



International Programme on the Elimination of Child Labour
(IPEC)
Statistical Information and Monitoring Programme on Child Labour
(SIMPOC)

Every Child Counts

New Global Estimates on Child Labour

International Labour Office
Geneva
April 2002

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PREFACE

Six years have passed since the ILO published its global estimate of 250 million child workers. The number drew international attention to the magnitude and scope of the child labour problem worldwide. It was widely publicised; hardly any article on child labour failed to mention it. It not only had a forceful impact on public opinion, but it also helped to mobilize many governments and civil society groups into action.

As the global movement against child labour grows, the need for more precise and detailed estimates of child labour has become apparent. Data from SIMPOC, the statistical unit of the International Programme on the Elimination of Child Labour (ILO/IPEC), and other sources as well as new analytical tools have enabled us to calculate the estimates contained in this report. They also enabled us for the first time to estimate the magnitude of children in hazardous work and in other worst forms of child labour.

This report is intended to serve both the interested public and professionals in the field of child labour studies. It will provide a basis for advocacy and further research. We have tried to be as clear, transparent and concise as possible, explaining every step of the methodology used to arrive at the final results.

The project on the new global child labour estimates provided an important input into two major ILO activities: (a) the drafting of the 2002 Global Report on Child Labour and (b) IPEC research on the economic costs and benefits of the elimination of child labour.

My sincere thanks to the team of staff and consultants, including statisticians, researchers and child labour standards specialists, for their tireless efforts in collecting and interpreting the vast amount of data required to prepare this report. Special thanks as well to the ILO's Bureau of Statistics (STAT), for a major contribution and to the joint ILO-UNICEF-World Bank project "Understanding Children's Work" (UCW) which provided valuable assistance.

We expect that these estimates will help to further improve awareness and understanding of child labour and reinforce efforts to eliminate it. Since the contours of child labour constantly evolve, both with regard to its incidence and distribution, we intend to repeat this undertaking on a regular basis.



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Summary of highlights

As part of its effort to increase the knowledge base on child labour, the ILO prepared new global estimates on the overall magnitude and distribution of working children. This includes estimates on economically active children, children in child labour that requires elimination and the extent to which children are engaged in hazardous work and other worst forms of child labour.

Children at work in economic activity. It is estimated that there were some 211 million children ages 5 to 14 at work in economic activity in the world in 2000. This accounts for a little less than one-fifth of all children in this age group. About 73 million working children are less than 10 years old. The total economically active child population 5-17 years old is estimated at 352 million children. The estimates show that there are no significant gender differences in the global incidence of children at work. In both the 5-9 and 10-14 year age brackets, boys and girls are equally likely to be engaged in economic activity. Only as boys and girls grow older do we observe a widening gap, with more boys working than girls. *Children at work in economic activity* is a broad concept that encompasses most productive activities by children, including unpaid and illegal work as well as work in the informal sector. It is, however, not the same as child labour which needs to be eliminated as per the ILO Minimum Age Convention, 1973 (No. 138) and the ILO Worst Forms of Child Labour Convention, 1999 (No. 182).

Global estimates of economically active children ages 5 to 17 in 2000

Age group	Total population (‘000s)	Number at work (‘000s)	Work ratio (%)
5- 9	600,200	73,100	12.2
10-14	599,200	137,700	23.0
5-14	1,199,400	210,800	17.6
15-17	332,100	140,900	42.4
Total	1,531,100	351,700	23.0

Regional distribution. The Asian-Pacific region harbours the largest number of child workers in the 5-14 age category, 127.3 million in total. It is followed by Sub-Saharan Africa and Latin America & the Caribbean with 48 million and 17.4 million, respectively. Developed economies and transition economies have the lowest absolute numbers of child workers. Seen in relative terms, Sub-Saharan Africa has the highest proportion of working children. The estimates show that almost one child in three below the age of 15 is economically active in the region. The child work ratios in other major world regions are all below 20 per cent. In Asia-Pacific and Latin America & the Caribbean the incidence is 19 and 16 per cent, respectively. In the Middle East and North Africa, it is 15 per cent.

Regional estimates of economically active children ages 5-14 in 2000

Region	Number of children (in millions)	Work ratio (%)
Developed economies	2.5	2
Transition economies	2.4	4
Asia and the Pacific	127.3	19
Latin America & Caribbean	17.4	16
Sub-Saharan Africa	48.0	29
Middle East & North Africa	13.4	15
Total	211	18

Child labour. Child labour is a narrower concept than “economically active children”, excluding all those children 12 years and older who are working only a few hours a week in permitted light work and those 15 years and above whose work is not classified as “hazardous”. It is estimated that there were about 186 million child labourers below the age of 15 in the world in 2000. About 110 million were below the age of 12. Among children in the larger age group 5-17 there were approximately 246 million children in child labour. On average, more boys tend to be exposed to child labour than girls, both in absolute as well as in relative terms.

Children in economic activity, child labour, and hazardous work in 2000

Age group	Economically active children (‘000s)	Child labour (‘000s)	Children in hazardous work (‘000s)
5-14	210,800	186,300	111,300
15-17	140,900	59,200	59,200

Children in hazardous work. An estimated 171 million children ages 5-17 were estimated to work in hazardous situations or conditions in 2000. In other words, children in hazardous work constituted about half the total number of economically active children and more than two thirds of those in child labour. A stunning 55 per cent of very young child labourers (i.e. those below 12 years of age) were already working in a hazardous occupation or situation. Boys outnumber girls in hazardous work across all age groups. Seen in relative terms, among all children about one-half of the working boys were in hazardous situations as compared with a little more than two in five working girls.

Children in unconditional worst forms of child labour. In addition to the number of children in hazardous work, it is estimated that there were about 8.4 million children involved in other worst forms of child labour as defined in ILO Convention No.182, Art. 3. This includes trafficking (1.2 million); forced and bonded labour (5.7 million); armed conflict (0.3 million); prostitution and pornography (1.8 million); and illicit activities (0.6 million).

Estimated number of children in unconditional worst forms of child labour

Unconditional worst form of child labour	Global estimate (‘000s)
Trafficked children	1,200
Children in forced & bonded labour	5,700
Children in armed conflict	300
Children in prostitution & pornography	1,800
Children in illicit activities	600
Total	8,400*

*The total excludes the category of trafficked children because of the risk of double-counting.

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Introduction

This document presents the results of ILO research on the global magnitude of child labour. It introduces new global estimates for economic activity by children and child labour in the sense of ILO Conventions Nos. 138 and 182. For the first time ever, we have also attempted to estimate the extent of children in hazardous work and other worst forms of child labour.

Data on working children are still a scarce commodity. This is especially true for some of the worst and often hidden forms of child labour such as bonded labour or child prostitution. As far as possible, we have tried to present and analyze data by age, gender and regional breakdown. Yet, the detail in presentation varies. In some cases, for instance on hazardous work, the available data did not allow us to move beyond the global estimation level.

There are no national data to be found in this document. The lowest aggregate level presented are the major world regions. All estimates are for the benchmark year 2000.

Child labour is a sensitive subject and numbers on its magnitude play an important role in global policy-making and advocacy efforts. We were acutely aware of this responsibility and have thus used well-proven statistical and research methodologies in an attempt to keep error margins to a minimum. All sources, underlying definitions and methodological steps are explained in detail.

The document is divided into three main sections. Section One presents the main findings; Sections Two and Three introduce definitions and methodologies. Data are presented in tables and charts. Some of the specific technical assumptions and harmonization techniques are provided as appendices.

1 Main findings

1.1 Children in economic activity

1.1.1 By age group

We estimate that there were some 211 million children ages 5 to 14 at work in economic activity in the world in 2000. This accounts for a little less than one-fifth of all children in this age group (17.6 per cent). The total economically active child population between 5-17 years old is estimated at 352 million children (Table 1).

Children at work in economic activity is a broad concept that encompasses most productive activities by children. “Economic activity” includes unpaid, casual, and illegal work as well as work in the informal sector. It is the only internationally agreed standard to measure work and employment¹. In the absence of any child-specific work measurement tools, it has often been used as a proxy quantifier for child labour. It has to be noted, however, that not every economically active child is working in contravention of the ILO Minimum Age Convention, 1973 (No. 138) and the ILO Worst Forms of Child Labour Convention, 1999 (No. 182).²

Table 1. Global estimates of economically active children ages 5 to 17 in 2000, by gender and age group

Gender and age group	Total population (‘000s)	Number at work (‘000s)	Work ratio (%)
Boys			
5-9	308,500	38,100	12.3
10-14	307,900	70,900	23.0
5-14	616,400	109,000	17.7
15-17	170,200	75,100	44.1
Total Boys	786,600	184,100	23.4
Girls			
5- 9	291,800	35,000	12.0
10-14	291,300	66,800	22.9
5-14	583,100	101,800	17.5
15-17	161,800	65,800	40.7
Total Girls	744,900	167,600	22.5
Both genders			
5- 9	600,200	73,100	12.2
10-14	599,200	137,700	23.0
5-14	1,199,400	210,800	17.6
15-17	332,100	140,900	42.4
Total	1,531,100	351,700	23.0

¹ See Section 2 on “Definitions” for a detailed explanation of the concept of “economic activity”.

² See Sections 1.2 to 1.4 for estimates of children in this somewhat narrower category.

5-9 year olds. About 73 million children in this age category are estimated to have been working in economic activity in 2000. This means that roughly one in eight children ages 5 to 9 were engaged in economic activity (12.2 per cent). It is estimated that most of these working children were engaged in unpaid economic activities in the family farm or business. Only a minority were involved in paid work in non-agriculture activities.

10-14 year olds. It is estimated that some 138 million children 10-14 years old were at work in economic activity in 2000. The figure for this category is significantly higher than that for the 5-9 years age group; about twice the size both in absolute and relative terms. About one in four 10-14 year olds were working (23 per cent). The work contents of the two groups are also different. The proportion of 10-14 year old children engaged in non-agriculture paid work is somewhat higher in comparison to the 5-9 year olds.

15-17 year olds. A marked difference in the incidence of economic activity can be observed as one crosses the benchmark minimum age to work and employment of 15 years. The estimated number of working children in the 15-17 year old age category was about 141 million in 2000, or 42.4 per cent of the population in that age category.

1.1.2 By gender

Our estimates show that there are no significant gender differences in the global incidence of children at work. In both the 5-9 and 10-14 age brackets, boys and girls are equally likely to be engaged in economic activity. Only as boys and girls grow older do we observe a widening gap. In the 15-17 year age category, the work ratio is noticeably higher among boys than among girls, 44.1 and 40.7 per cent respectively (Table 1).

1.1.3 By region

The Asia-Pacific region harbours the largest number of child workers in the 5-14 age category, 127.3 million in total. It is followed by Sub-Saharan Africa and Latin America & the Caribbean with 48 million and 17.4 million, respectively. Developed economies and transition economies have the lowest absolute numbers of child workers. There are about two-and a half million each in both country groupings (Table 2).

The picture changes when we examine the regional distribution in terms of incidence. Here, Sub-Saharan Africa comes first. No other region has such a high child work ratio. Our estimates show that almost one child in three below the age of 15 is economically active (29 per cent) in the region. The child work ratios in other major world regions are all below 20 per cent. In Asia-Pacific and Latin America & the Caribbean the incidence is 19 and 16 per cent, respectively. In the Middle East and North Africa, it is 15 per cent (Table 2).

Not surprisingly, the incidence of child work is lowest in developed economies. We estimate that about two per cent of all children below 15 years of age are economically active.

Table 2. Regional estimates of economically active children ages 5-14 in 2000

Region	Number of children (in millions)	Work ratio (%)
Developed economies	2.5	2
Transition economies	2.4	4
Asia and the Pacific	127.3	19
Latin America & Caribbean	17.4	16
Sub-Saharan Africa	48.0	29
Middle East & North Africa	13.4	15
Total	211	18

It is useful to take a closer look at the regional distribution in the two separate age groups we are most interested in, i.e. 5-9 years and 10-14 years. Table 3 suggests that there are about 21 million very young children at work in Sub-Saharan Africa. Every fourth child in the region appears to start work below the age of 10. While the Asia-Pacific region harbours twice as many child workers in the 5-9 brackets, its child work incidence is about half as low (12.3 per cent).

For the 10-14 year age group the regional patterns remain essentially the same: Sub-Saharan Africa has the highest relative number of working children - followed by Asia-Pacific - and developed and transition economies the lowest. For the 15-17 year old category, the pattern changes dramatically and, as a result, regional differences are significantly narrowed. As Table 3 demonstrates, economic activity ratios in all major regions are approximately in the range of 30 to 50 per cent, and Asia-Pacific now surpasses Sub-Saharan Africa with the highest relative number of working teenagers.

Table 3. Regional estimates of economically active children ages 5-17 in 2000, by age group

Age group & region	Number of children (‘000s)	Number at work (‘000s)	Work ratio (%)
5-9			
Developed economies	59,600	800	1.4
Transition economies	27,700	900	3.1
Asia and the Pacific	335,400	40,000	12.3
Latin America & Caribbean	54,400	5,800	10.6
Sub-Saharan Africa	88,800	20,900	23.6
Middle East & North Africa	44,200	4,800	10.8

Table 3. (cont'd)

Age group & region	Number of children (‘000s)	Number at work (‘000s)	Work ratio (%)
10-14			
Developed economies	59,400	1,700	2.8
Transition economies	34,700	1,500	4.2
Asia and the Pacific	329,700	87,300	26.5
Latin America & Caribbean	53,700	11,600	21.5
Sub-Saharan Africa	78,100	27,100	34.7
Middle East & North Africa	43,700	8,600	19.6
15-17			
Developed economies	36,700	11,500	31.3
Transition economies	20,600	6,000	29.1
Asia and the Pacific	179,500	86,900	48.4
Latin America & Caribbean	31,200	10,300	35.0
Sub-Saharan Africa	40,300	18,100	44.8
Middle East & North Africa	23,700	7,500	31.8

The regional estimates are prone to higher error rates than the corresponding global estimates due to the reduced number of datasets available for their calculations. Also, regional details may not add up to the corresponding global figures in Table 1 due to rounding. The calculation of ratios may not give results equal to the reported ratios due to rounding.

1.1.4 Comparing the results with the old estimates

In 1996, the ILO estimated that there were 250 million working children ages 5-14 in the world in 1995³. The estimate was based on children at work in economic activity, excluding those in developed and transition economies, for which data were not available at the time. There were no specific estimates for child labour that needs to be eliminated in the light of ILO Convention No. 138 and as presented in this report, nor were there any global estimates on the extent of children in hazardous work or other worst forms of child labour.

Can we compare the old number of 250 million economically active children in 1995 with our new estimate of 211 million or rather 206 million (if one deducts the roughly 5 million working children in developed and transition economies)? In relative terms, can we compare the work ratio of 24.7 per cent in 1995 with the 2000 ratio of 20.2 per cent (excluding again the portion of working children in developed and transition economies)? (Table 4). In other words, does it show us that there is indeed a downward trend? Perhaps so, but readers should be cautious when comparing the two estimates. This caution is advised mainly for two reasons: First, the data sources of both estimates vary widely, both in scope and in depth. Over the last few years, many countries have gone a long way in collecting good and reliable data on working children; and both the coverage and depth of information on the issue has

³ ILO, *Child labour: Targeting the Intolerable* (Geneva, ILO, 1996) and Ashagrie, K., *Statistics on Working Children and Hazardous Child Labour in Brief* (Geneva, ILO, 1997, rev. 1998)

greatly increased. Second, different extrapolation methodologies were used, given the more extensive data available.

There is a sizeable difference between both results, amounting to almost 20 per cent both in absolute and in relative terms. While the size of the difference, in spite of different sampling and extrapolation methodologies, may suggest that there were indeed less child workers in 2000 than in 1995, one should be cautious in interpreting the results. In view of the technical differences referred to above, it is difficult to derive a statistical trend from the analysis of the two estimate results.

Table 4. Children ages 5-14 at work in economic activity in the 1995 and the new 2000 estimates

Estimate benchmark year	Global number ('000s)	Work ratio (%)
1995	250,000	24.7
2000	210,800 (205,900)*	17.6 (20.2)*

*Figures in brackets exclude developed and transition economies

1.2 Child labour

1.2.1 By age group

Child labour is a narrower concept than “economically active children”. For the purpose of this study, and based on ILO Conventions Nos. 138 and 182, child labour was defined as comprising:

- in ages 5-11 = all children at work in economic activity;
- in ages 12-14 = all children at work in economic activity minus those in light work;
- in ages 15-17 = all children in hazardous work and other worst forms of child labour⁴.

We estimate that there were about 186 million child labourers below the age of 15 in the world in 2000. As Table 5 demonstrates, economic activity and child labour are closely linked. Almost nine economically active children in ten were reported to be in a child labour situation that requires elimination as per ILO Convention Nos.138 and 182. It is particularly striking to see that the majority of these, about 110 million, were below the age of 12.

Among children in larger age group 5-17, there were approximately 246 million children in child labour.

⁴ See Section 2 on “Definitions” for classification details.

Table 5. Children in economic activity, child labour, and hazardous work (by age group), 2000

Age group	Economically active children (EAC) ('000s)	Child labour ('000s)	Child labour as per cent of EAC	Children in hazardous work (CHW) ('000s)	CHW as percent of EAC	CHW as per cent of child labour
5 -11	109,700	109,700	100.0	60,500	55.2	55.2
12-14	101,100	76,600	75.8	50,800	50.2	66.3
Total 5-14	210,800	186,300	88.4	111,300	52.8	59.7
15-17	140,900	59,200	42.0	59,200	42.0	100.0
Total	351,700	245,500	69.8	170,500	48.5	69.5

1.2.2 By gender

While there was hardly any gender differential in the extent of children in economic activity (section 1.2), the picture changes when examining the more narrowly defined group of child labourers. On average, more boys tend to be exposed to child labour than girls, both in absolute as well as in relative terms (Tables 6, 7 and Chart 1). This pattern becomes more pronounced with increasing age. As Table 7 suggests, in the 5 to 14 age bracket, the gender distribution of child labour is roughly even. At a later age, it then tilts towards boys, particularly so in the 15-17 age group (57 per cent boys versus 43 per cent girls), where child labour is automatically equated with hazardous work.

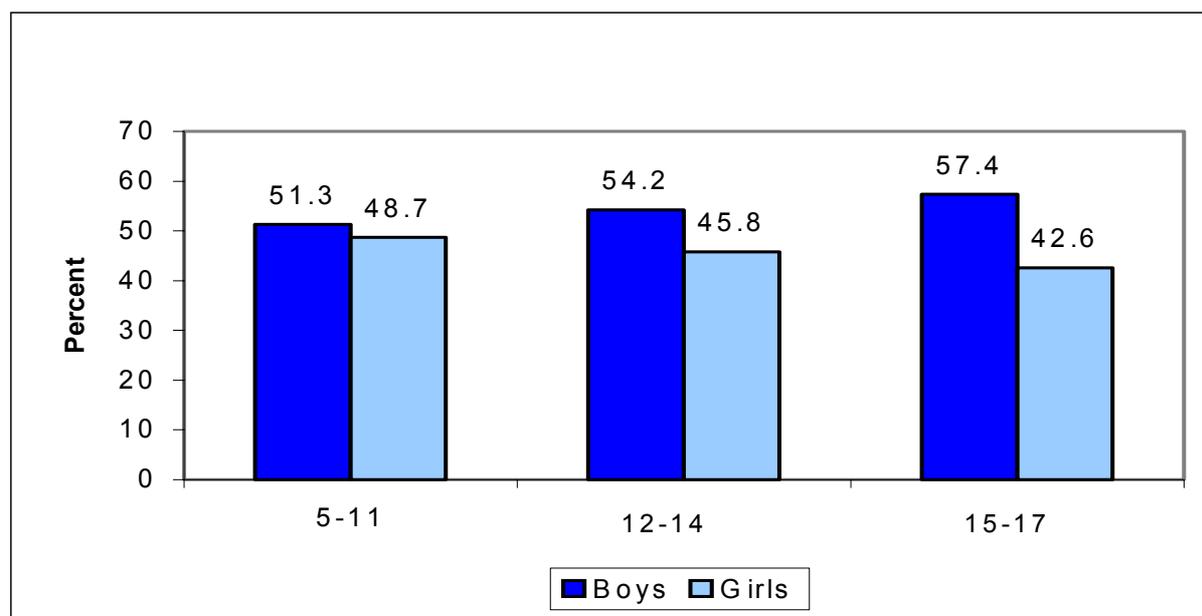
Table 6. Children in economic activity, child labour, and hazardous work (by gender and age group), 2000

Gender & age group	Economically active children (EAC) ('000s)	Child labour ('000s)	Child labour as per cent of EAC	Children in hazardous work (CHW) ('000s)	CHW as percent of EAC	CHW as per cent of child labour
5-11	109,700	109,700	100	60,500	55.2	55.2
Boys	56,300	56,300	100	30,700	54.5	54.5
Girls	53,400	53,400	100	29,800	55.8	55.8
12-14	101,100	76,600	75.8	50,800	50.2	66.3
Boys	52,700	41,500	78.7	30,600	58.1	73.7
Girls	48,400	35,100	72.5	20,200	41.7	57.5
Total 5-14	210,800	186,300	88.4	111,300	52.8	59.7
Boys	109,000	97,800	89.7	61,300	56.2	62.7
Girls	101,800	88,500	86.9	50,000	49.1	56.5
Total 15-17	140,900	59,200	42.0	59,200	42.0	100
Boys	75,100	34,400	45.8	34,400	45.8	100
Girls	65,800	24,800	37.7	24,800	37.7	100
Total	351,700	245,500	69.8	170,500	48.5	69.5
Boys	184,100	132,200	71.8	95,700	52.0	72.4
Girls	167,600	113,300	67.6	74,800	44.6	66.0

Table 7. Child labour and its gender distribution, 2000

Gender & age group	Child labour (in '000s)	Gender distribution (in %)
5-11	109,700	
Boys	56,300	51.3
Girls	53,400	48.7
12-14	76,600	
Boys	41,500	54.2
Girls	35,100	45.8
Total 5-14	186,300	
Boys	97,800	52.5
Girls	88,500	47.5
15-17	59,200	
Boys	34,000	57.4
Girls	24,800	42.6
Total 5-17	245,500	
Boys	132,200	53.8
Girls	113,300	46.2

Chart 1. Gender distribution of child labour, 2000



1.3 Children in hazardous work

1.3.1 By age group

Out of approximately 352 million economically active children ages 5 to 17, a little more than 246 million were in child labour that requires elimination, nearly 171 million of whom were working in hazardous situations or conditions in 2000. In other words, children in hazardous work constituted about half the total number of economically active children (48.5 per cent) and more than two thirds of those in child labour (69.5 per cent).

Table 5 demonstrates that throughout all age groups the majority of child labourers find themselves in hazardous work. A stunning 55 per cent of very young child labourers (i.e. those below 12 years of age) are already working in a hazardous occupation or situation. Indeed, the pattern is reinforced with increasing age. The older the child worker, the more likely it is that he or she is exposed to hazards at the workplace. The number of children in hazardous work as a percentage of child labourers reaches 66 per cent in the 12 to 14 age bracket.

Interestingly, we observe an inverse pattern when comparing the number of children in hazardous work to that of children at work in economic activity (Table 5). Here the percentage decreases from the above-mentioned 55 per cent of children ages 5-11 to 42 per cent in the 15-17 age category, reflecting perhaps the age-related increasing numbers of children in light and other permissible work.

1.3.2 By gender

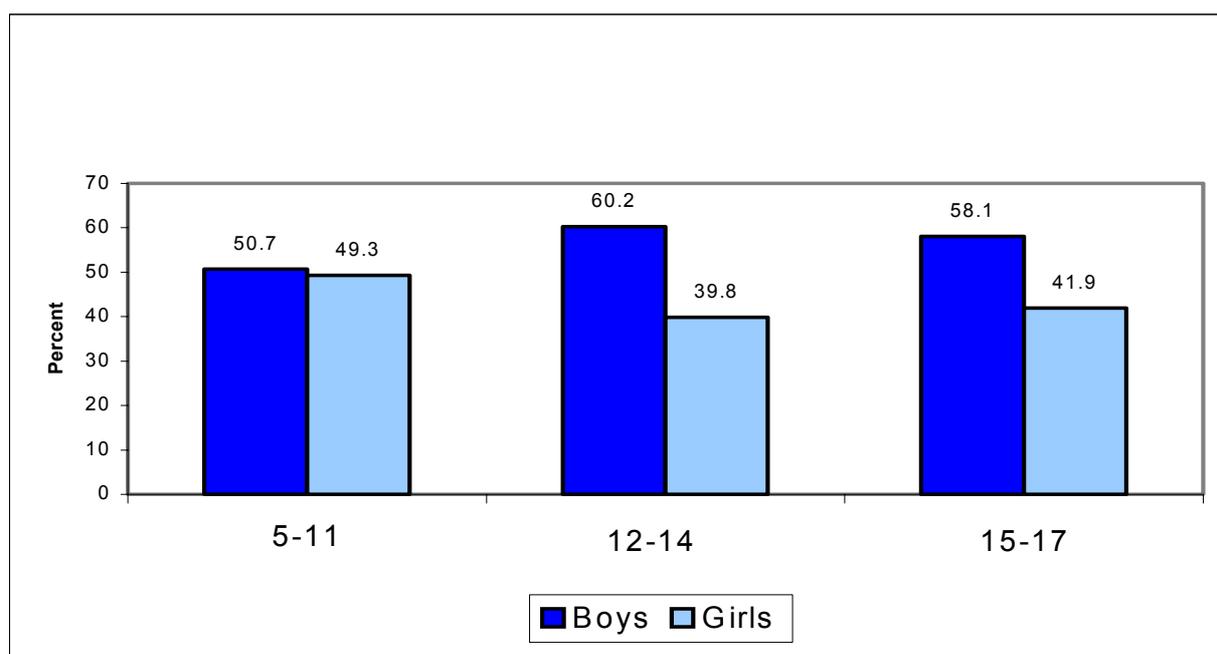
Boys outnumber girls in hazardous work across all age groups. For instance, in both the 5-14 and 15-17 year age groups, there were on average 10 million more boys exposed to hazards at the workplace than girls (Table 6). Seen in relative terms, among all children about one-half (52 per cent) of the working boys were in hazardous situations as compared with a little more than two in five working girls (44.6 per cent).

Table 8 and Chart 2 illustrate the gender distribution of hazardous work in the different age brackets. They confirm the dominance of boys in hazardous work. While the distribution is balanced in the youngest age category, a significant gap opens up in both the 12-14 and 15-17 age brackets, where boys account for about 60 per cent of children in hazardous work.

Table 8. Children in hazardous work and its gender distribution

Gender & age group	Children in hazardous work (‘000s)	Gender distribution (%)
5-11	60,500	
Boys	30,700	50.7
Girls	29,800	49.3
12-14	50,800	
Boys	30,600	60.2
Girls	20,200	39.8
Total 5-14	111,300	
Boys	61,300	55.1
Girls	50,000	44.9
15-17	59,200	
Boys	34,400	58.1
Girls	24,800	41.9
Total 5-17	170,500	
Boys	95,700	56.1
Girls	74,800	43.9

Chart 2. Gender distribution of children in hazardous work, 2000



1.4 Children in unconditional worst forms of child labour

In addition to the number of children in hazardous work discussed above, we estimated that there are about 8.4 million children involved in other worst forms of child labour as defined in ILO Convention No.182, Art. 3. For the purpose of our exercise, we grouped them into five categories: trafficking; forced and bonded labour; armed conflict; prostitution and pornography; and illicit activities (Table 9). In this report, they shall be referred to as “unconditional worst forms of child labour”⁵.

The figures for the unconditional worst forms of child labour are minimum estimates, based on conservative calculations. When no reliable figure was found for one country, it does not appear in the regional or global counting. No extrapolation from one country to another was made⁶. Neither did we attempt any extrapolation to the year 2000 in this case. However, none of the data used in the tally are older than three years.

Table 9. Estimated number of children in the worst forms of child labour

Worst form of child labour	Global estimate (‘000s)
Trafficked children	1,200
Children in forced & bonded labour	5,700
Children in armed conflict	300
Children in prostitution & pornography	1,800
Children in illicit activities	600
Subtotal	8,400⁷
Children in hazardous work	170,500
Total	178,900

Trafficking of children. Children were found trafficked to and from all regions of the world. About 1.2 million children are affected, involving both boys and girls of various ages. Gender and age seem closely correlated with the purpose of trafficking. Whereas boys tend to be trafficked for forced labour in commercial farming, petty crimes and the drug trade, girls mainly appear to be trafficked for commercial sexual exploitation and domestic service.

⁵ See Section 2 for detailed definitions of the unconditional worst forms.

⁶ See Section 3 for methodological details.

⁷ The subtotal does not include the 1,200,000 trafficked children in order to avoid double-counting. This is based on the assumption that children are generally trafficked into another worst form of child labour, such as prostitution.

Trafficking patterns and routes are often highly complex, ranging from trafficking within one country and cross-border flows between neighbouring countries to inter-continental and globalized trade. Most trafficked children appear ending up in another worst form of child labour. In order to avoid double-counting, the estimated number of trafficked children was not added to the total count of children in unconditional worst forms of child labour.

Children in forced and bonded labour. More than any other worst form of child labour, this is an area beset with severe problems of quantification⁸. We estimate that there are about 5.7 million children in forced and bonded labour, of which the overwhelming majority (5.5 million) seems concentrated in the Asia-Pacific region (Table 10). There is also evidence of forced and bonded child labour in the African and Latin American regions and some forced child labour seems to exist in developed countries. There were, however, no reliable estimates of its extent.

Children in armed conflict. It is estimated that approximately 300,000 children are being used in armed conflict around the world at any given time⁹. The African and Asian-Pacific regions account for the vast majority of child soldiers. Most of them are reported to be in the 15-17 age bracket. No reliable figures are available on the gender distribution of child soldiers, but boys seem to dominate clearly.

Children in prostitution and pornography. The commercial sexual exploitation of children is a global issue. About 1.8 million children are affected. It is prevalent in all major world regions, particularly so in Latin America & the Caribbean, the Asian-Pacific region and developed economies. Patterns are complex and tend to differ between countries and regions. For instance, whereas in some cases the commercial sexual exploitation of children seems clearly related to tourism, in others it mainly serves a domestic market. Most affected children are reported to be in the 15-17 age range.

Children in illicit activities. About 600,000 children are estimated to be engaged in illicit activities. Reliable data are difficult to come by. Those available mostly relate to drug production and trafficking. No particular age group seems prevalent.

⁸ See Sections 2 and 3 for a discussion of problems associated with data availability.

⁹ UN General Assembly, 55th Session, *Children in Armed Conflict*, Report of the Secretary-General, 2000 and Graça Machel, *The Impact of Armed Conflict on Children: A critical review of progress made and obstacles encountered in increasing protection for war-affected children*. International Conference on War-Affected Children, September 2000. Winnipeg, Canada. <http://www.waraffectedchildren.gc.ca/machel-e.asp>

Table 10. Estimated number of children in unconditional worst forms of child labour, 2000

Region*	Trafficked (‘000s)	Forced & bonded labour (‘000s)	Armed conflict (‘000s)	Prostitution & pornography (‘000s)	Illicit activities (‘000s)
Asia/Pacific	250	5,500	120	590	220
Latin America & Caribbean	550	3	30	750	260
Africa	200	210	120	50	n/a
Transition economies	200	n/a	5	N/a	n/a
Developed industrialized economies	N/a	n/a	1	420	110
Total (rounded)	1,200	5,700	300	1,800	600

* Regions represent origin of trafficking flows. In some cases origin and destination region are identical.

2 General definitions

2.1 Child and child age groups

A **child** is defined as an individual under the age of 18 years based on the 1989 United Nations Convention on the Rights of the Child and the ILO Convention on the Worst Forms of Child Labour, 1999 (No.182). Since it is commonly accepted that a child under five years of age is too young to be engaged in work (although there are some cases of exploitation or abuse by adults), or to start schooling¹⁰, we considered only the child population aged 5-17 for the purpose of our estimates.

Age is measured in number of completed years at last birthday.

Child age groups were broken down in two different ways. For the estimates on economic activity we applied the commonly used age brackets 5-9, 10-14 and 15-17. For the presentation of data on child labour and hazardous child work we cut the first two brackets in a different way, into 5-11 and 12-14¹¹, thereby following the logic of ILO Convention No.138 which allows light work of children in a developing country context from the age of 12.

2.2 Work

Work is defined in terms of **economic activity** in the sense of the System of National Accounts (SNA) 1993.¹² It corresponds to the international definition of employment as adopted by the Thirteenth International Conference of Labour Statisticians.¹³

Economic activity covers all market production (paid work) and certain types of non-market production (unpaid work), including production of goods for own use. Therefore, whether paid or unpaid, the activity or occupation could be in the formal or informal sector and in urban or rural areas. For example, children engaged in unpaid activities in a market-oriented establishment operated by a relative living in the same household are considered as working in an economic activity. Also, children working as maids or domestic workers in someone

¹⁰ UNESCO, *International Standard Classification of Education (ISCED)*, (Paris, 1997) which states that the customary or legal age of entrance to primary schooling is not younger than five years.

¹¹ See section 3.1.2 and appendix 1 on the question of age group harmonization and standardization.

¹² *System of National Accounts 1993* (Inter-Secretariat Working Group on National Accounts: Eurostat, IMF, OECD, United Nations, and World Bank, Brussels/Luxembourg, New York, Paris, Washington, D.C.)

¹³ ILO, *Resolution concerning statistics of the economically active population, employment, unemployment and underemployment*, Thirteenth International Conference of Labour Statisticians (Geneva, ILO, October 1982)

else's household are considered as economically active. However, children engaged in domestic chores within their own households are not considered as economically active¹⁴.

In line with the international definition of employment, one hour of work during the reference week is sufficient for classifying a person as at work in economic activity during that week. Included in the classification are also individuals with a job but temporarily absent from work due to illness, vacation and other similar absences.

Work was measured in relation to a reference week during the school year as opposed to a longer reference period such as a year. The reference week is a more convenient reference period as it permits a sharper measurement of economic activity, and minimizes the ambiguities due to the higher incidence of multiple statuses and changes in economic activity and work intensity that may arise during a longer reference period. Moreover, most sources of data on which the estimations rely have adopted the reference week as the basic reference period.

A simple activity status classification was adopted for the purpose of our global estimation. The activity status was defined in terms of three categories with a maximum of two levels:

1. At work in economic activity
 - a. At work only
 - b. At work and at school
2. At school, and not at work in economic activity
3. Neither at work nor at school
 - a. Household chores
 - b. Other (e.g., sick or disabled, at play or in informal education)

At each level of classification, the activity statuses are meant to be exhaustive and mutually exclusive so that each and every child should be classifiable in one and only one status. According to this scheme, the classification into the category “*at work in economic activity*” takes precedence over the “*at school*” category. Thus, children combining work and school will be classified as “*at work*” at the basic level of the classification, but identified separately at the second level of the classification. To be considered “*at school*”, the child should be attending a regular educational institution during the reference week. School enrolment does not necessarily imply school attendance.

Work of a domestic nature (household chores) performed by children in their own household are considered as **non-economic activities** and thus outside the “production boundary” as defined by the United Nations System of National Accounts (1993 Rev.3) for measuring GDP. Our estimates thus do not cover children working in non-economic activities. This is in line with international labour standards that provide for exceptions for household chores in the child's own household. The time children spend on these activities, however, can be substantial. In some cases, school enrolment or attendance is being jeopardized. Unfortunately, data on the extent of non-economic child work are very fragmented and not reliable enough to attempt a global estimation.

¹⁴ For further explanation on the concept of economic activity, see Hussmann, R., Mehran, F., Verma, V., *Surveys of economically active population, employment, unemployment and underemployment: An ILO manual on concepts and methods* (Geneva, ILO, 1990)

2.3 Child labour

Not all work performed by children is equivalent to “child labour” for abolition. Work in the sense of “economic activity”, as explained above, is a statistical definition. It does not necessarily match the provisions of international labour standards and national legislation. Minimum age conventions, such as the umbrella Minimum Age Convention, 1973 (No.138), include many optional and flexibility provisions.

The problem is how to draw a (statistical) line between **acceptable forms of work by children** (which may be regarded as positive) on the one hand, and **child labour that needs to be eliminated** on the other. In addition, another (statistical) line needs to be drawn between various forms of child labour and the worst forms of child labour, which require urgent action for elimination.

For the purposes of our global estimation, a single set of cut-off criteria was used for all countries. Taking international standards into account, efforts were made wherever possible to use the average level or criteria prevailing in national legislation. The choice of one set of criteria for this estimation was intended purely for the purpose of obtaining figures to allow the extent of the problem to be assessed. By no means do the chosen criteria intend to replace, revise or put into question current international labour standards or national provisions in force in each country. Inevitably, some situations included in these estimates may in fact be allowed in terms of national or international standards, and, in turn, certain other situations not included may be child labour that requires elimination.

Our concept of **child labour** is based on the ILO Minimum Age Convention, 1973 (No.138) which represents the most comprehensive and authoritative international definition of minimum age for admission to employment or work, implying “economic activity”. Convention No.138 stipulates that ratifying states fix a minimum age and it defines a range of minimum ages below which no child should be allowed to work. Minima vary according to the level of development and according to the type of employment or work (Table 11).

Table 11. Minimum ages according to the ILO Convention No.138

General Minimum Age	Light Work	Hazardous Work
<i>In general:</i>		
Not less than age of completion of compulsory schooling, and in any case not less than 15 years	13 years	18 years (16 years under certain strict conditions)
<i>Where the economy and educational facilities are insufficiently developed:</i>		
Not less than 14 years for an initial period	12 years	18 years (16 years under certain strict conditions)

As Table 11 illustrates, the minimum age for employment or work should normally not be less than 15 years, but developing countries may fix it at 14, and a number of countries have fixed it at 16. We used the age of 15 as a cut-off point for all countries in our global estimates.

The same Convention exempts children from 12 or 13 years old if engaged in “light work”. For the purpose of our estimates, we used 12 years as the global cut-off for light work. Thus, all children between 5-11, working in economic activities are considered to be in child labour that requires elimination. Working children aged 12 to 14 are considered in child labour, unless they perform light work.

Light work is notoriously difficult to define. ILO Convention No.138, in Art.7, stipulates that light work should (a) not be harmful to a child’s health and development and (b) not prejudice attendance at school and participation in vocational training nor “the capacity to benefit from the instruction received”. What does this mean in statistical terms? We decided on the following for the purpose of this study: Light work by children aged 12 to 14 is work which is not hazardous in nature (see definition of hazardous work below) and which does not exceed 14 hours per week. The chosen cut-off point is supported by ILO Convention No. 33¹⁵ and findings of research on the impact of child labour on school attendance and performance.

Children in the age group 15-17 are, in principle, allowed to work, because they have reached and surpassed the general minimum age. However, if they are engaged in hazardous work (due to the work's nature or conditions), their work becomes a worst form of child labour in urgent need of elimination.

Therefore, "**child labour**" as estimated in this document consists of **all children under 15 years of age** who are economically active **excluding** (i) those who are **under five years old** and (ii) those between **12-14 years old** who spend **less than 14 hours a week** on their jobs, unless their activities or occupations are hazardous by nature or circumstance. **Added** to this are **15-17 year old children in the worst forms of child labour**.¹⁶ Table 12 illustrates the classification of forms of work according to the above principles.

¹⁵ ILO Convention No. 33, Art. 3 (1)(c) sets two hours per day, on either school days or holidays, as the maximum for light work from 12 years of age. ILO Convention No.138 also requires such restriction of hours, but leaves the exact maximum to determination at the national level.

¹⁶ Only the number of children ages 15-17 in hazardous work was added, since - based on the data at our disposal - it was impossible to break down the estimates(s) for the unconditional worst forms of child labour into the various age categories (see also section 3.3).

Table 12. Child labour as defined for the purpose of global estimates

Age groups	Forms of work			
	<u>Non-hazardous work</u> (in non-hazardous industries & occupations and <43 hrs/week)		<u>Worst forms of child labour</u>	
	<u>Light work</u> (<14 hrs/week)	<u>Regular work</u> (≥14 hrs/week and <43 hrs/week)	<u>Hazardous work</u> (in specified hazardous industries & occupations plus ≥43 hrs/week in other industries and occupations)	<u>Unconditional worst forms</u> (Trafficked children; children in forced & bonded labour, armed conflict, prostitution & pornography, and illicit activities)
5-11				
12-14				
15-17				

The blue areas are considered as child labour in need of elimination as per ILO Conventions No. 138 and 182.

2.4 Hazardous work

Hazardous work by children is any activity or occupation which, by its nature or type has, or leads to, adverse effects on the child’s safety, health (physical or mental), and moral development. Hazards could also derive from excessive workload, physical conditions of work, and/or work intensity in terms of the duration or hours of work even where the activity or occupation is known to be non-hazardous or ‘safe’.

Both ILO Conventions Nos.138 and 182 define hazardous work only very generally as “likely to jeopardize/harm the health, safety or morals of children.” The list of such work must be determined at the national level after tripartite consultation.

Taking account of national classifications of hazardous child work, where they exist, we laid down and used for all countries the following criteria solely for the purpose of the estimates:

- any child working in mining and construction was considered in hazardous work;
- beyond mining and construction a number of occupations were considered to be of a hazardous nature (if they involved, for instance, work with heavy machinery or exposure to pesticides). The classification was based on (i) the stipulations contained in ILO Recommendation No.190 accompanying ILO Convention No.182 (see box below) and (ii) stipulations on hazardous work in national legislation (see Annex 3 for a list of such occupations and processes);

- any child below the age of 18 working 43 hours¹⁷ or more a week was considered to be in hazardous work (see also Recommendation No. 190, para. 3 (e)).

Recommendation No.190 on the Worst Forms of Child Labour (excerpt):

II. Hazardous work

3. In determining the types of work referred to under Article 3(d) of the Convention, and in identifying where they exist, consideration should be given, inter alia, to:

- (a) work which exposes children to physical, psychological or sexual abuse;
- (b) work underground, under water, at dangerous heights or in confined spaces;
- (c) work with dangerous machinery, equipment and tools, or which involves the manual handling or transport of heavy loads;
- (d) work in an unhealthy environment which may, for example, expose children to hazardous substances, agents or processes, or to temperatures, noise levels, or vibrations damaging to their health;
- (e) work under particularly difficult conditions such as work for long hours or during the night or work where the child is unreasonably confined to the premises of the employer.

It is important to note that our *statistical determination of hazardous work* by children does not take into account the following criterion:

- ILO Convention No. 138, Art.3, provides for exceptional authorization of work of a potentially hazardous nature under strict conditions as from 16 years of age, and ILO Recommendation No.190, Para.4 contains the same idea. We decided, however, to apply - for the purposes of this study - a single cut-off point of 18 years of age.

2.5 Unconditional worst forms of child labour

Pursuant to Article 3 of ILO Convention No. 182, the unconditional worst forms of child labour include:

- “(a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labour, including forced or compulsory recruitment, of children for use in armed conflict;*
- (b) the use, procuring or offering a child for prostitution, for the production of pornography or for pornographic performances;*
- (c) the use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties; ...”*

¹⁷ 43 hours is longer than most normal or usual hours of work per week for adults. Almost all countries have ‘normal’ hours of work per week as established by national labour legislation. Stipulations range from 35 hours to 46 hours, but most of them are in the range of 40 to 44 hours.

At the basis of our estimates are the following more detailed definitions for each category of the unconditional worst forms of child labour.

2.5.1 Trafficking of children

The most authoritative definition of trafficking under International Law to date is spelled out in the *UN Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children*.¹⁸ According to this instrument, child trafficking can be defined as "the recruitment, transportation, transfer, harbouring or receipt of a girl or boy of less than 18 year of age for the purpose of exploitation."

We limited our estimates to children trafficked for sexual and economic exploitation. This includes (i) child prostitution; (ii) other forms of sexual exploitation such as the use of children for pornography; and (iii) forced labour or services, slavery or practices similar to slavery and servitude.

2.5.2 Children in forced and bonded labour

Forced labour is defined in Article 2 (1) of the ILO Forced Labour Convention, 1930 (No. 29):

"The term forced or compulsory labour shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntary".

Forced child labour can be distinguished from other forms of child labour through the presence of one or more of the following elements: (i) a restriction of the freedom to move; (ii) a degree of control over the child going beyond the normal exertion of lawful authority; (iii) physical or mental violence; and (iv) absence of informed consent.

Bonded labour is a form of forced labour in which the element of coercion flows from a debt incurred by the worker. The Supplementary Convention on the Abolition of Slavery, the Slave Trade, and Institutions and Practices Similar to Slavery, adopted in 1956, defines debt bondage as follows (article 1(a)): "Debt bondage...is the status or condition arising from a pledge by a debtor of his personal services or those of a person under his control as security for a debt, if the value of those services, as reasonably assessed, is not applied towards the liquidation of the debt or the length and nature of those services are not respectively limited and defined".

While many reports provide estimates on forced or bonded labour, slavery or related phenomena, few are based on a definition in line with the ILO Forced Labour Convention, 1930, quoted above. Therefore, in each case a careful decision had to be taken as to what extent the available figures could be justifiably included in the global count.

¹⁸ *Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime*, United Nations, 2000 http://www.uncjin.org/Documents/Conventions/dcatoc/final_documents_2/convention_%20traff_eng.pdf

2.5.3 Children in armed conflict

We considered as a child in armed conflict any person under 18 years of age who is part of any kind of regular or irregular armed force or armed group in any capacity, including cooks, porters, messengers, and those accompanying such groups, other than purely as family members.¹⁹ It includes children recruited for sexual purposes and forced marriage.

While ILO Convention No.182 only refers to *forced recruitment*, we had to consider both *forced* and *voluntary* recruitment in our estimates, as it was impossible to separate them based on the available information. However, distinguishing between the two would have had only a relatively minor effect on the total number. There are two reasons. Firstly, many countries where voluntary recruitment under 18 occurs are not currently engaged in armed conflict, and thus would not have been included in our estimates. Secondly, there is a greater susceptibility of children to propaganda and peer pressure (as compared to adults) and the differences between forced and voluntary recruitment are often difficult to distinguish, especially in a situation of armed conflict.

2.5.4 Children in prostitution and pornography

We built our estimates on available data for the “commercial sexual exploitation of children”, a concept largely synonymous with child prostitution and pornography referred to in ILO Convention No.182.

According to the Optional Protocol to the Convention on the Rights of the Child on the sale of children, child prostitution and child pornography²⁰, child prostitution means “the use of a child in sexual activities for remuneration or any form of consideration”, whereas child pornography means “any representation, by whatever means, of a child engaged in real or simulated explicit sexual activities or any representation of the sexual parts of a child for primarily sexual purposes.”

2.5.5 Children in illicit activities

ILO Convention No.182, when referring to children in illicit activities, focuses on children involved in the production and trafficking of drugs. Given the general paucity of reliable data on children’s illicit activities (e.g. petty crimes such as small thefts), we followed this emphasis and concentrated our estimates on children in drug manufacture, including work in poppy plantations, and trafficking of illegal substances.

¹⁹ The definition is based on the *Capetown Principles*, adopted in the Symposium on the Prevention of Recruitment of Children into the Armed Forces and Demobilization and Social Reintegration of Child Soldiers in Africa, Cape Town, 30 April 1997. <http://www.pitt.edu/~ginie/mounzer/conventions.html#CapetownPrinciples>

²⁰ Optional Protocol to the Convention on the Rights of the Child on the sale of children, child prostitution and child pornography, adopted by the UN General Assembly on 25 May 2000, entered into force on 18 January 2002. (www.unhcr.ch/html/menu2/dopchild.htm)

3 Methodology

3.1 Estimates on number of children in economic activity

3.1.1 Sources

The global estimates for children at work in economic activity are based on 29 national household surveys mostly conducted in the late 1990s. Ten surveys were specifically designed to measure child labour and conducted under the ILO SIMPOC (Statistical and Information Monitoring Programme) project: Kenya 1999, Namibia 1999, Nigeria 2000, Pakistan 1996, Portugal 1998, South Africa 1999, Sri Lanka 1999, Turkey 1994, Ukraine 1999, and Zambia 1999.

The other 19 surveys are a mixture of broad-based household and community surveys with modules on different social concerns including employment of children or teenagers below 15 years of age. Most of these surveys were conducted as part of the World Bank's programme of Living Standards Measurement Surveys (LSMS): Azerbaijan 1995, Bolivia 1999, Brazil 1998, Cambodia 1996, Cameroon 1996, Colombia 1998, Costa Rica 1998, Egypt 1998, El Salvador 1999, Ghana 1997, Kazakhstan 1996, Mauritania 1995, Mexico 1996, Paraguay 1999, Philippines 1998, Senegal 1995. Three other surveys were conducted independently as part of national statistical programmes: Bangladesh 1999, India 1994 and Yemen 1997.

The countries were selected on the basis of stratification by geographical region and by size of country in terms of the number of children in the 5-17 years old age category. The regional groupings are those adopted by the ILO *Key Indicators of the Labour Market, 2000-2001*. There are six regions: Asia and the Pacific, Latin America and the Caribbean, Sub-Saharan Africa, Middle East and North Africa, Transition Economies, and Developed Industrialized Economies.

Within each region, three size categories of countries were considered in terms of their child population (large, medium, and small) and representative countries were selected giving higher likelihood of selection to large countries, and lower likelihood to small countries. The 29 countries combined cover slightly less than half the world population in the 5-17 years old category. Although not truly a random sample of countries, it is convenient to assimilate it to a stratified sample of countries selected with probability proportional to size, representing the world child population.

The decision to limit the data sources to a sample of countries as opposed to all countries with available data was based on two considerations: 1) to improve accuracy by careful attention to a manageable and representative number of countries; 2) to take advantage of theoretical results by mimicking a probability sample of countries as closely as possible.

3.1.2 Harmonization

The 29 national data sets were harmonized with respect to three aspects: age groups, reference year, and measurement of work.

Standardization of age groups was necessary in three circumstances: (a) the national data were grouped in a broader category, e.g., 15-19 year olds, while the required age group was 15-17 year olds; (b) the national data were grouped in a narrower category, e.g., 12-14 year olds, with no separate data for 10-11 year olds; and (c) no data at all were available for the required age group, for example, the 5-9 year olds.

All three cases were treated as part of the general problem of interpolating and extrapolating grouped data. Within each age group, a simple functional form (triangular distribution) was assumed for the underlying age distribution, and its single parameter was estimated using data from the available adjacent age groups. The triangular distribution is a generalization of the uniform distribution and appears to fit well for slightly increasing or slightly decreasing data, such as data on work or school attendance. (See Appendix 1 for details.)

A *common reference year*, 2000, was adopted and the national data were extrapolated to mid-year 2000. The national data on population was extrapolated using the average population growth rate of the country between 1995 and 2000 as calculated by the United Nations Population Division.²¹ The national age-group adjusted work-population ratios were then applied to the extrapolated population figures to obtain the estimated number of working children in the reference year 2000.

Adjustment for variations in the measurement of work was carried out in order to account for the differential probing of work activity of children in the national surveys. SIMPOC surveys designed specifically to measure child labour in general led to higher work-population ratios than non-SIMPOC surveys. The SIMPOC effect was measured by fitting a logistic regression to the work-population ratios in each gender and age category, with a dummy variable for distinguishing SIMPOC from non-SIMPOC surveys. The estimated regression coefficients of the dummy variables were then used to adjust the non-SIMPOC survey results to the supposedly more accurate levels obtained from the SIMPOC surveys. (See Appendix 2 for details.)

In the calculations, three SIMPOC surveys, in terms of application of the “SIMPOC effect” were treated as non-SIMPOC because of their apparent non-standard application of SIMPOC methodologies (Kenya, Pakistan and Zambia). Also, due to the limited number of observations, a single set of SIMPOC effects was estimated for the world as a whole, and assumed to be the same in all regions. An exception was made, however, for 5-9 years old in Asia, for whom the SIMPOC effect was multiplied by two to account for the unusually low survey figures for that region.

To control for possible outliers, the resulting work ratios were compared with the corresponding labour force participation rates in the ILO’s LABPROJ database²² produced as

²¹ United Nations, *World Population Prospects: The 2000 Revision*, New York 2001

²² The ILO LABPROJ database provides independent estimates and projections of the labour force participation rates for 178 countries and territories by sex and five-year age groups (from 10 to 64 years and 65 years and over) for the period 1950-2010 at ten-year intervals as well as for 1995. (www.ilo.org/public/english/bureau/stat/child/actrep/ecacpop.htm)

part of ILO's Programme on Estimates and Projections of the Economically Active Population, 1950-2010.²³ A work ratio found to be lower than the corresponding LABPROJ rate was replaced by the higher value. Only a few outliers were detected under this procedure.

3.1.3 Global inference and regional breakdown

After carrying out the harmonization process, the resulting adjusted data for the 29 sample countries formed the basis for estimating global aggregates. The global inference was carried out in three stages. First, the adjusted national data for each gender and age category was used to produce a ratio estimate to match the corresponding UN population data published by the United Nations World Population Prospects.

Then, the resulting ratio estimate was weighted by the inverse of the probability of selection of the country to produce regional estimates. The probability of selection was calculated by assimilating the 29 sample countries as a random sample of countries, stratified by region and selected with probability proportional to the number of children in the 5-17 years old age category.

At the last stage of estimation, the regional estimates were simply aggregated by arithmetical summation to obtain world totals. The procedure ensures that the resulting global estimates of the number of working children are consistent with the demographic data on the global number of children in the different sex and age categories.

The national datasets used for producing global estimates contain too few countries in a given region to lead to sufficiently accurate regional estimates. Thus, the regional breakdown of the global estimates was obtained by an alternative method based on missing value theory. For each sex and age category, imputed values of the work-ratio of the missing countries were obtained by the predicted mean of the model that links the work-ratio to the labour force participation rate for that particular sex and age category, and region. LABPROJ data cited earlier were therefore used as covariate for imputing work-ratios for the missing countries not among the 29 sample datasets.

The imputation was carried out using the specialized software SOLAS 2.0 for missing data analysis. The predicted mean option of the single imputation method was adopted and applied to the logistic transformation of the available data on work-ratios and labour force participation rates. The ordinary least square estimation method embedded in SOLAS 2.0 appears to lead to more stable results with data in logistic units than in original percentage units.

²³ ILO *Economically Active Population 1950-2010*, Fourth Edition (Rev. 1), CD-Rom, 2001.

3.1.4 Evaluation

The range of imprecision of the estimates may be evaluated by computing their sampling variances, giving a measure of how different the results would be had all countries been included in the study. The calculated margins of error for the global estimation by age group were found to be low, ranging from +/- 0.6 per cent to +/- 2.4 per cent.

Also, one may measure the effect of the various non-sampling assumptions made in constructing the estimates by recalculating the aggregates with neutral or alternative assumptions. Here the figures were evaluated for their internal consistency and against external sources.

For both girls and boys, the estimates show, as expected, increasing values of work-rate with age. As one should also expect, the sharper increase happens between the age groups 10-14 and 15-19, as opposed to between the age groups 5-9 and 10-14. Also, the estimates correctly show that the differential work-ratio between boys and girls reverses at the age group 10-14 and increases thereafter.

Comparing among each sex and age category, the work-ratios obtained here with the corresponding labour force participation rates from LABPROJ gives the following results as presented in Table 13.

Table 13. Comparison of global estimate work-ratio results with LABPROJ labour force participation rates

Age group	Work ratio in our global estimates (%)	Work ratio in LABPROJ (%)	Difference
10-14			
Both genders	23.0	11.3	+11.7
Male	23.0	12.2	+10.8
Female	22.9	10.4	+12.5
15-17²⁴			
Both genders	42.4	36.5	+5.9
Male	44.1	39.4	+4.7
Female	40.7	33.5	+7.2

It can be observed that the differences are relatively smaller for the 15-17 year olds, but more substantial for the 10-14 year olds. The substantial differences for the 10-14 year olds should be attributed to the underestimation of the LABPROJ figures that are based essentially on labour force and other household surveys, notoriously weak at measuring labour force

²⁴ The calculation for the split age category 15-17 years old is reported in Mehran, F., "Estimating the Economically Active Young Population (15-17 Years Old)," Mimeograph, ILO Bureau of Statistics, Geneva, 14 August 2001.

participation at the tails of the age distribution. A study comparing the ILO LABPROJ data for 10-14 year olds and UNESCO school enrolment data for 44 countries concluded that the LABPROJ data underestimated the economic activity of the 10-14 years old by a wide margin, on the average, 15 percentage points.²⁵

In that study, based on UNESCO data adjusted for age differences in enrolment in different countries, the average school enrolment rate for the 10-14 year olds in 1995 was estimated to be 77.6 per cent. For 2000, the percentage of children 10-14 years old attending school but not working is estimated to be 66.9 per cent as shown (Table 14). In addition, in that age group, it is estimated that 9.9 per cent combine school and work, leading to a total estimate for school attendance of about 76.8 per cent. The comparison between the school enrolment and school attendance figures shows a positive difference of +0.8 percentage point, as one should expect, since school enrolment must be larger than school attendance.

Table 14. Activity status of children in 2000

	Age groups		
	5-9 year olds	10-14 year olds	15-17 year olds
Number of children (‘000s)	600,200	599,200	332,100
Percentage at work	12.2	23.0	42.4
- at work only	5.4	13.1	31.1
- at work and at school	6.8	9.9	11.3
Percentage at school, but not at work	68.0	66.9	43.4
Percentage neither at school nor at work	19.8	10.1	14.2

Table 14 also shows that some 10% of children aged 10-14 are neither at school nor at work. Most of these children are engaged in household chores not considered as economic activity. The percentage is much higher (almost double) among 5-9 year old children, mainly because many of these children are below the starting age for schooling in their country.

Finally, the measurement of the SIMPOC effect and its use for adjusting non-SIMPOC data may be subject to criticism. It can be argued that since SIMPOC surveys are supposedly carried out in countries in which child labour is thought to be a problem, the SIMPOC effect would be a biased estimate of the variation in the measurement of work in non-SIMPOC surveys.

²⁵ Mehran, Farhad, “ILO labour force participation rates for 10-14 years old versus UNESCO school enrolment ratios,” *ILO Bulletin of Labour Statistics*, Geneva, 2000-3, pp. XI-XXI.

3.2 Estimates on child labour and children in hazardous work

3.2.1 Data sources

As explained in Sections 2.3 and 2.4, determining whether a child is in child labour that requires elimination and, on top of that, in hazardous work, depends not only on the age, but also on the type of activity and other characteristics of work performed. Statistical classifications of activities or occupations, however, often do not match these criteria. It was therefore necessary to make a number of assumptions as to whether economic activities or occupations are to be considered as hazardous. The smallest or most detailed units or sub-units of the international standard classifications of economic activities and occupations are, respectively, the 4-digit level of ISIC (International Standard Industrial Classification) Rev.3 (United Nations 1990) and the 3 or 4-digit level of ISCO (International Standard Industrial Classification of Occupations) ISCO-88²⁶. Unfortunately, only a limited number of countries have the required data at these levels relating to 5-17 year olds, and even fewer for 5-9 year olds. As a result, the data of the countries with the most detailed classifications (3-digit level in our case) were considered as priority for constructing absolute numbers and ratios in the first of three rounds of estimation on child labour and hazardous child labour at the global level.

The 3-digit level classification of occupations of children was identified by a thorough analysis of the micro-level data of each country within each 1-digit level of ISIC. This was followed by the listing of their codes and corresponding descriptions. The list was then used for identifying ‘hazardous’ and ‘non-hazardous’ occupations, based on the stipulations of ILO Convention No.182, Recommendation No. 190 and a compilation of occupations and working environments hazardous to child workers as identified by national legislation (Annex 3). The ‘non-hazardous’ occupations at the 3-digit level were analysed further by age group and hours of work.

During the first round of estimation and based on the respective totals of children in “child labour” and in “hazardous work” situations within each occupation (i.e., 1-digit ISCO) and using the respective total numbers of children economically active in that same occupation, single ratios were computed for the different age groups and by gender. In the second round, these ratios were applied to each 1-digit occupation for the countries whose raw data did not contain further occupational details. In the third round, the totals produced for all occupations at 1-digit level and for all countries were merged together into absolute numbers and single ratios of child labour and children in hazardous work were computed. The final global estimates on child labour and hazardous child labour were extrapolated by applying these ratios to the global estimates of economically active children (Chart 3).

The key variables on which raw data were required for the purposes of analysis at different levels are the following:

- (a) gender;
- (b) age groups (5-11, 12-14, 15-17 years);
- (c) industry at most detailed classifications of ISIC Rev. 3 (UN, 1990);
- (d) occupation at the most detailed classification of ISCO-88; and

²⁶ ILO: *International Standard Classification of Occupations: ISCO-88* (Geneva, ILO, 1990)

(e) hours worked.

For the purposes of the estimates, three sources of information were used:

- a) IPEC/SIMPOC national child labour surveys
- b) The World Bank's Living Standards Measurement Surveys (LSMS), as well as other household-based large-scale labour force surveys (LFS)²⁷
- c) Estimates of the economically active children as presented in Section 1

3.2.2 Extrapolation

First round estimates based on SIMPOC surveys

For each country, by gender and age group, the following were identified:

Industry: children in hazardous industries (HI), i.e., mining and construction, by age and gender:

- HI1 for 5-11 year olds
- HI2 for 12-14 year olds
- HI3 for 15-17 year olds

Occupation: Among the children not in hazardous industries, separate identification was made of children in "hazardous" occupations (HO) and "non-hazardous" occupations (NO), by age and gender.

- HO1 for 5-11 year olds
- HO2 for 12-14 year olds
- HO3 for 15-17 year olds

Hours of work: Among those not in hazardous industries and not in hazardous occupations, distinctions were made for number of hours worked (H), by age and gender, in order to exclude children in light work from estimates of child labour and to identify children working excessive hours.

- for 5-11 years olds, by gender:
 - H1 less than 43 hours
 - H2 43 hours or more
- for 12-14 year olds, by gender:
 - H3 14 hours or more
 - H4 43 hours or more

²⁷ SIMPOC surveys contain detailed information on working school age children as obtained through large-scale household-based sample surveys designed specifically for quantifying activities and occupations of youngsters, their conditions of work, etc. Given its suitability for measuring "child labour" in all its forms, including working conditions and consequences, this source was used as a priority. In contrast, LSMS - not primarily designed to measure child labour but a number of other social indicators - typically lacked detailed occupational breakdowns and often lacked data on all age categories of children.

- for 15-17 year olds, by gender:
H5 43 hours or more

Therefore, the ratios for child labour and hazardous child labour are the following:

Child labour by age group and gender:

- for 5-11 year olds, by gender:
 $HI1 + HO1 + H1 + H2 =$ all economically active children (ages 5-11)
- for 12-14 year olds, by gender:
 $HI2 + HO2 + H3$
- for 15-17 year olds, by gender:
 $HI3 + HO3 + H5$

Total child labour, as obtained from SIMPOC surveys, by age group and gender:

$$(HI1 + HO1 + H1 + H2) + (HI2 + HO2 + H3) + (HI3 + HO3 + H5)$$

Children in hazardous work by age group and gender:

- for 5-11 year olds, by gender:
 $HI1 + HO1 + H2$
- for 12-14 year olds, by gender:
 $HI2 + HO2 + H4$
- for 15-17 year olds, by gender:
 $HI3 + HO3 + H5$

Total children in hazardous work as obtained from SIMPOC surveys, by age group and gender:

$$(HI1 + HO1 + H2) + (HI2 + HO2 + H4) + (HI3 + HO3 + H5)$$

Second round estimates based on LSMS, other SIMPOC surveys, and LFS

Children in hazardous work

Each of the additional data sets not used in the first round of estimates had information at the 1-digit industry level. Children in hazardous industries were thus calculated as above. These additional surveys did not, however, provide information at the 3-digit ISCO classification level. Thus, the ratios of hazardous occupations established in the first round were applied to the distribution of economically active children (excluding those classified in hazardous industries to avoid double counting) by 1-digit ISCO classifications. Furthermore, at the time the study was undertaken, detailed breakdowns of hours of work were not available for these additional source countries. Consequently, the ratio of children working excessive hours as established above were applied to the numbers of children in these additional available data sets who were not in hazardous industries, nor in hazardous occupations.

Production of consolidated totals was made by summing the absolute numbers of children coded as being in child labour and hazardous work, based on the first and second rounds.

Computation of a single ratio was made by dividing the totals by the total number of economically active children, by age group and gender.

Third round estimates based on ILO Bureau of Statistics data

Global estimates on child labour

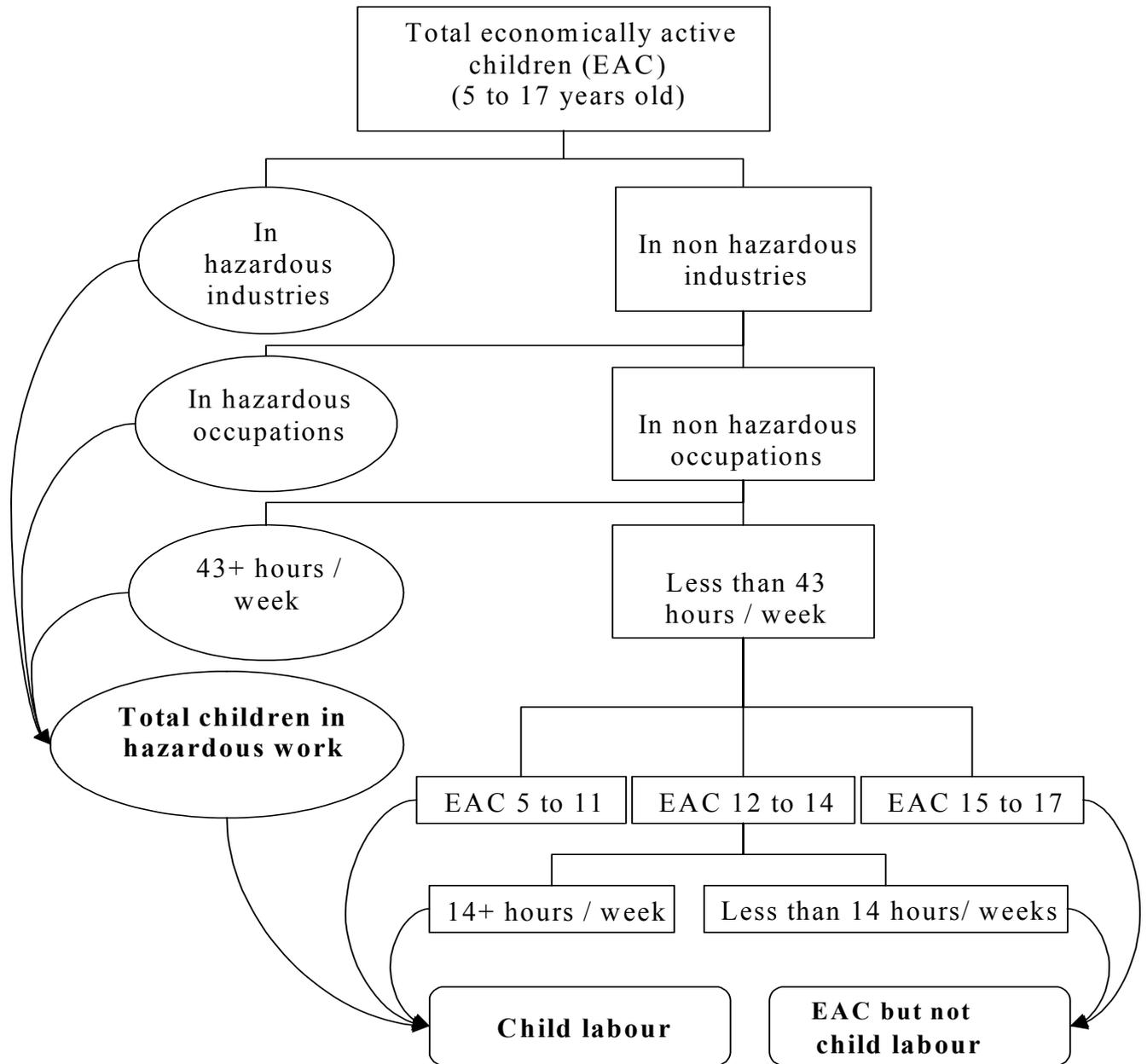
Extrapolation of the estimates on child labour were made by applying the single ratio for each age group by gender obtained in the second round to the global estimates of economically active children (see Section 1), by age group and gender.

Global estimates of children in hazardous work

Extrapolation of the estimates on hazardous work were made by applying the single ratio for each age-group by gender to the global estimates of economically active children, by age group and gender.

Chart 3. The estimation process of constructing global estimates for child labour and children in hazardous work

CONCEPTUAL FRAMEWORK



3.2.3 Evaluation

At the outset, it should be noted that because of a number of limitations, the macro-level estimates that have been produced on child labour and children in hazardous work must be interpreted with caution. One important limitation stems from the lack of adequate individual country-level raw-data containing all the required information. As a result, only a small number of national surveys were used to compute the relevant ratios in the first round. Again because only a few country-level micro-files provided information on some of the key variables, the ratios obtained in the first round were applied to another relatively small number of surveys in the second round for calculating the final ratios. These latter were, in turn, used for extrapolating the global estimates from the globally adjusted figures on the economically active children.

All the surveys are household-based samples undertaken at the national level in the respective countries. There are, however, major differences between the sources in their objectives, the most important being the fact that the SIMPOC surveys are designed specifically for quantifying the child labour phenomenon in all its facets, whereas the LSMS are formulated for measuring living standards, and labour force surveys are primarily concerned with the measurement of the size and socio-economic composition or characteristics of the adult work force. Thus, while the SIMPOC surveys focus on working conditions of economically active children, including work-related injuries and hazards, the other two types of surveys cover only very little of these, if any. Consequently, the SIMPOC survey instruments are formulated in some detail in order to probe into and capture all aspects of children's activities and occupations, which, for the most part are 'hidden'.

Another important difference, which has a positive impact on the quality of the final statistical results, is the fact that relatively large sample sizes are used in SIMPOC surveys. This is because of over-sampling, since most of children's activities are not only 'invisible', but are much more diversified than those of adults, particularly in the urban core. As a result, the SIMPOC sample sizes of the surveys considered for the first round of the estimates range between 8,000 households in the smallest country to more than 50,000 households in large countries. In contrast, those for LSMS are usually between 2,000 and 5,000 households or dwellings. The LFSs in Brazil and India have used, respectively, 115,000 and 120,000 households; but these are in due proportion to the size of each country, particularly India, as compared with the others. The larger the sample size, the less significant may be sampling errors of estimates.

It has become increasingly evident that, because of all the factors mentioned above, the SIMPOC surveys greatly assist in the production of superior information on working children, particularly those under 15 years of age and still better on those under 10 years, not only in terms of capturing the incidence of child labour, but also in the quality of the detailed statistical results. Moreover, although not exactly the same, one could observe from the 3-digit ISCO analysis a certain degree of similar patterns in the activities and occupations of children in the SIMPOC surveys.

Wherever the most recent international standards of industries and occupations were not used by the countries, their classifications were converted to ISIC 3rd Rev (UN 1990) and ISCO-88 (ILO 1987).

Given the advantage of the SIMPOC surveys in measuring children's work activities, they were used as a priority in the first round of the analysis of their respective raw data for computing the first series of ratios. Unfortunately, there were only seven surveys consisting of the required detailed information out of 13 completed at the time of the project. For the analysis on industries, however, all the surveys (SIMPOC, LSMS, LFS) had data available.

For the second round, similar analysis of the raw-data of several countries was carried out and 15 surveys were found to contain much of the necessary details. Six of these were SIMPOC surveys, seven were LSMSs and two LFSs in Brazil and India. Given the magnitude of the population of each of these two countries in their respective region the national statistics office was contacted and the raw data obtained. Fortunately, both data sets contained much of the information needed.

The survey reference years of the countries included in the first and second rounds of the estimates range between 1996 and 2001, although most of them were conducted between 1998 and 2000. However, the ratios for the different categories discussed above were computed without making adjustments for the variation in the reference periods. It is assumed that such corrections are not important or significant enough at the ratio-levels.

A point to be noted regarding the global estimates on children in hazardous work concerns the difficulty encountered in deciding on an activity or an occupation which may lie at the dividing line between hazardous and non-hazardous. For instance, some of the descriptions in the list provided in Annex 3 may not translate directly into ISIC or ISCO criteria. In addition, two or three related types of activities or occupations may be lumped together in a single code; and if one activity is deemed to be hazardous it cannot be identified alone. Since the hazardous nature or circumstance of an activity or occupation was not one of the objectives of ISIC or ISCO when classifications were established as international standards, the most detailed level of either of them does not always provide a clear distinction between hazardous or non-hazardous work. In all such borderline situations, conservative decisions were made, generally classifying occupations and activities in doubt as non-hazardous.

3.3 Estimates on unconditional worst forms of child labour

The findings presented in Section 1.4 are based on a comprehensive secondary data review, which was carried out in four steps: data collection; data validation; data selection; and calculation of the global estimates (Chart 4). In contrast to the methodologies employed for the global estimates on economically active children, child labour and children in hazardous work, no micro-data analysis was undertaken. It has to be noted that national micro data sets on unconditional worst forms on child labour are almost non-existent. This is an area where there is a severe dearth of sound statistics and an urgent need for development of appropriate survey tools and methodologies.

Step 1: Data collection. Data collection was undertaken in two phases: (a) the identification of pertinent sources, and (b) the extraction of data from these sources.

(a) Source identification:

Sources of seven main origins were taken into consideration:

- ILO sources, in particular IPEC reports;
- other UN and international organizations such as EUROPOL, IOM, OSCE, UNICEF, UNDCP, etc.
- trade unions and employers organizations;
- prominent and relevant non-governmental organizations, e.g. the Global March Against Child Labour;
- governments;
- knowledgeable academic institutions; and
- individual experts.

Data were gathered by access to specific databases, through comprehensive internet searches, as well as by letter, email, telephone calls, and interviews with key informants. It comprised qualitative and quantitative studies and reports, project documents, local surveys, fact sheets, and testimonies.

(b) Data extraction:

Once a source had been identified, the second phase was the data extraction from this source. Through studying the source, data items were constructed as sextuplets, based on the following questions: *Who, what, where, how many, from where, when*. Based on this information, they were entered into a preliminary database.

- “**Who**” provided the characteristics of children according to gender and age, where and whenever possible. Unfortunately, only a small percentage of the sources studied concentrated on children. This is particularly true for trafficking (where data on children are usually lumped together with data on adults) and for forced labour (where hardly any child specific study is available).
- “**What**” described the nature of child labour performed and entailed a verification of the extent it conformed to the definitions as presented in Section 2.5.
- “**Where**” defined the location. Sometimes, the source identified a specific country or district, in other cases data were reported only on a global or regional scale. The latter type of information, if selected, was used as reference data.
- “**How many**” was not always provided as an *absolute figure*. Sometimes only a *percentage* was given (with or without the total as reference), or a *general statement* such as “a vast majority of...”, or “many”, or an *estimate*, e.g. “millions of...”, “Hundreds of thousands of...”.
- “**From where**” identified the origin of the data item. In many cases, it was a quotation from another source.

- “**When**” was not always a specific point in time. Sometimes, it was rather stated as a period of time or in an ambiguous way (“in recent years”), or it was not given at all. Difficulties were encountered especially for data items related to child trafficking. Here, statistics were either stated on a yearly basis, measuring a flux, or as a “snapshot”, measuring the number of trafficked children in a specific situation, i.e. when the trafficking occurred.

Step 2: Data validation. Once the data item was built and entered into the preliminary database, it underwent a series of tests: Is the primary source known and the data recent? Is the situation pertinent to ILO Convention 182? If not, can the data be refined to fit the text of the Convention? Is the data a national estimate? If not, is the figure significant enough to be kept as a minimum estimate?

The result was either the rejection of the data (in which case no memory of it was kept) or the decision to keep it in the preliminary database. No limit to the number of data entries per country or per worst form was imposed at this stage. Altogether, around 400 data items were kept in the preliminary database at the end of step 2.

Step 3: Data selection. For each worst form and country, the input to the step of data selection was the data validated in step 2. The output was one single estimate for each worst form in each country for which data were available.

When can a figure be regarded as reliable? There is no easy answer to this question. To begin with, it is important to be aware that a figure is not necessarily true or reliable simply because it has often been quoted. There are many examples where doubtful information is widely quoted and propagated until its first serious verification. This can result in considerable over- or underestimation of the extent of the worst forms of child labour.

To avoid such unquestioned reproduction of figures, two main filters were applied in the selection process. The first one was to test the consistency of the estimate with other national figures. The second one was to request experts to verify it. Based on this procedure, it was not necessarily the official figures that were adopted. For instance, in the cases of sexual exploitation and trafficking, which are often closely related, it proved to be useful to test the consistency of one national figure with a national figure from another country.

As a result of the selection process, two different kinds of data items were selected for entry into the main database. Some were the result of a calculation made from several items out of the initial data collection; others, which appeared reliable, were carried over directly from the preliminary database. At the end of step 3, about 160 different data items entered the main database.

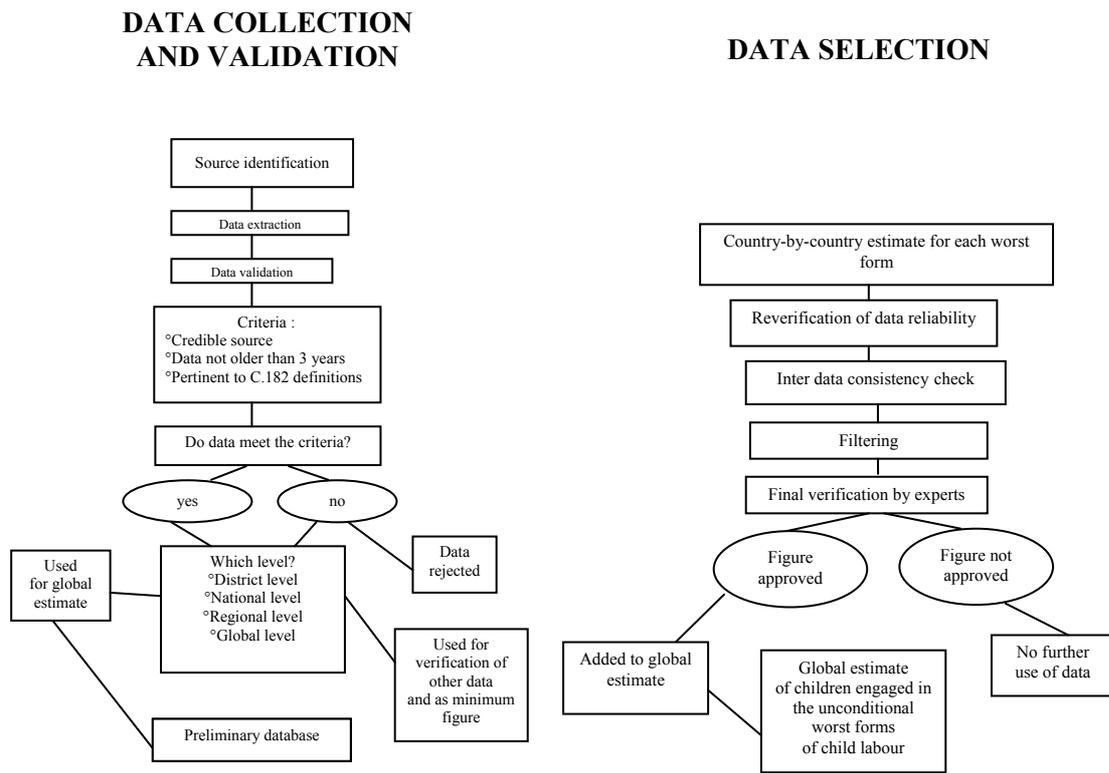
Step 4: Global estimate construction. All regional figures were constructed on the basis of the previous data selection, and then compared to known regional figures.²⁸ No attempt was made to extrapolate any existing data to other countries, for the incidence of the worst forms of child labour is too locally specific to justify such a procedure. This is true not only between countries, but also for the situation within a given country. For example, commercial

²⁸ The only exception is forced child labour in Africa, where available data was not detailed enough to build a good estimate. It was therefore decided to use the UNICEF regional estimate.

sexual exploitation is often found in some towns, and not in other parts of the country. Likewise, bonded labour may occur in some districts or states, and not in others.

Nor was it deemed appropriate, in the absence of established trends, to extrapolate from “old” figures to build a 2000 figure. Therefore, the regional estimates for the unconditional worst forms of child labour are simply the sum of the selected available national estimates. Hence, they should be considered as minimum figures.

Chart 4. The estimation process of constructing global estimates for unconditional worst forms of child labour



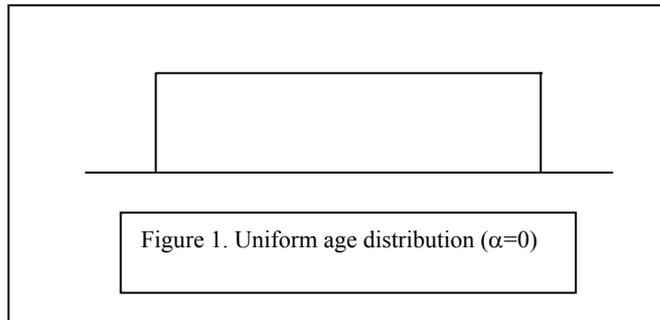
Appendices

1. Standardization of age groups

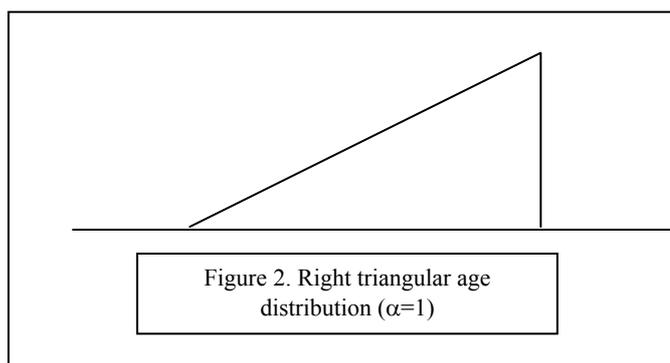
The age groupings used in the surveys may differ from the standard age groups adopted for the present study. Three situations may arise: (a) the available data are grouped in a broader category than prescribed, e.g., the national data are for 15-19 year olds, while the required age group is 15-17; (b) the available data are grouped in a narrower category than the prescribed one, e.g., the national data are presented for 12-14 year olds, with no separate information for 10 to 11 year olds; and (c) no national data exists for the required age groups, e.g., no data for the 5 to 9 age category.

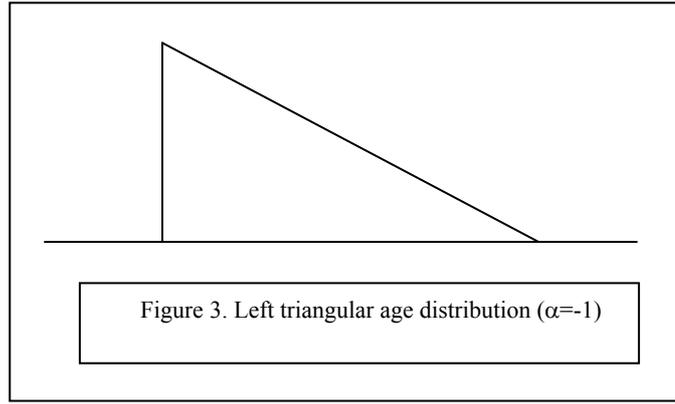
The harmonization of the data for each of these cases may be treated as part of a general problem of interpolating and extrapolating grouped data. By assuming a functional form for the underlying age distribution, it is possible to interpolate and extrapolate the available grouped data into broader and narrower age groups.

Triangular age distributions. For a given age interval, a-b, where a is the lower age limit and b is the upper age limit, denote by $f(x)$ the conditional density distribution of the age of the relevant population on this interval. If the distribution is uniform over the interval then $f(x)$ would take the form: $f(x) = 1/(b-a)$.



A more general form of density function that may be more appropriate for variables such as economic activity and schooling is given by $f_{\alpha}(x) = 1/(b-a) + 2\alpha(x-m)/(b-a)^2$, where $m = (b+a)/2$ is the mid-point of the interval and α is a parameter defining a particular distribution function $f_{\alpha}(x)$. For $\alpha=0$, it reduces to the uniform distribution; for $\alpha=1$, to a triangular distribution skewed to the right; and for $\alpha=-1$, to a triangular distribution skewed to the left, as shown graphically below:





In general, the formula for calculating the proportion of persons below a certain age, say x , within the age group a to b , is obtained by integrating $f_{\alpha}(x)$ from a to x , leading to the cumulative distribution function,

$$(1) \quad F_{\alpha}(x) = (x-a)/(b-a) - \alpha(b-x)(x-a)/(b-a)^2.$$

In any given application, the parameter α is unknown and may vary depending on the particular sex and age category, the variable in question, and the national circumstances. A simple method of estimating α consists of using the information on an adjacent age group, say, b to c , and assuming that its value is the constant over the combined age groups. Thus, over the combined interval a to b and b to c , the proportion of persons below b is known and is also given by

$$(2) \quad F_{\alpha}(b) = (b-a)/(c-a) - \alpha(c-b)(b-a)/(c-a)^2.$$

Solving the equation for α gives the estimated value

$$(3) \quad \alpha = (c-a)/(c-b) - F_{\alpha}(b) (c-a)^2/[(c-b)(b-a)],$$

which is then applied in (1) with the appropriate x value.

Numerical illustration. Suppose the number of working young men in the age group 15-19 years is 88,000 and the corresponding number in the adjacent age group 20-24 is 115,000. The problem is to split the 15-19 year old group and estimate the number of working male teenagers in the 15-17 years old category.

For this problem, $a=15$, $b=20$, $c=25$, and the proportion of working persons 15 to 19 of the combined 15-24 age group is $88,000/(88,000+115,000) = 43.35\%$. The estimated value of α in the combined age group is

$$\alpha = (25-15)/(25-20) - 0.4335 (25-15)^2/[(25-20)(20-15)] = 0.266.$$

Using the resulting value of α in the formula for $F_{\alpha}(x)$ with $x=18$, we obtain the estimate of the proportion of male teenagers 15 to 17 years old among the age group 15 to 19,

$$F_{\alpha}(18) = (18-15)/(20-15) - 0.266 (20-18)(18-15)/(20-15)^2 = 53.62\%$$

As there are 88,000 working male teenagers in the age group 15-19, it means that the estimated number in the split age group 15-17 is 53.62% giving the final estimate 47,182.

The actual survey result is 45,628.²⁹ The splitting error therefore is 1,554 or about 3%. If one had assumed that working male teenagers are uniformly distributed over the 15-19 years old group, the estimate for the 15-17 years old category would be 52,800, which is higher than the survey result by over 15%.

²⁹ Costa Rica, Labour Force Survey Results, 1998.

2. *Harmonization of differences in survey methodologies*

The national surveys conducted under ILO/IPEC's SIMPOC programme were specifically designed to measure the number and characteristics of working children 5 to 17 years old. The results obtained from the SIMPOC surveys are, therefore, not directly comparable with those obtained from other national household surveys that were not specifically designed for child labour measurement. We thus estimated the differential effects of the SIMPOC surveys on the measurement of the work-ratio of boys and of girls in the different age categories. The estimated differential effects were then used to adjust the results of the non-SIMPOC surveys in an attempt to make the two sets of data more comparable.

Logistic model: In a given country i and for a particular sex and age category of children, we assume that the work-ratio, p_i , measured in logistic units, may be expressed as a sum of three components,

$$(1) \quad \log[p_i / (1 - p_i)] = a + cd_{\text{Sim poc}} + e_i,$$

where a is a component common to all countries, c a component associated with SIMPOC surveys, and e_i a component particular to country i , assumed to have a finite symmetric distribution with mean zero. The term d_i is a dummy variable such that $d_i = 1$ if country i has a SIMPOC survey, and $d_i = 0$ if not.

Under this model, the component c measures the SIMPOC effect, assumed to be constant throughout the world. A robust estimate of c may be obtained by calculating the difference between median value of the work-ratios of SIMPOC countries and the corresponding median value of the non-SIMPOC countries.

Harmonization procedure: Based on the estimated values of c (one for each sex and age-category), the work-ratios of non-SIMPOC countries are adjusted to conform more closely to the work-ratios of the SIMPOC countries. The adjustment procedure is directly obtained by inverting the logistic function defined in (1). For non-SIMPOC countries, this gives the following adjustment formula:

$$(2) \quad p_i^{\text{Adj}} = p_i \exp(c) / [q_i + p_i \exp(c)],$$

where $q_i = 1 - p_i$. It can be verified that if the SIMPOC effect is zero ($c=0$), the adjusted value is the same as the original value p_i . Also, it can be verified that the adjusted values are always between 0 and 1, ensuring that no work-ratio is negative for above 100%. Finally, it can be verified that the adjustment factor decreases as the work-ratio increases, reflecting the fact that among countries with already high work-ratios the SIMPOC effect has little impact.

3. Hazardous occupations and processes in national legislation

The following *occupations or processes* have been documented to expose children to hazards to an extent that countries have prohibited the admission of children below 18 years (or a lower age, where indicated) to these occupations or processes by law:

Work in abattoirs and meat rendering
Work in the aluminium industry (16 years)
Work on airport runways
Work with dangerous or wild animals
Archaeological excavations
Brick manufacture
Cable laying
Care for mentally disturbed persons
Carpet weaving (14 years)
Catering at railway stations (14 years)
Cinder-picking, clearing ash-pits (14 years)
Work with circular saws and other dangerous cutting machines
Work in commercial agriculture (as opposed to subsistence agriculture)
Work in construction and/or demolition
Work with cranes/hoists/lifting machinery
Work in crystal and/or glass manufacture
Domestic service (16 years)
Work in entertainment establishments (night clubs, bars, casinos, circuses, gambling halls)
Excavation work
Work with fire brigades and gas rescue services
Forestry work
Work with machinery in motion (operation, cleaning, repairs, etc.)
Manufacture of matches (16 years)
Maritime work
Mining, work in quarries, underground work
Oil prospecting/work with petroleum
Work with oxyacetylene blowpipes (16 years)
Work with pedal/crank operated equipment (16 years)
Work in salt and brine processes
Shipbuilding (16 years)
Soap manufacture (14 years)
Work with steam engines or equipment
Street trades
Work in sugar mills (16 years)
Work in tanneries
Work in textile industries (specific tasks)
Operating vehicles
Underwater work
Work in the water and gas industry
Work with heavy weights and loads
Welding and smelting of metals, metal working
Work at courts, prisons or as probation officers

Countries may also prohibit the exposure of children at work to certain ***hazardous agents and products*** below 18 years of age (or a lower age, where indicated). The following agents or products have been subject to such legal prohibition in a number of countries:

- Alcohol production and/or sale
- Asbestos
- Benzene
- Bleaching and chlorine
- Cadmium
- Cement
- Chemicals, general provisions for exposure to
- Chromium
- Compressed air/gas
- Electricity
- Explosives
- Fumes, dust, gas and other noxious substances
- Infra-red and ultraviolet rays, laser, radio-frequency emissions
- Lead/zinc metallurgy, white lead, lead in paint
- Manganese
- Marble, stone and gypsum
- Mercury
- Paints, solvents, shellac varnish, glue, enamel
- Pathogenic agents, exposure to (hospital work, city cleaning, work related to sewers, handling corpses, etc.)
- Potassium and sodium
- Radioactive substances or ionizing radiation
- Rubber
- Tar, asphalt, bitumen
- Tobacco (inc. bidi and cigarette making) (16 years)

Finally, the admission to work below 18 years of age may also be prohibited on the basis of ***hazards relating to the physical environment*** in which the work takes place. Hazards that have given rise to a legal prohibition include:

- Thermal stress (heat and/or cold)
- Vibration and noise
- Inadequate ventilation
- Lack of light or abnormal levels of light
- Increased or decreased air pressure
- Ergonomic hazards
- Accident hazards