Methodology

8.7 ALLIANCE

GLOBAL ESTIMATES OF MODERN SLAVERY: FORCED LABOUR AND FORCED MARRIAGE

International Labour Office

WALK FREE FOUNDATION

In partnership with

International Organization for Migration (IOM)
The UN Migration Agency

Methodology of the global estimates of modern slavery: Forced labour and forced marriage

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Introduction

The global commitment through the Sustainable Development Goals (SDGs) to eradicate modern slavery, trafficking, forced labour, and child labour brings added urgency to understanding the scale and manifestations of these issues. Accurate measurement is fundamental to establishing baselines against which progress can be assessed and decisions made about the effective targeting of policies, interventions, and resources.

Measuring modern slavery is fraught with the challenges of investigating criminal activity that is deeply hidden. While not without gaps and limitations, the Global Estimates of Modern Slavery provide the international community with the best available data and information that exists about the scale and distribution of modern slavery today. Moreover, there is a link between SDG Target 8.7 (take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour…) and other goals and targets, particularly SDG 5.2 (on the elimination of all forms of violence against all women and girls in the public and private spheres, including trafficking), SDG 16.2 (to end abuse, exploitation, trafficking and all forms of violence against and torture of children), and SDG 10.7 (to facilitate orderly, safe, and responsible migration and mobility of people, including through implementation of planned and well-managed migration policies). The Global Estimates can also contribute to the benchmarks for meeting these goals and targets, and indeed to the broader SDG 8 objective of promoting sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all by 2030. For the purposes of informing action under SDG Target 8.7, the Global Estimates of Modern Slavery[1] sit alongside the Global Estimates of Child Labour.[2]

This report explains the results and methodology of the Global Estimates of Modern Slavery in further detail. As described in this report, as no single source provides suitable and reliable data for all forms of modern slavery, a combined methodology has been adopted, drawing on a variety of data sources as required. The central element is the use of 54 specially designed, national probabilistic surveys involving interviews with more than 71,000 respondents across 48 countries for estimates of forced labour and forced marriage. Case data from IOM from the victims of trafficking that the Organization provides assistance to were used, in combination with the 54 datasets, to estimate forced sexual exploitation and forced labour of children, as well as the duration of forced labour exploitation. Forced labour imposed by state authorities was derived from validated sources and systematic review of comments from the International Labour Organization (ILO) supervisory bodies with regard to ILO Conventions on forced labour. The methodology used to build these Global Estimates combined all of this data, covering a five-year reference period from 2012 to 2016.

The estimates are the result of a collaborative effort between the International Labour Organization (ILO) and the Walk Free Foundation, in partnership with the International Organization for Migration (IOM). They benefited from inputs provided by other UN agencies, in particular the Office of High Commissioner for Human Rights (OHCHR). It reflects two years of collaborative work to align measurement frameworks, refine survey instruments, collect and analyse hundreds of thousands of data points, and ultimately find solutions to complex measurement challenges. This reflects a deep commitment of all organizations

involved to achieve common, agreed-upon measurement on this critical issue as a first step towards solutions.

It is also hoped that the findings presented in this report will encourage further research and data collection efforts by governments and stimulate the harmonization of measurement frameworks across countries.

The report is structured in two parts. The first part presents the main results and the second describes the methodology used in developing the estimates.

Overall summary of results: Modern slavery, forced labour, and forced marriage by sex, geographical region, 2016

		Modern slavery sub-categories		Forced labour exploitation		Forced sexual exploitation		State-imposed forced labour		Forced marriages	
		('000)	per cent	('000)	per cent	('000)	per cent	('000)	per cent	('000)	per cent
World		40 293	-	15 975	-	4 816	-	4 060	-	15 442	-
Sex	Male	11 648	28.9	6 766	42.4	29	1.0	2 411	59.4	2 442	15.8
	Female	28 645	71.1	9 209	57.6	4 787	99.0	1 650	40.6	13 000	84.2
Age	Adults	30 327	75.3	12 995	81.3	3 791	78.7	3 778	93.1	9 762	63.2
	Children	9 965	24.7	2 980	18.7	1 024	21.3	282	6.9	5 679	36.8

	Total modern slavery		Forced labour		Forced marriages	
	('000)	per cent	('000)	per cent	('000)	per cent
World	40 293	100	24 850	100	15 442	100
Africa	9 230	22.9	3 420	13.7	5 820	37.7
Americas	1 950	4.8	1 280	5.2	670	4.3
Arab States	520	1.3	350	1.4	170	1.1
Asia and the Pacific	25 000	62.0	16 550	66.6	8 440	54.7
Europe and Central Asia	3 600	8.9	3 250	13.1	340	2.2

Terminology

In the context of this report, modern slavery covers a set of specific legal concepts including forced labour, debt bondage, forced marriage, slavery and slavery-like practices, and human trafficking.[3] **Although modern slavery is not defined in law**, it is used as an umbrella term that focuses attention on commonalities across these legal concepts[4]. Essentially, it refers to situations of exploitation that a person cannot refuse or leave because of threats, violence, coercion, deception, and/or abuse of power.

In order to make this set of complex legal concepts measurable, the Global Estimates focus on two key forms of modern slavery:

- **forced labour** (as per ILO Forced Labour Convention, 1930 (No. 29)), and
- **forced marriage** (that is, marriage without consent).

Forced labour is defined 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 or herself voluntarily.[5] The operational definition translates the legal definition into the following: "any

form of work or service for which both an element of involuntariness and an element of coercion can be found."

Forced labour of children is defined as work performed by a child under coercion applied by a third party (other than his or her parents) either to the child or to the child's parents, or work performed by a child as a direct consequence of his or her parent or parents being engaged in forced labour. The coercion may take place during the child's recruitment to force the child or his or her parents to accept the job. It may also occur once the child is working, to force him or her to do tasks that were not part of what was agreed to at the time of recruitment, or to prevent them from leaving the work.

TYPES OF FORCED LABOUR

Forced labour in the private economy for labour exploitation refers to forms of forced labour imposed by private individuals, groups, or companies in all sectors except the commercial sex industry. It is hereafter referred to as **forced labour exploitation**.

Forced labour in the private economy for commercial sexual exploitation refers to forced labour and services imposed by private individuals, groups, or companies involving commercial sex. It is hereafter referred to as **forced sexual exploitation**. This includes women and men who have involuntarily entered a form of commercial sexual exploitation, or who have entered the sex industry voluntarily but cannot leave. It also includes all forms of commercial sexual exploitation of children. This encompasses the use, procuring, or offering of children for prostitution or pornography.

State-imposed forced labour refers to forms of forced labour imposed by state authorities, regardless of the sector in which it takes place. It is also referred to as **forced labour imposed by state authorities**. For the purpose of this research, state-imposed forced labour includes labour exacted by the State as means of political coercion or education or as a punishment for expressing political views; as a punishment for participating in strikes; as a method of mobilizing labour for the purpose of economic development; as a means of labour discipline; and as a means of racial, social, national, or religious discrimination. While it has been acknowledged that States should be granted the power to impose compulsory work on citizens in certain circumstances relating to, for example, civic or military obligations as well as to enforcement of penal sanctions, the scope of this prerogative is limited by a number of conditions.[6] Failure to respect these conditions may lead to an activity being regarded as state-imposed forced labour.

Forced marriage refers to situations in which persons, regardless of their age, have been forced to marry without their consent.[7] A person might be forced to marry through physical, emotional, or financial duress, deception by family members, the spouse, or others, or the use of force, threats, or severe pressure. Forced marriage is prohibited through the prohibitions on slavery and slavery-like practices, including servile marriage.[8] Forced or sham marriages can also be used as a cover for situations of forced labour and human trafficking.[9] Child, early, and forced marriages are terms that are sometimes used interchangeably. While some child marriages, particularly those involving children under the age of 16 years, are considered a form of forced marriage,[10] it is important to note that there are exceptions. For example, in many countries 16 and 17-year-olds who wish to marry are legally able to do so following a judicial ruling or parental consent[11].

For the purpose of the current estimates, the measurement of forced marriage is limited to what was captured by the surveys. That is, forced marriage in these estimates includes all marriages of both adults and children that were reported by the survey respondents to have been forced to marry and without consent, regardless of the age of the respondent. Accordingly, the estimates do not include every instance of child marriage, as child marriage is not currently measured adequately at the scale or specificity required for a global estimate.

Child refers to any individual under the age of 18 years, in accordance with the United Nations Convention on the Rights of the Child and the ILO's Worst Forms of Child Labour Convention, 1999 (No. 182).

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Part A
Main results

Global results

AN ESTIMATED 40.3 MILLION PEOPLE WERE VICTIMS OF MODERN SLAVERY IN 2016

Of this number, 24.9 million people (62 per cent) were victims of a form of forced labour, and 15.4 million people (38 per cent) were living in a forced marriage (Figure 1).

Figure 1

Global estimates by form of modern slavery

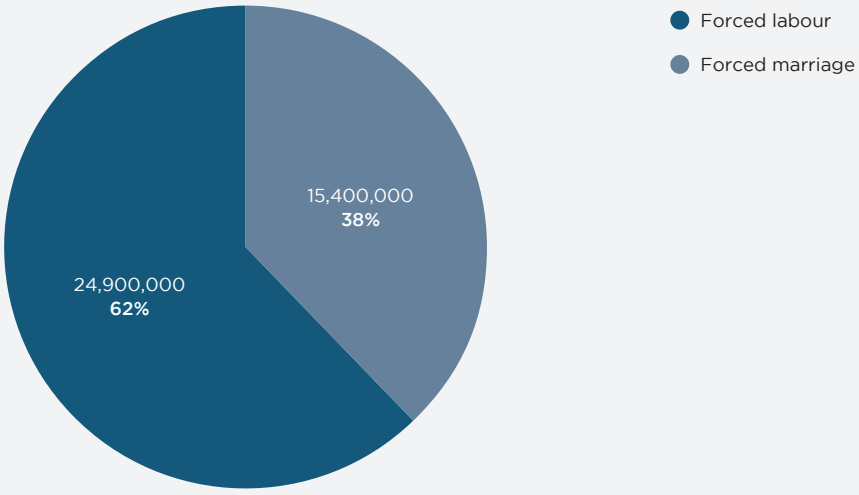
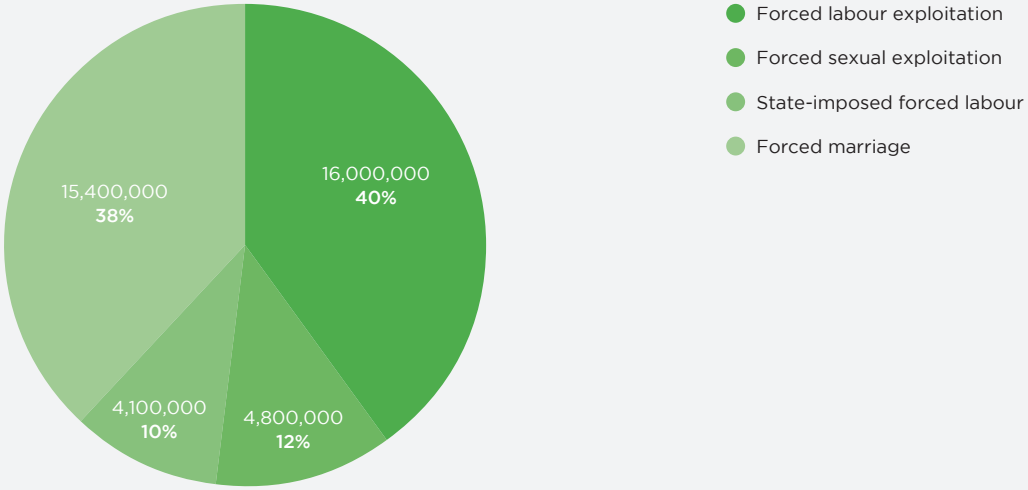


Figure 2

Global estimates by form of modern slavery and form of forced labour



Among the 24.9 million in any form of forced labour, 16 million were victims of forced labour exploitation in economic activities such as agriculture/fishing, construction, domestic work, and manufacturing, 4.8 million were victims of forced sexual exploitation, and 4.1 million were victims of forced labour imposed by state authorities. Figure 2 presents the distribution of the estimate by form of modern slavery.

Of the overall total, some victims were trapped in their job for weeks or months, others for years or decades. Some were recruited by force every year and were forced to work by private actors or state authorities for a matter of days or weeks. This estimate reflects the average number of people in forced labour at any point in time during that period, which we refer to as an "average stock" estimate.[12]

Demographic characteristics of victims

SEX OF THE VICTIMS

Modern slavery affects men and women, boys and girls differently. This reflects many factors, for example, gendered patterns of employment, with more women employed as domestic workers and more men employed in fishing, but also gender norms, particularly around marriage. The data suggests that, overall, more females than males are affected by modern slavery (71 per cent compared to 29 per cent). This varies across forms, with women and girls representing 99 per cent of victims of forced sexual exploitation, 58 per cent of victims in private labour in other sectors, 41 per cent of victims of forced labour imposed by authorities, and 84 per cent of victims of forced marriages (Table 1 and Figure 3).

Table 1

Global estimates of modern slavery by sex and age group

		Total Modern Slavery		Forced labour exploitation		Forced sexual exploitation		State-imposed forced labour		Forced marriages	
		('000)	per cent	('000)	per cent	('000)	per cent	('000)	per cent	('000)	per cent
World		40 293		15 975	-	4 816	-	4 060	-	15 442	
Sex	Male	11 648	28.9	6 766	42.4	29	1.0	2 411	59.4	2 442	15.8
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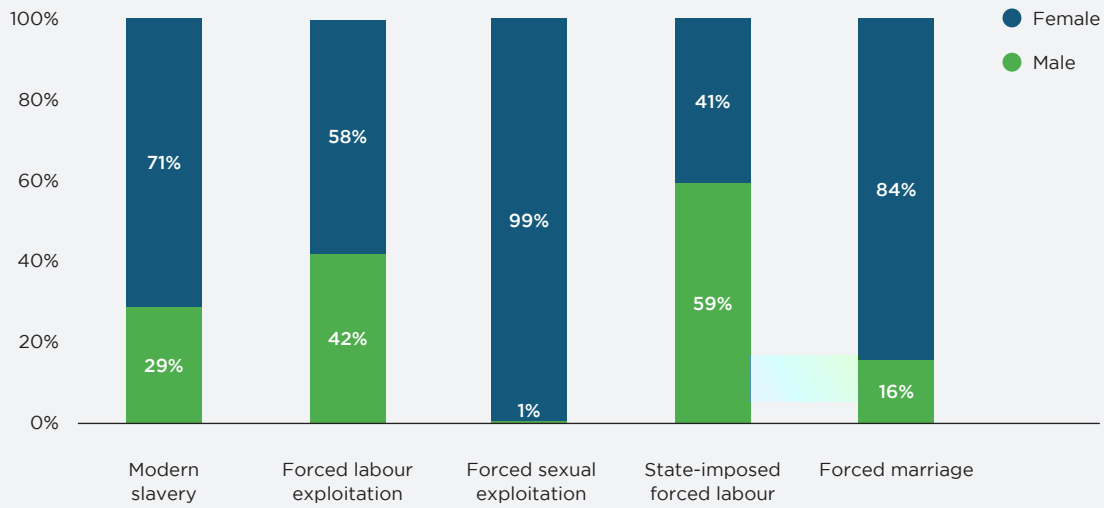
	Children	9 965	24.7	2 980	18.7	1 024	21.3	282	6.9	5 679	36.8

Figure 3

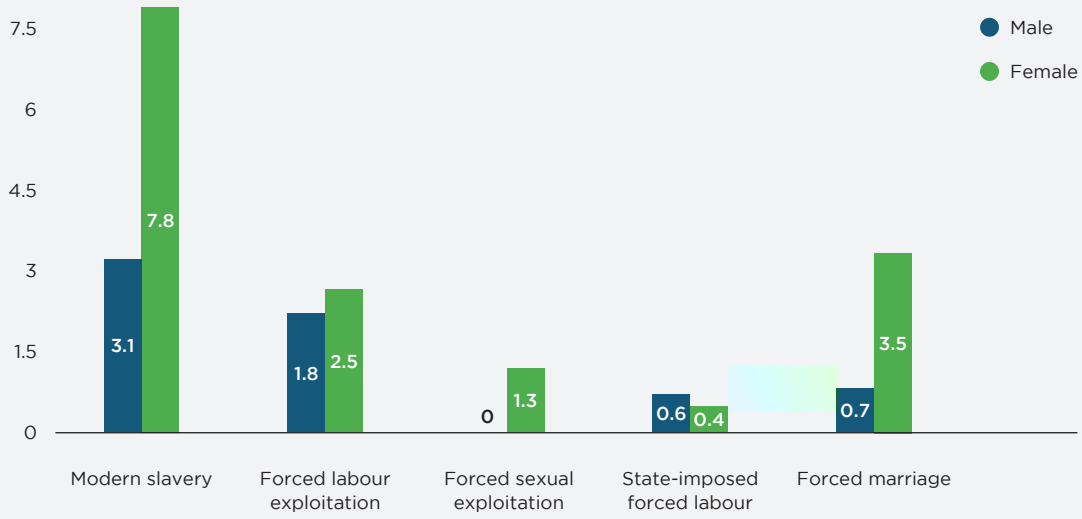
Global estimates of modern slavery by sex of victim



There were 7.8 female victims of modern slavery for every 1,000 females in the world. Comparatively, there were less than half as many male victims (3.1) for every 1,000 males in the world. With the exception of state-imposed forced labour, females were more likely than males to be victims of each form of forced labour and of forced marriage (Figure 4).

Figure 4

Prevalence of modern slavery by form and sex (number of victims per 1,000 inhabitants)



AGE GROUP

In 2016, one in four victims of modern slavery were children (Table 1). The share of children who were in one form of forced labour varied from 19 per cent in forced labour exploitation, 21 per cent in forced sexual exploitation, and 7 per cent in forced labour imposed by state authorities (Figure 5). Thirty-seven per cent of people who were forced to marry were children.

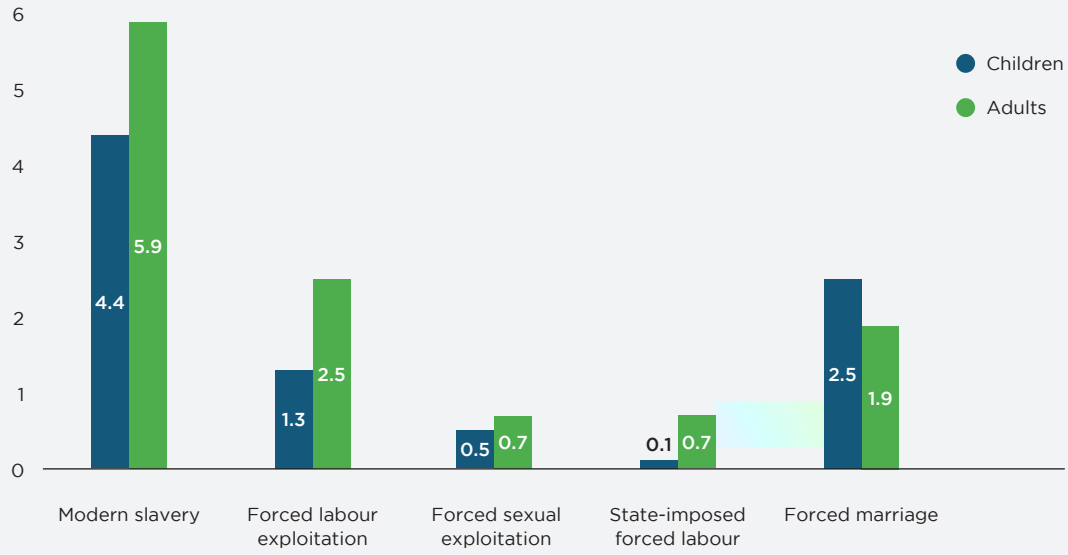
Figure 5

Global estimates of modern slavery by age of victim

While the proportion of adult victims is substantially higher than that of child victims, when the total population of adults and children is taken into account, the difference is much smaller. There were 5.9 adult victims of modern slavery for every 1,000 adults in the world, and 4.4 child victims for every 1,000 children. When examining the rates of prevalence by form of modern slavery, adults were more likely than children to be victims of all forms of forced labour; however, children were more likely than adults to be victims of forced marriage. For every 1,000 children in the world, 2.5 were victims of forced marriage, compared to 1.9 adults per 1,000.

Figure 6

Prevalence of modern slavery by form and age (number of victims per 1,000 inhabitants)



REGIONAL DISTRIBUTION

Three in five victims of modern slavery worldwide (62 per cent) were exploited in the Asia and the Pacific region (Table 3), followed by 23 per cent in the Africa region and 9 per cent in Europe and Central Asia. Asia and the Pacific led all regions in the share of victims for each form of modern slavery, ranging from 73 per cent of people who were victims of forced sexual exploitation to 64 per cent of those in forced labour exploitation, 68 per cent of those forced to work by state authorities, and 42 per cent of those who were forced to marry.

Table 2

Regional distribution of the Global Estimates of Modern Slavery

	Total modern slavery		Forced labour		Forced marriages	
	('000)	per cent	('000)	per cent	('000)	per cent
World	40 293	100	24 851	100	15 442	100
Africa	9 230	22.9	3 420	13.7	5 820	37.7
Americas	1 950	4.8	1 280	5.2	670	4.3
Arab States	520	1.3	350	1.4	170	1.1
Asia and the Pacific	25 000	62.0	16 550	66.6	8 440	54.7
Europe and Central Asia	3 600	8.9	3 250	13.1	340	2.2

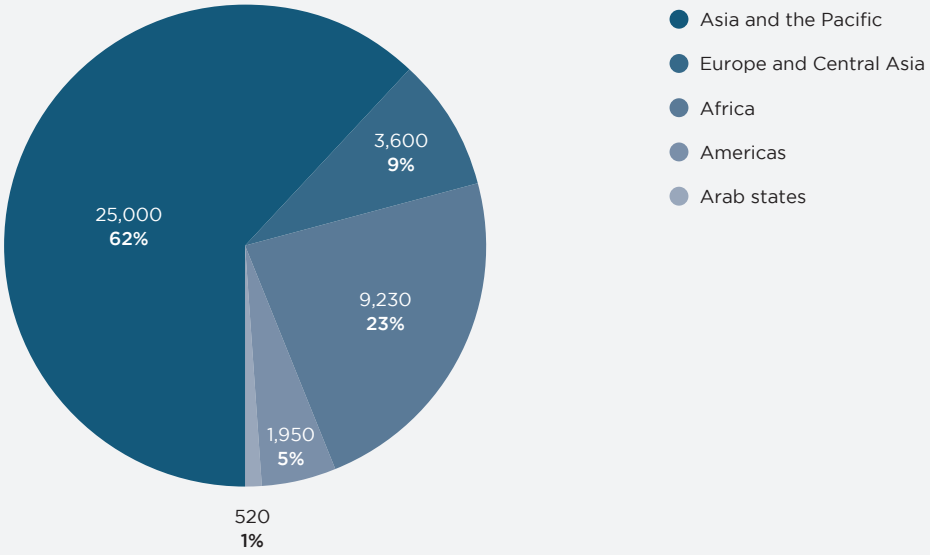
The regional figures should be interpreted with care, bearing in mind critical gaps and limitations of the data. This is especially the case in Central Asia and the Arab States, where few surveys have been conducted despite numerous reports of forced labour and forced marriages occurring.

In the case of the Arab States, and particularly the Persian Gulf countries, the exploitation of young women and girls as domestic servants and of men and boys in the construction industry has been well-documented by numerous international and non-governmental organizations. However, the estimate of forced labour exploitation of adults is based on household surveys, with all situations of modern slavery being applied to the country where the exploitation took place, regardless of the nationality or country of residence of the worker. In a region where more than one-third of total workers were migrants, it has been enormously difficult to gain access to and capture the experiences of these migrant workers, particularly while they are working, and remains difficult when they have returned home without more targeted sampling approaches. In addition, there were only two national surveys in the Arab States region, both conducted in Arabic, and none in the Gulf States. The regional estimate for the Arab States is therefore built mainly from respondents who were interviewed back in their country of origin and reported about their forced labour situation while previously working in that region. Accordingly, it is likely that the extent of modern slavery in this region is underestimated.

The estimates of sexual exploitation and forced labour of children were built on models of profiles of registered victims from the IOM database. Overall, the database provides solid data, but the regional distribution must be interpreted with caution.

Figure 7

Regional distribution of modern slavery (thousands)

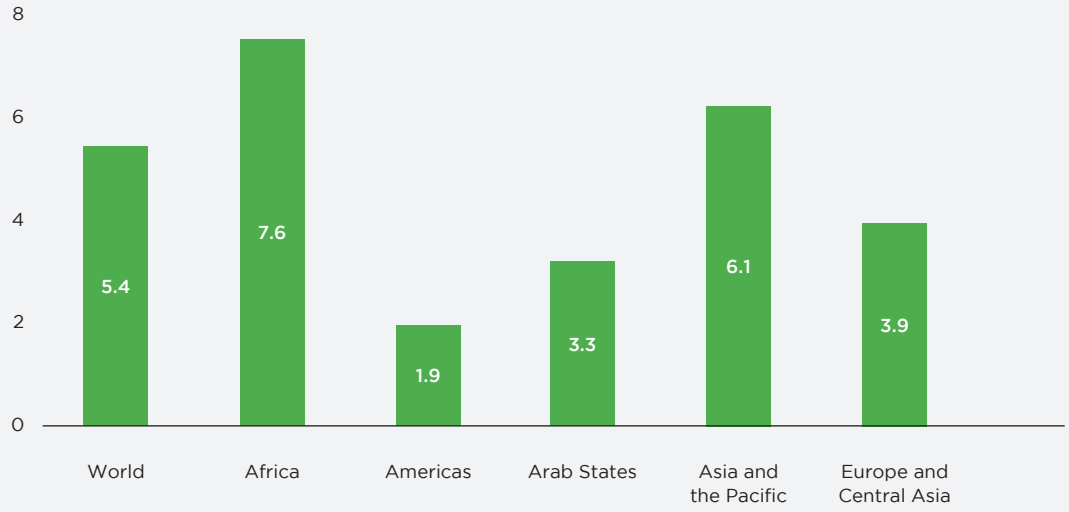


PREVALENCE PER REGION

In 2016, there were 5.4 victims of modern slavery for every 1,000 people in the world. In terms of regional distribution, the rate is highest in Africa with 7.6 victims of modern slavery for every 1,000 people in the region (Figure 8). This is followed by Asia and the Pacific at 6.1 victims per 1,000 people and Europe and Central Asia at 3.9 victims per thousand. The prevalence in the Arab States and Americas is lower, at 3.3 and 1.9 victims per 1,000 people respectively (noting gaps and biases in the data as presented above).

Figure 8

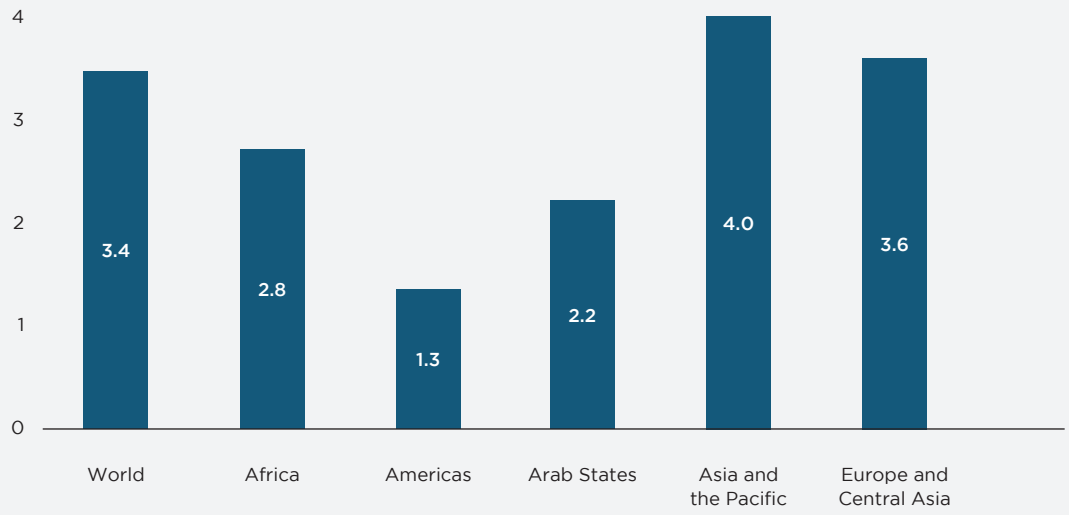
Prevalence of modern slavery by region (number of victims per 1,000 inhabitants)



Limiting the prevalence by region to forced labour (Figure 9) shows a different picture, where Asia and the Pacific has the highest prevalence (4.0 victims for every 1,000 people), followed by Europe and Central Asia (3.6) and Africa (2.8).

Figure 9

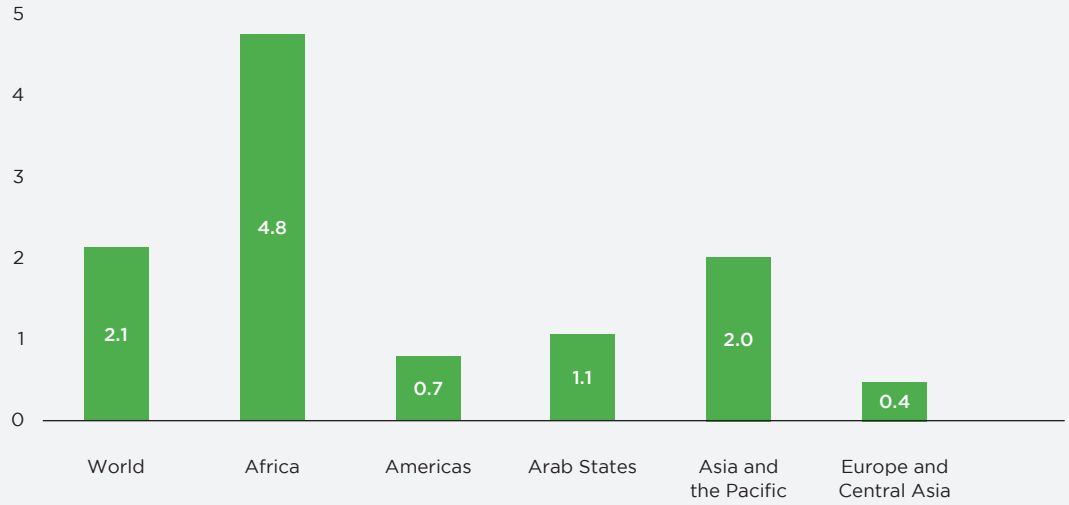
Prevalence of forced labour by region (number of victims per 1,000 inhabitants)



The regional breakdown for forced marriage is different again. In 2016, there were 2.1 people living in forced marriage for every 1,000 people in the world. In terms of regional distribution, the rate (average stock) is highest in Africa with 4.8 victims for every 1,000 people in the region (Figure 10). This is followed by Asia and the Pacific region at 2.0, then Europe and Central Asia and Arab States at 1.1 victims per 1,000 people. The prevalence in the Americas is lower standing at 0.7 per 1,000 people.

Figure 10

Prevalence of forced marriage by region (average stock per 1,000 inhabitants)

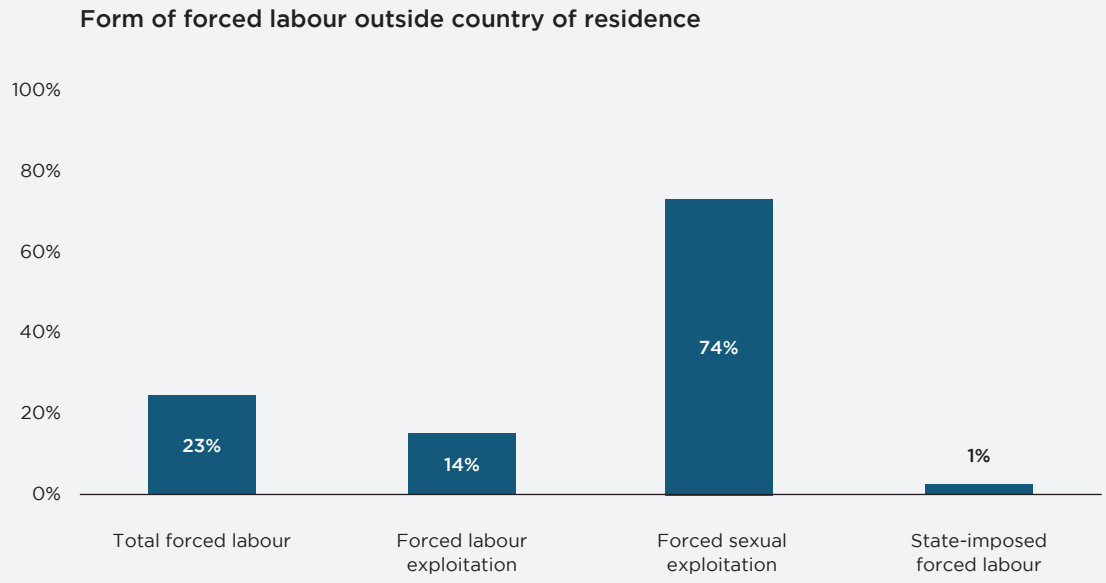


MIGRATION OF VICTIMS OF FORCED LABOUR

Certain migration practices, such as irregular migration or labour migration financed through loans taken from money lenders, are often cited as risk factors for modern slavery. This section examines the data on all forms of forced labour from the perspective of international migration. (Internal migration was not captured through the household surveys.) For forced sexual exploitation, the share of international migrants is calculated using the IOM database. As location of forced marriage was not captured, no result is presented for that form of modern slavery.

Nearly one in four victims of forced labour were exploited outside of their country of residence (Figure 11). Victims of forced sexual exploitation were more likely than victims of forced labour exploitation to be exploited outside their country of residence (74 per cent versus 14 per cent).[14] More research is needed to improve understanding of the relationship between migration and forced labour and forced sexual exploitation. Not surprisingly, almost all forced labour imposed by state authorities took place within the border of the responsible State, the only exceptions being States that forced prisoners and/or some categories of workers to work abroad.

Figure 11



FORCED LABOUR AND MIGRANT WORKERS BY REGIONAL INCOME LEVEL

Poverty is often cited as an important risk factor for modern slavery, and relative wealth disparities between countries are often cited as a pull factor. Certainly, poverty can impact on many factors such as a person's health, education, and access to finance. While it can drive a decision to migrate for labour, it can also act as a barrier to migration, as members of the poorest groups are often unable to raise the money required to reach their destination, whether through accessing loans in the local communities or from others in the migration industry. To date, there has been limited empirical data providing any insight into the connection between income levels and forced labour movements.

The estimates of victims of forced labour were examined according to the income levels of both the victims' countries of origin and their countries of destination (where the exploitation occurred). The countries are divided into four income-based groupings according to their gross national income (GNI) per capita[15] in 2015: low-income, lower-middle-income, upper-middle-income, and high-income. Ninety-four per cent of victims of modern slavery were exploited in a country that was in the same income-based grouping as their country of residence (Table 3). People who were exploited in the low-income and lower-middle-income groupings were almost exclusively from countries from the same income grouping. Slightly more diversity was apparent among persons exploited in the upper-middle-income grouping, with 3 per cent having migrated from a lower-middle-income country and 1.4 per cent from a low-income country. Among victims of modern slavery exploited in the high-income grouping, 57 per cent were from the same income grouping, 41 per cent from the lower-middle-income grouping, 1 per cent from the low-income grouping, and 1 per cent from the upper-middle-income grouping.

The picture that emerges shows that in high-income countries there is a minimal proportion of forced labour involving migrant workers from the low-income region, but a much larger proportion of exploited workers coming from lower-middle-income countries.

Table 3

Global estimates of forced labour exploitation of workers by income level (flow)

	Income level of region of exploitation			
Income level of region of residence	Low-income (per cent)	Lower-middle-income (per cent)	Upper-middle-income (per cent)	High-income (per cent)
Total	100	100	100	100
Low-income	99.9	0.3	1.4	1.0
Lower-middle-income	0.0	99.7	2.7	40.9
Upper-middle-income	0.1	0.0	95.9	0.9
High-income	0.0	0.0	0.0	57.2

DURATION AND TOTAL NUMBER OF VICTIMS OVER THE FIVE YEARS

There is wide variation in how long victims of modern slavery remain in their situation. While some victims manage to escape after a few days or weeks, others are trapped for years, as is the case for those in traditional forms of hereditary bonded labour and some forced marriages. Duration is a key parameter in the calculation of estimates of the average number of victims of modern slavery. The data underlying the estimates was drawn from the reference period, 2012 to 2016. Altogether, during these five years, a total of 89 million people were victims of one form of modern slavery for any length of time.

Average duration for forced labour exploitation and forced sexual exploitation was estimated using the IOM database. For victims registered after 2012, the average duration in the situation of forced labour was just above 20 months and was 23 months for the victims of sexual exploitation. These two variables were used to convert the total number of victims over the last five years into an estimate of the average number of victims on any given day in 2016. Duration of state-imposed forced labour was calculated for each form imposed in each country.

Detailed presentation of the findings

FORCED LABOUR EXPLOITATION

Forced labour, as set out in ILO Forced Labour Convention, 1930 (No.29),[16] refers to "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". This section refers to adults in forced labour imposed by private actors in agriculture/fishing, services, and industry. It excludes forced sexual exploitation and forced labour imposed by state authorities, both of which are presented in subsequent sections.

Men, women, and children are forced to work in various settings across the globe – with examples of forced labour found in garment making in South Asian factories, digging for minerals in African mines, harvesting tomatoes on North American farms, working as maids in East Asian homes, working in farms in Latin America, begging in European cities, and constructing high rise buildings in the Gulf States, among other sectors and geographic areas.

Regardless of the setting, an identifying feature of situations of forced labour is lack of voluntariness in taking the job or accepting the working conditions, and the application of a penalty or a threat of a penalty to prevent an individual from leaving a situation or otherwise to compel work. Coercion can take many forms, ranging from physical and sexual violence or threats against family members to more subtle means such as withholding of wages, retaining identity documents, threats of dismissal, and threats of denunciation to authorities.

Forced labour is estimated based on national household surveys conducted in 48 countries and involving face-to-face interviews with more than 71,000 people aged 15 years and older.

It is estimated that 16 million people were victims of forced labour exploitation in 2016. On average, victims remain in the situation of forced labour for 20.1 months before escaping or being freed. There were more female victims (57 per cent) than male (43 per cent). Nearly 20 per cent of the victims of forced labour exploitation were children, who may have been working alone, far from their families, or together with their parents.

DEBT BONDAGE

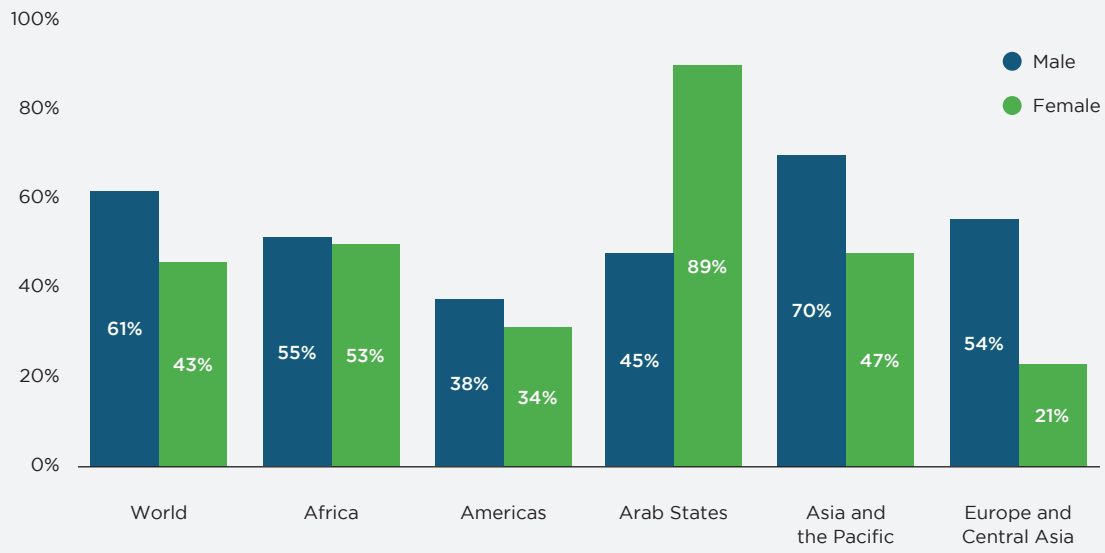
Analysis of the survey data on forms of coercion used confirms that half of the men and women who were in forced labour exploitation were in a situation of debt bondage (51 per cent). This proportion rises to more than 70 per cent for adults who were forced to work in agriculture, domestic work, or manufacturing. Debt bondage is defined here as being forced to work to repay a debt or being forced to work and being prevented from leaving because of a debt. In most cases, the initial debt grows at a rate that is unable to be met, and the individual (sometimes together with family members) is unable to leave the work as the debt mounts and cannot be paid with the level of compensation the worker may be getting. A male survey respondent in Bangladesh described the unmanageable increase in the debt he owed: *"I took loan to maintain the family. Later it became a high amount including the interest and original amount. To give back the loan they made me work forcefully and I paid back the loan by working for them*."

In these situations, the debt can last for years or even generations. Often, such debts transfer from one family member to another, as illustrated by a male survey respondent residing in Tunisia who described being forced "*...to sell the drugs to repay debts of my brother who was in an Italian prison at that time*". Others described the burden of such loans and the situations of vulnerability they gave rise to. For example, a 30-year-old male victim of forced labour in India described the situation he and his wife faced as having "*...become a curse on both of us. We had threats against our family and we also got the threat that we would be evicted from our house and the village. There were also threat of violence*".

Figure 12

Global estimates of debt bondage by sex and region

Percentage of those in forced labour who are in debt bondage



Globally, among those in forced labour, men were more likely than women to be bonded labourers, with three in five men (61 per cent) and two in five women (43 per cent) in debt bondage. A regional analysis found this proportion to be nearly equal between men and women in Africa and the Americas (Figure 12), while the highest proportion of females in bonded labour was found among women forced to work in the Arab States (89 per cent), and the highest proportion of men in bonded labour was found in Asia and the Pacific (70 per cent), followed by Europe and Central Asia (54 per cent).

FORCED LABOUR EXPLOITATION BY ECONOMIC ACTIVITY

Two-thirds of respondents reported the type of industry in which they were forced to work (Table 4). Among them, the largest share of adults who were forced to work were made to undertake domestic work (24 per cent). This was followed by construction (18 per cent), manufacturing (15 per cent), and agriculture and fishing (11 per cent). Male victims were much more likely than female victims to be in the mining, manufacturing, construction and agricultural sector. One-quarter of male victims of forced labour were exploited in the construction sector (25 per cent), followed by 21 per cent in manufacturing, 16 per cent in domestic work, and 13 per cent in agriculture and fishing. More than one-third of female victims of forced labour (36 per cent) were exploited for domestic work, followed by 21 per cent in accommodation and food services and 11 per cent in the wholesale and retail trade sector.

Table 4

Forced labour exploitation of adults by economic activity,[17] percentage

Industry	Total	Male	Female
	100	100	100
Agriculture, forestry and fishing (A)	11.3	13.0	8.9
Mining and quarrying (B)	4.0	6.8	0.0
Manufacturing (C)	15.1	21.0	6.6
Construction (F)	18.2	25.3	8.0
Whole sale & trade (G)	9.2	8.1	10.6
Accommodation & food service activities (I)	9.5	1.2	21.4
Arts (R)	0.1	0.1	0.0
Illicit	0.7	1.1	0.1
Begging	0.8	1.2	0.2
Personal services-(96)	6.8	6.0	8.0
Domestic work (T)	24.3	16.0	36.2

Note: This is based on cases of forced labour where industry was reported. Information on the industry was available for 65 per cent of cases of forced labour exploitation.

MEANS OF COERCION

Most victims of forced labour exploitation suffered multiple forms of coercion from employers or recruiters as a way of preventing them from being able to leave the situation. Many accounts collected from victims of forced labour describe scenarios involving threats of harm to them and their families, acts of physical and psychological violence, and financial threats through fines or retention of due wages.

Nearly a quarter of victims (24 per cent) had their wages withheld or were prevented from leaving by threats to withhold wages (Table 5). This was followed by threats of violence (17 per cent), acts of physical violence (16 per cent), and threats against family members (12 per cent). The forms of coercion experienced by males followed this pattern: 34 per cent had their wages withheld, 21 per cent were threatened with violence, 19.5 per cent experienced physical violence, and 18 per cent had threats made to their families. Among female victims of forced labour exploitation, the largest share had their wages withheld or were threatened that they would be withheld (16 per cent), 14 per cent experienced physical violence, 14 per cent were threatened with violence, and 7 per cent experienced sexual violence. It is clear that for both men and women, violence and threats of violence are commonly used by employers to force workers to take a job against their will, or to force them to work more or in conditions they would not otherwise accept, or to prevent them from leaving the job.

Table 5

Forced labour exploitation by means of coercion, percentage

Industry	Total	Male	Female
Physical violence	16.4	19.5	14.1
Sexual violence	4.1	0.2	7.0
Threats of violence	17.0	21.2	13.8
Threats against family	11.8	18.0	7.1
Locked in work or living quarters	6.7	9.9	4.3
Kept drunk/drugged	0.9	1.7	0.2
Punished through deprivation of food, sleep, etc.	5.0	7.7	3.0
Punished through fine/financial penalty	6.6	7.5	6.0
Threats of legal action	5.7	8.9	3.2
Withheld passport or other documents	4.3	3.5	4.8
Had to repay debt	9.1	16.3	3.6
Withheld wages	23.6	34.4	15.5
Too far from home and nowhere to go	6.7	14.0	1.3
Other penalty	14.5	20.3	10.2

Note: Column totals will not add up to 100 per cent because some respondents could identify more than one form of coercion.

FORCED SEXUAL EXPLOITATION

Forced labour occurring within the sex industry is presented as a separate sub-estimate. Although defined in the same way as other forms of forced labour – that is, situations in which work or service is performed by a person involuntarily and under the menace of a penalty[18] – experiences of forced sexual exploitation have specific needs in terms of support and other interventions. For example, forced sexual exploitation can result in rejection from family and community members upon the victims' return and may involve sexual health issues that can lead to long-term physical and psychological support needs. Further, in many countries, the sex industry is criminalized and so is not recognized as a form of work.

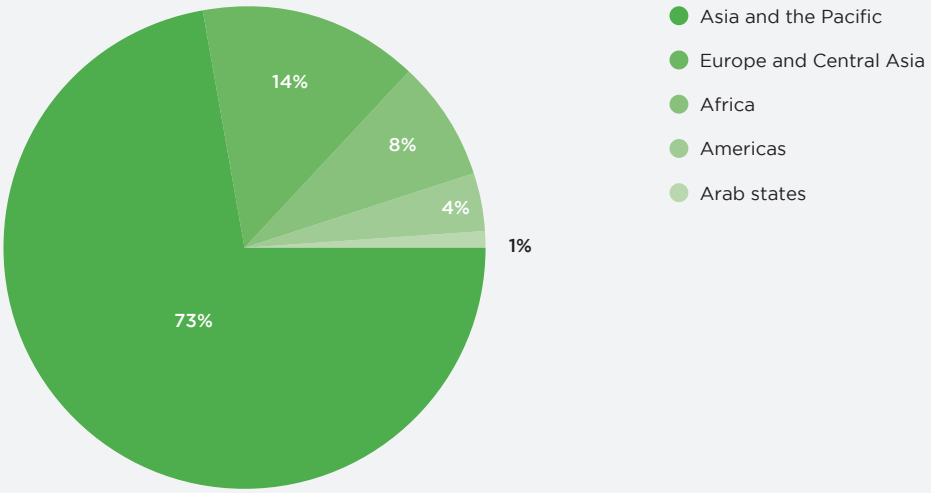
Estimating forced sexual exploitation required a different methodological approach than estimation of forced labour exploitation, as too few cases were reported across the 48 countries where household surveys were conducted. Underreporting of forced sexual exploitation is likely given the sensitive nature of the question and that people are surveyed within their homes. Estimates of forced sexual exploitation (children and adults) were calculated using two datasets, the national survey data on forced labour of adults and the International Organization for Migration (IOM)'s database of cases of human trafficking that the Organization assisted. The IOM dataset comprises information on the profile of the victims of human trafficking (i.e. age, gender, income) and on the trafficking situation (i.e. country and industry of exploitation). The estimates of forced sexual exploitation were calculated in two steps, first by using statistical models to estimate the ratio of the odds of "sex" to "labour" cases according to age and gender from the IOM database. The odds ratios from the best-fitting model were then multiplied by the estimate of forced labour exploitation of adults derived from the national surveys to obtain an estimate of adult and child victims of forced sexual exploitation.

GLOBAL ESTIMATES OF FORCED SEXUAL EXPLOITATION AND REGIONAL DISTRIBUTION

In 2016, it is estimated that 4.8 million people were victims of forced sexual exploitation (Table 1). On average, victims were in their situation of forced sexual exploitation for 23.1 months before being freed or managing to escape. More than seven in ten victims of forced sexual exploitation worldwide were exploited in the Asia and the Pacific region (Figure 13). This was followed by the Europe and Central Asia (14 per cent), Africa (8 per cent), the Americas (4 per cent), and the Arab States (1 per cent).

Figure 13

Global estimates of victims of forced sexual exploitation per region



SEX OF VICTIMS

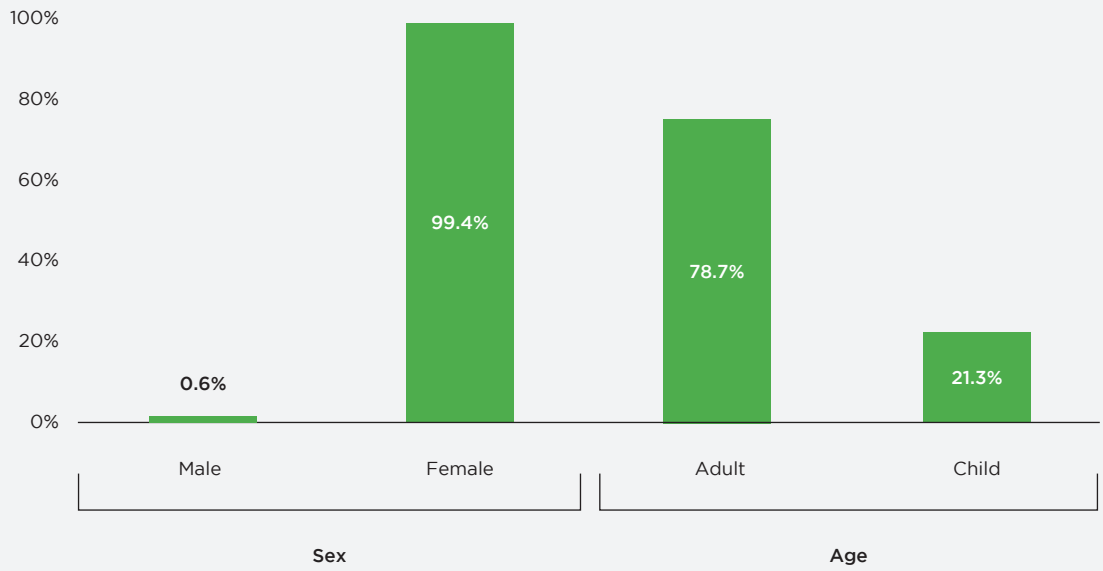
Although males are victims of forced sexual exploitation, they are vastly outnumbered by females, who account for 99 per cent of all victims (Figure 14).

AGE GROUP OF VICTIMS

Children comprised 21.3 per cent of the total victims of forced sexual exploitation (Figure 14). In accordance to the ILO Worst Forms of Child Labour Convention, 1999 (No.182), all children found in any type of commercial sexual exploitation are considered victims of forced sexual exploitation. However, given that the detection of children victimized in commercial sex is particularly difficult, in terms of both detection by law enforcement or protection agents and in survey data collection, this estimate is likely to be a severe underestimation of the reality.

Figure 14

Global estimates of forced sexual exploitation by sex and age group



STATE-IMPOSED FORCED LABOUR

For the purpose of this estimate, forced and compulsory labour imposed by state authorities has been classified in six main categories that are drawn from the ILO's Forced Labour Convention, 1930 (No. 29) and the Abolition of Forced Labour Convention, 1957 (No. 105). The categories are as follows:

(1) Abuse of conscription, when conscripts are forced to work for tasks which are not of purely military character.

(2) Obligation to perform work beyond normal civic obligations.

(3) Abuse of the obligation to participate in minor communal services when these services are not in the direct interest of the community and there was no prior consultation of the members of the community.

(4) Prison labour

- Compulsory prison labour of prisoners in remand or in administrative detention.
- Compulsory prison labour exacted for the benefit of private individuals, companies, or associations outside the exceptions allowed by the ILO supervisory bodies .
- Compulsory prison labour exacted from persons under certain circumstances, such as punishment for expressing political views, labour discipline, or participation in strikes.

(5) Compulsory labour for the purpose of economic development.

(6) Forced recruitment of children by governments or militia groups.

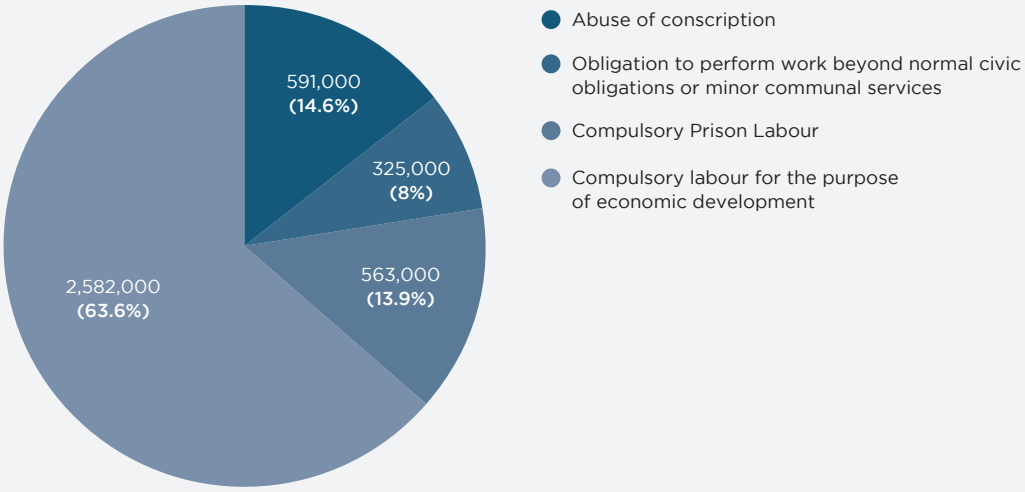
The forced recruitment of children by armed groups and armed forces was excluded from the estimate due to a lack of reliable data. For the remaining forms of state-imposed forced labour, data was identified through a systematic review of secondary sources following a thorough assessment of each identified case against the relevant indicators. For each country where there is an indication of the violation of the ILO forced labour Conventions by state authorities, an estimate of the extent of the violation

was built on the basis of available reliable sources. The total number of people who have experienced some forced labour imposed by the authorities every year during the last five years (total flow) and the average number of victims in this situation between 2012 and 2016 (average stock) are presented.

Based on the research outlined above, 45 cases across 28 countries were verified as among the abovementioned categories of state-imposed forced labour, resulting in an estimate of 4 million people in state-imposed forced labour at any given point in time between 2012 and 2016.

Figure 15

Global estimates by form of state-imposed forced labour



The total number of victims by form of state-imposed forced labour is shown in Figure 15. Of the 4 million people in state-imposed forced labour, 64 per cent were forced to work by their government for the purpose of furthering economic development, 15 per cent were obliged to perform work that was not of purely military character in the context of their military service (abuse of conscription), and 14 per cent were subjected to compulsory prison labour under conditions that contravene ILO standards on the issue. The remaining 8 per cent were either forced to perform work or services that go beyond normal civic obligations or were forced to perform communal services in violation of ILO Conventions on forced labour.

It is estimated that 7 per cent of all victims of state-imposed forced labour are children. They are the majority of victims forced to participate in minor communal services or to perform work beyond normal civic obligations.

Among cases of forced labour imposed by state authorities, not only the type of work varies widely, from picking cotton to constructing roads, but so does the length during which victims are exploited, depending on which form one is examining. A typical case of short duration, typically a matter of a few weeks, is found in States that requisition their citizens for economic development work, such as the forced participation of students, unemployed, or any individual in public construction, industrial, or agricultural projects. This is also the case

for the abuse of communal services for which a large share of a population is forced to perform "community work" that is not for the benefit of their communities and has not been decided upon by members of those communities. In these cases, the forced labour usually involves a large group of citizens for a few days per month. On the other end of the spectrum, some countries force military conscripts to perform non-military tasks for a number of years. And forced labour in prison varies between a few weeks for cases of people in administrative detention to many years for long-term sentences.

Because the largest share of victims is in forms that are imposed for a short duration, the total number of people who experienced one of these forms of state-imposed forced labour every year for at least a week is estimated to be 19.2 million. The large discrepancy between this annual number of victims (19.2 million) and the average number of victims at any moment of time (4 million) is due to this short average duration.

Table 6

Global estimates by form of state-imposed forced labour (total flow and average stock)

	Total number of people per year		Average number of people at any moment of time	
	('000)	per cent	('000)	per cent
World	19 254	100	4 060	100
Abuse of conscription	591	3.1	591	14.6
Abuse of the obligation to participate in minor communal services	9 224	47.9	270	6.7
Compulsory labour in administrative detention centres	294	1.5	202	5.0
Compulsory prison labour exacted from persons under certain circumstances (C.105)	187	1.0	183	4.5
Development work	8 656	45.0	2 582	63.6
Obligation to perform work beyond normal civic obligations	105	0.5	55	1.4
Prison labour (C.29)	196.5	1.0	178	4.4

Because forced labour as a result of abuse of conscription and prison labour affects many more men than women in all concerned countries, the share of men in forced labour imposed by state authorities is higher than that of women (60 per cent versus 40 per cent). This share of men varies from 50 per cent in communal services (women and men being forced by authorities in a similar way) to 90 per cent in forced prison labour.

The estimate of children in forced labour imposed by state authorities must be read with caution, given the scarcity of reliable data on children victims of these forms of forced labour. Few children were found in forced prison labour and in abuse of conscription (noting the estimate does not cover recruitment of children for armed services). The only forms of forced labour for which state authorities were found to use children (and most of those were aged between 15 and 17 years) were in the abuse of the obligation to participate in minor communal services or civic obligations and, to some extent, in work for the purpose of economic development. This explains the low share of children (6 per

cent) in the final average stock estimate. As noted above, the forced recruitment of children by armed groups and armed forces was excluded from the estimate due to a lack of reliable data.

FORCED MARRIAGE

There are many reasons for forced marriage, some of which are closely linked to longstanding cultural practices. In some parts of the world, young girls and women are forced to marry in exchange for payment to their families, the cancellation of debt, or to settle family disputes. In countries with significant levels of conflict, they are abducted by armed groups and forced to marry fighters, enduring all manner of sexual, physical, and emotional abuse. Forced marriages also occur in developed nations, with women and girls being forced to marry foreign men for cultural reasons or in order to secure another person's entry into the country. Once forced to marry, many victims are placed at greater risk of being subjected to sexual exploitation, domestic servitude, and other forms of forced labour. Children are especially vulnerable in these situations.

Forced marriage is estimated based on the national household surveys conducted in 48 countries, which involved face-to-face interviews with more than 71,000 respondents aged 15 years or older. Respondents were asked if they had ever been forced to marry and, later in the survey, they were also asked if they consented to the marriage.

The inclusion of "consent" as an additional indicator resulted from cognitive testing of the original survey instrument and is important because it limits overcounting. During testing, the language of both arranged and forced marriage was included to test understanding of the latter. This revealed cultural influences on understanding the concept of forced marriage. In countries where the practice of arranged marriages was either rare or common (for example, Russia and Pakistan, respectively), the difference between the two concepts was clearly understood. In countries where arranged marriages were neither the norm nor a rare exception (for example, Ethiopia, Indonesia, and Nigeria), respondents found it difficult to distinguish between "arranged" and "forced" and thereby defined both as marriages without the consent of the person being married. As the intention was to measure marriages that were forced (and not simply arranged) accordingly, an additional question was added to ask directly about whether the individual consented to the marriage.

The total number of people "living in a forced marriage" is comprised of all persons who were ever forced to marry and remain married at the time of the survey. This results in an estimated 15.4 million people "living in forced marriage" during the reference period (and of these, 6.5 million were recent cases in the sense that the forced marriage occurred in the reference period 2012-2016). In the absence of other global estimates on forced marriages, a comparison with estimates of child marriage allows for some assessment of the reliability of these findings. Interestingly, this estimate is within the same order of magnitude as global estimates of child marriage. The United Nations Population Fund estimates that each year 14.2 million girls are married before the age of 18 years, a figure that will rise to more than 15 million by 2021 if current trends continue.[19]

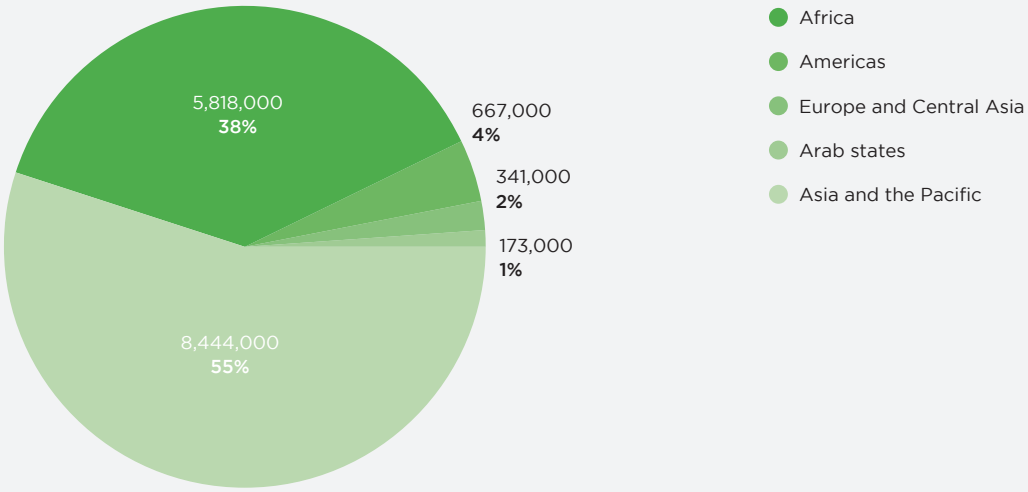
It is important to note that the measurement of forced marriage is at an early stage and both the scope and the methodologies are likely to be further refined. Accordingly, the current estimate should be considered very conservative.

REGIONAL DISTRIBUTION

UN agencies and NGOs have long documented examples of forced marriage in every region of the world. Data from national household surveys supports this. More than nine of ten forced marriages took place in one of two regions, Africa and Asia and the Pacific (Figure 16). This was followed by the Americas (4 per cent), Europe and Central Asia (2 per cent), and the Arab States (1 per cent).

Figure 16

Distribution of forced marriage across regions (average stock)

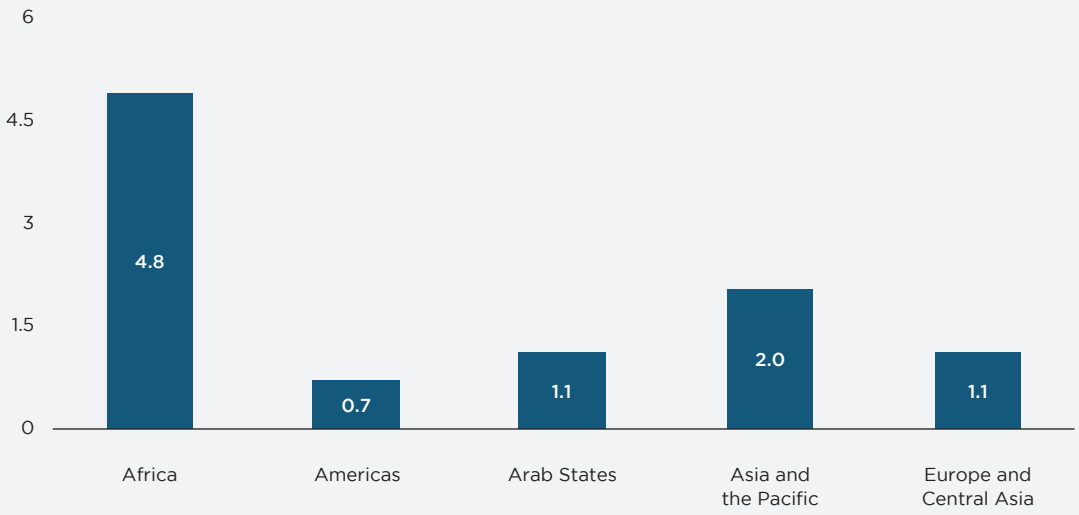


PREVALENCE

In 2016, there were 2.1 people living in forced marriage for every 1,000 people in the world. In terms of regional distribution, the rate (average stock) is highest in Africa, with 4.8 victims for every 1,000 people in the region (Figure 17). This is followed by Asia and the Pacific region at 2.0 victims per 1,000 people, then Europe and Central Asia and the Arab States at 1.1 victims per 1,000 people, followed by the Americas at 0.7 per 1,000 people. Analysis of these findings is hampered by limited surveys in several regions, particularly for Europe and Central Asia and for the Arab States, for which there are numerous reports of forced marriages[20] but where few surveys were conducted. Accordingly, the data on regional distribution should be interpreted with caution.

Figure 17

Prevalence of forced marriage by region (average stock per 1,000 inhabitants)



SEX OF VICTIMS

While men and boys can also be victims of forced marriage, most victims are women and girls. An estimated 13 million women and girls were victims of forced marriage in the last five years, representing 84 per cent of all victims (Table 7). The share of females in forced marriage is substantially higher than the share of females in all forms of modern slavery (84 per cent versus 71 per cent).

Table 7

Global estimates of forced marriage by sex and age group (stock)

	Modern slavery		Forced marriage	
	('000)	per cent	('000)	per cent
World	40 293		15 442	
Male	11 647	29	2 442	15.8
Female	28 645	71	13 000	84.2
Adults	30 327	75	9 762	63.2
Children	9 965	25	5 679	36.8

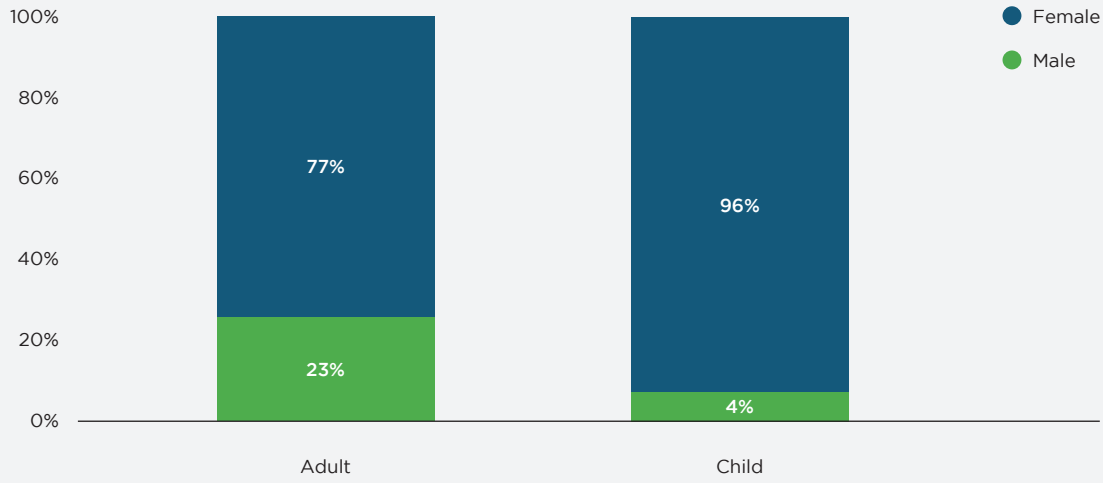
AGE OF VICTIMS

Child, early, and forced marriages are terms sometimes used interchangeably. However, it is important to be clear that for the purposes of these Estimates, measurement of forced marriage is limited to what was captured by the surveys. That is, all marriages of both adults and children that were reported to have been forced, regardless of the age of the respondent.

An estimated 37 per cent of victims living in forced marriage were children at the time the marriage took place (Table 7). Among child victims, 44 per cent were forced to marry before the age of 15 years. The youngest victims of forced marriage in the sample were nine years of age at the time they were forced to marry. Girls were more likely than boys to be forced to marry (96 per cent versus 4 per cent; Figure 18).

Figure 18

Global estimates of forced marriage by age group and sex



Duration and flow estimates of modern slavery

Modern slavery is highly variable. Victims of hereditary bonded labour or forced marriage may be trapped in modern slavery from an early age through to the end of their lives, while some victims of other forms may escape after a few weeks or months. This distinction is important for several reasons. From the victims' perspective, it is likely that the physical and psycho-physical impact of being trapped in forced labour for five years is not the same as being in the same situation for two weeks, and thus support needs may vary. From a law enforcement perspective, it is important to detect and free the victims as soon as possible. Taking note of the duration of each incident of forced labour will allow for progress on rapid detection to be tracked over the years.

For the purpose of estimation, the most complete picture of modern slavery is captured by looking at both the average number of victims at any given moment (stock) together with the total number of people who experienced any form of modern slavery during a particular reference period, regardless of the length of time during which they stayed in that

situation (flow). The stock and flow estimates are related to each other through the length of time – or duration – a victim is in slavery. For example, if four people are put in forced labour for three months, one after the other, those four people have been in forced labour over the year but on average there was only one person in forced labour during the year.

This section describes the role of duration in calculating stock estimates from the total number of people in modern slavery over the five-year reference period (2012-2016). During the five years of the reference period, 2012-2016, 89 million people were either in forced labour for a minimum number of days or entered into a forced marriage. Of these, 82.7 million were victims of forced labour and 6.5 million had been forced to marry against their will during the same period. This is explained further in Figure 19 and Table 8 that follow.

Figure 19

Global estimates by form of modern slavery

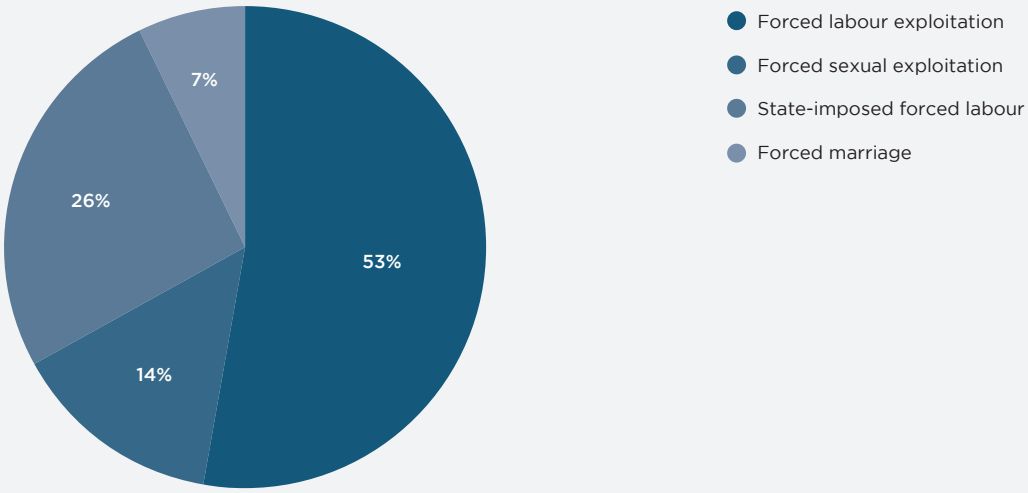


Table 8

Duration, total and average number of victims

	Victims at any point in time (per cent)	Total number of victims (per cent)	Average duration (months)
Total	100	100	
Forced labour exploitation	40	53	20.1
Forced sexual exploitation	12	14	23.1
State-imposed forced labour	10	26	
Forced marriage	38	7	-

FORCED LABOUR EXPLOITATION AND FORCED SEXUAL EXPLOITATION

Among the 82.7 million people who have experienced a form of forced labour during the last five years, some were trapped in their job for weeks or months, others for years or decades. Some were recruited by force every year and were forced to work by private actors or state authorities for a matter of days or weeks. Anyone who has been in any of these situations is part of this estimate.

Average duration of forced labour exploitation and forced sexual exploitation was estimated by averaging the duration of cases in the IOM database (Table 8). Using these average durations in the formula, the total flow estimate of 47.4 million victims of forced labour exploitation over five years converts into an average stock of 16 million people at any moment in time during one year, and the total flow of 12.5 million victims of forced sexual exploitation over five years converts into an average stock of 4.8 million victims at any moment of time during one year.

STATE-IMPOSED FORCED LABOUR

Duration of the cases of state-imposed forced labour was calculated for each case, and for each country. The total number of victims of forced labour imposed by state authorities is heavily influenced by cases in which very large groups of people are forced by their state authorities to perform some form of work, sometimes for short periods of time. Victims of forced labour imposed by state authorities were exploited for a duration that varies from a few days per month (for example, when authorities force their people to participate in illegal communal services) to several years for some cases of prison labour or forced labour in the context of military service. This explains the considerable difference between the large number of people who have been victims of this form of forced labour at some point during the last five years (22.9 million) and the average number of victims at any moment in time (4.0 million).

FORCED MARRIAGE

Data on duration of forced marriage was not captured in the survey process. However, the literature on this topic notes that forced marriages typically occur in very traditional, socially conservative societies with deep gender inequalities. As a result, it is unlikely that a person who was forced to marry would be able to leave that marriage within a short amount of time, if ever. In the absence of data on duration of forced marriages, it is assumed that given the socio-cultural context of forced marriage, such marriages are likely to last more than the five-year reference period.

The estimate of forced marriage is calculated as both a stock and a flow. In order to report on "people living in a forced marriage", those marriages that occurred in the last five years, or occurred more than five years ago but continued during the five-year reference period, comprise the "stock" estimate. The total flow estimate of forced marriage represents all people who were forced to marry between 2012 and 2016 – an estimated 6.5 million people.

Comparability with previous estimates

Due to substantial differences in scope, methodologies, regional groupings, and expanded data sources, the 2016 Global Estimates of Modern Slavery are not directly comparable to the 2012 ILO estimate nor the 2016 Global Slavery Index and therefore cannot be used to measure trends. These differences include the following:

- Differences in scope of coverage, with the addition of forced marriage to the 2016 estimate.
- Differences in the regional groupings used in the 2016 Global Estimates and both prior estimates.
- Significant changes in the sources of data upon which the 2016 Global Estimates

are based. For the 2012 estimate, the ILO used secondary data gathered from other sources. The 2016 Global Slavery Index estimate was based on 26 national surveys funded by the Walk Free Foundation. An additional 26 surveys were then jointly funded and conducted in 2016 by the ILO and the Walk Free Foundation, bringing the total to 54 national surveys conducted in 48 countries. These 54 surveys were used as the basis for this new estimate.

- The inclusion of an entirely new dataset – IOM's database of assisted victims.
- An improved method for the measurement of state-imposed forced labour. For the first time, this was measured against a comprehensive typology.

Despite differences in the methods used for each estimate, some aspects of the findings are similar.

THE PRESENT ESTIMATE AND ILO'S 2012 ESTIMATE

The 2012 ILO estimate of 20.9 million people in forced labour was a stock estimate based on identification of reported cases through systematic searches of publicly available information. Each case was then checked and validated against a set of criteria to ensure it was a real case of forced labour. This data was then used as the basis for capture-recapture, a statistical methodology used to estimate unreported cases. The results in 2012 (Table 9) showed 14.2 million people in forced labour exploitation (68 per cent), 4.5 million in commercial sexual exploitation (22 per cent), and 2.2 million in state-imposed forced labour (10 per cent).

Table 9

Global estimates (average stock) of forced labour, 2012 and 2016 estimates

	2012 (million)	2016 (million)
Total	21.9	24.9
Forced labour exploitation	14.2	16.0
Forced sexual exploitation	4.5	4.8
Forced labour imposed by state authorities	2.2	4.1

The higher estimate of victims in private forced labour (in all sectors, including commercial sex) in 2016 may be due to a real increase of the phenomenon globally since 2012. But the increase in the number of victims of forced labour imposed by state authorities is certainly due, at least in part, to improved methodology. With the number of such cases of forced labour being limited and easily identifiable, the methodology used in 2012 (capture-recapture) led to an underestimate of this form. The new estimate of 4.1 million victims is believed to be more accurate because it added up all the cases identified by ILO as situations of forced labour imposed by state authorities.

REGIONAL ESTIMATES

There are too many differences between the new and the previous definitions of regions to be able to directly compare the regional distribution of the ILO's 2012 estimate and the 2016 Global Estimates of Modern Slavery. For example, the United States, Canada, Australia, Israel, Japan, and New Zealand were previously grouped in the region called "Developed Economies and European Union". They are now included in their geographical

region, and changes such as this have led to important changes in regional absolute numbers and prevalence in the 2016 estimate.

DEMOGRAPHIC CHARACTERISTICS OF VICTIMS – SEX AND AGE

The demographic characteristics of victims of forced labour in the new Global Estimates are slightly different from the ILO 2012 estimate, in which 60 per cent of victims of forced labour exploitation were men (compared to 43 per cent in 2016) and 98 per cent of the victims in sexual exploitation were women (compared to 99.3 per cent in 2016). With regard to forced labour imposed by state authorities, the absence of hard data on the sex of victims required the continued use of assumptions in order to calculate the share of men and women. The high share of male victims of forced labour in prison labour and in abuse of military conscription is consistent with the new estimate of 60 per cent male.

The total share of children among victims of forced labour is 17.2 per cent in the current estimate, compared to the 26 per cent share in ILO 2012 estimate. This is due in part to the use in the current estimate of the IOM database, in which there are fewer child victims of trafficking for forced labour, especially in previous years, and also because of the more accurate calculation of the share of children in forced labour imposed by state authorities for 2016. More specific surveys need to be implemented to better capture the situation of children in forced labour.

THE PRESENT ESTIMATE AND WALK FREE FOUNDATION'S 2016 GLOBAL SLAVERY INDEX ESTIMATE

The 2016 Global Estimates of Modern Slavery are not directly comparable to the 2016 Global Slavery Index estimate and, accordingly, the increase in the number of victims in the current estimate does not represent a true increase. It is important to note the key differences in how the estimates were calculated. First, there are differences in scope. While the two estimates both similarly measured forced labour and forced marriage in the household surveys, there were differences between the two in how they measured forced sexual exploitation and child victims of forced labour exploitation. In the 2016 Index, this was acknowledged as a limitation and it was noted that the estimate presented was conservative as it did not adequately account for these sub-estimates. In contrast, the 2016 Global Estimates draw in additional data from the IOM database. Further, in the 2016 Index, state-imposed forced labour was accounted for in a very small number of countries based on available research. The approach to measuring state-imposed forced labour is more systematic in the 2016 Global Estimates, allowing for the presentation of a sub-estimate for that form.

Secondly, significant improvements have been made in the sources of data upon which the 2016 Global Estimates are based. At the time of the 2016 Walk Free Foundation estimate, 26 national surveys were available as data sources. The Walk Free Foundation and the ILO jointly funded an additional round of surveys in 2016, bringing the total available data for the 2016 Global Estimates to 54 national surveys conducted in 48 countries.

Thirdly, there are differences in the methodology for each estimate. While nationally representative surveys are central to both, they were calculated in different ways. The 2016 Global Slavery Index estimate involved a "bottom-up" approach, beginning with the calculation of national estimates that were then aggregated to produce a global estimate. In the 2016 Global Estimates, the countries surveyed were treated as a random sample of the entire world and the global figures were estimated directly from that without first calculating national estimates.

Further, as noted above, the 2016 Global Estimates used different methods to calculate sub-estimates for forced sexual exploitation, the forced labour exploitation of children, and state-imposed forced labour. Other differences in methodology include the ways in which cases are counted. Forced labour may be measured with respect to the

country of current residence of the victim or with respect to the country where the exploitation occurred. The distinction is important and leads to considerably different figures at country and regional levels. The 2016 Index had too few survey countries to consistently count victims where they were exploited, which is not the case in the 2016 Global Estimates, which are based on a much larger number of survey countries. This change had the impact of increasing the number of victims counted in developed countries, with the exception of the Arab States. As noted previously, measures in that region are hampered by insufficient data.

Another key difference is that the 2016 Global Slavery Index is a flow estimate; that is, the total number of people who have been a victim of modern slavery for any length of time over a five-year period. Taking note of the differences set out above, the 2016 Global Estimates' flow estimates of forced labour exploitation (excluding forced sexual exploitation and state-imposed forced labour) and forced marriage, at 53.8 million victims during the reference period, are higher than for the 2016 Global Slavery Index estimate of 45.8 million. This difference is likely the result of changes to the counting rules and the doubling of the number of data points available for analysis, allowing for more accurate estimation.

Part B
Methodology

The 2016 Global Estimates of Modern Slavery are based on a combined methodology that uses diverse data sources for the various forms of modern slavery, as no single source provides suitable and reliable data on all the different types of forced labour and forced marriage. The central element is the use of specially designed national surveys for measuring forced labour exploitation of the adult population and forced marriage. Measurement of forced commercial sex, state-imposed forced labour, and forced labour of children was undertaken through alternative methods described below, as measurement through national surveys has proven to be inefficient.

Forced sexual exploitation was measured using case data from IOM from the victims of trafficking that the Organization assists. The IOM data was used to construct models expressing the relationship between the odds ratios of forced sexual exploitation relative to forced labour exploitation of adults. The best-fitting model was then used to estimate forced sexual exploitation on the basis of the results of the national surveys on forced labour of the adult population.

A similar approach was adopted for estimating forced labour exploitation of children based on the corresponding estimates for the adult population. However, a different methodology was adopted for the measurement of state-imposed forced labour; it is based on data from a variety of sources including ILO published and unpublished reports, comments of the Committee of Experts on the Application of Conventions and Recommendations (CEACR), and source materials from other UN agencies, specialized non-governmental organizations, academia, and the media.

The remainder of this report is organized as follows:

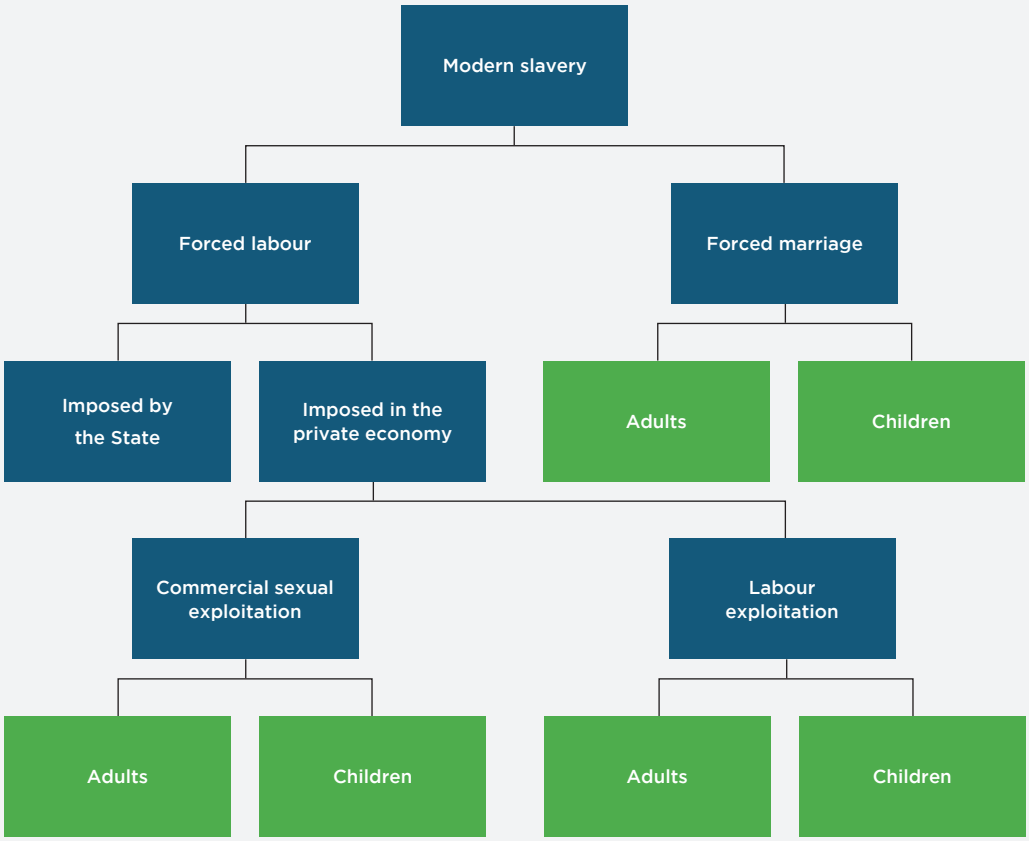
- Section 1 describes the overall measurement framework, including the basic concepts and definitions, the units of measurement, the distinctions between stock and flow of forced labour, and the distinction between country of current residence and country of exploitation.
- Section 2 describes in detail the methodology used for measuring forced labour exploitation of the adult population based national surveys.
- Section 3 describes the combined methodology used for estimating forced sexual exploitation based on IOM administrative data and national surveys.
- Sections 4, 5, and 6 document the methodologies used for measuring forced labour exploitation and forced sexual exploitation of children, state-imposed forced labour, and forced marriage.
- Section 7 examines the limitations of the data used and evaluates the results using various quality indicators and external sources.

Measurement framework

The 2016 Global Estimates of Modern Slavery have two sub-components: an estimate of forced labour and an estimate of forced marriage.

Figure 20

Typology of modern slavery for global estimation



FORCED LABOUR SUB-COMPONENT

The ILO Forced Labour Convention, 1930 (No. 29) 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".[21] In recent years, the ILO has examined various ways to measure the two criteria embedded in the ILO Convention, namely, "involuntariness" and "menace of penalty".[22] These criteria distinguish between forced labour of adults and forced labour of children.

Forced labour of adults is defined, for purposes of measurement, as work for which a person has not offered him or herself voluntarily (criterion of

"involuntariness") and which is performed under coercion (criterion of "menace of penalty") applied by an employer or a third party to the worker. The coercion may take place during the worker's recruitment process to force him or her to accept the job or, once the person is working, to force him or her to do tasks that were not part of what was agreed at the time of recruitment or to prevent him or her from leaving the job.

Forced labour of children is defined, for purposes of measurement, as work performed by a child under coercion applied by a third party (other than his or her parents) either to the child or to the child's parents, or worked performed by a child as a direct consequence of his or her parent or parents being engaged in forced labour. The coercion may take place during the child's recruitment to force the child or his or her parents to accept the job, or once the child is working, to force him or her to do tasks that were not part of what was agreed to at the time of recruitment or to prevent the child from leaving the work.

In line with the international standards concerning statistics of child labour, children are defined as all persons in the age group from 5 to 17 years, where age is measured as the number of completed years at the child's last birthday.[23] Forced labour of children refers in the present context to all persons who, during the past five years, were younger than 18 years old at the time they first became a victim of forced labour. Forced labour of adults refers to all persons currently 18 years old and over who have been victims of forced labour in the past five years.[24]

- **Typology of forced labour**

Forced labour can be found in its various forms in practically all countries and all economic activities. The above typology (see Figure 20), which was developed for the global estimation of forced labour, is based on three main categories and subdivisions for distinguishing between forced labour of adults and forced labour of children. It is the same as the typology that was used for the ILO's global estimates of forced labour in 2005 and 2012, with subdivisions for adults and children, which is not meant to indicate distinct forms of forced labour, but rather to indicate the use of distinct methodologies for estimation. The three main categories of forced labour are defined as follows:

- Forced labour imposed by private agents for labour exploitation, including bonded labour, forced domestic work, and work imposed in the context of slavery or vestiges of slavery.

- Forced labour in the private economy for commercial sexual exploitation refers to forced labour and services imposed by private individuals, groups, or companies involving commercial sex. It is hereafter referred to as **forced sexual exploitation**. This includes women and men who have involuntarily entered a form of commercial sexual exploitation, or who have entered the sex industry voluntarily but cannot leave. It also includes all children working in the sex industry, which Convention No. 182 defines as a worst form of child labour.

- Forced labour imposed by the state, including work exacted by the public authorities, military or paramilitary, compulsory participation in public works, and forced prison labour.

- **Stock, flow and duration of forced labour**

In principle, all forms of forced labour may be measured both as a stock and as a flow. As a stock, the measurement refers to the number of persons in forced labour at a given *point in time*. As a flow, the measurement refers to the number of persons who were victims of forced labour during a specified *period of time*. In order to better understand the differences, consider a population consisting of 12 persons whose forced labour status has been measured over five points in time – t_1, t_2, t_3, t_4 and t_5. The following table presents a numerical example:

Table 10

Forced labour status of a population of 12 persons over five points in time

Person no.	t_1	t_2	t_3	t_4	t_5	Duration in forced labour
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	1	1	0	2
9	0	0	0	0	1	1
10	1	1	0	1	1	4
11	1	1	1	0	0	3
12	1	1	1	1	1	5
Total	**3**	**3**	**3**	**3**	**3**	

Each numbered row of the table refers to one of the 12 persons in the population of this numerical example. The columns refer to the five points of time of measurement. Each cell takes on values either 0 or 1, with 0 indicating the person was not in forced labour at the given time and 1 indicating that the person was victim of forced labour at that time. The last row of the table counts the number of persons who were victims of forced labour at the given time. The last column of the table represents the duration in forced labour of each person.

In this example, seven persons were not victims of forced labour at any time during the five points of time of measurement while five experienced forced labour at some time during the period. Five is the flow count of forced labour over the time period of the numerical example. The five persons were:

- person no. 8 in forced labour at time t_2 and t_3;
- person no. 9 in forced labour at a single time t_5;
- person no. 10 was a victim of forced labour twice, each for a duration of two points of time t_1, t_2, and t_4, t_5;
- person no. 11 was a victim of forced labour once for a duration of three points of time t_1, t_2 and t_3; and
- person no. 12 was victim of forced labour at all five points of time.

Looking now at the last row of the table, it can be observed that there were at any given point of time three persons in forced labour. Three is the stock count of forced labour. There were three victims of forced labour at any given point of time:

- persons no. 10, 11 and 12 at time t_1 and time t_2;
- persons no. 8, 11 and 12 at time t_3;
- persons no. 8, 10 and 12 at time t_4; and
- persons no. 9, 11 and 12 at time t_5.

We say that the total flow count of forced labour in this example was five and the average stock count was three. The flow count, five, refers to the total number of persons who were victims of forced labour during the time period. The stock count, three, refers to the average number of persons who were in forced labour at any time during the period.

The average stock count and the total flow count are related to each other through the duration of forced labour. The relationship may be expressed by

- Average stock count = Total flow count x Average duration in forced labour
  (expressed as fraction of total duration)

In this example, the average duration in forced labour may be calculated using the last column of Table 10:

- Average duration in forced labour = (2+1+4+3+5)/5 = 3,
- Average duration expressed as fraction of total duration = 3/5 = 0.6.

It can then be verified that the average stock (3) = the total flow (5) x the average duration in forced labour (0.6).

The 2016 Global Estimates of Modern Slavery calculate both average stock and total flow estimates of the different components of forced labour. Data on duration for both forced labour exploitation and forced sexual exploitation was calculated based on the relevant cases within the IOM dataset. Forced labour and forced marriages being statistically rare events, the survey questionnaire was designed to capture the flow of victims over five years (2012-2016) in order to get enough cases for analysis.

- **Country of residence and country of exploitation**

Forced labour may be measured with respect to the country of current residence of the victim or of where the exploitation occurred. The distinction leads to considerably different figures at country and regional levels. Table 11 shows the theoretical distribution of global forced labour according to country of current residence and country of exploitation. The world consists of *n* countries and territories and global forced labour is *N*. The columns represent the countries of current residence of the victims and the rows the countries of exploitation.

Table 11

Global forced labour by country of current residence and country of exploitation

		Country of current residence							
		1	2	...	j	...	...	N	**Total**
Country of exploitation	1								
	2								
	...								
	i				N_{ij}				N_{i+}
	...								
	...								
	n								
	Total				N_{+j}				N

Each cell of the table (N_{ij}) denotes the unknown number of victims of forced labour exploited in country *i* currently residing in country *j*. In cases where the person was victim of forced labour in more than one country, the country of exploitation refers to the country where the last episode of forced labour took place. For victims of forced labour exploited in their own country, the country of exploitation *(i)* and the country of current residence *(j)* are the same.

A row total of the matrix shown in the last column of the table (N_{i+}) refers to the total number of victims of forced labour exploited in country *i*. The column total (N_{+j}) shown in the last row of the table gives the total number of victims currently residing in country *j*. The diagonal elements of the matrix (N_{ij}, $i = j$) represent the number of victims of forced labour exploited in their country of current residence and the off-diagonal elements (N_{ij}, $i \neq j$) represent the number of victims exploited outside their current country of residence. It is clear that the number of victims of forced labour exploited in country *i* (N_{i+}) may be different than the number of victims of forced labour current residing in that country (N_{+i}), $N_{i+} \neq N_{+i}$.

A numerical example illustrates this point. Consider the hypothetical example given earlier of a world consisting of 12 persons, five of whom are victims of forced labour. Suppose further that the world consists of three countries, A, B, and C, where the victims were exploited. Table 12 shows the distribution of the victims by country of exploitation and country of current residence.

Table 12

Distribution of victims of forced labour by country of exploitation and country of current residence: Numerical example:

		Country of current residence			
		A	B	C	**Total**
Country of exploitation	A	0	0	1	1
	B	0	1	0	1
	C	0	2	1	3
	Total	**0**	**3**	**2**	5

In this example, no current resident of country A has been victim of forced labour, but one victim from country C has been exploited in country A. In country B, there were three victims of forced labour, one exploited in country B itself and the other two in country C. In country C, there were two victims of forced labour, one exploited in country C itself and the other in country A. Comparing the column totals and row totals, it can be observed that in this example the country with the highest number of residents who were victims of forced labour is country B with $N_{+B}=3$. But country B is not the country in which

the most exploitation took place. The country in which the most exploitation took place is country C with $N_{+C}=3$.

FORCED LABOUR EXPLOITATION OF ADULTS

The core element of the Global Estimates of Modern Slavery is the data collected on forced labour and forced marriage on the basis of national surveys conducted at the country of residence with indirect information collected on country of exploitation. The procedure is explained below.

- **National surveys**

The main datasets were derived from 54 national surveys conducted in 48 countries during the period from 2014 to 2016.[25] All surveys were implemented by Gallup, Inc. In seven countries, surveys were conducted more than once during the period from 2014 to 2016. The survey countries are shown in Annex 2. The national surveys were household-based surveys with face-to-face interviewing of a sample of individuals at their places of residence, collecting data on forced labour and forced marriage regarding themselves and their immediate family members.

- Sample design

The sample design of a typical national survey conducted as part of the Gallup World Poll is briefly described below.[26] With some exceptions, all surveys were based on probability samples representing the resident civilian, non-institutional[27] population 15 years old or over. The scope of the survey was the entire geographic area of the country including urban and rural areas, with some exceptions such as scarcely populated islands in some countries, areas where the safety of interviewing staff may be threatened, and remote areas that interviewers could reach only by foot, animal, or small boat. The sample size of most surveys covers about 1,000 persons, with the exception of Russia (2,000), Haiti (504), and some countries where multiple surveys were implemented with samples of 2,000 (or 17,000 in the case of India). Altogether, the national surveys used for the global estimation of forced labour included a total sample size of 71,758 individuals. Sample selection was based on a multi-stage stratified sample design as follows:

In the first stage, an area sample of 100 to 135 primary sampling units (clusters) was created with probabilities proportional to size where population information was available in the sampling frame, otherwise by random sampling where population data was not available in the sampling frame. Prior to area sampling, the clusters were stratified by population size and or geography in multiple steps such as first stratification by large geographic units and then by smaller geographic units within them. In general, sample areas were drawn independently of any samples drawn for surveys conducted in previous years.

In the second stage of sampling, a fixed number of households were selected by random route procedures. Unless an outright refusal occurred, interviewers were instructed to make up to three attempts to survey the sampled household. To increase the likelihood of contact and survey completion, attempts were made at different times of the day and, where possible, on different days. If an interviewer could not obtain an interview at the initial sampled household, a simple substitution method could be followed.

In the third stage of sampling, individual respondents were randomly selected within the sampled households. Interviewers listed all eligible household members and recorded their ages and birthdays. The respondent was then selected from among the household members 15 years old and over using the Kish grid, a widely used method of randomly selecting members within a household to be interviewed, which is based on a pre-assigned table of random numbers. The interviewer was not supposed to inform the person who answers the door of the selection criteria until after the respondent had been identified. In few countries where cultural restrictions dictate gender matching of respondents and interviewers,

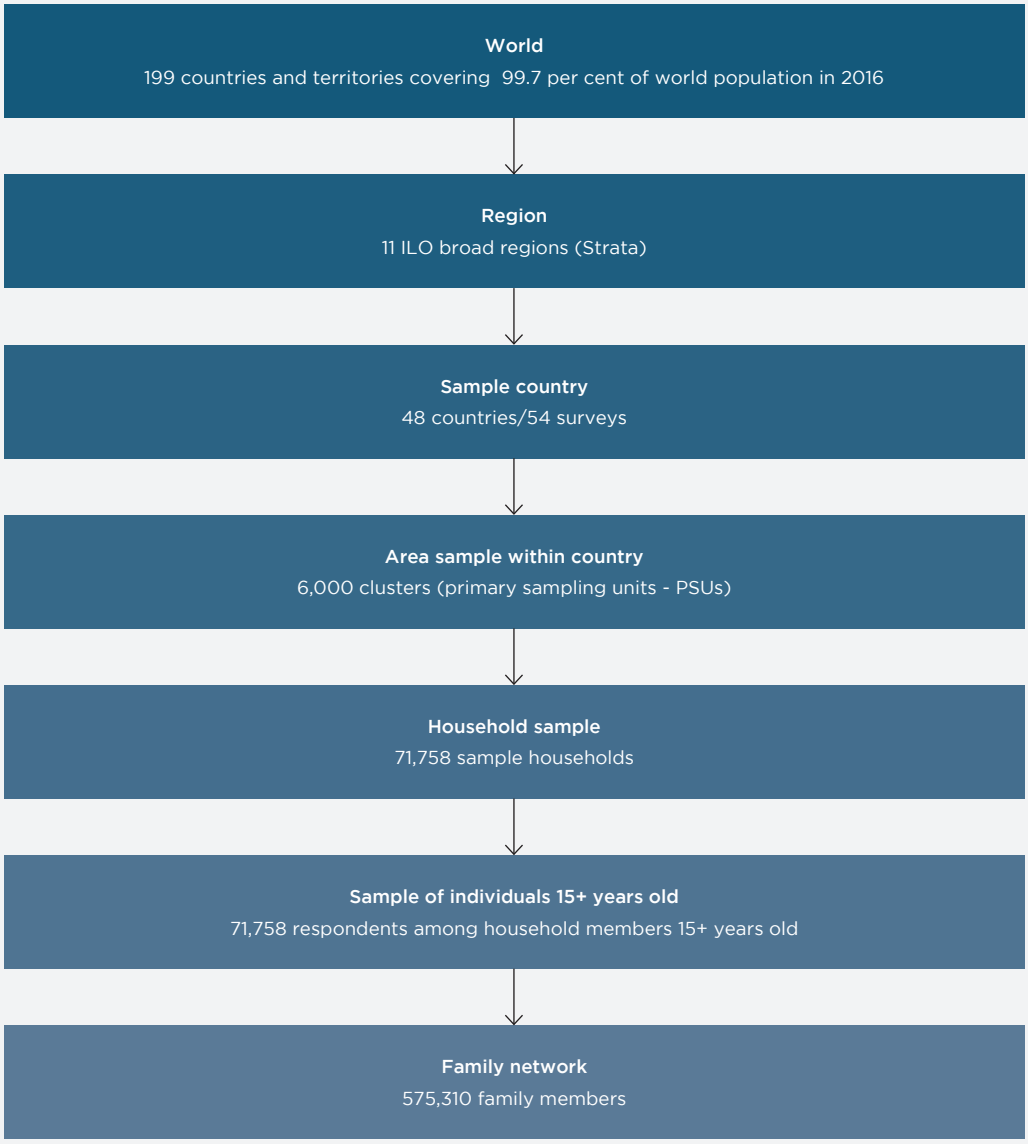
respondents were randomly selected using the Kish grid from among all eligible persons of the matching gender.

To boost the effective sample size, the sample was extended to cover the family members of the sample respondents; that is, respondents were asked the questions in relation to both their own experience and members of their immediate family.[28] The family network includes the respondent, his or her spouse or partner, and other immediate family members, namely parents (living biological mother and father, excluding step parents or adoptive parents); sons and daughters (living biological children excluding step children or adoptive children); and brothers and sisters (living biological siblings, i.e. sons or daughters of a parent, including half-siblings but excluding foster siblings, adoptive siblings, and step siblings – step siblings are the children of one's step parent from a previous relationship unrelated by blood).

In the 54 surveys used for global estimation of forced labour and forced marriage, the aggregate size of the family network of the 71,758 sample respondents included a total of 575,310 persons, corresponding to an average family network size of about eight. The family network included children below 15 years of age as well as adults 15 years old and over. The family network may have included members living outside the country from which the sampled respondent was selected, as well as persons outside the scope of the base survey. For example, it may have included non-civilians or persons living in institutions. The essential elements of the sample structure may be presented in hierarchal order as follows:

Figure 21

Overall sample structure



- Questionnaire design and counting rule

The questionnaire used in the 2016 survey was built on an earlier instrument that had initially been developed by the Walk Free Foundation, drawing on lessons learnt from crime victimization surveys, earlier guidance from the ILO, and key concepts. Initially developed and tested in 2014, the surveys were further refined in 2015 and again in 2016. In all the surveys, steps were taken to reduce response errors by following processes that ensure quality and account for factors that can influence response rates such as population coverage, method of data collection, the response load imposed through length, difficulty and sensitivity, questionnaire design and layout, language used, and relevant cultural contexts.

An initial instrument was drafted by the Walk Free Foundation with reference to forced labour as defined by ILO Forced Labour Convention, 1930 (No.29)[29] and

to forced marriages, which are defined under the Supplementary Convention on the Abolition of Slavery, the Slave Trade, and Institutions and Practices Similar to Slavery, 1956 (Article 3).[30] Cognitive testing was undertaken in six of the seven survey countries in the first round of surveying in 2014. Results of testing were generally positive, although some changes were made to the instrument to improve clarity and reduce response errors.

For the 2016 round of surveys, additional questions were added on duration and to ensure better representation of children in survey results. The resulting questionnaire was used in the ILO-Walk Free Foundation modules of the Gallup World Poll survey 2016.[31] There were three sections in the questionnaire: questions establishing network size, questions on forced labour, and questions on forced marriage. The forced labour part of the questionnaire included 14 main questions outlined in Table 13, as well as a series of sub-questions described below.

Table 13

Outline of questionnaire on forced labour in the ILO-Walk Free Surveys conducted as part of Gallup World Poll surveys 2016

Questions	Description
P1-P4	Identification of immediate family network
P5-P7	Inquiry on forced labour experience by anyone among immediate family
P8-P10	Who in the immediate family, sex and age
P11	When last happened
P11l	Total duration over last five years
P12	Country in which last spell happened
P13	Type of work forced to do
P14	Means of coercion

After accounting for the immediate family network (P1-P4), a series of main questions measured the involuntariness criteria of forced labour in the ILO Convention No. 29 definition by inquiring about particular work situations experienced by anyone in the immediate family:

- forced to work by an employer or recruiter (P5);
- forced to work to repay a debt with an employer or recruiter and not allowed to leave (P6);
- offered one kind of work, but forced to do something else and not allowed to leave (P7);

with additional questions for administration in countries where they were relevant:

- forced to work for a master as a slave (P7A);
- had to work in order to help another family member who was forced to work by an employer (P7B); and
- forced to work for an employer so that another person would receive a job, land, money, or other resources (P7C).

In this context, "work" is defined as any economic activity destined for the market, whether for sale or barter, including all goods or services provided free to individual households and all

production of goods for one's own use. Production or services for one's own final consumption within households, e.g. household chores, are not considered as "work", but agricultural production for one's own consumption is considered "work".

Follow-up questions (P8-P10) identified and determined the demographic characteristics of family members for whom a positive reply was given for any of the questions P5 to P7. The series of questions then inquired on when the particular work situation last happened (P11), what was the total duration during the last five years (P12), in which country it occurred (P13), and what type of work it was (P14). The type of work was coded in terms of sector of activity adapted from the international standard industrial classification of all economic activities (ISIC Rev 4). Fifteen categories were provided:

1. Agriculture, forestry
2. Fishing
3. Mining and quarrying
4. Manufacturing
5. Construction
6. Wholesale and retail trade
7. Accommodation and food services activities
8. Military
9. Arts, entertainment, and recreation
10. Sex industry and sexual exploitation
11. Drug production, drug sales, trafficking
12. Begging
13. Personal services
14. Domestic labour
15. Other

The criterion of "menace of penalty" of the ILO Convention No. 29 was measured at the end with a separate question (P14) on the means of coercion. The questionnaire provided for verbatim response on this question, which was then coded into one or more of the following 14 categories:

1. Physical violence
2. Sexual violence
3. Threats of violence
4. Threats against family
5. Locked in work or living quarters
6. Kept drunk/drugged
7. Punished through deprivation of food, sleep, etc.
8. Punished through fine/financial penalty
9. Threats of legal action
10. Withheld passport or other documents
11. Had to repay debt
12. Withheld wages
13. Too far from home and nowhere to go
14. Other

The results of the surveys were processed in STATA and victims of forced labour of adults were identified according to the following counting rule:

Forced labour in 5 years = involuntary & penalty & family & in 5yrs

Therefore, a case was included if it met the following conditions:

(a) The work was involuntary if:

- forced to work by an employer or recruiter, OR
- forced to work to repay a debt with an employer or recruiter and not allowed to leave, OR
- offered one kind of work, but forced to do something else and not allowed to leave, OR
- forced to work for a master as a slave, OR

- had to work in order to help another family member who was forced to work by an employer, OR
- forced to work for an employer so that another person would receive a job, land, money, or other resources.

(b) The work was under menace of penalty if one or more of the following:

- Physical violence
- Sexual violence
- Threats of violence
- Threats against family
- Locked in work or living quarters
- Kept drunk/drugged
- Punished through deprivation of food, sleep, etc.
- Punished through fine/financial penalty
- Threats of legal action
- Withheld passport or other documents
- Had to repay debt
- Withheld wages
- Too far from home and nowhere to go
- Other penalty

(c) The situation was experienced by a member of the immediate family; that is, the victim was the self (respondent), spouse, brother/sister, daughter/son, mother/father.

(d) The work occurred in the last five years (that is, said it took place either less than one year ago or less than five years ago).

- **Particular statistical treatments**

- Verbatim responses

Following changes to the survey instrument in 2015, verbatim responses were collected from respondents in 44 surveys. Respondents were asked to describe in their own words the type of work they were forced to perform and the ways in which they were prevented from leaving. This allowed for the review of codes allocated by Gallup against the verbatim response and, where appropriate, for the re-coding of responses.

All verbatim responses to the question on coercion, threats, and penalty (P14) were independently reviewed by the ILO and the Walk Free Foundation. Given the formulation of the counting rules, careful consideration was given to the treatment of penalties in question P14.The verbatim responses provided a rich set of information for understanding the process of forced labour and for verifying the accuracy of the coding of question P14. Three types of cases were subject to special statistical treatment:

- If the content of the text was recognized to be a penalty among the pre-coded categories in line with the ILO Convention No. 29, the response was recoded into that category.
- If the text was recognized as a penalty not among the pre-coded categories, a new code "95" was added to cover these situations, such as "threat of dismissal".
- If, however, the text was not recognized as a penalty, the response was recoded as 96 "No penalty", for example, "*I needed some work*."

Changes to original Gallup coding were made only in cases where the verbatim response clearly contradicted the coding allocated, indicating a mistake. Through this process, the following types of changes were made.

In a limited number of cases, answers to the filter questions P5 to P7c required recoding to align with verbatim responses. Any "yes" on questions P6 to P7c for which the verbatim response clearly stated that the person was not forced were deleted from the set of "positive" or "confirmed" cases. There were very few of these and all were clear cases that warranted exclusion.

For example, one respondent answered "yes" to the question *"Have you or has anyone in your immediate family ever been forced to work by an employer or a recruiter?"* When asked to explain in their own words how they were kept from quitting that work, the person replied *"I did the job because I wanted to, I was never forced to it."* This was clearly a case that should be excluded.

Conversely, if the verbatim response indicated that there was forced labour even though the respondent had answered "no", this was changed to "yes". For example, in one case the verbatim response stated *"He didn't let my son to go to Afghanistan till he finish his work, after that my son was in prison for two months"*. Although this respondent had originally indicated that neither he, nor anyone in his family, had been forced to work, the verbatim response clearly contradicted that.

The variables on forms of coercion were recoded following a review of transcripts. In most cases, changes to the reported forms of menace or penalty were treated as additional forms of coercion, rather than a change to the original Gallup coding. New codes were created for answers to question P14 to better cover the range of threats covered in the transcripts. For example, the following verbatim response clearly indicates the use of physical violence, being locked in work or living quarters, kept drugged, and threats made against the family.

> *"What to say of this violence against me. I am being given drugs and kept locked in a single room whenever I tried to oppose them. My family is also under threat and I am usually beaten by the employer and in the domestic quarters I have to spend the whole day. My life has become a hell to me."*

The verbatim responses were reviewed and coded by two independent coders (say, c1 and c2). If the two codes agreed (c1=c2), then the common code was maintained. If, on the other hand, the two codes were different (c1≠c2), then the two coders jointly reviewed the conflict and discussed the reasons. This often led to a resolution on the coding. In the event that no agreement was reached at this stage, a third party would be consulted.

- Refusals

During data processing, it was found that in several national surveys the number of refusals to critical questions was unusually high. Two types of refusals were singled out for special statistical treatment:

- Refusal on any of the key questions on forced labour, e.g. question on "forced to work by an employer to repay a debt with that employer?" (P6==4); question on "ever been offered one kind of work but then forced to do something else and not allowed to leave?" (P7==4); question on "ever had to work in order to help another family member who was forced to work by an employer?" (P7b==4); or question on "ever been forced to work for an employer so that another person would receive a job, land, money or other resources?" (P7c==4).

- Refusal on identifying family member (P8==9) after having responded positively to at least one of the filter questions (P5==1 or P6==1 or P7==1 or P7B==1 or P7C==1).

Such refusals were considered to be indicative of recent experience of forced labour that the respondent did not want to reveal and discuss during the interview, perhaps out of fear of reprisal by the employer or agent. These refusals were recoded as forced labour within last five years in the data processing of the national surveys.

- Other non-responses

One implication of refusal to answer the filter questions or identify the family member is that the follow-up questions on demographic characteristics of the victim and on the timing, place, type of work, and kind of coercion were not administered and therefore the responses to these questions are missing.

It was decided to impute for missing values only with regard to sex and country of exploitation, leaving all other values as missing. Thus, refusal or non-response to the question P9 on "gender" was imputed as P9=2 (female) to account, in part, for the low representation among females, and refusal or non-response to the question P12 on "country that last happened" was imputed as country of residence (P12=WP5).

- Self-response versus proxy-response

The analysis of the survey results revealed that respondents were able to provide more ample information on their own forced labour experience than on their family members. Table 14 shows the total number of forced labour victims identified in the national surveys by type of response. Altogether, the surveys identified 2,672 persons who have experienced forced labour – either themselves or a family member – at any time in the past, representing a prevalence rate of 4.64 per thousand. The reported prevalence rate was 10.41 per thousand for self-response (those who reported on their own forced labour experience), significantly higher than the rate for proxy-response on experience of children, which was the lowest at 1.19 per thousand, followed by proxy-response on siblings at 2.16 per thousand and on parents at 2.87 per thousand.

Table 14

Prevalence of forced labour by type of response (Not weighted)

Self-response versus response on family members	Total number in family network	Forced labour victims at any time in the past	Rate
Total	**575 310**	**2 672**	**4.64**
Self	71 758	747	10.41
Spouse/partner(1)	43 802	228	5.21
Child	139 643	166	1.19
Parent	79 823	229	2.87
Sibling	240 285	518	2.16
Other(2)	-	768	-

Note: (1) The total number of spouses or partners of respondents could not be determined on the basis of the survey questions. (2) Other includes don't knows and refusals.

The higher reported prevalence for self-response has been consistently observed for forced labour experience reported to have occurred within the last year, the last five years, or the last ten years, as well as under different weighting schemes of the data. This could be because respondents tend to know more about their own experiences than about those of their family members and therefore are more likely to respond affirmatively to questions about themselves. However, it can also be argued that respondents may have the tendency to exaggerate their own forced labour experiences while understating those of their family members. Either way, the reported prevalence rate of forced labour would still be higher for self-responses relative to proxy responses.

- Memory failures

It is well known that survey response errors can be caused by memory lapses, in particular by a respondent forgetting to report an event or incorrectly reporting the timing.[32] Memory error due to forgetting an episode entirely is called

"omission". A second type of memory error, known as "telescoping", reflects the compression of time when an event is remembered as occurring more recently than it actually did.

In the context of forced labour, an omission error occurs when the respondent fails to remember an event considered as force labour in the survey. Such omissions may be rare when the respondent is reporting about his or her own experience, but may be frequent when reporting about family members. For telescoping errors, where the respondent remembers a forced labour experience but cannot accurately recall the date of its occurrence, the tendency is to bring time forward and report a closer date to the present that it really was. The error due to telescoping often operates in opposite direction to the error due to omission.

Table 15 presents the survey data on the reported cases of forced labour in terms of the timing of their occurrences. If there were no response errors, one would expect that the number of victims in the category "1 year to less than 5 years" to have been about four times the number of victims in the category "Less than 1 year", reflecting the much longer period of time. However, as the data in Table 15 shows, 562 victims reported experiencing their most recent episode of forced labour within the previous year, while the number of those who reported the most recent episode occurring between one and five years previous was 693 – or only about 23 per cent higher. This suggests substantial memory failures in responses.

Table 15

Forced labour victims by reported time of last episode of forced labour

Last episode	Total victims	Self-response	Proxy response
Total	**2 672**	**747**	**1 925**
Less than 1 year	562	215	347
1 year to less than 5 years	693	274	419
5 years to less than 10 years	302	127	175
10 years or more	309	109	200
Unknown	806	22	784

Note: "Unknown" includes don't knows and refusals.

However, one could not argue that victims who reported incidents of forced labour occurring over the previous year have among them fewer memory errors and therefore the true number of victims of forced labour in last five years could be obtained by simply multiplying the figure for the most recent year by five (e.g. 562*5=2810). This is because some of the cases reported as less than a year may have in fact occurred earlier but were reported as within the previous year due to telescoping. In general, rates of omission increase as a function of the length of the recall period, but errors in the perception of time tend to increase in the opposite direction. Also, factors other than length of time, such as the salience or social stigma of the event, affect both the rates of omissions and accuracy of dating the event.

Models have been developed to express the memory effects of responses to retrospective questions.[33] They can be applied to the data in Table 15 to estimate the omission rates and the telescoping

effect in reporting the most recent experience of forced labour for self-response and proxy response, separately. The results confirm the fact that the rate of response errors is higher with proxy response than with self-response. The estimates of the probability of omissions and the fraction of events brought forward in time are both greater for proxy respondents than for self-respondents with any recall period.

The lower rate of response error of self-respondents is treated by means of giving more weights to responses obtained from self-responses than to proxy responses. This is implemented as part of the extrapolation of the survey data described in the next section.

- **Extrapolations**

The survey results are expanded to global aggregates using extrapolation weights that compensate for the sample nature of the observations. In the present context, the sampling weights are the product of two parts, one reflecting the choice of the sample countries within the universe of countries called "country weights" and the other the sample design of the national surveys called "survey weights". In mathematical terms, the extrapolation weights may be expressed by

$$w_{ijh} = w_{jh} \times w_{ij}$$

where w_{jh} is the country weight, i.e. the weight of the sample country *j* in the region (stratum) *h* and w_{ij} is the survey weight, i.e. the sampling weight of individual *i* in the sample country *j*. The calculation of the survey weights w_{ij} is first described, followed with the description of the country weights w_{jh}.

- Survey weights

The sample design of the national surveys is based on a conventional two-stage sampling of areas and households, followed by a random selection of one adult household member. The selected household member and all his or her immediate family form the ultimate sampling units of the survey. The survey weight may thus be derived from the principle of multiplicity sampling[34] and may be expressed as follows,

$$w_{ij} = \frac{w_{(k)j}}{netsize_k}$$

where *i* represents an individual in the family network of sample person k in the sample country *j*. The family network of the sample person *k* includes the person itself. The numerator $w_{(k)j}$ is the sampling weight of the sample person *k* in the sample country *j*. It is calculated by Gallup Inc. as part of the World Poll methodology and given as

$$w_{(k)j} = projwt$$

in the datasets submitted to the ILO and the Walk Free Foundation.

The denominator $netsize_k$ is the size of the family network of sample person *k* restricted to those who are 15 years of age and older. These are the individuals who could have been selected either directly as part of the initial sample or indirectly as a family member of the sample person. In order to correctly account for this double possibility of selection, the survey weight is adjusted by the multiplicity factor netsizek. The size of the family network as a whole can be calculated on the basis of the responses to the survey question on household relationship to identify the existence of spouses and survey questions P1 to P4 to determine the number of living parents, siblings, and children. Those 15 years of age and older can be derived by

$$netsize_k = \frac{projwt}{netwt}$$

where *netwt* is the network weight also computed by Gallup Inc. and provided in the datasets submitted to the ILO and the Walk Free Foundation.

The sample design of the national surveys provides the possibility of producing estimates of forced labour based on self-responses alone using the sampling weights ($w_{(k)j}$) as well as on total responses based on the network weights (w_{ij}). To give more importance to self-responses relative to proxy responses,

the two sets of weights – self and proxy – were combined to produce the survey weights for use in the global estimation of forced labour and forced marriage.

These combined survey weights are obtained by computing a weighted average of the two sampling weights after deducting the respondent from the network size in the denominator of the network weight,

$$wt_{ij} = \alpha \times projwt + (1-\alpha) \times \frac{projwt}{netsize_k - 1}$$

The parameter of α may be evaluated based on the following consideration.[35] Let μ be the true value of global forced labour and *bself* the bias from the over-estimation based on self-reporting and *bproxy* the bias from the underestimation based on proxy response. Then $\alpha(\mu+b_{self})+(1-\alpha)(\mu-b_{proxy}) = \mu+\alpha b_{self}-(1-\alpha) b_{proxy}$. For the overall bias to be equal to zero, one must choose α such that

$$\frac{1-\alpha}{\alpha} = \frac{b_{self}}{b_{proxy}}$$

or $\alpha b_{self}-(1-\alpha)b_{proxy}=0$. This result indicates that if self-response is assumed to be unbiased then α must be chosen such that $(1-\alpha)/\alpha=0$, i.e. $\alpha=1$. It means that under this assumption, all the weight should be given to the self-responses. On the other hand, if it is assumed that the two sets of biases cancel each other, i.e. $b_{self}=b_{proxy}$, then $(1-\alpha)/\alpha = 1$ and $\alpha=0.5$, and the average of the arithmetic average of the weights of self-response and proxy response should be used for extrapolation.

In practice, the value of α may be interpreted as the odds of detecting a victim of forced labour based on self-response against the odds of detection based on proxy response. The odds ratio calculated from the raw data of the national surveys gives $\alpha=0.753$.

This choice of α is also about at the mid-point of the range from 0.5 to 1. It can be argued that to give more importance to self-responses relative to proxy responses for adult family members 15 years old and over, the averaging parameter α should be at least 0.5, i.e. in the range from 0.5 to 1, or at around mid-point of the range, i.e. $\alpha=0.75$.

It should be mentioned that the survey weights are not sampling weights, as they are not solely based on sample probabilities. They take also into account the quality of the response in terms of whether it is obtained from self-response or proxy response.

- Country weights

Table 16 presents the sample version of Table 4, where the columns represent the sample countries and the rows represent the countries of exploitation generated by the responses obtained from the national surveys. In practice, there were 48 countries where the national surveys were conducted and 91 countries and territories reported as countries of exploitation. So the matrix has in fact 91 rows and 48 columns.

Table 16

Estimation of forced labour in countries of exploitation based on national surveys in countries of current residence

		Country of current residence							
	Country weights	1 w_{1h}	2 w_{2h}	... ...	j w_{jh}	... ...	... ...	s w_{sh}	**Weighted total**
Country of exploitation	1								
	2								
	...								
	...								
	...								
	S								
	+1								
	+2								
	...								
	Weighted Total								Global estimate

The matrix provides the basis for calculating the global estimates of forced labour in 2016. The survey values are extrapolated into global aggregates using weights w_{jh} attached to the sample countries represented in the column of the matrix. The countries with national surveys were in fact grouped into strata *h* according to the 11 ILO broad regional groupings. The global estimates of forced labour are thus calculated as the weighted sum over all strata *h*,

$$\hat{N} = \sum_{h, j \in s_h} w_{jh} \times \hat{N}_{+j}$$

where s_h denotes the sample of countries where the national surveys were conducted in stratum *h*, w_{jh} is the country weight of national survey *j* in stratum *h*, and N_{+j} represents the estimate of forced labour obtained from the national survey in country *j*. The + sign in the expression of N_{+j} refers to all countries of exploitation identified in national survey of country *j*.

The country weights w_{jh} were calculated as follows

$$w_{jh} = \frac{UNPOP_h(2016)}{\sum_{j \in s_h} UNPOP_{jh}(2016)}$$

where $UNPOP_h(2016)$ is the UN estimate of the size of the working age population 15 years of age and older in stratum *h* at mid-year 2016 obtained from the UN World Population Prospects,[36] $UNPOP_{jh}(2016)$ is the corresponding population estimate in country *j* of stratum *h* and s_h is the set of all countries in stratum *h* with national surveys. In practice, the country weights are adjusted for the reference year of the survey and differences between the survey estimate of the population and the UN estimate for the same reference year. The adjustment factor is given by $UNPOP_j(2016)/POP_j$ where the numerator is the UN population estimate of the country for 2016 and the denominator the survey population estimate for the reference year of the survey.

Under this weighting scheme, the regional estimate of forced labour according to country of residence may be expressed

as the product of the population of the region and a weighted average of the prevalence of forced labour in that region,

Regional estimate = $UNPOP_h(2016) \times r_h$

where r_h is the weighted average prevalence of forced labour in region *h* expressed as,

$$r_h = \sum_{j \in s_h} \omega_{jh} \times \frac{\hat{N}_{+j}}{POP_j}$$

The weight ω_{jh} is the share of the population of country *j* in the total population of the region,

$$\omega_{jh} = \frac{UNPOP_{jh}(2016)}{\sum_{j \in s_h} UNPOP_{jh}(2016)}$$

- Clustering

Clustering was explored in order to make sound decisions about extrapolation from the existing data points. Ultimately, clustering was not used due to the difficulty in identifying interpretable, stable clusters. Instead, ILO regional groupings were used for aggregation by country of exploitation. The process by which clustering was considered and rejected is set out below.

The purpose of clustering is to group the universe of countries and territories into a limited number of groups, called clusters. Clusters are grouped so that the countries of exploitation within each cluster are homogeneous with respect to their forced labour profile and there is at least one (but preferably more) sample observation on the countries of exploitation in the cluster. Non-sample countries within the same cluster are then assumed to have the same rate of prevalence of forced labour. Clustering may therefore be viewed as a form of post-stratification for global estimation of forced labour.

As part of its Global Slavery Index, the Walk Free Foundation uses clusters of countries constructed on the basis of a measure of vulnerability to forced labour and modern slavery.[37] Vulnerability is assessed with 24 variables reflecting four dimensions, including civil and political protections and social, health, and economic rights. The dimensions are interpretations of the four principal axes of a factor analysis of the data and the 24 variables are derived from an initial list of 35 variables. The data is obtained from a variety of sources, normalized to a linear scale, checked for multicollinearity, and inverted in certain cases for comparability. The Walk Free Foundation universe of 167 countries was then grouped into 12 clusters using a nearest-neighbour clustering method and ordered according to the vulnerability measure from high to low.

An alternative clustering method was considered based on the IOM database of cases of human trafficking that the organization assists. The IOM dataset used for the Global Estimates includes 44,905 human trafficking cases recorded from 2002 to the present, covering 152 countries and territories and containing a wide range of information from which key variables may be constructed including sex, age, nationality, branch of economic activity, date of registration, length of trafficking, and country of exploitation.

Using the IOM dataset, an initial set of 12 clusters of countries of exploitation were constructed based on the percentage of victims of trafficking outside the country of origin and the ILO prevalence rates of forced labour according to its 2012 estimate. The 12 initial clusters are shown in Table 17.

Table 17

Structure of initial clusters of countries of exploitation

IOM Percentage of trafficking outside country of origin	ILO Regional prevalence rate of forced labour (2012)	Cluster number
Percentage of victims in country of exploitation outside country of origin <=5 per cent	High (>= 4 per thousand)	1
	Mid (~ 2-3 per thousand)	2
	Low (<= 2 per thousand)	3
Percentage of victims in country of exploitation outside country of origin >5 per cent & <=50 per cent	High (>= 4 per thousand)	4
	Mid (~ 2-3 per thousand)	5
	Low (<= 2 per thousand)	6
Percentage of victims in country of exploitation outside country of origin >50 per cent & <=95 per cent	High (>= 4 per thousand)	7
	Mid (~ 2-3 per thousand)	8
	Low (<= 2 per thousand)	9
Percentage of victims in country of exploitation outside country of origin > 95 per cent	High (>= 4 per thousand)	10
	Mid (~ 2-3 per thousand)	11
	Low (<= 2 per thousand)	12

The use of the 2012 ILO prevalence rates in the construction of the initial clusters was intended to build in a degree of consistency with the regional distribution of the previous round of ILO global estimation of forced labour. The final clusters were then obtained by conducting a cluster analysis based on additional IOM variables describing the country profile of victims of human trafficking. The k-medians procedure of the k-th nearest neighbour methodology of STATA was used for the analysis. The results are shown in Figure 22.

Figure 22

ILO/IOM Clusters of countries of exploitation derived from the k-medians procedure of the k-th nearest neighbour methodology of STATA with initial clusters as starting values

Cluster 1	10 countries **(6)**		
Armenia	Gabon	Kazakhstan	**Rwanda**
Botswana	Gambia	Réunion	
Congo	**Georgia**	**Russian Federation**	
Cluster 2	4 countries **(3)**		
Djibouti	**Egypt**	**Jordan**	**Libya**
Cluster 3	10 countries **(8)**		
Bahrain	**Kuwait**	**Qatar**	**United Arab Emirates**
Brunei Darussalam	Macau, China	**Saudi Arabia**	
Hong Kong, China	**Oman**	**Singapore**	
Cluster 4	1 country **(1)**		
Canada			
Cluster 5	13 countries **(7)**		
Afghanistan	Comoros	Democratic Republic	Sierra Leone
Belarus	Equatorial Guinea	**Malawi**	**Uganda**
Burundi	**Ghana**	**Mozambique**	
Cameroon	Lao People's	**Philippines**	
Cluster 6	53 countries **(24)**		
Antigua and Barbuda	Costa Rica	Jamaica	**Peru**
Argentina	Cuba	Kiribati	Saint Lucia
Aruba	Curaçao	**Lebanon**	Samoa
Bahamas	Ecuador	**Malaysia**	Suriname
Bangladesh	**El Salvador**	**Maldives**	Syrian Arab Republic
Barbados	French Guiana	Martinique	**Thailand**
Belize	French Polynesia	**Mexico**	Timor-Leste
Bhutan	Grenada	**Mongolia**	Tonga
Bolivia, Plurinational	Guadeloupe	**Myanmar**	United States Virgin
State of	Guam	**Nepal**	Islands
Brazil	**Guatemala**	New Caledonia	Vanuatu
Cambodia	**Honduras**	Nicaragua	**Venezuela, Bolivarian**
Chile	**India**	**Pakistan**	**Republic of**
China	**Iraq**	Papua New Guinea	**Viet Nam**
Cluster 7	39 countries **(13)**		
Albania	Congo, Democratic	Madagascar	**South Africa**
Algeria	Republic of the	**Mauritania**	**Sudan**
Angola	Côte d'Ivoire	Mayotte	Swaziland
Azerbaijan	Croatia	**Morocco**	**Tanzania, United**
Bosnia and	Eritrea	Namibia	**Republic of**
Herzegovina	Guinea	Niger	Togo
Burkina Faso	Guinea-Bissau	**Nigeria**	**Tunisia**
Cape Verde	**Lesotho**	Sao Tome and Principe	Turkey
Central African	Liberia	**Serbia**	Western Sahara
Republic	Macedonia, the former	Seychelles	Zambia
Chad	Yugoslav Republic of	**Somalia**	**Zimbabwe**

Note: Countries shown in bold are countries with information from the national surveys on forced labour. Countries in standard weight are countries without information from the national surveys on forced labour.

Cluster 8	37 countries **(18)**		
Australia	**France**	Lithuania	Slovakia
Austria	**Germany**	Luxembourg	Slovenia
Belgium	**Greece**	Malta	**Spain**
Bulgaria	**Hungary**	**Montenegro**	Sweden
Channel Islands	Iceland	**Netherlands**	Switzerland
Cyprus	**Ireland**	New Zealand	**United Kingdom**
Czech Republic	Israel	Norway	**United States**
Denmark	**Italy**	**Poland**	
Estonia	**Japan**	Portugal	
Finland	**Latvia**	**Romania**	
Cluster 9	8 countries **(2)**		
Benin	Mauritius	Tajikistan	**Ukraine**
Colombia	Moldova, Republic of	Turkmenistan	Uzbekistan
Cluster 10	4 countries **(3)**		
Ethiopia	**Haiti**	**Kenya**	Kyrgyzstan
Cluster 11	4 countries **(2)**		
Dominican Republic	Mali	**Senegal**	South Sudan
Cluster 12	16 countries **(3)**		
Fiji	Korea, Democratic	Puerto Rico	Trinidad and Tobago
Guyana	People's Republic of	Saint Vincent and the	Uruguay
Indonesia	Korea, Republic of	Grenadines	West Bank and Gaza
Iran, Islamic Republic of	Panama	Solomon Islands	Strip
	Paraguay	**Sri Lanka**	Yemen

Note: Countries shown in bold are countries with information from the national surveys on forced labour. Countries in standard weight are countries without information from the national surveys on forced labour.

The ILO universe of 199 countries and territories was then assigned to the final 12 clusters. All clusters included at least one country of exploitation with information from the national surveys. The count of the number of countries in each cluster is given in at the bottom of the list together with the number of countries with available data from the national surveys on forced labour.

Ultimately, it was decided not to use clustering in the 2016 Global Estimates of Modern Slavery. The main reason for this decision was the difficulty in interpreting the composition of the clusters and their instability when one variable was added or omitted in the clustering algorithm or when the number of required clusters was changed by one unit or more. Also, the fact that the clusters cut across the ILO regional groupings complicated the calculation of weights for aggregation into regional and global totals.

It was therefore decided to use the same ILO regional groupings *h* for aggregation by country of exploitation. The regional estimates of forced labour by country of exploitation was thus calculated based on the following expressions,

$$\hat{N}_{h+} = \sum_{j' \in s'_h} \sum_{h, j \in s_h} w_{jh} \times \hat{N}_{j'j}$$

where w_{jh} is the country weight of the national survey in country *j*, *j'* is the country of exploitation, and

$$\hat{N}_{j'j} = \sum_{i \in j'} w_{ij} \times n_{ij'j}$$

where w_{ij} is the survey weight of individual i in national survey of country j with $n_{ij'j} = 1$ if individual i in sample of country j was victim of forced labour in country j' and $n_{ij'j} = 0$ otherwise.

FORCED SEXUAL EXPLOITATION

The use of national surveys to obtain reliable data on victims of forced sexual exploitation and on forced labour exploitation of children proved to be difficult because the surveys did not capture an adequate number of cases for estimation. Thus, a different measurement approach was adopted for these two components of forced labour.

▪ Measurement framework

The basic idea for measuring forced sexual exploitation is to first establish a relationship between the odds of falling victim to forced sexual exploitation relative to forced labour exploitation for different demographic and social characteristics of the population, and then to use that relationship for estimating the number of victims of forced sexual exploitation on the basis of the estimates previously obtained on victims of forced labour exploitation. The procedure is meant to be simple and ensure consistency between the estimates of the two main forms of forced labour.

Let p denote the proportion of victims of forced sexual exploitation among the total number of victims of forced sexual and labour exploitation. Then the ratio $p/(1-p)$ would represent the odds of falling victim of forced sexual exploitation relative to forced labour exploitation. A logit model expressing the relationship between the relative odds and a set of socio-demographic characteristics of the victims may be specified as follows,

$$\ln\left(\frac{p_x}{1-p_x}\right) = f(x)$$

where ln is the logarithmic function, p_x is the proportion of victims of forced sexual exploitation with socio-demographic characteristics x, and f is a linear function of the characteristics x to be specified.

Based on a dataset developed from IOM human trafficking cases covering both trafficking for sexual exploitation and for labour exploitation, the data was fitted to alternative model specifications. The best-fitting model was then chosen to estimate the odds ratio $p/(1-p)$ and to serve as base for estimating the number of victims of forced sexual exploitation in the different socio-demographic characteristics x as follows,

$$CSE_x = LEA_x \frac{\hat{p}_x}{1-\hat{p}_x}$$

where CSE_x is the estimated number of victims of forced sexual exploitation with socio-demographic characteristics x, LEA_x is the corresponding estimate of forced labour exploitation of adults derived from the forced labour surveys described earlier, and

$$\hat{p}_x /(1-\hat{p}_x)$$

is the estimated odds ratio. The proposed methodology in effect calibrates the IOM data on forced sexual exploitation to the global estimates of forced labour exploitation.

▪ Data sources

Estimates of forced commercial sex (children and adults) were calculated using two datasets, the national survey data on forced labour of adults and the IOM's database of cases of human trafficking that the organization assisted in the reference period 2012-2016 covering both trafficking for sexual exploitation and for labour exploitation. As mentioned earlier, the IOM dataset comprises information on 44,905 cases of human trafficking recorded from 2002 to present and covering 152 countries. The dataset is derived from operational data produced by IOM's case management system, the Migrant Management & Operational System Application (MiMOSA). It has been extracted from IOM's central data warehouse, which pulls and merges older data from the now disused legacy system and newer data from the new, online MiMOSA Web

system. The data file produced for the global estimates contains data on the profile of the victims of human trafficking (sex, age, nationality), location (screening country, country of last exploitation), movement (date of registration, length of trafficking), branch of economic activity (agriculture, factory work, prostitution, etc.), and certain proxy variables for treating missing values.

The IOM dataset was cleaned and limited to cases where data was present for key variables used the purpose of global estimation of forced sexual exploitation.[38] The resulting dataset (IOM_clean_database.dta) contained 39,192 records with 14 variables. The cleaned database was further processed for the present purpose of model fitting of forced sexual exploitation. The additional processing involved limiting the database to records of the relevant forms of forced labour: *form_fl=1* (forced labour exploitation) and *form_fl=2* (forced sexual exploitation), and the addition of derived variables at the individual level and auxiliary variables at the national level for handling missing values in the models. The final dataset has 10,268 records and 21 variables, 14 variables at the individual level mentioned earlier, three additional derived variables and four auxiliary variables at the national level listed in Table 18.

Table 18

List of variables from IOM dataset and additional derived and auxiliary variables for global estimation of forced sexual exploitation

n	Variable	Description
1	id	16-digit identification number
2	sex	0 = Male "M"; 1 = Female "F"
3	age	Age at registration
4	industry	Branch of economic activity: agriculture; begging; construction; domestic work; factory work; fishing; low level crime; marriage; mining; prostitution; hospitability; small street commerce; education; trade; transport; other; unemployed; unknown; not applicable
5	form_fl	Form of forced labour: 1 Labour; 2 Prostitution; 3 Marriage; 5 Unknown
6	date_reg	Date of registration
7	date_entry	Date of entry into forced labour
8	duration	Number of days in forced labour calculated as difference between date_entry and date_reg
9	age_fl	Age at date of entry into forced labour
10	child_fl	1 if age_fl < 18; 0 otherwise
11	country_expl_ilo	Country of exploitation (ILO spelling of name of country)
12	country_expl_ilo_code	ILO code of country of exploitation
13	country_citizen	Country of citizenship (ILO spelling of name of country)
14	country_citizen_ilo_code	ILO code of country of citizenship
15	child	1 if age<18; 0 otherwise
16	adultfemale	1 if victim is female and age>= 18 years; 0 otherwise.
17	out	1 if country of exploitation different than country of citizenship; 0 otherwise.
18	income5	Income group of country of current residence: 1 = Low-income; 2 = Lower-middle-income; 3 = Upper middle-income; 4 = High-income
19	income12	Income group of country of exploitation: 1 = Low-income; 2 = Lower-middle-income; 3 = Upper-middle-income; 4 = High-income
20	code2res	Region of country of exploitation: 1= Africa; 2= Asia and the Pacific excluding Central and Western Asia; 3= Latin America and the Caribbean; 4= Arab States; 5= Eastern Europe, Central and Western Asia; 6= Northern America and Northern, Southern and Western Europe
21	code2exp	Region of country of exploitation: 1= Africa; 2= Asia and the Pacific excluding Central and Western Asia; 3= Latin America and the Caribbean; 4= Arab States; 5= Eastern Europe, Central and Western Asia; 6= Northern America and Northern, Southern and Western Europe

The auxiliary variables on income group and geographical region of country of current residence and country of exploitation are obtained from the ILO standard regional countries of all countries and territories developed by the ILO Department of Statistics.[39]

- **Logit models and odds ratios**

Model fitting to the IOM data was carried out on an incremental basis, starting with a simple model having a single variable to increasingly more complex models with multiple variables and interaction terms among the variables. The computations were carried out using the logistic regression function of STATA for binary outcomes. The starting point was the simple logit model with the single variable (sex). The fitted model may be expressed as,

Model 1.

$$\ln\left(\frac{p}{1-p}\right) = \alpha + \beta \times sex$$

where the estimated parameters are α = -5.423594 and β = 4.652538 with standard errors, respectively, 0.2779612 and 0.2807518.

These results indicate that both estimated parameters are statistically significant, the 95 per cent confidence intervals of both estimates exclude the value 0. The positive value of the estimate of the parameter β is in line with the common expectation that the risk (or the odds ratio) of forced sexual exploitation for women is significantly higher than for men. The low value of the pseudo R2 coefficient, however, indicates that the degree of fit of the model to the data is relatively low, suggesting that there are additional factors predicting the risk of forced sexual exploitation. Testing of models continued in order to find a better fit.

Model 2.

$$\ln\left(\frac{p}{1-p}\right) = \alpha + \beta \times sex + \delta \times child\_fl$$

where the estimated parameters are α=-5.57045, β=4.632723, and δ=0.3783102

with standard errors, 0.2787266, 0.2808426 and 0.105673 respectively, all indicating statistically significant values.

Model 3.

$$\ln\left(\frac{p}{1-p}\right) = \alpha + \beta \times sex + \delta \times child\_fl + \lambda \times sex * child\_fl$$

where the estimated parameters are α=-5.876933, β=5.04587, δ=1.677277 and λ=-1.329002 with standard errors, 0.3784934, 0.3810003, 0.5589268 and 0.569115 respectively, again all indicating statistically significant values. Table 19 shows the calculation of the odds ratio based on this model.

Table 19

Calculation of odds-ratios from logit model 3

Calculation of odds-ratios from logit model 3				
sex	child_fl	sex*child_fl	ln(p/(1-p))	odds ratio
1	1	female * child	-0.482788	0.610909
1	0	female * adult	-0.831063	0.435586
0	1	male * child	-4.199656	0.014852
0	0	male * adult	-5.876933	0.002803

Note: Data may not correspond exactly to the reported parameter values of model 3 due to rounding errors.

The first line with variables sex=1 and child_fl=1 corresponds to girls who were victims of forced sexual exploitation. This includes women who were children at the time of forced sexual exploitation. The value obtained from the logit model 3, except from rounding errors, is:

$$\ln\frac{p}{1-p} = \alpha + \beta + \delta + \lambda = -5.876933 + 5.04587 + 1.677277 - 1.329002 = -0.482788$$

from which the odds ratio is obtained:

$$\frac{p}{1-p} = \exp(-0.482788) = 0.61090$$

The data in Table 19 can be understood as follows:

- For females under 18 years of age, the odds that they were a victim of forced sexual exploitation is more than 0.61 of the odds that they were victim of forced labour exploitation. This result may also be interpreted as follows: for every 100 girls who were victims of forced labour exploitation, it is likely that there were about 61 others who were victims of forced sexual exploitation.
- The second line indicates that for every 100 adult women 18 years old or over who were victims of forced labour exploitation, there are about 44 others who were victims of forced sexual exploitation.
- The third line indicates that for every 100 boys under 18 years of age who were victims of forced labour exploitation, there is only one who was a victim of forced sexual exploitation.
- Finally, the fourth line indicates that for every 1,000 adult men 18 years old and over who were victims of forced labour exploitation, there were about three who were victims of forced sexual exploitation.

These results (i.e. model 3) were used for estimating the number of adult victims of forced sexual exploitation based on the corresponding estimates of adult victims of forced labour exploitation obtained from the national surveys.[40] For example, the estimate of the number of female adult victims of forced sexual exploitation in a region (435,586) was obtained by multiplying the odds ratio (0.435586) with the estimate of the number of female adult victims of forced labour exploitation in the same region (1,000,000). For children, the calculation involved an additional step as described in the next section.

FORCED LABOUR OF CHILDREN

The application of the logit model 3 to derive estimates of forced sexual exploitation of children requires corresponding survey estimates of the number of child victims of forced labour exploitation. That is, it was necessary to first have an estimate of children in forced labour before the estimate of children in sexual exploitation could be calculated. But, as mentioned earlier, survey estimates of children in forced labour were found to be insufficiently reliable for global estimation. Therefore, an approach similar to that of estimation of forced sexual exploitation of adults was adopted for obtaining estimates of forced labour exploitation of children on the basis of odds ratio applied to the corresponding survey estimates of adults. The results were then in turn used to estimate forced sexual exploitation of children using the logit model 3. The calculations were carried out in STATA. The procedure is explained below.

- **Forced labour exploitation of children**

Estimation of forced labour exploitation of children is based on the corresponding estimates of adults using the same IOM dataset for fitting logit models. But this time the logit function is defined in terms of forced labour exploitation, as opposed to forced sexual exploitation. The model examines the odds ratio that a victim of forced labour exploitation is a child relative to that of being an adult. In mathematical terms, let q_x denote the probability that a victim forced labour exploitation with a specified set of characteristics is a child. Then the odds ratio is expressed as

$$\ln(\frac{q_x}{1-q_x}) = g(x)$$

where g is a linear function of the characteristics x to be specified. As in the previous section, the appropriate model is selected and the estimated parameters are used to derive the corresponding estimated odds ratios, which are then used to obtain the estimates of forced labour exploitation of children on the basis of the corresponding survey estimates of forced labour exploitation of adults applying the following equation,

$$LEC_x = LEA_x \frac{\hat{q}_x}{1-\hat{q}_x}$$

where LEC_x is the estimated number of child victims of forced labour exploitation with socio-demographic characteristics x, LEA_x is the corresponding estimate of forced labour exploitation of adults derived from the Gallup Inc. forced labour surveys described earlier, and

$$\hat{q}_x/(1-\hat{q}_x)$$

is the estimated odds ratio.

A number of models were fitted to the IOM data starting with the simplest model with only sex as the dependent variable:

Model 4.

$$\ln(\frac{q}{1-q}) = \alpha + \beta \times sex$$

The estimated parameters were α=-1.83985 and β=-0.0126279, with respective standard errors, 0.0535582 and 0.0084114, both indicating statistically significant values. The negative value of the estimate of β indicates that the odds of being a child relative to being an adult in forced labour is lower among girls and women than among boys and men.

A more complicated model was also fitted in which it was assumed that the relative odds ratio of child to depend on type of activity,

Model 5.

$$\ln(\frac{q}{1-q}) = \beta \times sex + \delta \times industry$$

In this model, the estimated parameter β was -1.579528 with standard error 0.1379034 and the vector parameter δ had different values for the different types of activity. The standard error relative to the estimated parameter indicates that all parameters are statistically significant except for fishing, trade, and transport.

Table 20

Estimated parameters and standard errors of logit model 5

Industry code	Industry label	Estimated parameter δ	Standard error
1	Agriculture	(ommitted)	(ommitted)
2	Begging	5.051193	0.2900045
3	Childcare	2.249468	0.4922266
4	Construction	-1.156994	0.2006919
5	Domestic work	2.278533	0.1906216
6	Factory work	-0.593532	0.2353040
7	Fishing	0.021187	0.2394030
8	Low level crime	3.865726	0.5878154
11	Not applicable	0	(empty)
16	Hospitability	2.139673	0.2728567
17	Small street commerce	3.124881	0.2873832
19	Trade	-0.114569	0.6276156
20	Transport	-1.665738	1.0253600

Several other models were also tested, but for the sake of simplicity model 4 was finally retained for estimation of forced labour exploitation of children on the basis of the corresponding survey estimates of adults. The odds ratio for sex=1 (female) may be calculated as 0.1568739 and for sex=0 (male) 0.1588675. Thus, for every 100 adult women who are victims of forced labour exploitation, there are an additional 15.8 girls who are victims of forced labour exploitation. Similarly, for every 100 adult men who are victims of forced labour exploitation, there are an additional 15.6 boys who are victims of forced labour exploitation. As an example of the use of these results, we estimate the number of girls who are victims of forced labour exploitation in a given region as 156,800= 0.1568739x1,000,000 where 0.1568739 is odds ratio and 1,000,000 is the estimate of the number adult women who are victims of forced labour exploitation in the same region.

- **Forced sexual exploitation of children**

In the final step of the global estimation of forced labour (except state-imposed forced labour), the estimates of forced labour exploitation of children obtained from the logit model 4 are used to derive the corresponding estimates of forced sexual exploitation of children from the logit model 3 described earlier. For example, the results for girl victims of forced sexual exploitation in the same region is 95,789= 0.610909x156,800, where 0.610909 is the odds ratio for female children from logit model 3 (Table 21) and 156,800 is the estimate of the number of girls who are victims of forced labour exploitation, which was obtained in the numerical example of the preceding section.

The various estimated components of forced labour may be pieced together to obtain the total number of victims of forced labour except state-imposed forced labour (GEFL Rev1.xlsx). The example for women in Latin America and the Caribbean is shown in Table 21.

Table 21

Combining the components of forced labour except state-imposed forced labour in a region with 1,000,000 adults in forced labour exploitation

Component	Estimate	Methodology
Forced labour exploitation of adults	1,000,000	National surveys
Forced labour exploitation of children	1,000,000*.1568= 156,800	Logit model 4
Forced sexual exploitation of adults	1,000,000*0.435586= 435,586	Logit model 3
Forced sexual exploitation of children	156,800*.610909=95,789	Logit models 4 & 3

Notes: (1) The data refers to the flow concept of forced labour, i.e. the number of victims of forced labour at any time during the five-year period 2012-2016. (2) Details may not add to totals due to rounding.

STATE-IMPOSED FORCED LABOUR

Most forms of state-imposed forced labour affect whole groups of persons who are not protected by the law, contrary to forced labour and sexual exploitation in the private sector, which tend to be imposed by individual (or small groups of) employers or by recruiters working on behalf of employers. This is, for example, the case in countries where the state authorities use conscripts to perform tasks that are not of military nature, or when a State uses its population for the purpose of economic development work. In the forms of forced labour imposed by private individuals (recruiters or employers), each case needs to be assessed separately, hence the use of national surveys to obtain reliable data on victims. For state-imposed forced labour, a different measurement approach was adopted, one that assesses whether a whole situation in one country is or is not a case of forced labour. The following describes the methodology used for estimation of state-imposed forced labour.

▪ Typology of state-imposed forced labour

For the purpose of this research, state-imposed forced labour has been classified in eight main categories found in the Forced Labour Convention, 1930 (No. 29), the Abolition of Forced Labour Convention, 1957 (No. 105), and the Worst Forms of Child Labour Convention, 1999 (No. 182).

Table 22

Typology of state-imposed forced labour

Typology	Description	Reference
1. Abuse of conscription	Any work or service exacted from conscripts which is not of purely military character, such as work of general interest, or the use of conscripts for purposes of economic development.	Article 2 (2) (a) of Convention No. 29:
2. Obligation to perform work beyond normal civic obligations	Any work or civic obligation to participate in public works or in civil/civic services that go beyond normal civic obligations, for instance the requisitioning of persons to perform public work, mass mobilization of children, students, residents, civil servants, and any individual for participation in government events; forced mobilization of citizens at the benefit of private actors.	Article 2 (2) (b) of Convention No. 29
3. Abuse of the obligation to participate in minor communal services	Work imposed on members of a community which is not minor in scale, not in the direct interest of the community, and has not benefitted from prior consultation of the members of the said community on the need for such works.	Article 2 (2) (e) of Convention No. 29
4. Compulsory prison labour of prisoners in remand, or in administrative detention	Mandatory labour of prisoners in remand or in administrative detention.	Article 2 (2) (c) of Convention No. 29.
5. Compulsory prison labour exacted for the benefit of private individuals, companies or associations	Mandatory labour of prisoners in privatized prisons or prisoners in public prison placed at the disposal of private entities inside or outside the prison premises. Amounts to forced labour when prisoners have not given their free, formal, and informed consent to work and when conditions of work do not approximate those of a free labour relationship.	Article 2 (2) (c) of Convention No. 29.
6. Compulsory prison labour exacted from persons under certain circumstances	Compulsory prison labour exacted from persons: ▪ As a punishment for holding or expressing political views or views ideologically opposed to the established political, social, or economic system. ▪ For labour discipline. ▪ As a punishment for having participated in strikes.	Article 1 (a), (c) and (d) of Convention No. 105
7. Forced recruitment of children by governments or militia groups	Forced or compulsory recruitment of children under 18 for use in armed conflict, whether by military forces, paramilitary, or rebel groups. **Note**: While forced recruitment of children by governments or militia groups is part of the typology used for measurement, ultimately this form was not able to be measured.	Article 3 of the Worst Forms of Child Labour Convention, 1999 (No. 182)
8. Compulsory labour for the purpose of economic development	Compulsory labour or services exacted as a method of mobilizing and using labour for purposes of economic development.	Article 1 (b) of Convention No. 105

- **Basic statistical unit: a case of state-imposed forced labour**

The unit of information for this component is a case of state-imposed forced labour, defined in terms of the country of exploitation *ci* and type of state-imposed forced labour *tj*. A case is registered for the estimate of state-imposed forced labour if the type of forced labour *tj* is proven to be prevalent in the country *ci* during the reference period.

The type *tj* must be one of the eight types identified in the typology presented in Table 22, which correspond, as explained before, to a violation of ILO conventions on forced labour.

In order to qualify for inclusion in the sample, a "reported case" has to, at a minimum, contain details on all of the following elements:

- labour situation (work or service) which amounts to forced labour, and which could be classified according to the typology presented above;
- geographical location (country) where the activity took place; and

- date or time period within the reference period of 2012-2016 during which this form of forced labour is taking place.

The identification of cases was based on the comments of the Committee of Experts on the Application of Conventions and Recommendations (CEACR). When examining the application of ratified Conventions by Member States, the CEACR makes two kinds of comments: observations and direct requests. Observations contain comments on fundamental questions raised by the application of a particular Convention by a State and have served as the primary source for the identification of cases of forced labour. The CEACR comments were systematically reviewed to identify legislation and situations in violation with one of the provisions of the Forced Labour Convention, 1930 (No. 29) and the Abolition of Forced Labour Convention, 1957 (No. 105).[41] Based on this list of cases, further research was conducted based on a wide variety of secondary sources to establish if the legislation has been applied in practice and to gather the required information outlined above on each case.

- **Data collection**

For each case (that is, each identified type of state-imposed forced labour by country), a systematic review of secondary sources led to collection of the following information, when available:

1. Type of forced labour
2. Summary of the case
3. CEACR comment or judicial data
4. Three indicators to assess why it is forced labour
5. Validation Forced labour case: Yes/No
6. Stock or flow value for 2012, 2013, 2014, 2015, 2016
7. Average duration
8. Ratio of children
9. Ratio male/female
10. Stock figure over 5 years
11. Flow over 5 years
12. Economic data

At a minimum, variables 1 to 6 were required to be included in the estimate.

- **Verification and estimation**

Indicators were developed for each category of forced labour. These allowed for the systematic assessment of individual cases against the defined indicators, to check they met the criteria. Each source was cross validated with other sources, and for each case both the number of victims per year and the length of the work imposed by the state authorities enabled the calculation of the global estimates. Upon validation of a case as a form of state-imposed forced labour, estimates of flow over five years and/or average stock during the reference period and average duration were collected and validated. In cases for which we had only two pieces of information, stock or flow and average duration, the third element was calculated with the same formula:

> Average stock count = Total flow count x Average duration in forced labour
>
> (expressed as fraction of total duration)

Contrary to private forced labour, where extrapolation methods have to be developed to extrapolate from the sampled countries to the whole world, no such extrapolation is made for this estimate; rather, the global and regional estimates are produced by a simple addition of the whole list of cases. The rationale behind it is that our database is a complete picture (census) of violations of Convention Nos 29 and 105 by state authorities. The main limitation was that because of the impossibility of getting reliable estimates on the number of children recruited by armed forces and armed groups, this type has been excluded from the overall estimate.

Regional and global estimates are calculated by simple aggregation of the

data based on the regional groupings presented above. For some forms of state-imposed forced labour for which sex disaggregation was not available, such as communal services, an arbitrary share of men and women was taken for the estimate on the basis of the best available sources.

FORCED MARRIAGE

Forced marriage refers to situations where a person has been forced to marry without her or his consent. A forced marriage might be achieved through physical, emotional, or financial duress, deception by family members, the spouse, or others, or the use of force, threats, or severe pressure. Forced marriage is proscribed through the prohibitions on slavery and slavery-like practices, including servile marriage, under Article 1(c) of the 1956 UN Supplementary Convention on the Abolition of Slavery,[42] and it can also provide a vehicle for forced labour or trafficking in persons. Child marriage is also considered a form of forced marriage when certain conditions are met, however, it is important to emphasize that not all child marriages are counted as forced.[43] For example, in many countries 16 and 17-year olds who wish to marry are legally able to do so following a judicial ruling.

For the purpose of the current estimates, the measurement of forced marriage is limited to what was captured by the surveys. That is, forced marriage in the estimates includes all marriages of both adults and children that were reported by the survey respondent to have been forced and without consent, regardless of the age of the respondent. Accordingly, the estimates do not include every instance of child marriage, as child marriage is not currently measured adequately at the scale or specificity required for a global estimate.

The literature on this topic notes that forced marriages typically occur in traditional, socially conservative societies with deep gender inequalities. As a result, it is unlikely that a person who was forced to marry would be able to leave that marriage within a short amount of time, if ever. In the absence of data on duration of forced marriages, it is assumed that given their socio-cultural context, such marriages are likely to last more than the five-year reference period.

The estimate of forced marriage is calculated as both a stock and a flow. In order to report on "people living in a forced marriage", those marriages that occurred in the last five years, or occurred more than five years ago but continued during the five-year reference period, comprise the stock estimate. The total flow estimate of forced marriage represents all people who were forced to marry between 2012 and 2016.

▪ NATIONAL SURVEYS

Forced marriage is estimated based on national household surveys conducted in 48 countries, which involved face-to-face interviews with more than 71,000 respondents aged 15 years or older. The global estimates were calculated based on those who reported having been forced to marry in the last five years without their consent, or who reported a forced marriage occurred more than five years ago but continued during the five-year reference period (comprising the stock estimate).

The questionnaire described in the section setting out the method by which forced labour exploitation was estimated is also central to calculation of forced marriage estimates.[44] The forced marriage part of the questionnaire included ten main questions outlined in Table 25 as well as a series of sub-questions described below in Table 23.

Table 23

Outline of questionnaire on forced marriage in the ILO-Walk Free Foundation surveys conducted as part of Gallup World Poll surveys 2016

Questions	Description
P1-P4	Identification of immediate family network
P15	Inquiry on forced marriage experience by anyone among immediate family
P17-20	Who in the immediate family, sex, and age at time of forced marriage
WP1220	Current age
P21	Whether consented to the marriage

After accounting for the immediate family network (P1-P4), two questions measure whether the marriage was forced:

- forced to marry (P15); and
- did not consent to the marriage (P21).

The inclusion of "consent" as an indicator resulted from cognitive testing of the original survey instrument in 2014. This is an important inclusion as it allows for the identification of false positives and thereby limits the potential for overcounting. For example, respondents who indicated they were forced to marry, but then said they in fact had consented, would not meet the counting rules for inclusion. During testing, respondents were also asked about both arranged and forced marriage as a way of testing understanding of the latter. This revealed cultural influences on understanding the concept of forced marriage. In countries where the practice of arranging marriages was either rare or common, the difference between the two concepts was clearly understood. In countries where arranged marriages were neither the norm nor a rare exception, respondents found it difficult to distinguish the two concepts and defined both as marriages without the consent of the person being married. The surveys were intended to exclude arranged marriages from the estimate except in cases where a person was actually forced to marry or did not consent to the arranged marriage.

- **Counting rules**

The results of the surveys were processed in STATA and victims of forced marriage were identified according to the following counting rules:

(1) respondents who answered "yes" to the forced marriage question, AND

(2) reported that the forced marriage was either in relation to their own experience, or on behalf of a spouse, child, parent or sibling, AND

(3) had occurred without their consent (forced marriage), AND

(4) the forced marriage occurred in the five years preceding the survey, or took place prior to the reference period but the victim reported their marital status as "married" during the reference period.

The time period in which the forced marriage took place was calculated based on responses to current age (*wp1220*) and age at time of forced marriage (P20) as follows:

Time FM = wp1220 – P20

- **Particular statistical treatments**
- Refusals

Refusals were dealt with in a manner consistent to those found in the forced

labour dataset. In the same way that refusal on any of the key questions on forced labour, and refusal to identify which member of the immediate family was in this situation, were singled out for special statistical treatment, so too were refusals to critical questions regarding forced marriage. Two types of refusals were singled out for special statistical treatment:

- Refusal on any of the key questions on forced marriage, e.g. question on "forced to marry?" (P15==4); or the question on "did you consent to the marriage?" (P21==4).
- Refusal on identifying family member (P17==9) after having responded positively to at least one of the key questions (P15==1 or P21==1).

Such refusals were considered to be indicative of recent experience, or knowledge, of forced marriage that the respondent did not want to reveal and discuss during the interview. These refusals were recoded as forced marriage within last five years in the data processing of the national surveys.

- Other non-responses

One implication of refusal to answering the filter questions or identifying the family member is that the follow-up questions on demographic characteristics of the victim are not administered and therefore the responses to these questions are missing.

It was decided to impute only for missing values on sex and age group, leaving all other values as missing. Thus, refusal or non-response to the question P18 on "gender" was imputed as P18==2 (female). Question P20 on "age at time of forced marriage" or question wp1220 on "current age" were used to create CHILDFM, an age group variable for those who have been forced to marry in the reference period. Refusal or non-response to question P20 or wp1220, which resulted in missing information for CHILDFM, was imputed as CHILDFM==0 (adult).

- **Extrapolations**
- Self-response versus proxy-response

The analysis of the survey results revealed that respondents were able to provide more information on their own forced marriage experience than on their family members. Table 24 shows the total number of forced marriage victims identified in the national surveys by type of response. Altogether the surveys identified 1,415 persons who have experienced forced marriage at any time in the past, representing a prevalence rate of 2.46 per thousand. The reported prevalence rate is highest at 3.78 per thousand for self-response, e.g. for respondents who reported on their own forced marriage experience. This is followed by proxy-responses on siblings at 3.09 per thousand. For proxy-responses on experience of children, the prevalence rate is the lowest at 0.39 per thousand, followed by proxy-response on parents at 1.39 per thousand and on spouse or partner at 1.58 per thousand.

Table 24

Prevalence of forced marriage by type of response (not weighted)

Self-response versus response on family members	Total number in family network	Forced marriage victims at any time in the past	Rate per '000
Total	**575 310**	**1 415**	**2.46**
Self	71 758	271	3.78
Spouse/partner[1]	43 802	69	1.58
Child	139 643	55	0.39
Parent	79 823	111	1.39
Sibling	240 285	743	3.09
Other[2]	-	166	-

Notes: (1) The total number of spouses or partners of respondents could not be determined on the basis of the survey questions. (2) Other includes don't knows and refusals.

The higher reported prevalence for self-response has been consistently observed for forced labour experience over the past decade, as well as under different weighting schemes of the data. This could be because respondents tend to know more about their own experiences than about those of their family members and therefore are more likely to respond affirmatively to questions about themselves. However, it can also be argued that respondents may have the tendency to exaggerate their own forced labour experiences while understating those of their family members. Either way, the reported prevalence rate of forced labour would be higher for self-responses relative to proxy responses.

- Memory failures

As noted in the section on forced labour, response errors can occur in surveys due memory lapses. The two types of error, "omission" and "telescoping", were approached in the same manner as for forced labour cases.

Table 25 presents the survey data on the reported cases of forced marriage in terms of the timing of their occurrences. The data shows that 297 victims were forced to marry less than one year ago, while for 168 victims the forced marriage occurred at least one year ago but less than five years ago. As noted for forced labour cases, if there were no response errors, one would have expected that the number of victims in the category "1 year to less than 5 years" to have been about four times the number of victims in the category "Less than 1 year". But this is not case, suggesting substantial memory failures in responses.

Table 25

Forced marriage victims by reported time of marriage

Last episode	Total victims	Self-response	Proxy response
Total	**1 415**	**437**	**978**
Less than 1 year	297	181	116
1 year to less than 5 years	168	32	136
5 years to less than 10 years	188	48	140
10 years or more	762	176	586

In addition to the memory failures, there are important differences to consider in prevalence rates based on the relationship between the respondent and the victim. When the victim was the respondent, the respondent's sibling, or the respondent's parent/s, the prevalence rates were higher than when the victim is the respondent's child or spouse. These findings indicate that reports of forced marriage for the "self", "sibling", and "parent" victims were more reliably reported than the "child" and "spouse" victims.

Given the issues related to telescoping effects noted in the handling of forced labour cases, the greater reliability of self-reports, and the need for the treatment of the forced labour and forced marriage cases to be treated in a consistent manner wherever possible, more weight was given to responses obtained from self-responses than to proxy responses. As was the case for forced labour, this approach was implemented as part of the extrapolation of survey data (see detailed description of this in the forced labour section).

Data limitations

As with all empirical research, there are some limitations within which the findings should be interpreted. In this section, the results of the Global Estimates are examined in terms of the known limitations of the survey and other data.

First, the set of surveyed countries that was used to produce the 2016 Global Estimates of Modern Slavery was treated as a random sample of the world and the global figure was estimated directly from that (that is, without first calculating national estimates). However, the selection of the countries to be surveyed was not random as countries were selected for specific reasons.

Second, while data was taken from both country of residence and country of exploitation, there were only two national surveys in the Arab States (Lebanon and Jordan), both conducted in Arabic, and none in the Gulf States. The regional estimates for the Arab States is therefore built mainly from respondents who were interviewed in their country of residence and reported about their forced labour situation while working in that region. It is likely that this led to underestimating the extent of modern slavery in this region across both forced labour and forced marriage.

Similarly, it is typically not possible to survey in countries that are experiencing profound and current conflict, such as Syria, Iraq, Yemen, Libya, South Sudan, and parts of Nigeria and Pakistan. Yet it is known that conflict is a significant risk factor – the breakdown of the rule of law, the loss of social supports, and the disruption that occurs with conflict all increase risk of both forced labour and forced marriage. The lack of data from countries experiencing conflict means that modern slavery estimates in regions in which conflict countries are situated

will understate the problem.

In determining migration of victims of forced labour – that is, the country in which the exploitation took place – internal migration was not captured through the household surveys and, as a result, only international migration is reflected in the statistics on migration flow of victims.

The estimates of sexual exploitation and forced labour of children were built on models of profiles from IOM's database of assisted cases of human trafficking. Overall, the database provides solid data, but the regional distribution must be taken with caution as explained earlier.

Evaluation of results

In this section, the results of the global estimation of forced labour are evaluated below in terms of three criteria: (1) the coverage of the national surveys, (2) the standard errors of the estimates, and (3) the amount of underlying "hard" data.

1. Survey coverage

As mentioned previously, the Global Estimates draw on 54 national surveys on forced labour and forced marriage in 48 countries during 2014-2016. The respondents were asked to answer questions to assess whether they themselves or members of their immediate family, narrowly defined, had any forced labour experience or were in a forced marriage during the last five years. In the case of forced labour exploitation, the respondent was asked, among other things, to specify the country where the victim was exploited. In this process, data on some 79 countries of exploitation was identified, including 48 countries of current residence and an additional 31 new countries.[45] In this sense, the survey coverage represented not only the countries where the surveys were conducted, but also the other countries of exploitation identified in the surveys. The resulting survey coverage is shown in Table 26 by region.

Accordingly, the national surveys covered some 71 per cent of the world population, with the highest coverage in the Americas (93.5 per cent) and the lowest coverage in Asia and the Pacific (63.4 per cent) and in the Arab States (67.4 per cent). This data did not take into account many refusals, don't knows, blanks and in some cases partial responses such as "Africa" or "Arab country" instead of the name of a specific country.

Table 26

Coverage of national surveys on forced labour and forced marriage by region (taking into account country of exploitation)

ILO Regional grouping	Total number of countries and territories	Number of survey countries[1]	Population coverage[2]
World	**199**	**79**	**71.1 per cent**
1. Africa	57	22	79.0 per cent
2. Americas	40	13	93.5 per cent
3. Arab States	12	8	67.4 per cent
4. Asia and the Pacific	39	17	63.4 per cent
5. Europe and Central Asia	51	19	71.3 per cent

Notes: (1) Number of countries and territories of exploitation identified in the national surveys on forced labour. (2) UN population 2016, *World Population Prospects*: The 2015 Revision, Files POP/DB/WPP/Rev.2015/INT/F03-2 and F03-3 Medium fertility variant, 2015-2100, July 2015.

2. Standard errors

When a sample, rather than the entire population, is used to measure aggregate values, the resulting estimates may differ from the population parameters they represent. This difference, or sampling error, occurs by chance and its variability may be measured by the standard error of the estimate if the sample was drawn based on known probabilities. The standard errors of the global and regional estimates for 2016 were calculated to assess their sampling variability assuming that the national datasets used for estimating forced labour have themselves negligible variability relative to the variability due to differences that would occur had the sample included different countries than the ones used here. The calculation also assumed that the countries covered in the study form a random sample of the countries in the world.

The national surveys used for global estimation include those conducted under the auspices of the Walk Free Foundation for the 2014 and 2015 editions of its Global Slavery Index and the additional surveys conducted by the Walk Free Foundation and the ILO for the joint 2016 Global Estimates. The countries were selected within the following framework:

(1) belonging to the set of 143 countries covered by the World Poll conducted annually by Gallup Inc.;

(2) survey interviewing carried out using face-to-face interviewing (CAPI); and

(3) consent of national authorities to the module on forced labour and forced marriage.

Within this framework, the countries were selected such that the total set of national surveys included at least two countries per ILO broad sub-region and represented a substantial part of the sub-region population.[46] The idea behind this selection procedure was to mimic as closely as possible a stratified random sample of countries where the strata are the 11 ILO broad sub-regions and the random selection scheme is probability proportional to size (pps sampling) with size measured in terms of the working age population (15 years old and over). In practice, it was possible to implement the specified requirements in all sub-regions except the North America sub-region where no national surveys could be conducted. Also, in certain other sub-regions, substitution had to be made as the consent of some selected countries could not be obtained in time for the preparation of the fieldwork.

Although the two assumptions are not fully satisfied in practice, the results are indicative of the margin of error of the estimates that can be attributed to the selection variability of the countries in the sample. The standard errors of the estimates are obtained using the procedure of variance calculation in indirect sampling where the sampling units are the countries of residence (that is, where the national surveys are conducted) and the target units are the countries of exploitation identified by the sampling units. The calculations have been carried in STATA.

The results are shown in Table 27. They are built on the total number of victims who were in a forced labour situation for any length of time during the reference period. The standard error of the global estimates of the number victims of forced labour exploitation is 4,400,000, corresponding to a relative standard error 9.3 per cent. The region with the highest relative standard error is Africa (20.6 per cent) followed by the Arab States (19.6 per cent). The regions with the lowest relative standard estimates are the Americas (5.1 per cent), followed by Europe and Central Asia (10.3 per cent), and Asia and the Pacific (13.6 per cent).

The relative standard error of global and regional estimates of forced labour exploitation in 2016 is generally higher than for the corresponding figures in 2012. A reason for this apparent decrease in precision may be due to the nature of the present methodology. In 2016, forced labour in the country of exploitation was measured indirectly based on surveys conducted in the country of current residence. The indirect method of sampling entails additional variability and therefore reduces the precision of the estimates.

The results for forced marriage are presented in Table 28. They are built on the total number of people who were forced to marry at any time and remained married during the reference period. The standard error of the global estimates of forced marriage is 600,000, corresponding to a relative standard error of 4.2 per cent. The region with the highest relative standard error is the Americas (33.6 per cent), followed by Europe and Central Asia (27.4 per cent) and the Arab States (19.5 per cent). The regions with the lowest relative standard error are Africa (4.7 per cent), followed by Asia and the Pacific (5.7 per cent).

Table 27

Standard errors and confidence intervals of global and regional estimates of forced labour exploitation

	Estimate ('000)	Standard error ('000)	Relative standard error (per cent)	Confidence interval ('000)	
				Lower bound	Upper bound
World	**47 400**	**4 400**	**9.3**	**38 800**	**56 000**
1. Africa	6 500	1 340	20.6	3 900	9 100
2. Americas	2 600	130	5.1	2 300	2 900
3. Arab States	900	180	19.6	600	1 200
4. Asia and the Pacific	30 400	4 100	13.6	22 300	38 500
5. Europe and Central Asia	7 000	720	10.3	5 600	8 400

Table 28

Standard errors and confidence intervals of global and regional estimates of forced marriage

	Estimate ('000)	Standard error ('000)	Relative standard error (per cent)	Confidence interval ('000)	
				Lower bound	Upper bound
World	**15 400**	**600**	**4.2**	**14 200**	**16 700**
1. Africa	5 800	280	4.7	5 300	6 400
2. Americas	6 700	200	33.6	200	1 100
3. Arab States	200	30	19.5	100	200
4. Asia and the Pacific	8 400	500	5.7	7 500	9 400
5. Europe and Central Asia	300	100	27.4	100	500

It may be noticed that, in general, the higher the size of an estimate, the lower the relative standard error and the higher the precision of the estimate. Conversely, the lower the size of an estimate, the higher the relative standard error and the lower the precision of the estimate. This is reflected in the approximate generalized standard errors calculated using the values in Table 27, and shown in Table 29.

Table 29

Generalized standard errors and confidence intervals

Estimate ('000)	Standard error ('000)	Relative standard error (per cent)	Confidence interval ('000)	
			Lower bound	Upper bound
50 000	**6 200**	**12.3**	**37 900**	**62 100**
20 000	2 500	12.5	15 100	24 900
10 000	1 300	12.9	7 500	12 500
5 000	700	13.5	3 700	6 300
2 000	300	15.4	1 400	2 600
1 000	200	18.0	700	1 300
500	100	22.3	300	700
200	60	32.0	80	320
100	40	43.6	20	180

Notes: The generalized variance of an estimate *(y)* is calculated using the approximate relationship between the variance of an estimate and its size, expressed by $var(y)/y2 = b + a/y$, where here the estimates of the parameters are a=17.5386722 and b=0.01479864.

Thus, an estimate of about 10,000,000 has an approximate standard error of 1,300,000 with relative standard error of 12.9 per cent. Similarly, an estimate of about 1,000,000 has an approximate standard error of 200,000 with a relative standard error of 18.0 per cent. Estimates as low as 100,000 have very high relative standard errors, almost 45 per cent. The table can be used to decide on the size of estimates that can be meaningfully considered as statistically significant for analysis. For size of estimates that are not listed in the table, the approximate standard errors can be obtained by interpolation or extrapolation of the values given in the table.

The generalized standard errors apply in principle to both flow and stock estimates. The stock estimates are derived by dividing the corresponding flow estimates with the average duration in forced labour, a fixed number with no variability. Although not specifically calculated for the purpose, the generalized standard errors could be also extended to estimates of forced sexual exploitation as they are calculated with reference to the national surveys, but not to forced labour imposed by the state or to estimates involving this form of forced labour. Cases of state-imposed forced labour are said to be exhaustive and therefore not subject to sample variability.

3. Underlying hard figures

Another assessment of the 2016 Global Estimates of Modern Slavery relates to the number of hard figures on which it is based. Aside from state-imposed forced labour, the estimates of the various forms were calculated on the basis of 3,060 sample observations identified from the 2014 to 2016 surveys as adult victims of forced labour exploitation and adult and child victims of forced marriage, and 5,847 cases of trafficking in persons registered by IOM between 2012 and 2016. The total and its breakdown are shown in Table 30.

By contrast, the implementation of the capture-recapture methodology for the ILO global estimation of forced labour 2012 used in 5,491 validated reported cases of forced labour. A validated case involved on average about 190 victims. The median was 64. The data on victims was available as a group and as part of the case. Therefore, the data is not to be considered as separate pieces of information.

Table 30

Number of records used in the Global Estimates of Modern Slavery

	Number of records	Source
Forced labour exploitation	**6 899**	
1. Adults	(1 987)	Survey observations
2. Adults	(4 232)	IOM registered cases
3. Children	(680)	IOM registered cases
Forced sexual exploitation	**935**	
1. Adults	(761)	IOM registered cases
2. Children	(174)	IOM registered cases
Forced marriage	**1 073**	
1. Adults	(739)	Survey observations
2. Children	(334)	Survey observations
Total	**8 907**	

Note: IOM reported cases refer to victims of trafficking in persons registered as of 2010.

Future directions in measurement

Substantial improvements have been made over time in the measurement of various forms of modern slavery. These 2016 Global Estimates of Modern Slavery capture a large part of the spectrum of abuses related to modern slavery and provide the best available data and information about the scale and distribution of forced labour and forced marriage today. It is can be used as a baseline against which future progress on achieving SDG Target 8.7 can be measured, although it is important to acknowledge that this is a conservative estimate.

There remains a need to continue improving and refining measurement of modern slavery, and several areas for improvement were identified during the development of the current Global Estimates. As noted in this report, not all situations listed in SDG Target 8.7 are covered by the new Global Estimates. There is a need to improve measurement of forced labour of children in general, in particular all cases of sexual exploitation and the forced recruitment and use of children by armed groups and armed forces, which are excluded from the current Global Estimates. Similarly, while many cases of trafficking in persons for forced labour are likely to be covered by the current Global Estimates, some forms of trafficking in persons were not captured, for example if there was no forced labour involved.[47]

A great deal has been learned from surveys of child labour, forced labour, and modern slavery to date, and the development of the present Global Estimates has also added to the lessons learned. These lessons have reinforced the need to continue to fill gaps, including, but not limited to, the following areas:

- exploring different approaches to sampling in order to better measure specific sub-populations, such as children, victims of forced sexual exploitation, and victims in conflict contexts, among others;
- further refining and developing the existing survey tools to better capture experiences of forced labour and forced marriage;
- ensuring data is being increasingly produced in all regions and across many different countries;
- ensuring data is sufficiently robust to support measurement of change over time; and
- developing alternative methods for measurement in countries where surveys are not an efficient approach – that is, where prevalence is expected to be lower, where forms of modern slavery are far more hidden, or where access to relevant populations is an issue.

The 2016 Global Estimates of Modern Slavery are the result of collaboration between the International Labour Organization, the Walk Free Foundation, and the International Organization for Migration. To continue to fill data gaps and improve methodologies, it is vital that this and many other collaborations continue and are grown over time and across governments, academia, international organizations, and service providers. No one organization can eradicate modern slavery on its own. It is only by working together that we can keep learning, innovating, and increasing data at the necessary pace, to know if we are having the intended impact of eradicating modern slavery.

Annex 1: World and regions composition

Region	Subregion – broad	Country
Africa	Northern Africa	Algeria
		Egypt
		Libya
		Morocco
		Sudan
		Tunisia
		Western Sahara
	Sub-Saharan Africa	Angola
		Benin
		Botswana
		Burkina Faso
		Burundi
		Cameroon
		Cabo Verde
		Central African Republic
		Chad
		Comoros
		Congo
		Congo, Democratic Republic of the
		Côte d'Ivoire
		Djibouti
		Equatorial Guinea
		Eritrea
		Ethiopia
		Gabon
		Gambia
		Ghana
		Guinea
		Guinea-Bissau
		Kenya
		Lesotho
		Liberia
		Madagascar
		Malawi
		Mali
		Mauritania

Region	Subregion – broad	Country
Africa	Sub-Saharan Africa	Mauritania
		Mauritius
		Mayotte
		Mozambique
		Namibia
		Niger
		Nigeria
		Réunion
		Rwanda
		Saint Helena
		Sao Tome and Principe
		Senegal
		Seychelles
		Sierra Leone
		Somalia
		South Africa
		South Sudan
		Swaziland
		Tanzania, United Republic of
		Togo
		Uganda
		Zambia
		Zimbabwe
Americas	Latin America and the Caribbean	Anguilla
		Antigua and Barbuda
		Argentina
		Aruba
		Bahamas
		Barbados
		Belize
		Bolivia, Plurinational State of
		Brazil
		British Virgin Islands
		Cayman Islands
		Chile
		Colombia
		Costa Rica
		Cuba

Region	Subregion – broad	Country
Americas	Latin America and the Caribbean	Curaçao
		Dominica
		Dominican Republic
		Ecuador
		El Salvador
		Falkland Islands (Malvinas)
		French Guiana
		Grenada
		Guadeloupe
		Guatemala
		Guyana
		Haiti
		Honduras
		Jamaica
		Martinique
		Mexico
		Montserrat
		Netherlands Antilles
		Nicaragua
		Panama
		Paraguay
		Peru
		Puerto Rico
		Saint Kitts and Nevis
		Saint Lucia
		Saint Martin (French)
		Saint Vincent and the Grenadines
		Sint Maarten (Dutch)
		Suriname
		Trinidad and Tobago
		Turks and Caicos Islands
		United States Virgin Islands
		Uruguay
		Venezuela, Bolivarian Republic of
	Northern America	Bermuda
		Canada
		Greenland
		Saint Pierre and Miquelon

Region	Subregion – broad	Country
Americas	Northern America	United States
Arab States	Arab States	Bahrain
		Iraq
		Jordan
		Kuwait
		Lebanon
		Oman
		Qatar
		Saudi Arabia
		Syrian Arab Republic
		United Arab Emirates
		West Bank and Gaza Strip
		Yemen
Asia and the Pacific	Eastern Asia	China
		Hong Kong (China)
		Japan
		Korea, Democratic People's Republic of
		Korea, Republic of
		Macau (China)
		Mongolia
		Taiwan (China)
	South-Eastern Asia and the Pacific	Brunei Darussalam
		Cambodia
		Indonesia
		Lao People's Democratic Republic
		Malaysia
		Myanmar
		Philippines
		Singapore
		Thailand
		Timor-Leste
		Viet Nam
		American Samoa
		Australia
		Cook Islands
		Fiji
		French Polynesia
		Guam

Region	Subregion – broad	Country
Asia and the Pacific	South-Eastern Asia and the Pacific	Kiribati
		Marshall Islands
		Micronesia, Federated States of
		Nauru
		New Caledonia
		New Zealand
		Niue
		Northern Mariana Islands
		Palau
		Papua New Guinea
		Samoa
		Solomon Islands
		Tonga
		Tuvalu
		Vanuatu
	Southern Asia	Afghanistan
		Bangladesh
		Bhutan
		India
		Iran, Islamic Republic of
		Maldives
		Nepal
		Pakistan
		Sri Lanka
Europe and Central Asia	Northern, Southern and Western Europe	Albania
		Andorra
		Austria
		Belgium
		Bosnia and Herzegovina
		Channel Islands
		Croatia
		Denmark
		Estonia
		Faroe Islands
		Finland
		France
		Germany
		Gibraltar

Region	Subregion – broad	Country
Europe and Central Asia Arab States Asia and the Pacific	Northern, Southern and Western Europe	Greece
		Iceland
		Ireland
		Isle of Man
		Italy
		Kosovo
		Latvia
		Liechtenstein
		Lithuania
		Luxembourg
		Malta
		Monaco
		Montenegro
		Netherlands
		Norway
		Portugal
		San Marino
		Serbia
		Slovenia
		Spain
		Sweden
		Switzerland
		The former Yugoslav Republic of Macedonia
		United Kingdom
	Eastern Europe and Central Asia	Belarus
		Bulgaria
		Czech Republic
		Hungary
		Moldova, Republic of
		Poland
		Romania
		Russian Federation
		Slovakia
		Ukraine
	Central and Western Asia	Armenia
		Azerbaijan
		Cyprus
		Georgia

Region	Subregion – broad	Country
Europe and Central Asia Arab States Asia and the Pacific	Central and Western Asia	Israel
		Kazakhstan
		Kyrgyzstan
		Tajikistan
		Turkey
		Turkmenistan
		Uzbekistan

Annex 2: List of survey countries

Country	Sample size
Afghanistan	1 000
Argentina	1 000
Armenia	1 000
Bangladesh	2 000
Bolivia	1 000
Botswana	1 000
Brazil	1 007
Cambodia	2 000
Cameroon	1 000
Chile	1 032
Colombia	1 000
Czech Republic	1 000
Dominican Republic	1 000
Egypt	1 000
Ethiopia	1 004
Georgia	1 000
Ghana	1 000
Guatemala	1 000
Haiti	504
Honduras	1 000
Hungary	1 000
India	17 000
Indonesia	2 000
Jordan	1 000
Latvia	1 019
Lebanon	1 000
Malawi	1 000
Mauritania	1 000

Country	Sample size
Mexico	1 031
Mongolia	1 000
Morocco	1 008
Myanmar	2 040
Nepal	2 050
Nigeria	1 000
Pakistan	2 000
Philippines	1 000
Poland	1 000
Romania	1 001
Russia	2 000
Serbia	1 000
Singapore	1 000
South Africa	1 000
Sri Lanka	1 062
Thailand	2 000
Tunisia	1 000
Uganda	1 000
Ukraine	1 000
Vietnam	1 000
Total	**71 758**

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End notes

1. ILO, WFF: *Global estimates of modern slavery: Forced labour and forced marriage*, Geneva, 2017.

2. ILO: *Global estimates of child labour: Results and trends, 2012-2016*, Geneva, 2017.

3. The ILO Committee of Experts on the Application of Conventions and Recommendations (CEACR) has provided guidance on the scope of the definition of forced labour, stressing that it encompasses trafficking in persons for the purpose of labour and sexual exploitation as defined by the Palermo Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children. See: ILO Committee of Experts on the Application of Conventions and Recommendations (CEACR): *Eradication of forced labour: General survey concerning the Forced Labour Convention, 1930 (No. 29), and the Abolition of Forced Labour Convention, 1957 (No. 105)*, (Geneva, 2007), Report III (Part 1B), para. 77.

4. As noted in the *UNODC, Global Report on Trafficking in Persons 2016 (United Nations publication, Sales No. E.16.IV.6)*, "The common denominator of these crimes is that they are all forms of exploitation in which one person is under the control of another" (p16).

5. ILO Forced Labour Convention, 1930 (No. 29), ILO Abolition of Forced Labour Convention, 1957 (No. 105), see also Protocol of 2014 to the Forced Labour Convention, 1930 (No. 29) and Forced Labour (Supplementary Measures) Recommendation, 2014 (No. 203), International Covenant on Civil and Political Rights, Article 8.

6. As per ILO Forced Labour Convention, 1930 (No.29) and ILO Abolition of Forced Labour Convention, 1957 (No.105), the exceptions provided for work imposed by State authorities in specific contexts such as: compulsory military service, normal civic obligations, as a consequence of a conviction in a court of law (provided that the work or service in question is carried out under the supervision and control of a public authority and that the person carrying it out is not hired to or placed at the disposal of private individuals, companies, or associations), in cases of emergency, or for minor communal services performed by the members of a community in the direct interest of the community.

7. In 2006, the United Nations Secretary-General stated, "A forced marriage is one lacking the free and valid consent of at least one of the parties". *In-depth study on all forms of violence against women*, Report of the Secretary-General, UN document A/61/122/Add.1.

8. The Office of the High Commissioner for Human Rights has noted, "Women and girls in situations of child and forced marriage may experience conditions inside a marriage which meet "international legal definitions of slavery and slavery-like practices" including servile marriage, sexual slavery, child servitude, child trafficking and forced labour ...." United Nations General Assembly, *Preventing and Eliminating Child, Early and Forced Marriage*, Report of the Office of the United Nations High Commissioner for Human Rights, A/HRC/26/22, 2 April 2014. http://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session26/_layouts/15/WopiFrame.aspx?sourcedoc=/EN/HRBodies/HRC/RegularSessions/Session26/Documents/A-HRC-26-22_en.doc&action=default&DefaultItemOpen=1

9. UNODC, *Global Report on Trafficking in Persons 2016* (United Nations publication, Sales No. E.16.IV.6).

10. Anti-Slavery International, 2013, *Out of the Shadows: Child Marriage and Slavery*, http://www.antislavery.org/wp-content/uploads/2017/01/child_marriage_final-1.pdf.

11. "A child marriage is considered to be a form of forced marriage, given that one and/or both parties have not expressed full, free and informed consent. As a matter of respecting the child's evolving capacities and autonomy in making decisions that affect her or his life, a marriage of a mature, capable child below 18 years of age may be allowed in exceptional circumstances, provided that the child is at least 16 years of age and that such decisions are made by a judge based on legitimate exceptional grounds defined by law and on the evidence of maturity, without deference to culture and tradition." Joint general recommendation No. 31 of the Committee on the Elimination of Discrimination against Women/general comment No. 18 of the Committee on the Rights of the Child on harmful practices CEDAW/C/GC/31-CRC/C/GC/18, https://documents-dds-ny.un.org/doc/UNDOC/GEN/N14/627/78/PDF/N1462778.pdf?OpenElement.

12. A detailed explanation of "stock" and "flow" can be found in Part B.

13. ILO: *ILO global estimates on migrant workers: results and methodology*, Geneva, 2015, http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_436343.pdf.

14. This is not the case in IOM database. Among victims of trafficking assisted by IOM, the share of victims exploited outside their country of residence is higher for labour exploitation (85 per cent) than for sexual exploitation (74 per cent).

15. The grouping was made on the basis of the World Bank's country income classification. See https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

16. Defined 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". See International Labour Organization, Forced Labour Convention, 1930 (No. 29). http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C029.

17. The categories presented here reflect the one digit classification of industries from ISIC Rev.4, except begging and illicit activities, which have been introduced to capture those activities that may be outside the economic activities but are still a "sector" in which people are employed in forced labour. https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27.

18. Defined 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". See International Labour Organization, Forced Labour Convention, 1930 (No. 29). http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C029.

19. United Nations Population Fund 2012. *Marrying too young: End child marriage*. UNFPA, New York. http://www.unfpa.org/sites/default/files/pub-pdf/MarryingTooYoung.pdf.

20. For example, bride kidnapping in Kazakhstan, forced marriages in Yemen, Syria, Iraq, and Lebanon, among others; cases of forced marriage have also been reported throughout Europe and there is concern that this will grow in years to come given the large intake of refugees from countries where it is a more common cultural practice. See Emma Psaila, Vanessa Leigh, Marilena Verbari, Sara Fiorentini et al., *Forced Marriage from a gender perspective*, (European Parliament, 2016), pp. 60–68, accessed 13/04/2016. http://www.europarl.europa.eu/RegData/etudes/STUD/2016/556926/IPOL_STU(2016)556926_EN.pdf.

21. International Labour Organization, Forced Labour Convention, 1930 (No. 29).

22. International Labour Office, *Hard to see, harder to count. Survey guidelines to estimate forced labour of adults and children*, ILO, Geneva, 2012.

23. International Labour Organization, *ILO Resolution concerning statistics of child labour*, Eighteenth International Conference of Labour Statisticians, Geneva, November-December, 2008.

24. It should be mentioned that these contrasting definitions of adults and children may entail some double-counting, to the extent that there may be young adult victims of forced labour in the last five years who may have also been in forced labour as children in the recent past.

25. The surveys from 2014 and 2015 were developed and funded by the Walk Free Foundation, the surveys in 2016 were revised and funded by the Walk Free Foundation and the International Labour Office.

26. Gallup, Inc., *Worldwide Research Methodology and Codebook*, 2008-2014, Updated July 2015.

27. People who are not in an institution (criminal, mental, or other type of facility) or on active duty military.

28. Gallup, Inc. *Special Modules on Word Poll Surveys*, Project Lincoln Questions (P1-P21), training materials.

29. Defined 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". See International Labour Organization, Forced Labour Convention, 1930 (No. 29), http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C029.

30. Defined as a slavery-like practice when a person is given or promised in marriage "without the right to refuse". See United Nations, Office of the High Commissioner Human Rights, 1956, Supplementary Convention on the Abolition of Slavery, the Slave Trade, and Institutions and Practices Similar to Slavery. http://www.ohchr.org/EN/ProfessionalInterest/Pages/SupplementaryConventionAbolitionOfSlavery.aspx.

31. ILO, Walk Free Foundation and Gallup, Inc., *Special Modules on World Poll Surveys. Project Lincoln Questions*, Gallup, Inc., 2016.

32. Sudman, Seymour and Norman M. Bradburn, "Effects of Time and Memory Factors on Response in Surveys," *Journal of the American Statistical Association*, December 1973, Volume 68, Number 344, pp. 805-815.

33. Sikkel, Dirk, "Models for Memory Effects," *Journal of the American Statistical association*, December 1985, Vol. 80, No. 392, pp. 835-841.

34. Verma, Vijay, *Sampling elusive populations: Applications to studies of child labour*, ILO Department of Statistics and FPRW/International Programme on the Elimination of Child Labour, Geneva, 2013, Chapter 7, Multiplicity Sampling, pp. 327-356.

35. The authors are grateful to Vijay Verma for the formulation of the choice of the parameter α in the combination of self-response and proxy response weights.

36. United Nations Population Division, *World Population Prospects: The 2015 Revision*, Files POP/DB/WPP/Rev.2015/INT/F03-2 and F03-3 Medium fertility variant, 2015-2100, July 2015.

37. Walk Free Foundation, *Global Slavery Index 2016: Detailed Methodology*. http://www.globalslaveryindex.org/methodology.

38. The logit model to be used required data on age at start of exploitation and type of exploitation.

39. ILO Department of Statistics, "ILO Regional Groupings: Improving Consistency, Transparency and Visibility: A proposal," ILO, Geneva, July 2015. Excel file "Regional Groupings – Country Composition – single print.xlsx."

40. The STATA dofile developed for estimating forced sexual exploitation incorporates an additional parameter that accounts for an eventual degree of double-counting when some of the refusals in the national surveys were actually related to forced sexual exploitation.

41. Or other validated sources for non-ILO Member States.

42. The Supplementary Convention on the Abolition of Slavery, the Slave Trade and Institutions and Practices Similar to Slavery 1956 defines servile marriage as a "slavery-like practice" in Article 1(c) as follows: "Any institution or practice whereby: (i) A woman, without the right to refuse, is promised or given in marriage on payment of a consideration in money or in kind to her parents, guardian, family or any other person or group; or (ii) The husband of a woman, his family, or his clan, has the right to transfer her to another person for value received or otherwise; or (iii) A woman on the death of her husband is liable to be inherited by another person." See also, International Covenant on Civil and Political Rights, Article 8; and Resolution A/RES/71/175, adopted by the General Assembly on 19 December 2016, 71/175. Child, early and forced marriage.

43. See "Joint general recommendation No. 31 of the Committee on the Elimination of Discrimination against Women/general comment No. 18 of the Committee on the Rights of the Child on harmful practices", CEDAW/C/GC/31-CRC/C/GC/18, https://documents-dds-ny.un.org/doc/UNDOC/GEN/N14/627/78/PDF/N1462778.pdf?OpenElement.

44. ILO, Walk Free Foundation and Gallup, Inc., *Special Modules on World Poll Surveys*. Project Lincoln Questions, Gallup, Inc., 2016.

45. If forced labour experience at any time in the past is considered, there were 91 countries of exploitation identified.

46. The requirement of at least two countries per sub-region was meant to enable the calculation of sampling variances of the resulting estimates.

47. The ILO and UNODC are currently working to develop a joint measurement framework and survey tools for the measurement of trafficking for forced labour, which will lead to better data on that issue.

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