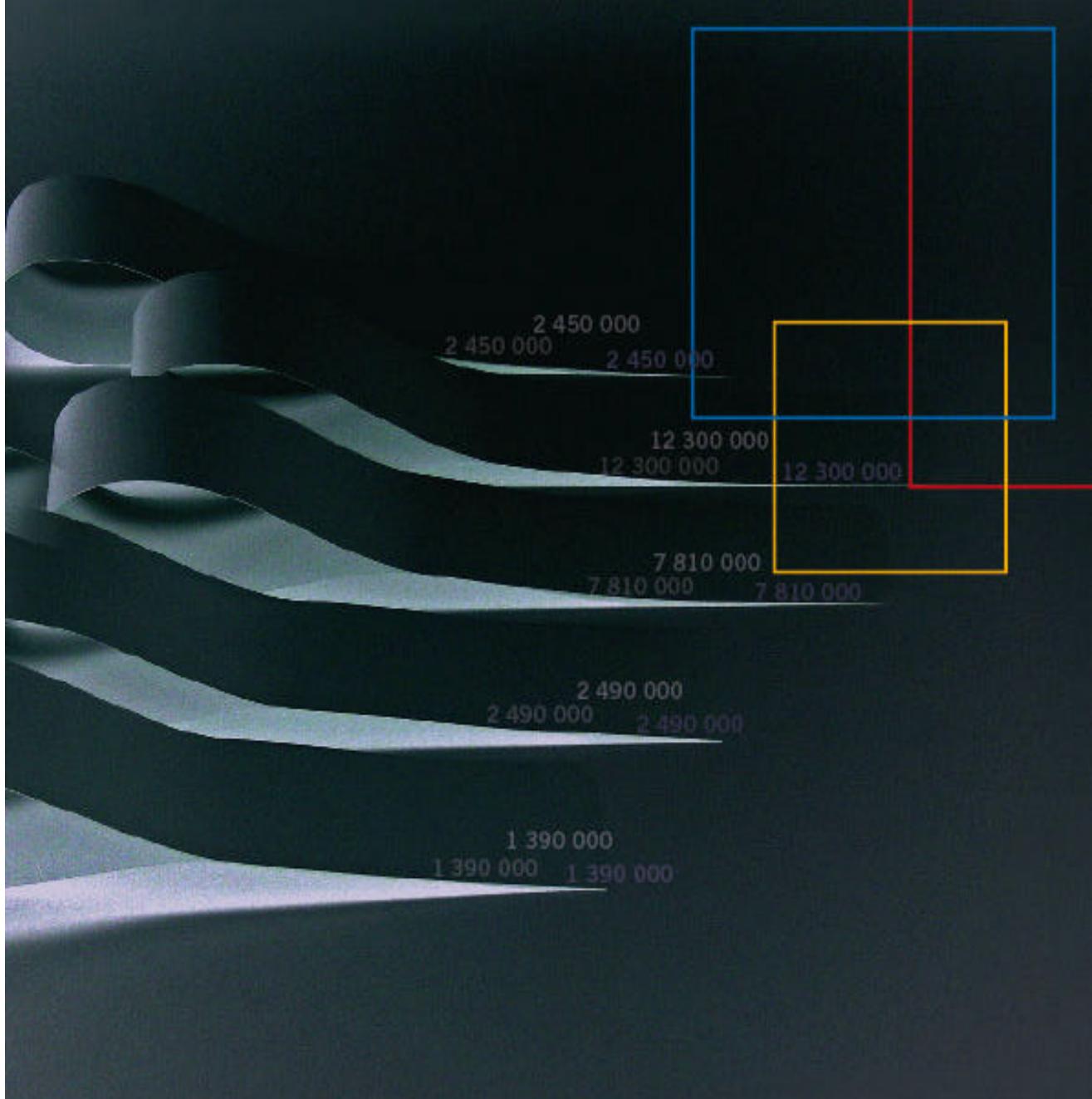




International
Labour
Office
Geneva

ILO Minimum Estimate of Forced Labour in the World

Patrick Belser, Michaëlle de Cock, Farhad Mehran



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**International Labour Office,
Geneva**

April 2005

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Foreword

In June 1998 the International Labour Conference adopted a Declaration on Fundamental Principles and Rights at Work and its Follow-up that obligates member States to respect, promote and realize freedom of association and the right to collective bargaining, the elimination of all forms of forced or compulsory labour, the effective abolition of child labour, and the elimination of discrimination in respect of employment and occupation.² As a follow up, the Director-General of the ILO publishes each year a Global Report that provides a dynamic global picture of one of the four categories of fundamental principles and rights. The purpose is to assess the effectiveness of the assistance provided by the Organisation and to determine future priorities.

The first Global Report on forced labour - *Stopping Forced Labour (2001)* – showed that slavery, slavery-like practices, debt bondage, compulsory prison work and other forms of forced labour have by no means been relegated to history. The report also indicated that some newer forms of forced labour and human trafficking – called the “underside of globalization” – were on the rise worldwide (ILO, 2001). Yet, no estimate of the numbers of people affected was provided. It was seen as “not possible at this stage to give an accurate estimate of the numbers affected on a global scale”. This was due to the fact that the exaction of forced labour is usually illicit, occurring in the underground economy and escaping national statistics as well as traditional household or labour force surveys. The Director-General indicated, nevertheless, that credible measurement of forced labour on a global scale had to be given high priority in the future.

The ILO’s Special Action Programme to Combat Forced Labour (SAP-FL) and the Statistical Development and Analysis Unit of the ILO’s Policy Integration Department have pooled their efforts and resources to confront the methodological challenge of estimating global forced labour. The ILO also relied on external advice. On 28 and 29 April 2003, a consultation meeting was held at the ILO in Geneva with participants from academia, international organizations, NGOs, and governments. The meeting brought together statisticians, specialists in quantitative methods, and recognized international experts of forced labour. After this meeting, the estimation project carried on for a period of nearly two years.

Today the ILO publishes its first ever estimate of forced labour in the world, with indications of its regional distribution and broad forms. The main results are published in the Director General’s 2005 Global Report called *A Global Alliance against Forced Labour*. The present technical document provides a detailed account of the methodology used in the estimate. It also includes a thorough evaluation of the results, with calculation of margins of error and comparison with external sources.

²The text of the Declaration is available on the following website: <http://www.ilo.org/declaration>

The global estimate's methodology is experimental and there are, doubtless, many ways to improve it. With the present document, the ILO makes the calculations transparent in the hope of stimulating an intellectual debate on the most appropriate way to estimate hidden problems such as forced labour for which little or no reliable data is available at the country level. But ultimately, we hope that these estimates will serve the purpose of attracting public attention to the continued existence of forced labour in the world and drawing support for its elimination.

Peter Peek

Roger Plant

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Policy Integration Department*

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InFocus Programme on Promoting the Declaration*

Table of contents

Foreword	iii
1. Main Results	1
1.1. Results by form of forced labour	1
1.2. Results by region	2
1.3. Trafficking in persons	4
1.4. Sex and age of victims	5
2. What is forced labour?	7
2.1. Defining “forced labour”	7
2.2. A typology of forced labour	10
3. Estimation methodology	13
3.1. The basic statistical unit: a reported case of forced labour	14
3.2. The sampling of reported cases	15
3.3. From reported cases to reported victims	18
3.4. From reported victims to the global estimate (reported and unreported)	21
4. Data collection and validation	24
4.1. Data collection	24
4.2. Data validation	27
4.3. Validated output	30
5. Evaluation of the data	32
5.1. Sampling errors	32
5.2. Comparison with other existing estimates	34
Annex: list of countries	38

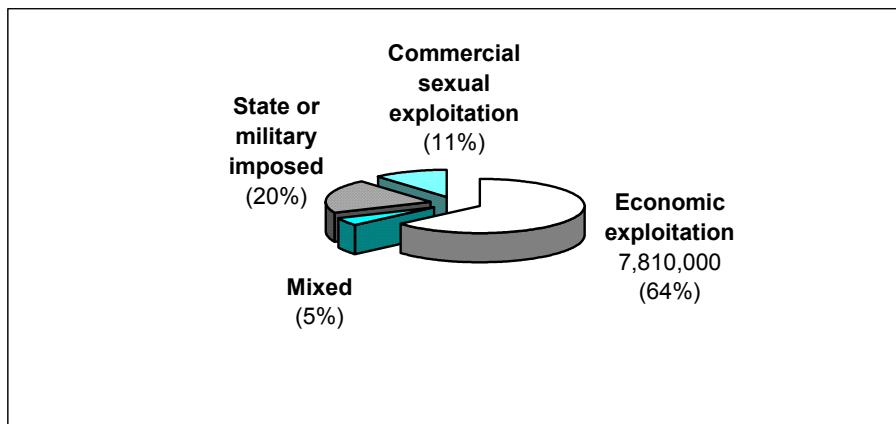
1. Main Results

Globally, there are at least 12.3 million people in forced labour. This number should be interpreted as the estimated minimum number of persons in illicit forced labour, in the sense of ILO Conventions Nos. 29 and 105, at present in the world. The estimate is a minimum because it was decided throughout the study to be very cautious in the choice of the underlying sources of information and to subject the data, as far as possible, to a rigorous validation process. Relating the ILO global estimate to the world population at mid-decade³, it can be calculated that there are at least 2 victims of forced labour per 1,000 inhabitants. In relation to the total world labour force⁴, the minimum estimate corresponds to about 4 persons in forced labour per 1,000 workers.

1.1. Results by form of forced labour

Figure 1 below shows the distribution of the global minimum estimate of forced labour by its main form.

Figure 1: Forced Labour by Form



State- or military-imposed forced labour (including forced labour imposed by rebel groups) is estimated to involve at a minimum 2,490,000 persons, representing 20% of global forced labour. The other 80% of forced labour is exacted by private individuals, agents or enterprises. It is estimated that there are at least 9,810,000 victims of such forced labour in the world: 1,390,000 in forced labour for commercial sexual exploitation; 7,810,000 for other economic exploitation including slavery and

³ United Nations, *World Population Prospects. The 2002 Revision. Volume II: Sex and Age*, ST/ESA/SER.A/223, UN Secretariat, Department of Economic and Social Affairs, Population Division, New York, 2003, p. 39.

⁴ International Labour Office, *Estimates and Projections of the Economically Active Population (1950-2010)*, preliminary 5th edition, ILO, Geneva, 2004.

serfdom, debt bondage and forced domestic labour; and the remaining 610,000 in mixed or undetermined forms of forced labour.

1.2. Results by region

Estimates of the number of victims of forced labour were obtained for each form of forced labour and for each geographical region (see the list of countries in the Annex). Full results are shown in table 1. It has to be noted that results are more robust for regional totals (shown in the last column of the table) than for specific forms within regions (as shown in the first four columns). This is because the relative standard errors of the estimates increase significantly when the level of the estimate is lower. For this reason, it was not considered meaningful to produce global estimates for detailed categories of forced labour beyond the three main forms noted above. And although in table 1 we present the full results for the sake of transparency, we believe that the regional and world estimates are most robust.

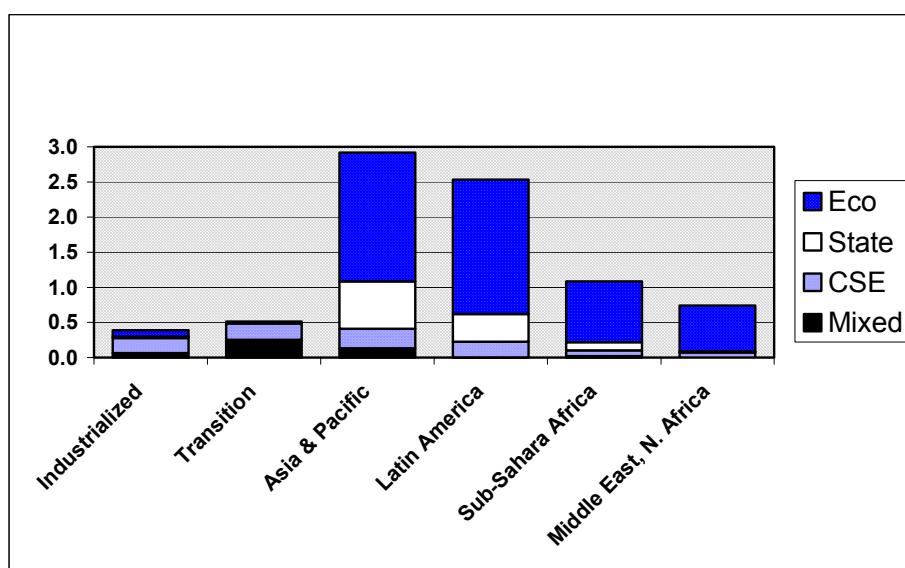
Table 1: ILO Minimum Estimate of Forced Labour in the World

	State-imposed	Commercial Sexual Exploitation	Economic Exploitation	Mixed	Total (rounded up)
Industrialized Economies	19,000	200,000	84,000	58,000	360,000
Transition Economies	1,000	98,000	10,000	103,000	210,000
Asia and the Pacific	2,186,000	902,000	5,964,000	434,000	9,490,000
Latin America and the Caribbean	205,000	115,000	994,000	3,000	1,320,000
Sub-Saharan Africa	70,000	50,000	531,000	13,000	660,000
Middle East and North Africa	7,000	25,000	229,000	-	260,000
World	2,490,000	1,390,000	7,810,000	610,000	12,300,000

We see that the bulk of global forced labour is in Asia and the Pacific, where some 9.5 million persons are estimated to be victims of forced labour. This figure represents more than three quarters of the total number of persons in forced labour in the world. The region with the next highest number of victims is Latin America and the Caribbean where some 1.3 million persons, or slightly less than 11% of the world total, are estimated to be engaged in forced labour. This is followed by Sub-Saharan Africa (660,000 victims or 5% of total), the industrialized countries (360,000 or 3%), Middle East and North Africa (260,000 or 2%), and finally transition economies (210,000 or 2%).

The following diagram (fig. 2) shows the incidence of forced labour in relation to the size of population in the different regions. Asia & the Pacific and Latin America & the Caribbean, are the regions with the highest incidence of forced labour in relation to their population, with 3 and 2.5 victims of forced labour per 1,000 inhabitants, respectively. This is followed by Sub-Saharan Africa (1 person per 1,000 inhabitants), the Middle East & North Africa (0.75 person per 1,000 inhabitants), Transition Economies (0.5 person per 1,000 inhabitants) and Industrialized Countries (0.3 person per 1,000 inhabitants).

**Figure 2: ILO Estimated Minimum Incidence of Forced Labour per 1,000 inhabitants
(1995-2004)**



Eco: Economic exploitation

State: State-imposed

CSE: Commercial Sexual Exploitation

Almost two-thirds of total forced labour in Asia and the Pacific is privately-imposed for economic exploitation, mostly debt bondage in agriculture and domestic work. About 20% of total forced labour in Asia and the Pacific is state-imposed, concentrated in a small number of countries in the region including in Myanmar. Forced labour for commercial sexual exploitation makes up just under 10% of total forced labour in that region.

The pattern of forced labour is similar in other developing regions. In Latin America and the Caribbean, the dominant form of forced labour is privately-imposed for economic exploitation (75%), including forced domestic work as well as debt bondage and/or internal trafficking of workers for agricultural work. This form is followed by state-imposed forced labour (16%) – including the problem of child soldiers and forced conscription - and forced labour for commercial sexual exploitation (9%).

In Sub-Saharan African, the bulk of forced labour is also for economic exploitation (80%), including cases of slavery-like practices, work imposed by traditional or religious authorities, and child trafficking. It is followed by state-imposed forced labour (11%) – amongst which the practice of using prisoners for private activities – and forced labour for commercial sexual exploitation (8%).

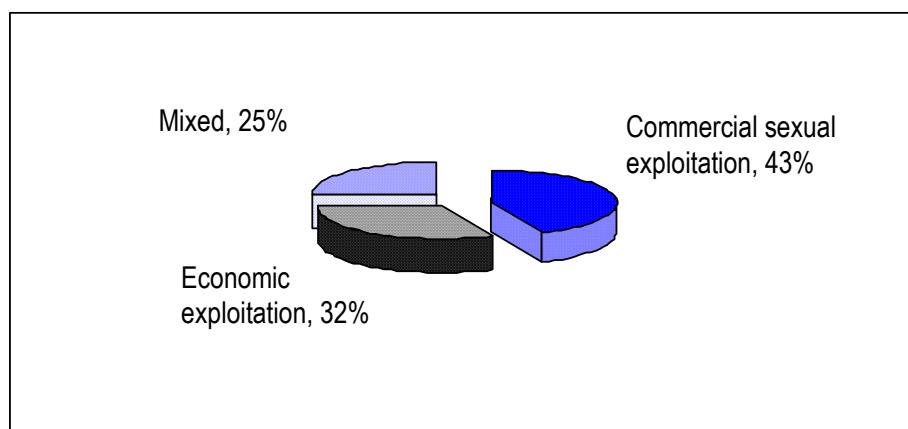
In the Middle East & North Africa, privately-imposed forced labour for economic exploitation is also the dominant form of forced labour (88%), concerning mostly migrant domestic workers who have their passports confiscated, as well as some cases of abductions and slavery in Africa. In this region, forced commercial sexual exploitation (10%) represents a higher proportion than State-imposed forced labour (3%).

Finally, transition economies and industrialized countries are different in that the dominant form of forced labour is forced commercial sexual exploitation (46% and 55%, respectively), with many women trafficked into prostitution. This form is followed by forced labour for economic exploitation (5% and 23%). This encompasses forced labour in sectors such as agriculture and construction, as well as domestic workers in servitude - including domestic workers attached to employers with diplomatic immunity. State-imposed forced labour accounts for the smallest proportion - almost nil in Transition Economies and less than 5% in Industrialized Countries.

1.3. *Trafficking in persons*

Globally, there are at least 2.45 million people in forced labour as a result of trafficking in persons. Trafficking therefore represents about 20% of total forced labour. This estimate includes both transnational trafficking and trafficking within countries. Most people are trafficked into forced labour for commercial sexual exploitation (43%) or mixed reasons (25%). The remainder (32%) concerns trafficking for economic exploitation.

Figure 3. Trafficked forced labour by form



Here again, estimates can be calculated for each geographical region. Results are shown in table 2. The highest numbers of trafficked people end up in forced labour in Asia and the Pacific (1.36 million), followed by industrial countries (270,000), Latin America and the Caribbean (250,000), and the Middle East and North Africa (230,000). It has to be emphasized that trafficked people are counted in the region of destination (i.e., where they are forced to work) and not in their region of origin. The lower estimates for Africa (130,000) and for Transition economies (200,000) should not obscure the fact that many people from these regions are trafficked towards other regions, including industrial countries.

Table 2: Forced labour outcome of trafficking

	Total number of victims
Industrialized Economies	270,000
Transition Economies	200,000
Asia and the Pacific	1,360,000
Latin America and the Caribbean	250,000
Sub-Saharan Africa	130,000
Middle East and North Africa	230,000
World	2,450,000

1.4. Sex and age of victims

Who are the people trapped in forced labour? We have estimated a breakdown by sex based on those sources where such information was available. On average, in the cases included in our dataset,

women and girls represent 56% of victims of forced economic exploitation, and men and boys represent 44%. Regarding forced commercial sexual exploitation, an overwhelming majority (98%) are women and girls. A breakdown of the results by age was not possible, as the exact age of victims is not very often reported in the sources. Many sources refer to the trafficking of young people with unspecified age. However, based on available data, we estimate that children under 18 represent between 40 and 50 percent of all the victims of forced labour.⁵

Figure 4: Forced economic exploitation by sex

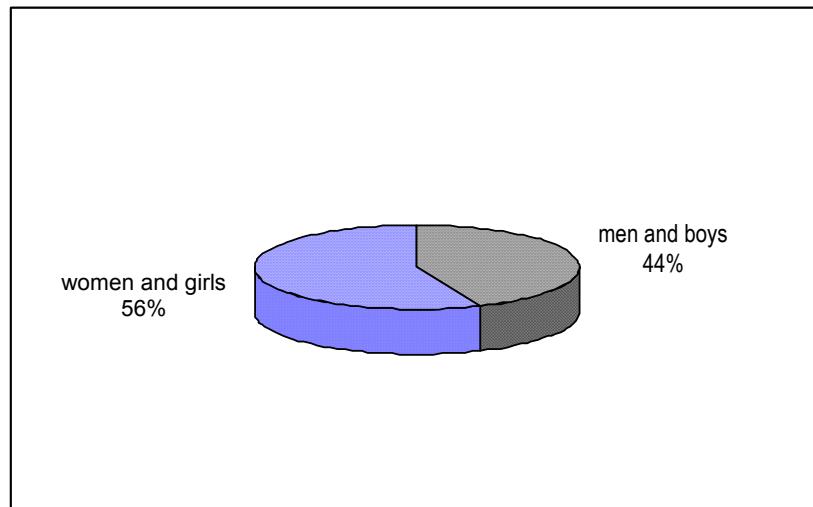
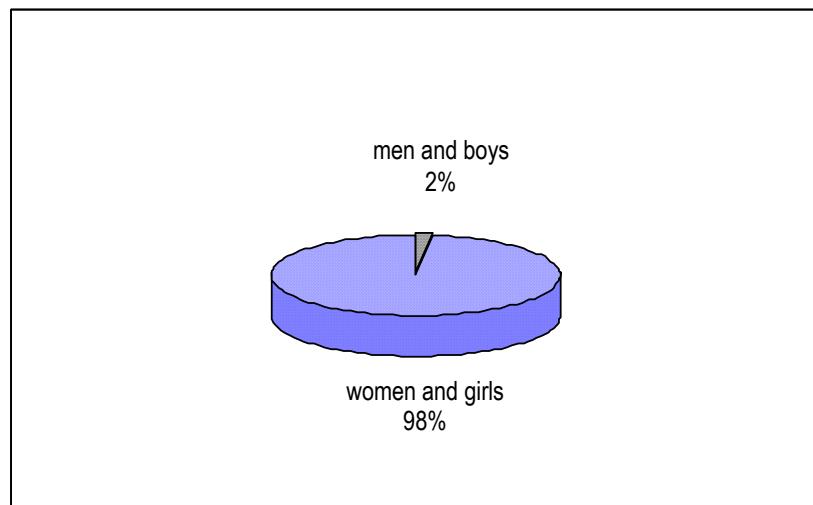


Figure 5: Forced commercial sexual exploitation by sex



⁵ This is consistent with the estimate in the ILO's 2002 Global Report "A Future Without Child Labour" which had estimated with a different methodology that there were 5.7 million children involved in forced and bonded labour.

2. What is forced labour?

2.1. Defining “forced labour”

ILO definition. ILO Convention No. 29, adopted in 1930, defines forced or compulsory labour as “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 voluntarily” (Art. 2.1). The Convention provides for certain exceptions, in particular, with regard to military service for work of purely military character, normal civic obligations, work as a consequence of a conviction in a court of law and carried out under the control of a public authority, work in emergency cases such as wars or other calamities, and minor communal services (Art. 2.2). A subsequent ILO Convention, No. 105, adopted in 1957, specifies that forced labour can never be used for the purpose of economic development or as a means of political education, discrimination, labour discipline or punishment for having participated in strikes.

Forced labour, as defined by the ILO, encompasses situations such as slavery, practices similar to slavery, debt bondage or serfdom – as defined in various international instruments, in particular, the League of Nations’ *Slavery Convention* (1926), and the UN *Supplementary Convention on the Abolition of Slavery, the Slave Trade and Institutions and Practices Similar to Slavery* (1956)⁶. Other ILO Conventions rely on, or complement, Convention No. 29, without modifying this definition. In particular, ILO Convention No. 182 on the elimination of the worst forms of child labour, adopted in 1999, considers that the worst forms of child labour include, among others, “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 ...” (Art. 3)⁷.

The double criteria: “penalty” and “involuntariness”. Embedded in the international definition of forced labour as formulated in ILO Convention No. 29 are two essential criteria: “menace of penalty” and “involuntariness”. Accordingly, forced labour occurs when people are being subjected to psychological or physical coercion (the menace or the imposition of a penalty) to perform some

⁶ The League of Nations’ *Slavery Convention* (1926) defines slavery as “the status or condition of a person over whom any or all of the powers attaching to the right of ownership are exercised”. Serfdom, on the other hand, is defined by the UN *Supplementary Convention on the Abolition of Slavery, the Slave Trade and Institutions and Practices Similar to Slavery* (1956) as “the condition or status of a tenant who is by law, custom or agreement bound to live and labour on land belonging to another person and to render some determinate service to such other person, whether for reward or not, and is not free to change his status”. The *Supplementary Convention* also defines debt bondage as “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”.

⁷ ILO Convention No. 95 on the protection of wages prohibits methods of payment that deprive workers of the genuine possibility of terminating their employment. The Indigenous and Tribal People Convention, 1989 (No. 169), also prohibited forced labour.

work that they would otherwise not have accepted to perform at the prevailing conditions (the involuntariness). The use of deception or fraud, and the retention of identity documents in order to achieve the consent of workers, are illegitimate and can lead to forced labour.

In practice, the menace of a penalty can be in the form of a threat of physical violence or death addressed to the victim or a member of his or her family. The penalty can also be in the form of menace of denunciation to the police or immigration authorities in the case of people without legal residence or work status, of confiscation of identity papers, or even of supernatural retaliation. The threat of non-payment of wages can also be used to force workers to provide additional labour. In sweatshops, workers can be threatened of being dismissed or not receiving their normal pay unless they accept to work long overtime hours. As for the second criterion, “involuntariness” may be verified by examining the process by which the victim has entered into forced labour. In the most obvious cases, persons are taken by force or kidnapped from their place of origin and forced to work in a distant place. In other cases, victims enter into forced labour through fraud and deceit, for example, by accepting a job presented as legal and well paid, only to find out later the true nature of the activity.

In principle, both the penalty and involuntariness criteria should be verified for a person to be considered as in forced labour. Yet, in practice, when there is a *menace of penalty* there is normally also a lack of free choice. A prostitute who risks violence if she does not give the assigned amount of money to her “employer” at the end of each day of work must be considered as in forced labour. A similar consideration may apply to trafficked persons. A person may decide to migrate voluntarily, only to end up in forced domestic work at their destination with no reasonable possibility of returning or getting out of the engagement.

Forced labour versus poor working conditions. Forced labour is not equivalent to poor working conditions. It represents a very serious restriction on human freedom and is to be treated by States as a penal offence. It is the type of engagement that links the person to the “employer” which determines whether a person is in forced labour, not the type of activity he or she is actually performing. A bonded labourer cutting and logging timber is in forced labour because of the coercion linked to a debt, not because of the particular type of forestry activity he or she is conducting – however poor or hazardous the conditions of work. Similarly, a woman trafficked and forced into prostitution is in forced labour because of the menace under which she is working, not because of the sexual duties that her job demands or the legality or illegality of that particular occupation. Extremely poor working conditions may, however, be an indicator pointing to the need to examine whether the labour is in fact forced.

The activity itself may in fact not be an economic activity in the sense of national accounts, yet the conditions under which it is performed can qualify it as forced labour. An example is the situation of a child beggar who has to hand over his or her daily collection to an “employer” under the menace of reprisals. According to economic statistics, begging is not counted as an economic activity, even though it generates income. Yet the child beggar should be considered as being in forced labour because of the menace under which he or she is operating, irrespective of the economic or non-economic nature of the activity of begging.

Forced labour and trafficking in persons. Forced labour is sometimes the result of human trafficking. According to the 2000 *UN Protocol to Prevent, Suppress, and Punish Trafficking in Persons, Especially Women and Children* (the Palermo Protocol), trafficking in persons refers to the recruitment or transfer of persons, by force, abduction or deception, for the purpose of “exploitation”. The U.N. protocol further specifies that “exploitation” includes “forced labour or services, slavery, or practices similar to slavery” as well as other things – which are not the subject of the present paper – like “the removal of organs”⁸.

Although the Palermo Protocol is specifically linked to the U.N. Convention Against Transnational Organized Crime, trafficking can take place both across or within borders. An example of internal trafficking involves casual workers in Latin America, who are recruited by labour intermediaries who promise good pay for hard work. Workers are then transported into distant places and greeted by a group of armed people, who force them to work for little or no pay at all in agriculture. Examples of international trafficking include women moved abroad as forced domestic workers or forced prostitutes, or migrant males deceived by traffickers and tricked into forced work in destination countries.

Forced labour and child labour. Not all child labour is categorized as forced labour. In the estimate, child labour has only been counted as forced labour when coercion is applied by a third party to the children or to the parents of the children, or when a child's work is the direct result of the parents being in forced labour. Forced child labour is considered a “worst form of child labour” under ILO Convention No. 182.

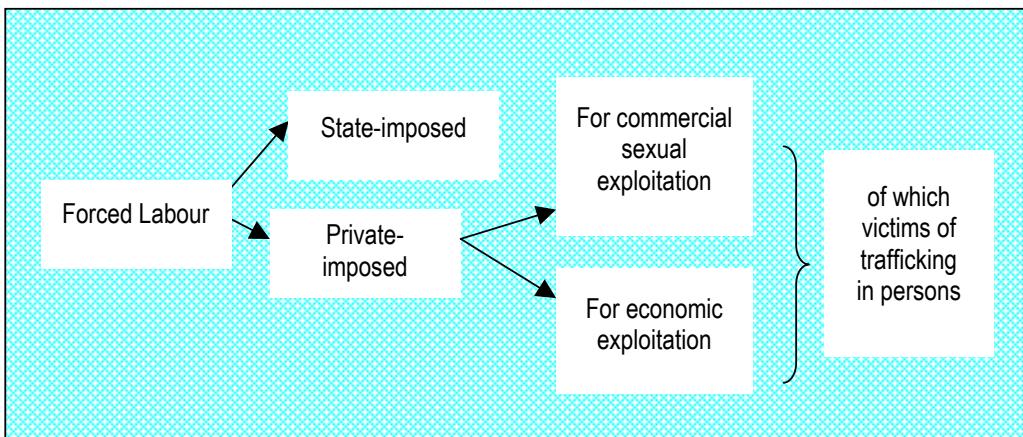
⁸ The Palermo protocol’s full definition of trafficking in persons is “the recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person for the purpose of exploitation”. The document further specifies that, “exploitation shall include, at the minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery, or practices similar to slavery, servitude or the removal of organs” (Art. 3).

2.2. A typology of forced labour

Forced labour includes a wide range of situations. The ILO Director-General's Global Report *Stopping Forced Labour* (2001) identified no less than eight different categories of forced labour: (1) "slavery and abductions"; (2) "compulsory participation in public works"; (3) "forced labour in agriculture and remote rural areas, with coercive recruitment practices"; (4) "domestic workers"; (5) "bonded labour"; (6) "forced labour exacted by the military"; (7) "forced labour as a result of trafficking"; and (8) "prison-linked forced labour". For purely statistical purposes, this categorisation is somewhat problematic. It requires adequate information to enable classification of actual cases into one or the other of the eight categories. Unfortunately, such detailed information is not always available. In many practical cases, the reported numbers are aggregates covering more than one category, with no objective basis to guide their division into components. Given the scarcity of data on forced labour in general, the finer the categorization, the heavier is the burden on data requirements.

For the purpose of preparing the present estimates, the data has ultimately been regrouped into three main categories: (1) state-imposed forced labour; (2) privately-imposed forced labour for commercial sexual exploitation; and (3) privately-imposed forced labour for economic exploitation. In addition, the measurement framework developed in this study, as shown in figure six, provides for separate estimates of the number of victims of forced labour as a result of trafficking.

Figure 6: A typology of forced labour for statistical estimation



(1) **State-imposed forced labour.** The early international standards set by the ILO were designed to combat forms of forced labour which involved the direct responsibility of the state authorities. Convention No. 29 (1930) on Forced or Compulsory Labour targeted particularly colonial public authorities who forced women and men to work in plantations, mines or infrastructure development, though it also has very contemporary applications as shown in this study. In 1957, a new ILO Convention on the Abolition of Forced Labour (No. 105) was adopted to address newer forms of

state-exacted forced labour, principally the “gulags” and prison camps established in socialist countries, but also recalling the slave-labour camps established under the Nazi regime.

Three main types of state-imposed forced labour, discussed at length in the Global Report of 2001, can be identified: (a) *Forced labour exacted by the military*. An extreme case involves Myanmar, where the army uses forced labour in the construction of roads and of military bases or for compulsory portering and detection of mines.⁹ (b) *Compulsory participation in public works or for development*. Such practices continue to exist in some socialist countries and some non-socialist African countries. (c) *Forced prison labour*. Forced prison labour under the supervision and control of a public authority is only allowed under ILO norms if it results from a conviction of a proper court of law. Also, ILO standards require that prisoners should never be forced to work for private individuals, companies or associations, though of course they may do so voluntarily. If a prisoner is being forced to work under the menace of losing privileges or of a reduced prospect of early release, it should in principle be counted as forced labour. It should nevertheless be made clear that prison labour imposed for non-commercial purposes, after conviction in a court of law and under government supervision, is not prohibited forced labour, unless it is being imposed for one of the reasons listed in Convention No. 105.¹⁰

(2) *Forced commercial sexual exploitation (CSE)*. While state-imposed forced labour unfortunately continues to exist, new forms of forced labour are now emerging - much of it imposed by individuals or by private groups and gangs. Most cases fall into one of two forms of sexual exploitation. (a) *Forced prostitution*. Globalization has been accompanied by an increasing internationalization of prostitution, with an increase in the number of foreign prostitutes in many countries. The implication, according to some observers, is that prostitution is now increasingly in the hands of international networks and of mafia-type organizations, which not only trade arms and drugs but also traffic young women and girls into forced prostitution; (b) *Forced pornography*. In forced pornography, young women and men are being coerced into performing sexual acts for the production of sexually explicit pictures or films.

Victims of forced commercial sexual exploitation are often young migrant women with primary education or less. These women are attracted by traffickers in their countries of origin, who promise good jobs and high pay in destination countries. Proposed jobs typically include domestic workers or waitresses. Women often take a loan from the trafficker in order to pay for the visa and

⁹ Compulsory military service for purely military purposes is excluded from the coverage of Convention No. 29, and is not regarded here as forced labour. However, for practical purposes, this category also includes forced labour for rebel military groups and forced recruitment of child soldiers or young adults by military, paramilitary or rebel groups.

¹⁰ These are: (a) as a means of political coercion or education or as a punishment for holding or expressing political views or views ideologically opposed to the established political, social or economic system; (b) as a method of mobilising and using labour for purposes of economic development; (c) as a means of labour discipline; (d) as a punishment for having participated in strikes; and (e) as a means of racial, social, national or religious discrimination.

travel arrangements. Once in the country of destination, these women are asked to repay the loan by working as prostitutes, and have their passports confiscated. However, not all forced commercial sexual exploitation is the result of trafficking. In some cases, women and girls are forced into prostitution in their places of origin. Traffickers and pimps almost always use threats and violence towards victims and their families in their home countries.

(3) Forced economic exploitation. Privately-imposed forced labour includes not only forced commercial sexual exploitation, but also other types of economic exploitation, both modern and traditional forms. As already mentioned earlier, traditional forms include slavery, debt bondage and serfdom. Modern forms mostly affect migrant workers, and occur in sweatshops, restaurants or agricultural fields. Because they work in private households, migrant domestic workers are particularly vulnerable to forced labour. Many migrant domestic workers in the Middle East, for example, have their passports confiscated and are maltreated. Such abuses also take place in industrialized countries and in other parts of the world.

One particularly important and also controversial form of forced labour is “bonded labour” – a type of debt bondage found in South Asia. In Indian and Pakistani legislation, bonded labour is defined in broad terms as a system under which a debtor enters into an agreement with the creditor to the effect that he would (1) provide his or her own work, or the work of somebody else, to the creditor for a specified or unspecified period of time, either without wages or for less than the minimum wage; or (2) forfeit the freedom of changing employment; or (3) forfeit the right to move freely from place to place; or (4) forfeit the right to sell his or her property or the product of his labour at market value. In general, therefore, a bonded labourer is a worker who has taken a loan from an employer and who is repaying the loan and accumulated interest through labour and who is not free to leave the employer as long as the debt is not fully reimbursed. The bondage results from this third factor. Bonded labour qualifies as “debt bondage” when the value of labour services is not properly accounted towards the liquidation of the debt or when the length and/or nature of those services are not limited and defined, that is, when the employer is retaining a disproportionate part of the worker’s salary for the reimbursement and service of the debt. In many cases, a pre-existing debt is the origin of forced labour, for example, when the debt is inherited from parents or even grandparents, or when the victim becomes collateral for the debt of a third party.

The concept of bonded labour has at times been interpreted broadly by the South Asian judiciary, for example not encompassing the element of direct coercion which would constitute a forced labour situation. According to one Indian Supreme Court ruling¹¹, anyone who earns less than the minimum wage may be identified as a bonded labourer due to the presumption that a person working for less than the minimum wage is acting under some form of coercion. For the purpose of

¹¹ India Supreme Court Judgement dated 18.09.1982.

the present estimate, however, the evasion of minimum wage regulations is not treated as a sufficient indication of forced labour and is therefore not included in the estimates. Indeed, many people may prefer - and hence voluntarily chose - a job that pays less than the minimum wage to no job at all. Also excluded from the coverage here are all “benign cases” that can be considered as non-exploitative, short term, wage advances with clearly specified repayment terms. In general, the criteria taken into consideration for identifying debt bondage include whether there is use of coercion or physical violence, whether the length of the debt repayment is limited in time and whether the work of the debtor is reasonably applied towards the liquidation of the debt (i.e. whether implicit interest rates are reasonable).

3. Estimation methodology

A usual method to derive global estimates of a phenomenon is to aggregate corresponding national estimates into regional and then global figures. This direct aggregation method is often preceded by preliminary steps to harmonize eventual differences in national concepts and definitions, and to impute for possible missing data. This approach has been adopted in broad terms by the ILO since the 1970s for deriving global estimates and projections of the economically active population (<http://laborsta.ilo.org> EAPEP data), and more recently for calculating global and regional estimates of unemployment (Schaible, 2000/6).¹²

In the case of forced labour, however, reliable and widely accepted national estimates based on specialised data collection instruments, directly surveying the victims themselves, have yet to be developed. Available national estimates are often disparate, concerning one or two particular forms of forced labour, generally calculated on the basis of secondary information obtained by individual experts or by humanitarian institutions or non-governmental organizations for specific purposes. The underlying concept and methodology of these estimates are in most cases undocumented and in some cases even the date or the time period to which they refer is unclear. They are often based on judgemental considerations or simply derived by applying a fraction to a broader estimate, such as assuming that forced prostitution concerns 10% of the total number of prostitutes in the country.

In contrast, there also exist estimates with well-documented methodologies. As part of the present project, a review has been made of a selected number of such methods.¹³ These include estimates of sweatshop workers in the United States, bonded labour in Brazil, India and Pakistan, traditional slavery in Niger, forced labour imposed by the military in Myanmar, trafficked children in

¹² Schaible, Wes, *Methods for producing world and regional estimates for selected key indicators of the labour market*, ILO Employment Paper 2000/6.

¹³ Fiorito, Giancarlo, “Methodological Compendium for the Calculation of Estimates of Forced Labour,” Mimeo graph, In-focus Programme on Promoting the Declaration, ILO, Geneva, 2003.

Benin, Mexico, Nepal and Tanzania, and forced prison labour in the United Kingdom and the United States. The review covers also the appraisal of the International Organisation for Migration (IOM) estimates of global trafficking of human beings.

Nevertheless, in the absence of solid and widely accepted national estimates, we have developed our own methodology relying on reported cases (or traces) of forced labour. The methodology has two main steps. First, we estimate the global number of reported cases of forced labour in the world and the total number of reported victims. This first part of the estimate is based on a so-called “capture-recapture” sampling method and leads to an estimate of total reported victims over the period 1995-2004. Secondly, we use the total reported victims over 1995-2004 to develop estimates of the actual number of persons in forced labour in each of the three forms of forced labour mentioned above. The result is a minimum estimate providing lower bounds on the total number of victims of forced labour in the world. The methodology is described in some detail below.

3.1. *The basic statistical unit: a reported case of forced labour*

A *reported case of forced labour* is a piece of information in a secondary source that contains the following four elements:

a = an activity recognized as a form of forced labour;

x = a numerical figure indicating the number of persons engaged in that activity;

h = a geographical area where the activity is reported to have taken place; and

t = a date or a time period in which the persons were recorded as having been engaged in that activity.

In practice, of course, each of these elements may be reported with different degrees of precision. There may be doubt about the nature of the activity as a form of forced labour. The numerical value may be an approximation. The reported area may be broader than the actual area to which the number refers. The reported time period may erroneously represent the date of the report rather than the date of the activity. Many other ambiguities may arise in the process of identifying and recording a reported case.

For *validating* the reported cases, two basic principles were established. First, there must be sufficient reason to believe that the reported numerical figure x represents actual people, i.e., persons who could have potentially been identified and listed. This principle discards as reported cases, a numerical figure that is known to be an estimate or an extrapolation. It also discards data reported in the form of ratios or percentages, where the population figures to which they apply are vague or

unknown. Second, the process used to validate a reported case should be replicable to the extent possible. Two researchers independently analysing the same page or document should in principle reach the same conclusion and record the same information.

Two reported cases are considered as *distinct reported cases* if one or more of the four recorded elements (a, x, h, t) are different. It should be noted that the source of the information does not enter into consideration in establishing distinctions among reported cases. Thus, if the same information is reported both in the French newspaper *Le Monde* and the Pakistani monthly *The Herald*, the two reported cases are considered as one, and only one of them is accounted for in this study. Furthermore, in determining identity or distinction, some allowances are made for rounding numbers, and differences in terms used and locations named. For example, the case of 387 children, victims of commercial sexual exploitation in Rondonia may be reported in a different document as a case involving around 400 children in North Western Brazil. Similarly, the case of 7,121 persons in forced prison labour may be reported elsewhere as 7,121 prisoners in forced rehabilitation camps. In each of these examples, it is clear that the reported cases are identical.

Because the procedure relies on the available information, cases of *false identity* may occur, i.e., declaring two reported cases as identical while they are in fact distinct. For example, one document may report the case of 100 freed workers from debt bondage in Uttar Pradesh in April 2001, and another a seemingly identical case of 100 freed workers from debt bondage in 2001 in the same Indian state. If it is decided to neglect the precision of the month of April in one report, the two cases will mistakenly be considered as identical. The reverse, i.e. *false distinction*, may also occur, when two identical reports are falsely considered as distinct.

3.2. The sampling of reported cases

Sampling without a frame. Complete enumeration of all reported cases of forced labour is an impossible task. The normal practice, when complete enumeration of a phenomenon is not possible or too costly, is to draw a random sample and generalise from the sample observations by means of special statistical techniques. Random sampling procedures, however, require a reliable sampling frame from which to draw the sample. But no such sampling frame exists, or can reasonably be constructed, for measuring forced labour at the global level. As an alternative to random sampling from sampling frames, it was decided to use other sampling techniques designed originally to estimate the abundance of animal populations and more recently applied also to estimate the abundance of elusive human populations such as the homeless and irregular migrants. The method is called capture-recapture sampling and is briefly described in the following section.

The capture-recapture method. In its simplest form and in the context of estimating the abundance of fish in a lake, the method consists of two parts: capture and recapture.¹⁴ In the capture part, an initial sample of fish is drawn, their number counted, and each fish marked with a special ink-marker before being released back in the lake. After a sufficient but short period of time, a second sample is independently obtained (the recapture part), and the number of fish with ink-marks and the number without ink-marks are counted and noted. These numbers are then used to estimate the total number of fish in the lake. The argument goes as follows: If the second sample is representative of the fish population in the lake, the ratio of marked to unmarked fish in that sample should be the same as in the fish population as a whole. From this relationship, the total number of fish in the lake can thus be estimated. The method gives also estimates of margin of errors, from which confidence intervals can be constructed.¹⁵ More elaborate procedures are also available to deal with more than two catches and with capture probabilities varying from sample to sample, and detection probabilities.¹⁶

A numerical illustration. To clarify the method, a numerical illustration of the method is given below with fictive numbers using reported cases of forced labour as sampling units. Suppose two teams of researchers are formed. Each team independently draws haphazardly a sample of reports on forced labour and examines their contents. Team 1 finds eight valid reported cases of forced labour, and records the number of victims involved as shown in the first set of columns in Table 3 below. Team 2 working independently finds twelve valid reported cases of forced labour and notes the number of victims in the second set of columns of the table. The cases common to the two teams are marked by * in the fifth column of the table.

¹⁴ Thompson, Steven K., *Sampling*, Chapter 18. Capture-recapture Sampling, John Wiley & Sons, Inc., New York, 1992.

¹⁵ Jensen, A.L., "Confidence Intervals for Nearly Unbiased Estimators in Single-Mark and Single-Recapture Experiments," *Biometrics*, Volume 45, December 1898, pp. 1233-1237.

McDonald, J.F. and D. Palanacki, "Interval Estimation of the Size of a Small Population from a Mark-Recapture Experiment," *Biometrics*, Volume 45, December 1898, pp. 1223-1231.

¹⁶ Norris, III, James L. and Kenneth H. Pollock, "Nonparametric MLE Under Two Closed Capture-Recapture Models with Heterogeneity," *Biometrics* Volume 52, June 1996, pp. 639-649.

Pledger, Shirley, "Unified Maximum Likelihood Estimates for Closed Capture-Recapture Models Using Mixtures," *Biometrics*, Volume 56, June 2000, pp. 434-442.

Table 3. A numerical illustration of capture-recapture sampling of reported cases of forced labour

Team 1		Team 2		Common to team 1 & 2	
Reported case	Reported number of victims	Reported case	Reported number of victims	Reported number of victims	Reported number of victims
1	10	1	10	*	10
2	8	2	12		
3	50	3	50	*	50
4	120	4	8		
5	72	5	80		
6	240	6	240	*	240
7	30	7	100		
8	5	8	180		
		9	50		
		10	32		
		11	20		
		12	80		
TOTAL					
8	535	12	862	3	300

The ratio of marked (common) to non-marked (new) reported cases captured by Team 2 is 3 to 9, or equivalently 25% of the total (3 out of 12). If this proportion is also valid in the universe of reported cases and given that Team 1 captured 8 reported cases, then the total number of reported cases in the world is $8/(0.25) = 32$. Thus, the two teams captured together $12+8-3 = 17$ distinct reported cases out of the total of 32, meaning that there are $32-17= 15$ missing reported cases, not caught by either of the two teams. These results can be presented in a compact way in a two-by-two table as shown in Table 4 below.

Table 4. Capture-Recapture Estimation of Reported Cases of Forced Labour: Numerical illustration (Summary results)

		Team 1		
		Capture	Not Captured	
Team 2	Recapture	3	9=12-3	12
	Not captured	5=8-3	15 =32-(12+8-3)	20=32-12
		8	24=32-8	32 =8*12/3

Underlying assumptions. For the capture-recapture method to work, two basic conditions should be satisfied. First, the two teams should be working independently of each other and second,

they should be sampling the reported cases on a random basis. In practice, of course, neither of the conditions is fully satisfied, but as reported later, attempts have been made to organize data collection and validation activities to be as close as possible to the underlying assumptions of the capture-recapture methodology. Second, the calculation for the numerical illustration is based on the assumption that each reported case has the same probability of being captured by the two teams. In practice, however, this assumption may not be valid all the time, as some reported cases may be more difficult to find than others. In the present study, this aspect has been dealt with by stratifying the sample according to region and type of forced labour. This in effect assumes that the probability of capture differs from one stratum to another, but remains constant within strata. Thus, reported cases of state-imposed forced labour in Sub-Saharan Africa may have lower probability of capture than, say, reported cases of forced commercial sexual exploitation in industrialized countries.

3.3. From reported cases to reported victims

Average number of victims of forced labour per reported case. Having estimated the total number of reported cases of forced labour based on the “capture” and “recapture” of cases, the total number of victims involved may be estimated by straightforward multiplication with the average number of victims per reported case. In the numerical illustration given earlier, the average number of victims may be calculated in at least three ways: on the basis of reported cases captured by Team 1 or Team 2, and on the basis of the combined set of reported cases captured by Team 1 and Team 2. The calculations are shown below:

$$\text{Average number of victims per reported case (Team 1)} = 535/8 = 66.875$$

$$\text{Average number of victims per reported case (Team 2)} = 862/12 = 71.833$$

$$\begin{aligned}\text{Average number of victims per reported case (Teams 1 and 2)} \\ = (535+862-300)/(12+8-3) = 64.53\end{aligned}$$

The value of 300 in the above expression is the duplicate number of victims in reported cases common to Team 1 and Team 2. In general, the third estimate based on both Team 1 and Team 2 data should be preferred as it uses a larger number of observations. It can be shown that the combined estimate lies necessarily between the Team 1 and Team 2 estimates.

The final estimate of the aggregate number of victims of forced labour in the numerical illustration presented earlier is obtained by multiplying the estimated total number of reported cases (32) with the estimated average number of victims per case (64.53). The result is thus given by

$$32 * 64.53 = 2,064.9 = 2,065 \text{ reported victims of forced labour}$$

Weighted number of reported cases. Another approach in estimating the total number of victims of forced labour is to frame the estimation problem in the context of sampling theory where a total is being estimated on the basis of a sample of observation units with known probabilities of selection. Here the observation units are the reported cases and the probability of selection in each strata is the probability of the reported case being captured by the first team, and if not, by the second team.

This formulation may be expressed in mathematical terms as follows. Let i denote a reported case of forced labour, and X_i the number of victims involved. Suppose there are in total N reported cases (N unknown). The corresponding total number of victims of reported forced labour, also unknown, is expressed by

$$T = X_1 + \dots + X_i + \dots + X_N$$

The capture-recapture methodology gives a sample of n distinct reported cases, $n=n_1+n_2-n_{12}$, where n_1 is the number of reported cases found by Team 1, n_2 the number found by Team 2, and n_{12} the number in common. Let x_1, \dots, x_n denote the corresponding number of reported victims. According to sampling theory, an estimate of T based on these observations is given by

$$T = (x_1/\pi_1) + \dots + (x_i/\pi_i) + \dots + (x_n/\pi_n),$$

where π_i is the probability of selection of reported case i , $i=1,2,\dots,n$. Using the capture-recapture assumptions, this probability may be calculated to be equal to

$$\pi_i = p_1 + q_1 p_2,$$

where p_1 is the probability that the reported case i is captured by Team 1, q_1 the probability that it is not, and p_2 the probability that it is captured (or recaptured) by Team 2. Under simple random sampling with fixed sample size, these component probabilities can be further calculated as follows,

$$p_1 = n_1/N, q_1 = 1 - n_1/N, \text{ and } p_2 = n_2/N,$$

leading after simplification to

$$\pi_i = n_1/N + n_2/N - (n_1 n_2)/N^2.$$

Replacing the unknown value of N by its capture-recapture estimate, N, the estimated probability of selection obtained above can be re-expressed simply as

$$\pi_i = n/N,$$

where $n=n_1+n_2-n_{12}$ and $N = (n_1 n_2)/n_{12}$. Finally, replacing π_i by its estimate π_i in the expression of T, we obtain after simplification the required estimate of the total number of reported victims of forced labour,

$$T = N x,$$

where N is the estimated total number of reported cases and x is the average number of victims per reported case found in the sample of distinct reported cases.

This result is identical to the calculation suggested in the previous section. The main advantage of the present formulation is that it can be generalized in a straightforward manner to variables other than number of victims so as to maintain consistency between the different estimates. For example, to estimate the number of children in forced labour consistently with the estimate of the number of children trafficked into forced labour. Another advantage of this formal approach of estimation is its computational generality. Once the probabilities of selection are estimated and associated to each reported case in the sample, the calculation of different estimates will be based on the same form of a weighted sum of reported cases, the values of the x's changing depending on the phenomenon being estimated, but the weights themselves remaining constant. This format can be easily programmed for general computer application and ready to apply at any time, on variables that may not have been included in the first place but are added later in the analysis.

In practice, the formula used for computation is slightly more complicated as the calculations are carried out for each strata separately, and the capture-recapture formula used is a modified version of the one used for the numerical illustration. The modified version, which avoids the problem that arises when the number of common cases n_{12} is zero in one or more strata, is given by:

$$N = \frac{(n_1+1)(n_2+1)}{(n_{12}+1)} - 1$$

3.4. From reported victims to the global estimate (reported and unreported)

As we have already said, the capture-recapture methodology is applied to reported cases of forced labour over the period 1995 to 2004. The validation process of the data attempts to eliminate duplicate cases or cases that involve wholly or partially the same victims. The resulting estimate, therefore, may be interpreted as an estimate of the total number of victims who experienced forced labour at some time during the ten-year period, 1995-2004. This flow estimate should be distinguished from the desired stock estimate of forced labour which gives the total number of victims of forced labour at a given time in that period. The flow and stock estimates are related to each other by the following relationship involving the average duration in forced labour:

Relationship between stock and flow of forced labour

Total number of victims of forced labour at a given time during 1995-2004

=

Total number of victims who experienced forced labour during 1995-2004

x

Average duration in forced labour as a fraction of the ten-year period 1995-2004

Average duration in forced labour. The length of time victims suffer from forced labour greatly varies from one individual to another, depending particularly on the type of forced labour. Little data exists on the duration of forced labour. A study in the United States based on a press review and interviews with 49 service providers concluded that the majority of cases lasted between 2 and 5 years (Free the Slaves, 2004)¹⁷. However, the available information tends to indicate wide variation, from a few hours to a lifetime. Some situations tend to be relatively short. There are in particular some seasonal activities in agriculture or domestic work where forced labour often lasts six-months. Andrees (2004)¹⁸, who has analysed data from ILO studies, found that trafficked victims in Europe spend an average of 8 months in forced labour. In the case of forced labour in commercial sexual exploitation, our own data indicates an average duration of about 12-18 months. But in South Asia, bonded labourers often experience longer period of forced labour. One study conducted on 112 bonded labourers in Gujarat found, for example, that 42 of them were in debt bondage for more than

¹⁷ Free the Slaves & Human Rights Center University of California. 2004. *Hidden Slaves: Forced Labour in the United States*, September.

¹⁸ Andrees, Beate. (2004). "Designing Trafficking Research from a Labour Market Perspective: The ILO Experience", paper submitted to the IOM International Expert Meeting on Improving Data and Research on Human Trafficking, Rome, May.

15 years, 24 between 5 and 15 years, and 48 for less than 5 years (Navsarjan)¹⁹. Another study conducted in six states of India concludes that the average duration of debt bondage is about 6 years (Anti-Slavery International, 1997).²⁰

Let μ_h denote the average duration in forced labour of workers in stratum h . The total stock of persons in forced labour at any given time may be expressed by

$$T_{\text{stock}} = \sum_h T_{\text{flow } h} \mu_h$$

where $T_{\text{flow } h}$ is the flow estimate of the total number of persons in stratum h who experienced forced labour during the study period. The flow estimates are given by the capture-recapture method described earlier.

Ratio of reported to unreported number of victims. The final step in the estimation of forced labour is to account for the unreported victims of forced labour. The unreported cases of forced labour by nature will fall outside the scope of any direct method of estimation, including the capture-recapture methodology. They have to be accounted for by indirect procedures. Let r_h denote the ratio of reported to unreported number of victims of forced labour in stratum h . It can be then deduced that the total number of victims of forced labour, reported and unreported, is given by the expression

$$\text{Total forced labour} = \text{Total reported} + \text{Total unreported}$$

$$\begin{aligned} T_{\text{stock}} &= \sum_h T_{\text{flow } h} \mu_h + \sum_h T_{\text{flow } h} \mu_h / r_h \\ &= \sum_h T_{\text{flow } h} \mu_h (1 + 1/r_h) \\ &= \sum_h T_{\text{flow } h} \mu_h / p_h \end{aligned}$$

where p_h is the proportion of reported cases in the total region in stratum h .

Net effect on global estimate. The stock estimation of forced labour as formulated in the last expression above requires information on the ratio of the average duration of forced labour and the proportion of reported cases of forced labour in each stratum. Unfortunately, numerical estimates of these elements are not available and cannot be easily obtained. However, there are good reasons to believe that the average value of the ratio is close to 1. The argument is based on the relationship between the probability of reported cases of forced labour and the duration in forced labour.

¹⁹ Navsarjan. (date unknown). "Migration in search of labour; Gujarat", Ahmedabad

²⁰ Anti-Slavery International. (1997). "A survey of bonded labour in six states of India". London.

Studies mentioned earlier indicate that forced labour for commercial sexual exploitation is of relatively short duration, often less than one or two years. Also, most forced labour for commercial sexual exploitation results from trafficking in persons. As both the activity and the means of entering in the activity are illicit, one can expect the proportion of reported cases of this form of forced labour to be relatively low. Thus, one may infer that low probabilities of reported cases go together with short duration of forced labour. At the other end of the spectrum, there is forced labour for economic exploitation, in particular, bonded labour. Bonded labour is generally of long duration, sometime transmitted from one generation to another. Most bonded labour is in agriculture and people are trapped into it by incurring debt. As there is nothing unlawful about either the economic activity itself, or the mechanisms by which workers enter into it, one might expect the proportion of reported cases for this form of forced labour to be relatively higher. Thus, one may infer that forced labour of long duration is associated with higher probabilities of reported cases.

The positive relationship between probability of reported cases of forced labour and the duration of forced labour is drawn schematically in figure 7, where the dotted line shows the positive relationship between the two variables and where the upward diagonal line shows the line of equality between the two variables. Note that for forced labour of very short duration there is a non-zero probability of reported cases of forced labour, whereas for forced labour of long duration the probability of reported cases is less than 100%.

Assuming that the positive relationship between the probability of reported cases of forced labour and duration in forced labour is continuous and monotone, one may assume that the curve intersects with the line of equality somewhere in the mid-range of the duration of forced labour. By the mean value theorem, one can conclude that the expression of the stock of forced labour can be approximated by

$$T_{\text{stock}} = \sum_h T_{\text{flow } h} \mu_h / p_h$$

$$= \sum_h T_{\text{flow } h} x / p(x)$$

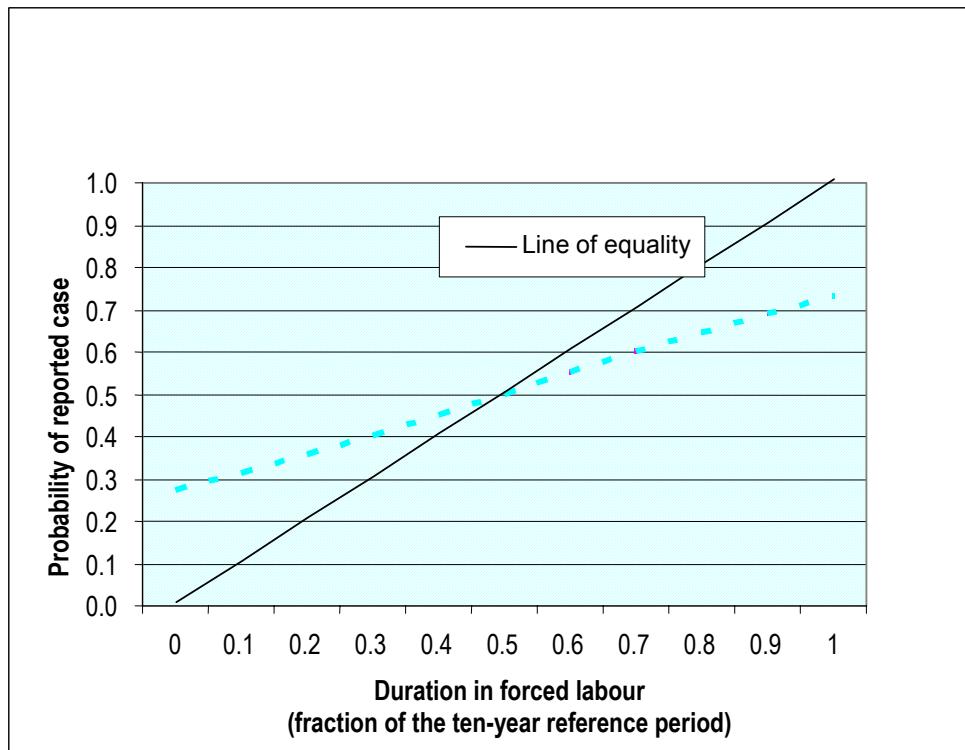
$$= \sum_h T_{\text{flow } h} x / x$$

$$= \sum_h T_{\text{flow } h}$$

where x is the average duration in forced labour over all forms of forced labour and $p(x)$ is the probability of reported cases of forced labour for forms of forced labour of average duration, argued to be approximately equal to x at the point of intersection.

This argument indicates that the flow estimate of forced labour is approximately equal to the stock estimate. To the extent that the area between the two lines is about equal in the right side and in the left side, the errors committed in this approximation cancel each other out at the global level.

Figure 7: Relationship between probability of reported cases of forced labour and duration in forced labour



4. Data collection and validation

4.1. Data collection

The re-sampling methodology adopted here requires that the two samples involved (capture and recapture samples) be drawn independently of each other and each with identical probabilities of sample selection. These requirements have been implemented in practice by constituting two teams of researchers working with identical instructions and work-loads, but independently of each other. Independence was enforced by physically placing the two teams at opposite ends of ILO Headquarters and requesting them to avoid exchanging information on their findings and work methods.

Each team had a total of six person-months of work load and access to similar equipment (Internet, ILO telephone and libraries, etc.). They received the same length of training with identical

syllabus, covering ILO Conventions Nos. 29 and 105 on forced labour, and other related documents. Each team was instructed on the materials to look for and on the elements to enter in the database. Each team's database was reserved to that team with no access possible to the database of the other team. To facilitate the supervision of the work and the subsequent data validation process, each team was instructed to place in a special folder a hardcopy of the screen or page of document from which the forced labour information was extracted. A unique identification code was given to each document which had to match with the identification code of the corresponding record entered in the database.

In addition to the source identification code, the following elements were considered as key and no record with blank information on any one of them would be constituted in the database. The mandatory key fields were:

- Identification code of the source of information
- Country or geographic region
- Type of forced labour
- Numerical estimate of number of persons involved
- Reference date or time period of the estimate

No other limit was set on the nature of data that the researchers were to collect. In fact, they were encouraged to also include, where relevant, qualitative information that may help the understanding of particular forced labour phenomena.

Data sources. During their assignment, the two teams examined a wide range of sources of data in a multitude of languages (French, English, Spanish, Arabic, Portuguese, Russian and Hindi). Close to 1500 data sources were explored by the two teams including the following broad categories:

- ILO (reports of the Committee of Experts, national and regional studies, results of rapid assessment surveys)
- Other international organisations (qualitative studies, regional or thematic estimates, data compilations)
- Governments (national estimates, statistical reports, court and police reports)
- Trade Unions (data compilations, regional or thematic analyses, global estimates)
- Local NGO's (testimonies, case studies, reports of activities, local estimations, qualitative information)
- International NGO's (data compilations, regional or thematic analyses, global estimates)
- Academia (research papers, qualitative studies, quantitative estimations with methodologies)
- Media (testimonies, interviews, press reports, global estimations, quotations)

Overall more than 5,000 data on forced labour, of all sorts, were identified from these sources. The geographical distribution for each of the two teams is shown below:

Region	Team 1	Team 2
Asia and the Pacific	710	1,049
Industrialized Countries	820	402
Latin America and the Caribbean	290	578
Middle East and North Africa	200	110
Sub-Saharan Africa	298	224
Transition Economies	230	140
World	6	54
Total	2,554	2,557

It can be noticed that the total number of data collected by each team is about equal; team 1 covered relatively more the industrialized countries, transition economies, and the Middle East and North Africa, while team 2 concentrated more on Asia and the Pacific and Latin America and the Caribbean. The coverage of Sub-Saharan Africa was about even between the two teams. The 6 and 54 data items recorded under the general heading “world” refer to general information transcending several regions or pertaining to the world as a whole.

The content of the database. In order to help the analysis of forced labour beyond mere estimation of its incidence, a framework was developed to collect, where possible, a maximum of information on the nature and circumstance of forced labour and the characteristics of the persons involved. In addition to geographical information (country or region), the contents of the database include information on the population category of the victims (children, women, indigenous, etc.), their status (freed, rehabilitated, etc.), the circumstance of entry in forced labour (trafficked in, trafficked out, etc.), the economic aspects (branch of economic activity, salary, etc), as well as information on debt situation, confiscation of documents, violence and threats. The database also includes information on the nature of recorded data, in particular, the date or time period of forced labour, whether the data refers to a headcount or an estimate, whether it is a stock or a flow, and whether it is meant to be a minimum value or a maximum. Finally, the database records full bibliographical information of the source of the data including page number, the name of the researcher who entered the data and the date of data-entry. Provision is also made to record the validation result.

4.2. Data validation

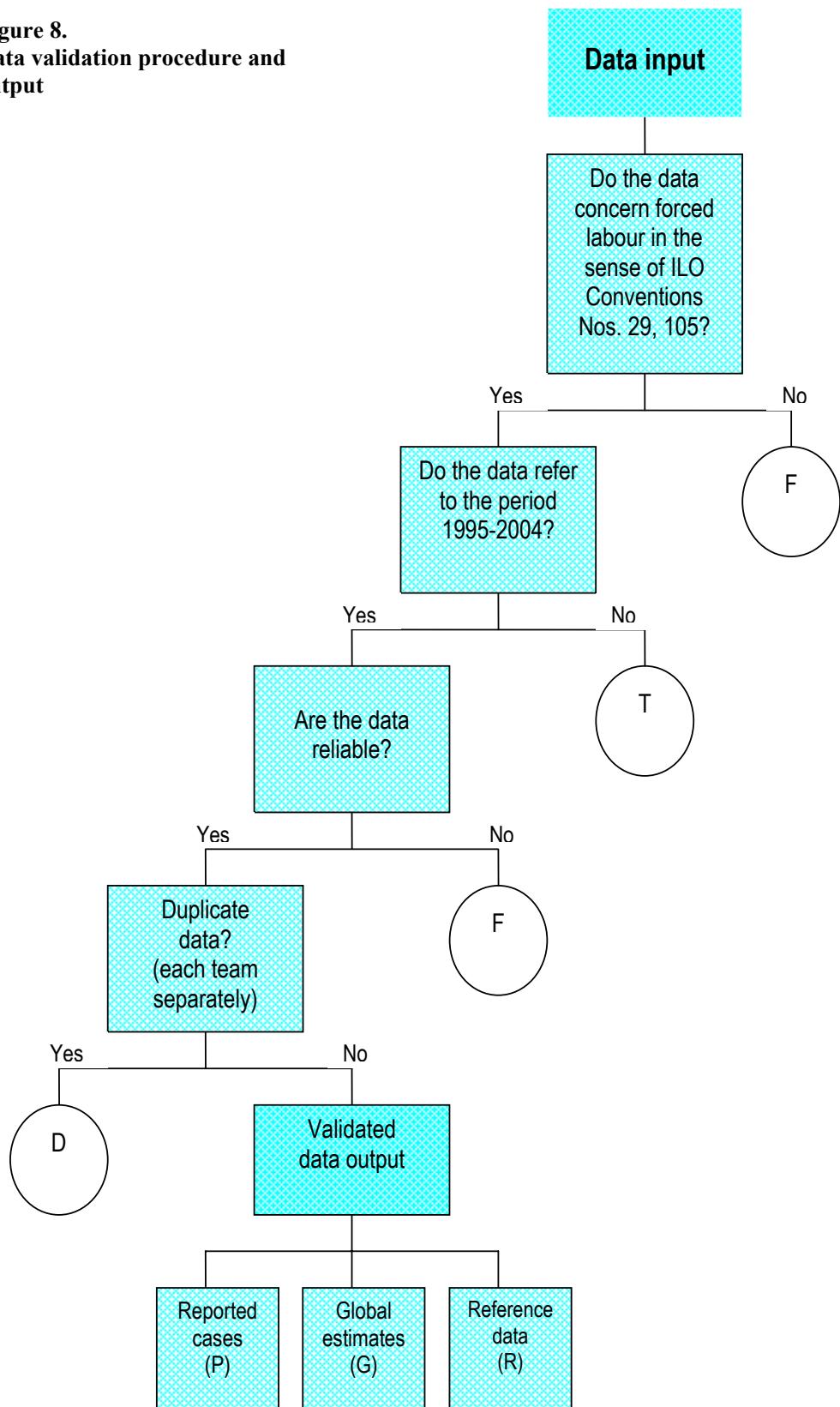
The data entered by each team in their respective database were subject to a four-step validation procedure. The validation procedure is schematically presented in figure 8 and each step is described below:

(a) The nature of data on forced labour. The first step in the validation process is to verify that the data entered in the database concerns forced labour in the sense of the ILO Conventions Nos. 29 and 105. Experience has shown that there is a general lack of precision in the vocabulary used in respect to forced labour and related situations. The fact that the materials published along with the data explicitly refer to forced labour may not be a sufficient reason to associate that piece of data with forced labour for the present purpose of measurement. Irregular migrants working in harsh conditions are sometime presented as being in a situation of “slavery”, even though their work relationship may not have any binding constraints. Conversely, there are situations that are not explicitly referred to as forced labour in the reports, although they actually fall under the definition of ILO Convention No. 29. There are also situations such as the sales of organ or the trafficking of children for purpose of adoption where the basic activity is not a work activity and therefore the classification as forced labour would be incorrect.

In practice, the following three general criteria have been used for considering a situation as forced labour:

1. The person has entered into that work against his or her will. The victim may have been kidnapped, menaced or deceived. Children pledged in exchange for debts of their parents or forced into commercial sexual exploitation fall into this category.
2. The person is retained in work against his or her will. The person could have been retained physically (locked in a room, or working and living in a place permanently watched, or even guarded by armed personnel), or by other means such as confiscation of identity papers or holding back part or the whole of wages.
3. The person can only leave the job at great risk, such as menaces against the person or his or her family, or menaces of being denounced to the authorities.

Figure 8.
Data validation procedure and output



It should be noted that the last two criteria are independent of the first. A person may have initially entered into a job voluntarily and later be retained in the job by force. Data that did not meet one or more of the above criteria were discarded from forced labour calculation and entered in a special file called “F” for discarded data.

(b) The date or time-period. The next step in the validation procedure was to ensure that the data refer to the estimation period 1995-2004. Curiously, a significant number of publications report on events and data with no mention of dates or time periods. The main task of validation has therefore been to find, if possible, a date or time-period that could be associated to the reported fact. A number of problems had to be surmounted in this process. Often, there was no way to know whether the data in question referred to an annual flow of victims or to a total number of persons in forced labour at a given time. Sometimes, data presented as recent actually relates to a situation reported ten or fifteen years ago. In all, some 310 data were eliminated by this filter, and transferred to a special file called “T”.

(c) The reliability of the data. The next step in the validation process was to assess the reliability of the data. Not all that is written or published should be believed. Two basic principles were used in evaluating the data.

1. Primary source. The evaluation should relate to the primary source of the data, not necessarily the reporting source. This principle implied a tedious exercise to find primary sources. In some instances this turned out to be impossible, for example when discovering loops such as A citing B, B citing C, and C citing A! Such data were of course not validated.
2. Credibility of source. The reliability of the data depends on the credibility of the original source. This principle was adopted as a short cut to detailed analysis of sometime unavailable information on the methodology used to obtain the data. Credibility was assessed on the basis of authorship. In the case of specific facts, all data first issued by identified individuals or institutions were considered as reliable. By contrast, all data reported with no mention of authorship or affiliation, were discarded. In the case of local estimates, data emanating from organisations working directly in the field were accepted as reference data even if no methodological description were available. In the case of global estimates, documentation on methodology was the deciding element and data without methodological description were discarded.

Overall, about 300 data were refused as unreliable. They were transferred to file “F” together with the data that failed the definitional filter described earlier.

(d) Duplications. The final step in the validation process was the elimination of duplicated data within each team’s database. This step did not concern duplications between teams, as these are considered valid and represent the essence of the capture-recapture methodology. Four types of duplications were observed:

1. A source publishes information or an estimate on forced labour and the article is cited in a multitude of other studies. In the present validation process, two publications reporting the same number with the same primary source were considered as duplicates.
2. Material published by a source is reproduced by another one but with some minor or major distortions, for example, rounding the figure of 783 to 800, changing the date of, say, “July 2003” to “last year”, or omitting the identity of “women and children” and referring simply as “victims of forced labour”. These types of duplications were in general more difficult to identify, but they could often be detected by finding the original source.
3. In the case of trafficking in persons for forced labour, duplications may occur when one person from a team finds the data recorded at the place of origin, and another member of the same team finds it for the place of destination. Such duplications were detected by matching the figures and the locations. Where duplications were found, the place-of-origin data were discarded, and the place-of-destination data maintained.

Close to 1,000 data were invalidated on duplication ground of all sorts. The duplicate items were separately stored in a special file called “D”.

4.3. Validated output

The final output of the validation process forms the basis of the ILO global estimation of forced labour. The validated data output are grouped into three categories depending on the nature of the data.

1. The first category comprises validated data on reported cases. The data are stored in a special database labelled “P”, to be analysed using the capture-recapture methodology described above. As we have already pointed out, validated data are classified as reported cases of forced labour if the victims are identified or identifiable. Victims are identified when they are reported as part of a testimony or they are liberated say, in a police raid. Victims are

identifiable when they were part of a survey or inquiry or were beneficiaries of targeted support programmes. The distribution by team is shown below:

Region	Team 1	Team 2
Asia and the Pacific	75	202
Industrialized Countries	201	195
Latin America and the Caribbean	86	262
Middle East and North Africa	43	49
Sub-Saharan Africa	131	126
Transition Economies	89	73
World	0	2
Total	625	909

2. The second category of output consists of validated global estimates on one or more forms of forced labour. The estimates could be at the local level, national, regional or at the world level. They may be presented as absolute figures or in the form of annual flows or percentages. Some 730 such global estimates have been validated and stored in a special file labelled “G”, which was not directly used in the capture-recapture estimation process but which was used to evaluate our results.
3. Finally, the third category of output are so-called reference data, i.e., validated data that are not direct estimates of forced labour but provide indirect information on the phenomena. For example, the number of prostitutes in a country provides information on the upper bound of the number of women in forced labour, trafficked for commercial sexual exploitation. Similarly, results of case studies or partial surveys giving percentages provide information on the different aspects of forced labour although they cannot be used directly for the present exercise on global estimation of forced labour. Some 900 such reference data have been validated and stored in a special file labelled “R”.

It can be calculated that the total number of validated data stands at about 3,164 (625 + 909 in the P category, 730 in the G category, and 900 in the R category). Comparing this figure with the total number of data items collected by the two teams, 5,111, it follows that the validation process discarded as invalid close to one-third of the data, retaining about two-thirds. Our estimates were then calculated by using the capture-recapture methodology described earlier and the data labelled “P” which contains valid reported cases of forced labour.

5. Evaluation of the data

Like most global estimates, our estimates on the incidence of forced labour in the world are subject to errors. There are essentially two types of errors involved: sampling and coverage errors. Sampling errors are due to the fact that only a sample of all reported cases of forced labour has possibly been examined in the study. The capture-recapture methodology was designed to control the sampling errors and provide estimates of its extent. The estimated margins of errors due to sampling are discussed in more details in the next section below.

By contrast, coverage errors are the result of the fact that we were not able to sample any forced labour that has not been reported somewhere. An effort has been made to account for this incomplete coverage by exploiting the relationship that exists between the different forms of forced labour and their likely propensity of non-reporting. As it is difficult to evaluate the coverage errors, the following sections compare the global estimates derived here, or some of their components, with estimates obtained from other sources.

5.1. Sampling errors

Sampling errors arise from the fact that the estimate is based on a generalization from a sample portion of the totality of reported cases of forced labour. Had different samples been examined on different occasions by the researchers, no doubt the resulting global estimate would be somewhat different each time. The double-sampling methodology adopted here, fortunately, provides not only an estimate of global forced labour, but also an estimate of the induced sampling error involved. This sampling error, called standard error in the statistical terminology, is calculated in the present context to be about 2,500,000. Thus different sampling of reported cases should lead, with high likelihood, to global estimates of forced labour within the range of 9,800,000 to 14,800,000. Hence, the relative standard error, calculated as the ratio of the standard error to the estimate, is about 20%, indicating a large rate of sampling error.

The sampling error may be interpreted in terms of a confidence interval. Thus, the unknown number of people in forced labour in the world, estimated from a set of sample data, is likely to be within an estimated range of roughly one standard error, which in the present context is equal to

12,300,000 +/- 2,500,000

or

$$9,800,000 - 14,800,000$$

The level of confidence associated with this confidence interval is about 68%.

The sampling error of the global estimate is calculated on the basis of the proportions of common reported cases in the capture-recapture sampling process. The formula used is given in Thompson²¹. In practice, it is adjusted to account for the variability of the number of victims per reported case. For regional and component estimates of forced labour, the standard error is generally smaller, but not proportionately. The relative standard error of an estimate x may be roughly calculated by the formula below:

$$\text{Relative standard error} = p(a + b/x),$$

where $a = 0.04$, $b = 12,000$, and x is the estimate for which the relative standard error is to be calculated. The standard error itself is obtained by the product of the estimate and the relative standard error

$$\text{Standard error} = x * \text{relative standard error}$$

The standard errors of the different regional and component estimates produced in this report have been computed in this fashion and are shown below:

	ILO minimum estimate	Standard error
World	12,300,000	2,500,000
- Asia and the Pacific	9,500,000	1,900,000
- Latin America and the Caribbean	1,300,000	300,000
- Sub-Saharan Africa	660,000	160,000
- Middle East and North Africa	260,000	80,000
- Transition economies	210,000	70,000
- Industrialized countries	360,000	100,000
- State-imposed forced labour	2,500,000	530,000
- Private-imposed for commercial sexual exploit'	1,400,000	310,000
- Private-imposed for other economic exploitation	7,800,000	1,600,000
- Mixed private-imposed forced labour	610,000	150,000
- Forced labour as result of trafficking in persons	2,450,000	520,000

²¹Thompson, Steven K., *Sampling*, John Wiley & Sons, Inc., New York, 1992. (p. 214, equation (6)).

It can be verified that, in general, the standard error of an estimate decreases as the value of the estimate decreases, but the relative standard error increases (not shown here). Thus, for smaller geographical regions and more forms of forced labour, the relative error of the estimate increases. For this reason, no estimate at the national level and for specific forms of forced labour can be given with some degree of reliability.

5.2. Comparison with other existing estimates

As mentioned earlier, the process of validating data for the capture-recapture estimation gave rise not only to validated data on reported cases of forced labour (the file called “P” in figure 8) but also to validated gross estimates of different forms of forced labour in various countries and regions (the file called “G” in figure 8). These G-file data did not enter the calculations of the capture-recapture estimation. Rather, they were compiled for comparison purposes. Where they can be considered as independent estimates of comparable phenomena, they provide a useful basis for evaluating the component estimates of forced labour derived from the capture-recapture methodology, as shown below.

Global forced labour

In the first research study to examine contemporary global slavery, Kevin Bales compiled data on more than 110 countries and territories in all continents and tentatively estimated 27.9 million victims of slavery in the world, of which 26.4 million in Asia. Our own minimum global estimate of forced labour is substantially lower. Except for Asia, however, our estimate matches rather closely the result obtained by Kevin Bales. This can be noted in the tabulation below. The difference for Asia is probably due to a combination of two factors. First, the ILO methodology is based on reported cases, while Kevin Bales’ methodology involves the aggregation of country-estimates from secondary sources validated by country experts. Some of Bales’ country-estimates include high figures, such as 22 million in India. The reported cases obtained from the capture-recapture sampling did not lead to such high estimates of forced labour in Asia. Second, whereas the ILO measures forced labour as defined in Convention No. 29, Bales measured the incidence of slavery defined as “a social and economic relationship marked by the loss of free will where a person is forced through violence or the threat of violence to give up the ability to sell freely his/her own labor power”.²²

²² Bales, Kevin, *Disposable People, New Slavery in the Global Economy*, University of California Press, Berkeley and Los Angeles, California, 1999.

- Bales, Kevin, “International Labor Standards: Quality of Information and Measures of Progress in Combating Forced Labor,” Paper commissioned by the Committee on Monitoring International Labor Standards, National Academies, 2003.

	Kevin Bales	ILO Minimum Estimate
Global forced labour	27.9 million	12.3 million
Asia	26.4 million	9.5 million
World except Asia	1.5 million	2.8 million

Forced labour outcome of human trafficking

The United States Government regularly publishes global estimates on human trafficking in terms of annual flows. The latest available data show that annually between 600,000 and 800,000 people are trafficked across international borders worldwide and some 14,500 to 17,500 of those are trafficked into the United States. The ILO minimum estimate of victims of forced labour as a result of trafficking is about 2,450,000. This is a stock estimate indicating the number of victims at a given time. For comparison with the US estimate, it should be converted into annual flows by taking into account the average duration in forced labour of trafficked persons. If we assume an average duration of about 2 years in forced labour, the calculation below shows that the ILO flow estimate is quite similar to the corresponding US Government estimate.

	US Government Estimate	ILO Minimum Estimate
Trafficked forced labour (stock)	-	2,450,000
Average duration in forced labour	-	2 years
Trafficked forced labour (flow)	600,000 - 800,000	1,225,000

At least in part, the difference is due to the number of victims of forced labour as a result of internal trafficking, a phenomenon accounted for in the ILO estimate but not in the US Government estimate, which is limited to trafficking across international borders.

Worst forms of child labour

The ILO International Programme on the Elimination of Child Labour (IPEC) published global estimates in 2002 of children in “unconditional worst forms” of child labour, including children in forced and bonded labour, estimated at 5,700,000.²³ A precise breakdown by age group of the ILO global estimate on forced labour was not possible, as the age of victims was seldom reported in the

²³ ILO, *Every Child Counts. New Global Estimates on Child Labour*, International Programme on the Elimination of Child Labour, Geneva, April 2002.

available sources. On the basis of scant information, it is estimated that children represent roughly between 40 and 50 percent of all victims of forced labour. These percentages correspond to about 4.9 to 6.15 million children, a range consistent with the IPEC global estimate of children in forced and bonded labour, as shown in the tabulation below.

	IPEC Every Child Counts	ILO Minimum Estimate
Global estimate in forced labour	-	12,300,000
Estimated percentage of children	-	40% - 50%
Children in forced labour	5,700,000	4,900,000-6,150,000

Forced labour for commercial sexual exploitation

The G-file data leads to a global estimate of about 14 million prostitutes in the world, a value that corresponds approximately to 0.2% of the world population. The ILO minimum estimation of forced labour for commercial sexual exploitation is about 1.6 million which implies that 11% of the total number of prostitutes is in forced labour. This percentage is roughly consistent with findings from case studies undertaken in Thai brothels, where 13.5% of prostitutes were found to have been forced into prostitution.²⁴

Forced labour imposed by private agents in Asia and the Pacific

The G-file data on forced labour imposed by private agents and enterprises in Asia varies enormously, between 5 and 25 million victims, depending on the number that is used for India. When the details are analysed, it can be observed that the main component of divergence is the estimate of forced labour for economic exploitation other than for commercial sexual exploitation. For commercial sexual exploitation, the G-file data give a strikingly close value to the corresponding ILO minimum estimate, as shown below. For other economic exploitation, which includes the problem of bonded labour in South Asia, our estimate clearly falls in the lower end of the range based on the G-file.

	ILO Minimum Estimate	G-file data
Private imposed forced labour	6,700,000	5-25 million
- For commercial sexual exploitation	960,000	40% - 50%
- For economic exploitation	5,700,000	-

²⁴ Boonchalaski, W. and Philip Guest, "Prostitution in Thailand," Chapter 5 in *The Sex Sector. The economic and social bases of prostitution in Southeast Asia*, ed. Lin Lean Lim, Geneva, ILO, 1998, pp. 130-169.

Forced labour imposed by private agents in Latin America and the Caribbean

The G-file data on forced labour imposed by private agents and enterprises in Latin America and the Caribbean give between 300,000 to 860,000 victims. The corresponding ILO minimum estimate, 930,000, is outside this range, but not by far. The lower value of the aggregation of G data may be due to the statistical treatment of domestic workers in servitude, which we evaluate at 5 percent of all domestic workers in Latin America and the Caribbean, but which are almost completely absent from estimates in other secondary sources. If one was to add an estimated 5 percent of all domestic workers in forced labour, the G-data would increase by about 350'000 to a total of about 650'000 to 1.2 million. The ILO estimate falls within such a range.

Forced labour imposed by private agents in Sub-Saharan Africa

The ILO minimum estimate of forced labour imposed by private agents and enterprises in Sub-Saharan Africa is 635,000 victims. The sum of the G-file data gives corresponding estimates that range between 270,000 and 720,000. The estimate reported by Kevin Bales for Africa is 450,000, also of the same order of magnitude.

Forced labour imposed by private agents in Industrialized Countries

The G-file data on forced labour imposed by private agents and enterprises in industrialized countries led to a range of between 255,000 and 365,000 victims, roughly in line with the corresponding ILO minimum estimate of 340,000. It is instructive to note that the estimate made by Kevin Bales for industrialized countries also falls within this range (265,000).

Similar comparisons for forced labour estimates in Middle East and North Africa and in Transition Economies could not be made as too few estimates were found among the G-file data. The comparisons carried out for the regions and components for which corresponding data could be found, however, show that the ILO minimum estimates are for the most part consistent with estimates from other sources.

Annex: list of countries

Regional breakdown according to ILO's KILM (Key Indicators of Labour Market)

Developed (industrialized) economies

Major Europe

Austria
Belgium
Denmark
Finland
France
Germany
Germany, Federal Republic of (Western)
Greece
Iceland
Ireland
Italy
Luxembourg
Netherlands
Norway
Portugal
Spain
Sweden
Switzerland
Turkey
United Kingdom

Major non-Europe

Australia
Canada
Japan
New Zealand
United States

Other Europe

Andorra
Cyprus
Faeroe Islands
Gibraltar
Isle of Man
Liechtenstein
Malta
Monaco
San Marino

Other non-Europe

Greenland
St. Pierre and Miquelon

Transition economies

Baltic States

Estonia
Latvia
Lithuania

Central and Eastern Europe

Albania
Bosnia and Herzegovina
Bulgaria
Croatia
Czech Republic
Czechoslovakia
Germany, Former Democratic Republic of (Eastern)
Hungary
Poland
Romania
Serbia and Montenegro
Slovakia
Slovenia
The former Yugoslav Republic of Macedonia
Yugoslavia (Former)

Commonwealth of Independent States

Armenia
Azerbaijan
Belarus
Georgia
Kazakhstan
Kyrgyzstan
Republic of Moldova
Russian Federation
Tajikistan
Turkmenistan
Ukraine
Uzbekistan

Former USSR

USSR: before Sept. 1991

Asia and the Pacific

Eastern Asia

China
Hong Kong, China
Korea, Democratic People's Republic of
Korea, Republic of

Macau, China
Mongolia
Taiwan, China

Pacific

Melanesia

Fiji
New Caledonia
Papua New Guinea
Solomon Islands
Vanuatu
Micronesia
Guam
Kiribati
Marshall Islands
Nauru
Northern Mariana Islands
Pacific Islands (Trust Territory)

Polynesia

American Samoa
Cook Islands
French Polynesia
Niue
Samoa
Tokelau
Tonga
Tuvalu
Wallis and Futuna Islands

South-central Asia

Afghanistan
Bangladesh
Bhutan
India
Maldives
Nepal
Pakistan
Sri Lanka

South-eastern Asia

Brunei Darussalam
Cambodia
East Timor
Indonesia
Lao People's Democratic Republic
Malaysia
Malaysia: Peninsular Malaysia
Myanmar
Philippines
Singapore
Thailand
Viet Nam

Latin America and the Caribbean

Caribbean

Anguilla
Antigua and Barbuda
Aruba
Bahamas
Barbados
Belize
Bermuda
British Virgin Islands
Cayman Islands
Cuba
Dominica
Dominican Republic
Grenada
Guadeloupe
Guyana
Haiti
Jamaica
Martinique
Montserrat
Netherlands Antilles
Puerto Rico
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Suriname
Trinidad and Tobago
Turks and Caicos Islands
United States Virgin Islands

Central America

Costa Rica
El Salvador
Guatemala
Honduras
Mexico
Nicaragua
Panama

Latin America

Argentina
Bolivia
Brazil
Chile
Colombia
Ecuador
Falkland Islands (Malvinas)
French Guiana
Paraguay
Peru
Uruguay
Venezuela

Sub-Saharan Africa

Eastern Africa

Burundi
 Comoros
 Eritrea
 Ethiopia
 Kenya
 Madagascar
 Malawi
 Mauritius
 Mozambique
 Réunion
 Rwanda
 Seychelles
 Tanzania, United Republic of
 Uganda
 Zambia
 Zimbabwe

Middle Africa

Angola
 Cameroon
 Central African Republic
 Chad
 Congo
 Congo, Democratic Republic of
 Equatorial Guinea
 Gabon
 Sao Tome and Principe
 Southern Africa
 Botswana
 Lesotho
 Namibia
 South Africa
 Swaziland

Western Africa

Benin
 Burkina Faso
 Cape Verde
 Côte d'Ivoire
 Gambia
 Ghana
 Guinea
 Guinea-Bissau
 Liberia
 Mali
 Mauritania
 Niger
 Nigeria
 Senegal
 Sierra Leone
 St. Helena
 Togo

Middle East and North Africa

Middle East

Bahrain
 Djibouti
 Iran, Islamic Republic of
 Iraq
 Israel
 Jordan
 Kuwait
 Lebanon
 Oman
 Qatar
 Saudi Arabia
 Somalia
 Syrian Arab Republic
 United Arab Emirates
 West Bank and Gaza Strip
 Yemen

North Africa

Algeria
 Egypt
 Libyan Arab Jamahiriya
 Morocco
 Sudan
 Tunisia