unpublished observations,

1984). On the other hand, anthropometric data such as those collected in the Korean study (S.H. Lee, unpublished observations, 1985) can be used for the adjustment of work to the workers in question. Without such data, there is no way of introducing the practice of ergonomics in the developing countries.

5.4 Ergonomic protection of children at work

The study in Nigeria indicated that a number of children combined schooling with employment (S.E. Asogwa, unpublished observations, 1984), particularly in the absence of free education. Instead of having one arbitrary age at which schooling gives way to employment, perhaps some countries or communities may see their way to providing children in some age groups with opportunities for combining schooling with employment. In this case, the total time spent on schooling and working per day would have to be taken into account in the assessment of general fatigue.

While the Study Group endorsed the concept of "light work", which takes both the health and the education of the children into consideration, it noted that the examples of its application that had been presented were limited. As pointed out earlier, "light work" for children has to be assessed with respect to both the nature of the work and the condition of the worker. Unless a country or community looks at the economic contribution of children realistically, it will be unable to make a firm commitment to their protection at work by means of ergonomics.

6. SPECIAL PSYCHOSOCIAL RISKS

6.1 The concept of psychosocial risk factors at work

Until recently, the emphasis in occupational health practice has been mainly on the elimination of risk factors in the physical working environment and little attention has been paid to adverse psychosocial factors at work. The rapid technological changes in work in many countries in recent years, notably the mechanization of work in developing countries, have brought the psychosocial factors into the limelight. In 1972, a WHO Meeting on Occupational Mental Health started the ball rolling with its recognition of the importance of promoting research on psychosocial factors at work

and applying the findings. The work of this meeting was followed up in 1984 at the ninth session of the Joint ILO/WHO Committee on Occupational Health, which examined the recognition and control of adverse psychosocial factors at work (21).

After reviewing the definitions of psychosocial factors at work proposed by a number of experts, the Joint Committee proposed the following definition for use by ILO and WHO:

“Psychosocial factors at work refer to the interactions between and among work environment, job content, organizational conditions and workers’ capacities, needs, expectations, custom, culture, and personal extra-job considerations that may, through perceptions and experience, influence health, work performance and job satisfaction.” (21)

For adult workers, a number of negative, potentially health-related psychosocial factors, or psychosocial risk factors, at work have been identified in numerous studies in recent years. These include such factors as under-utilization of abilities (underload), work overload, lack of control, role conflict, inequity of pay, lack of job security, problems in relationships at work, shift work, and physical danger.

6.2 Psychosocial risks to children at work

In 1976, a WHO Expert Committee met in Geneva to discuss child mental health and psychosocial development. In its report, it drew attention to the importance of ensuring healthy psychosocial development and the prevention and treatment of mental health problems in children. It also commented on the inadequacy of the existing services for this purpose in most countries (41).

The following factors influencing psychosocial development in children were discussed by the Expert Committee: (1) biological factors; (2) cognitive factors; (3) ecological and social factors; (4) patterns of upbringing; and (5) ameliorating influences and factors leading to positive development. Poverty, migration, housing, urbanization, and industrialization were all discussed as ecological and social factors, but no direct reference was made to children at work (41).

Though the study of psychosocial risks to adults at work has been going on for some time, the study of psychosocial risks to children at work is only just beginning (D. Kayongo-Male and S.I. A. Rahim,

unpublished observations, 1985).¹ At this stage, the main aim of almost all the studies is to identify and explain social and psychological problems affecting children at work. No research has been done on the psychosocial risks encountered by children at work or their effects on the children either in the immediate future or later on in life.

In a recent WHO-sponsored review of studies on the social and psychosocial problems of children at work, four groups of children are considered (D. Kayongo-Male, unpublished observations, 1985). The first group consisted of children working in other people's homes in Kenya as baby minders and general household-helpers (29). The study showed the following reactions or problems to be common among these child workers: (1) withdrawal; (2) regressive behaviour; (3) premature aging; (4) depression; (5) inferior status identity; and (6) resistance. Factors that may be responsible for these problems include: (1) the relatively deprived status of the child worker *vis-à-vis* other children in the household of the employer; (2) the poor social relationship of the child with members of the household and with others outside the household; (3) the child's total exclusion from any education; (4) the demands of a tedious and often strenuous work schedule; (5) the denial of any expression of developmental needs; and (6) emotional disturbance resulting from physical abuse, which occurred in a limited number of cases.

The second group consisted of children working on plantations and farms. No scientific study on the health problems of these children had been conducted and only descriptive accounts were found. Taylor (38) describes the problems of one such group of child workers who are constantly on the move with their parents. Instability due to "following the crops" is a major feature of the lives of these children. Taylor describes how they change schools as they migrate with their parents for seasonal work; they work for long hours and do heavy and exhausting jobs; as a result, they are tired and bored, becoming indifferent and introverted; and they feel worthless and develop a fatalistic attitude.

The third group consisted of children working in the streets as bootblacks, newspaper vendors, messengers, sweepers, vendors at market and food stalls, as well as accomplices in illegal activities such as theft. There is much anecdotal evidence to show that the

¹ See: NAIDU, U.S. Psychosocial problems of working children. Geneva, 1984 (unpublished WHO document).

conditions described in Clopper's book *Child Labor in City Streets*, first published in 1912, are still prevalent today in some parts of the world. The effects of street work on children, according to Clopper, include: (1) distaste for regular employment; (2) excessive fatigue; (3) use of coffee, cigarettes, and liquor; (4) venereal disease; (5) defiance of parental control; (6) recruitment into criminal activities; and (7) bodily deformation and stunting (7).

The fourth group consisted of children working in factories. Those working in the carpet industry in Morocco and the match industry in India are often quoted as examples. Factory work creates a great deal of stress for the child, who must be responsible, exact, and alert. Failing that, the child risks dismissal or injury leading to permanent disability. Long hours and days of uninterrupted work have a stultifying effect on the child, narrowing his horizons and often crippling him emotionally (8). 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 (26).

6.3 The special situation of being both a child and a worker

The special situation of being both a child and a worker either generates psychosocial risk factors over and above those faced by adults at work or makes the children react differently from adults on exposure to similar psychosocial risks. S.I.A. Rahim (unpublished observations, 1985) points out that there are certain common stressful psychosocial factors inherent in child labour *per se*. Whatever the economic sector (agriculture, industry, or services), environmental setting (rural or urban), or form of employment (donated children, bonded labour, wage-earning, or marginal self-employment), the very adverse socioeconomic and family backgrounds that have compelled the children to join the labour force are from the beginning a source of stress.

When children become workers, they are possibly subject to the general and special risk factors in the physical working environment that were referred to in the two previous chapters. In addition, they have to face the following types of psychosocial risk factor because

they are children and workers at the same time (D. Kayongo-Male, and S.I.A. Rahim, unpublished observations, 1985).¹

6.3.1 *Work versus childhood*

Economically productive activities deprive the child of the time as well as the opportunity to go through normal development at the most critical stage of life. Children need time to establish meaningful relationships with family members, peers, and other persons in their community. They need opportunities for play, exploration, exercise, and rest. They also need opportunities to be spontaneous, free, and uncontrolled (26). Having occasional brief periods of indecision and irresponsibility helps them appreciate and develop the opposite characteristics. Child workers are likely to develop permanently negative attitudes towards work since work has deprived them of their childhood. Some children in the Malaysian study (R. Mahathevan, unpublished observations, 1985) were indifferent to the question of how long they had been working, since for them, perhaps, childhood seemed never to have existed.

6.3.2 *Work versus education*

Work competes with education, either because the child drops out of school to work, or because there is less emphasis on school than on work. The Nigerian study (S.E. Asogwa, unpublished observations, 1984) and the Malaysian study (R. Mahathevan, unpublished observations, 1985) illustrate this point. Education prepares an individual for adult life, including work. Child workers not only lack this essential preparation but also have no opportunities to catch up with it later on in life. Being illiterate or poorly educated, child workers will be in a precarious position as regards employment throughout their lives.

6.3.3 *Work versus family life*

In many instances, work separates children from their families as both the Malaysian study (R. Mahathevan, unpublished observations, 1985) and the Turkish study (A.G. Fisek, unpublished observations, 1985) indicated. The children became deprived of

¹ See: NAIDU, U.S. Psychosocial problems of working children. Geneva, 1984 (unpublished WHO document).

parental affection, family care, supervision, support, and control. Having to tackle intricate problems of daily life by themselves, they frequently found themselves bewildered or helpless. This applied particularly to rural children migrating alone to seek employment in urban areas. A conflict usually arose in these children between a constant desire to return home and a compelling need to endure bitter reality.

6.3.4 Disadvantages in power relationships at work

At work, a child is doubly disadvantaged in terms of power relationships, for being young and being an employee. Child employees are usually not allowed to express their feelings or needs. They are often subject to very rigid discipline, and sometimes to intimidation or even physical abuse. In many countries, there is no protection under the law, which offers children no compensation for disabling injuries at work.

6.3.5 Involuntary nature of the work

Children are often forced to work by their parents or other adults. This means that they have not willingly quitted school or gone to work. Work will thus tend to have a flavour of force about it long into adulthood, with resentment of it extending to the entire working life. Moreover, while work demands taking up responsibility, giving a child responsibility does not necessarily have the effect of making the child more responsible. On the contrary, the child may react negatively to the responsibility imposed upon him or her and become more self-centred instead. Again, this may affect acceptance of responsibility in later life.

6.3.6 Role conflict in the child worker

Role conflict in the child worker is fundamentally different from role conflict in the adult worker. For an adult worker, role conflict exists solely in the work-place, and even then it is rare. For a child worker, role conflict exists everywhere: in the family, in the work-place, and in the community. Almost all children at work suffer from role conflict to a certain extent.

In the family, child workers are expected to earn incomes like adults but to behave obediently like children. In the work-place, they

are expected to perform tough duties like adults but to accept social treatment like children. In the community, they are expected to make economic contribution like adults but to receive basic education like children. To sum up, these children are expected to play an adult role as workers, while remaining children in all other respects.

6.4 Protection of children from psychosocial risk factors at work

Responsibility for the control of the psychosocial risk factors to which adults are subject at work, can usually be left mainly to the employer. The policy here is to promote better knowledge of the essential requirements for a healthy working environment, to adapt work to the capacity and needs of each worker and his or her state of physical and mental health, and to create and maintain a working environment likely to favour an optimal state of physical and mental health in relation to work (21).

For the control of the special psychosocial risk factors encountered by children at work, it is obviously not enough to leave the responsibility to the employers alone. The community or the government should intervene, in the context of socioeconomic planning, to determine the types of work appropriate for children, taking their health and education into consideration. Then employers can play their part in the control process. Ways and means have to be sought to help employers who provide acceptable jobs for children to acquire a thorough understanding of the special psychosocial risks faced by children at work.

7. HEALTH CARE OF CHILDREN AT WORK

7.1 Traditional health services and children at work

The health of children at work is not covered by any of the traditional services. The general health services do not provide health care for working children, and occupational health services are organized to look after the health of adult workers and young people (15 years and over) working for the first time. In fact, one of the tasks of occupational health services is to exclude children who are too young to work. Thus the application of the primary health care approach may be only way of providing health care for these children.

7.2 The primary health care approach and children at work

The International Conference on Primary Health Care (Alma-Ata, 1978) was jointly sponsored by the WHO and UNICEF (2) —two organizations with a common interest in child health, whether in the home, at school or, in this exceptional case, at work.

Primary health care would first and foremost stimulate community awareness of the problem of child labour and, more effectively than any legislation, secure community participation in its control.

One of the aims of primary health care is to “reach people where they live and work”, and this of course includes children at work. Through a primary health care service, supported by whatever services and facilities the workers’ health service can make available, it should be possible to provide the essential services needed for the protection of all underprivileged workers, including children. The expertise and facilities required of the workers’ health service could then be realistically planned and progressively developed.

Unlike labour inspectors, community health workers can gain access to children at work, irrespective of the form of employment and the nature of the work, and obtain real and complete information on all children in any work-place. Information on work-places, industrial or agricultural hazards involved, and the state of health of the workers would be helpful in:

(a) determining the sort of knowledge and skills community health workers should possess;

(b) determining the expertise and facilities required of the supporting workers’ health services;

(c) setting priorities for the work to be carried out by the national workers’ health programmes; and

(d) decision-making by the socioeconomic planners in the community or country on the types of work acceptable for children.

In countries where primary health care has been used for different occupational sectors, the community health worker, who can be voluntary or elected, receives training on specific aspects of occupational health, including the handling of emergencies, referring cases to district health centres or to an occupational health unit, and providing periodic reports that would be helpful in the evaluation of the types and extent of workers’ health problems. This work is supported by mobile units for the detection and control of various

occupational hazards. Nutritional problems, communicable diseases, and occupational hazards are all equally dealt with through systems of this kind which are now being developed in several countries with the full participation of WHO.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

Most people differentiate between the terms “children at work” and “child labour”, considering that there is a suggestion of exploitation about the latter. Yet, in borderline cases, it is difficult to agree at what point exploitation begins. The economic exploitation of children at work has been much studied and discussed, but the health consequences have so far received little attention.

The statistics on economically active children in a large number of countries are in need of improvement. However, the information available points to a problem of some magnitude that derives mainly from the socioeconomic conditions in certain countries.

The current international labour standard sets 15 years of age as the basic minimum age for employment. Yet it is flexible enough to allow for modification or relaxation in the case of certain economic sectors and certain types of work or employment. Thus, the international labour standard does not prevent any country setting its own realistic standard of minimum age for employment according to its stage of socioeconomic development.

The concept of “light work” stipulated in the international labour standard as permissible for children under 15, demands that the health and education of the children should be taken into consideration. While endorsing this concept, the Study Group cannot find any evidence of its faithful application. Perhaps this is because most governments have not as yet been able to define the dimensions and demands of “light work”.

For a number of reasons, health studies on children at work are not easy to plan and carry out. There are two categories of health studies with respect to special risks to children at work. The first category involves studies in which an attempt is made to establish a causal relationship between certain risk factors and health effects. The second comprises studies dealing with the health status of children at work.

In attempting to establish the special risk factors to which children at work are subject, information from experimental and epidemiological studies on young workers (15–21 years) and epidemiological studies on children living in areas with air pollution were considered. Three broad groups of factors have been identified: (1) exposure to environmental agents, (2) factors relating to working capacity and limitations, and (3) psychosocial factors.

The second category of health studies is very important for purposes of intervention. Such studies can start with either a register of children at work or a survey of young workers in industry. The former approach is more appropriate for the informal employment sectors, and the latter for the formal sectors, but both approaches can be used by the community health worker.

Compared with adults, children tend to react differently or more severely, when exposed to chemical substances and physical agents at work. Though direct epidemiological evidence is limited, there is now sufficient evidence from experimental studies and from the surveys of young workers quoted in section 4.2 to indicate that the exposure limits recommended for adult workers are not adequate for protecting children. For some extremely toxic chemical substances such as lead, and harmful physical agents such as ionizing radiation, there is no compromise but to impose an absolute ban on the exposure of children to them. In the case of less toxic substances and harmful agents, additional safety margins have to be allowed whenever children are exposed.

With respect to children's working capacity and limitations, problems arise because children have not been taken into consideration in designing work methods and tools. Though the evidence of damage to the health of children at work because of work design factors is mainly anecdotal, it is sufficient to give rise to concern about the lack of information and expertise in developing countries with regard to ergonomics. This is an area of occupational health practice in which research and intervention go together, but firm commitment in each country is needed before ergonomic research and services can go ahead, supported by ILO and WHO.

Interest in psychosocial risks to adult workers is only relatively recent. Serious attention to psychosocial risks to children at work can be said to start with this Study Group. Previously, researchers had shown interest in only the social and psychological problems of children at work. The special situation of being both a child and a worker either generates additional psychosocial risk factors over and

above those faced by adults at work or makes the children react differently to adults on exposure to similar psychosocial risks. The mere fact that a child works is a source of psychosocial stress in the child. Work deprives the child of his or her play, education, family life, and opportunities to establish meaningful relationships with peers and other persons in the community at large. Instead, the child is disadvantaged as regards power relationships at work, and is subject to harsh working conditions and disciplinary rules. This in turn affects physical and mental development at a most critical stage of life.

Moreover, a child worker experiences role conflict in the family, in the work-place, and in the community. As workers, children are forced to act like adults, but cannot escape from their normal role as children. Unless a community makes a real effort to humanize work for children, not just from the physical standpoint, but from the mental health and social standpoints as well, it will not be able to exercise adequate control over the special psychosocial risks to which children are subject at work.

Health services organized in the traditional way do not consider working children as potential clients. Until recently, such children received practically no health care of any kind. The adoption of the primary health care approach would make it possible to extend the essential health care provided in the national health system to children at work. This is because primary health care workers would find ways and means of reaching children at work and giving them appropriate health care, with the support of the occupational health infrastructure of the overall national health system.

Community health workers could gather information on health and exposure to health risks in the community, including data on children at work. This information would help health planners in integrating the health services and setting priorities for action. It would also be useful to socioeconomic planners in realistically determining and approving the types of work that may suitably be carried out by children at each stage of socioeconomic development.

8.2 Recommendations

The Study Group considers it expedient and appropriate to make recommendations for action at three levels: (1) the community level, (2) the national level, and (3) the international level.

8.2.1 *At the community level*

The Study Group believes that the most effective way to achieve the eventual abolition of child labour, and the humanization of work for children in the meantime, is through community decisions based on adequate information and full participation.

The community must know the extent of the contribution made by its children to the economy and how far the community is from reaching the goal of no longer needing their contribution. No matter how rough the estimate, this piece of information is essential for the community's own decision-making.

Next the community must know what types of work its children are doing, after which it must identify the risk factors, general or special, associated with each type of work. Then, information on control measures and on the health care of children exposed to the risk factors has to be obtained. Finally, basic cost-effectiveness and cost-benefit analyses relating to the health protection and care of children at work have to be carried out, the information being broken down according to the main types of work available locally. This allows the community to have some idea of the cost to health of letting its children contribute to the economy.

Together with the cost to health, other social costs have to be set against the economic contribution. The community then will be in a good position to decide on approved types of work for its children and the services needed to look after the children doing the work. This procedure will be repeated periodically until children in the community are no longer required to make an economic contribution.

To achieve this, it is necessary for each community to:

(a) use the primary health care approach to deliver health care to children at work and to obtain information on these children;

(b) organize its workers' health service to support community health care workers in making work assessments and applying control measures;

(c) produce its own list of jobs that are unsuitable for children and of agents to which children should not be exposed.

Once these essential steps have been inaugurated it will then gradually become possible to:

—provide educational opportunities for working children, including health education;

- disseminate information to parents and employers on the health hazards to which children at work are subject and their effects;
- present information on the health of children at work in the community systematically and periodically to aid decision-making.

8.2.2 *At the national level*

The Study Group notes that each country has developed its own legislation to combat child labour in the course of time, but has the impression that at the moment a number of countries do not have specific policies of their own concerning children at work. The Study Group urges each country to formulate its own policy realistically, according to the stage of socioeconomic development it has managed to achieve.

For this, it may be necessary in some countries to reconsider this issue and create a special division within the appropriate ministry to deal with issues and matters relating to children at work, such as legislation, registration, inspection, intervention, guidance, research, and evaluation. Also, a national committee including representatives of all the governmental departments and nongovernmental organizations that have a definite involvement or influence on children at work, e.g., those dealing with health, education, employment, industry, welfare, finance, etc., may be formed to monitor development and provide appropriate advice leading to a realistic national policy on children at work.

To achieve this, it is necessary for each country to:

(a) monitor socioeconomic development in all its communities and their efforts towards reaching the goal of the abolition of child labour;

(b) revise the legislation on child employment according to overall socioeconomic development in the country, making special allowances for certain communities and economic sectors that have real difficulty in keeping up with others;

(c) give higher priority in the national budget to basic education and vocational training;

(d) consider modifying the educational system to make it possible for children in some age groups to combine schooling with employment;

(e) ensure that children at work are covered by the national system of social security and workmen's compensation;

(f) make a firm commitment to the primary health care approach and organize the national health system accordingly;

(g) integrate and reorientate the occupational health infrastructure to give effective support to community health workers in delivering health care to children at work;

(h) provide training courses for health workers in work assessment, covering both work demand and the working environment, so as to ensure the safety of children at work;

(i) promote research on information that would serve to identify the special risks to which children at work are subject, including experimental studies on young animals, epidemiological studies on children and young people at work, and ergonomic studies on the working capacity and limitations of children;

(j) produce educational material on health and safety for the children themselves, as well as for their employers and parents;

(k) provide assistance to communities in making lists of jobs that are unsuitable for children and agents to which they should not be exposed;

(l) provide assistance to communities in conducting cost-effectiveness and cost-benefit analyses relating to the health protection and care of children at work.

8.2.3 *At the international level*

The Study Group finds that, in addition to the tremendous efforts made by ILO over the years, several other United Nations specialized agencies and some nongovernmental organizations have their own programmes and activities for combating child labour.

The Study Group believes that an Inter-Agency Committee on Child Labour should now be created, on which all international organizations concerned would be represented, with a commitment to abolish child labour in the long run and to humanize work for children in the interim period.

This Committee would deal with all aspects of the problem of child labour at the international level, including the health and welfare of children at work. By exchanging information and coordinating activities, the Committee would attempt to achieve uniformity of policies and strategies among its various member organizations.

The Inter-Agency Committee on Child Labour would ensure that one or more of its member organizations was responsible for:

- (a) acquiring information on the stage of socioeconomic development of each country and the efforts made to combat child labour;
- (b) stimulating awareness of the problem of child labour in those communities where it exists, encouraging community involvement in making decisions on suitable work for children, and following up the extension of primary health care to working children;
- (c) promoting the dissemination of information on the health hazards faced by children at work and their effects;
- (d) stimulating research on the identification of the special risks to which children at work are exposed;
- (e) stimulating research on control measures for protecting children exposed to special risks;
- (f) stimulating evaluative studies on the health protection and care of children at work;
- (g) promoting, and assisting with, the provision of training courses on work assessment for children and the provision of community health workers at work-places;
- (h) promoting, and assisting with, the revision of legislation on child employment.

Annex 1

ILO CONVENTIONS DEALING WITH THE EMPLOYMENT OR WORK OF CHILDREN AND YOUNG PERSONS

A. *Minimum age*

Minimum Age (Industry) Convention, 1919 (No. 5)
Minimum Age (Sea) Convention, 1920 (No. 7)
Minimum Age (Agriculture) Convention, 1921 (No. 10)
Minimum Age (Trimmers and Stokers) Convention, 1921 (No. 15)
Minimum Age (Non-Industrial Employment) Convention, 1932
(No. 33)
Minimum Age (Sea) Convention (Revised), 1936 (No. 58)
Minimum Age (Industry) Convention (Revised), 1937 (No. 59)
Minimum Age (Non-Industrial Employment) Convention
(Revised), 1937 (No. 60)
Minimum Age (Fishermen) Convention, 1959 (No. 112)
Minimum Age (Underground Work) Convention, 1965 (No. 123)
Minimum Age Convention, 1973 (No. 138)

B. *Conditions of work*

Night Work of Young Persons (Industry) Convention, 1919 (No. 6)
Night Work of Young Persons (Non-Industrial Occupations)
Convention, 1946 (No. 79)
Night Work of Young Persons (Industry) Convention (Revised),
1948 (No. 90)

C. *Provision of medical examination*

Medical Examination of Young Persons (Sea) Convention, 1921
(No. 16)
Medical Examination of Young Persons (Industry) Convention,
1946 (No. 77)
Medical Examination of Young Persons (Non-Industrial
Occupations) Convention, 1946 (No. 78)
Medical Examination (Fishermen) Convention, 1959 (No. 113)
Medical Examination of Young Persons (Underground Work)
Convention, 1965 (No. 124)

D. Other pertinent subjects

White Lead (Painting) Convention, 1921 (No. 13) (Article 3, para. 1)
Night Work (Bakeries) Convention, 1925 (No. 20) (Article 3)
Social Policy (Non-Metropolitan Territories) Convention, 1947
(No. 82) (Article 19)
Radiation Protection Convention, 1960 (No. 115) (Article 7)
Social Policy (Basic Aims and Standards) Convention, 1962 (No.
117) (Article 15)
Maximum Weight Convention, 1967 (No. 127) (Article 7)
Benzene Convention, 1971 (No. 136) (Article 11, para. 2)
Occupational Safety and Health (Dock Work) Convention, 1979
(No. 152) (Article 38, para. 2)

Annex 2

ILO RECOMMENDATIONS DEALING WITH THE EMPLOYMENT OR WORK OF CHILDREN AND YOUNG PERSONS

A. *Minimum age*

- Minimum Age (Non-Industrial Employment) Recommendation, 1932 (No. 41)
- Minimum Age (Family Undertakings) Recommendation, 1937 (No. 52)
- Minimum Age (Coal Mines) Recommendation, 1953 (No. 96)
- Minimum Age (Underground Work) Recommendation, 1965 (No. 124)
- Minimum Age Recommendation 1973 (No. 146)

B. *Conditions of work*

- Night Work of Young Persons (Non-Industrial Occupations) Recommendation, 1946 (No. 80)
- Condition of Employment of Young Persons (Underground Work) Recommendation, 1965 (No. 125)

C. *Provision of medical examination*

- Medical Examination of Young Persons Recommendation, 1946 (No. 79)

D. *Other pertinent subjects*

- Lead Poisoning (Women and Children) Recommendation, 1919 (No. 4) (Paras. 1 & 2)
- Unemployment (Young Persons) Recommendation, 1935 (No. 45) (Para. 1)
- Holidays with Pay Recommendation, 1936 (No. 47) (Para. 5)
- Weekly Rest in Commerce and Officer Recommendation, 1957 (No. 103) (Para. 4)
- Maximum Weight Recommendation, 1967 (No. 128) (Paras. 19–23)
- Benzene Recommendation, 1971 (No. 144) (Para. 20)

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