International Labour Organization

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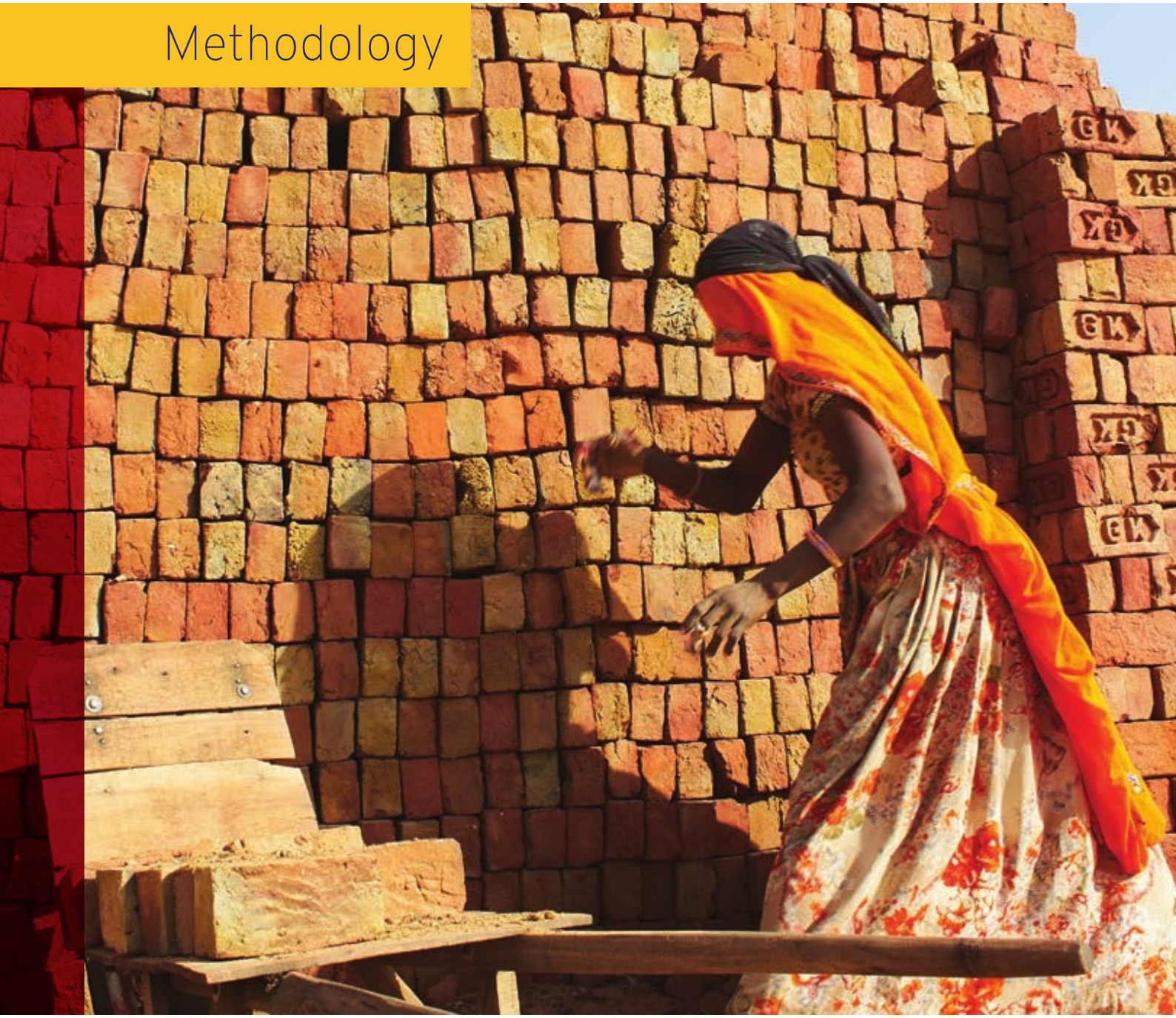
Global Estimates of Modern Slavery

Forced Labour and Forced Marriage

Methodology



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First published 2025

Global Estimates of Modern Slavery: Forced labour and Forced Marriage. Methodology.

ISBN: 978-92-2-039862-3 (print); 978-92-2-039863-0 (web PDF)

Funding for this report is partly provided to the ILO by the United States Department of Labor under cooperative agreement number IL-30147-16-75-K-11 (MAP16 project) (GLO/18/29/USA) and by the Government of France under the framework of the Entr'Alliance project (GLO/20/60/FRA).

One hundred per cent of the total costs of the MAP16 project is financed with federal funds for a total of 23.9 million dollars.

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This publication was issued without formal editing by IOM. This publication was issued without IOM Publications Unit (PUB) approval for adherence to IOM's brand and style standards.

Cover image: Grace Forrest

Design and layout by Candy Factory

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Acknowledgements

This report details the methodology underlying the *2021 Global Estimates of Modern Slavery: Forced Labur and Forced Marriage*, which was jointly produced by the International Labour Organization (ILO), Walk Free, and International Organization for Migration (IOM).

The principal authors of this report are Farhad Mehran (ILO Consultant), Francesca Francavilla (ILO), Michaelle De Cock (ILO), and Jacqueline Joudo Larsen (Walk Free), who led the development and drafting of the report. Contributing authors include Elise Gordon (Walk Free), Harry Cook (IOM), and Claire Galez-Davis (IOM), whose input and expertise supported the report's development.

The statistical analysis, estimation, and preparation of the Global Estimates were carried out by Farhad Mehran (ILO Consultant), Francesca Francavilla (ILO), Michaelle De Cock (ILO), and Jacqueline Joudo Larsen (Walk Free), in close collaboration with Harry Cook (IOM) and Claire Galez-Davis (IOM).

This report would not have been possible without the valuable contributions of many colleagues across the partner agencies. Special thanks go to Gabriella Breglia (ILO), Federico Blanco (ILO), Bernadette Joudo (Walk Free), Elly Williams (Walk Free), Lorraine Wong (IOM), Dima Al Haddad (IOM), and Pawel Szalus (IOM) for their extensive research support throughout the study.

We also gratefully acknowledge the expert consultants whose input and guidance contributed to the development of the Global Estimates.

Finally, we extend our sincere thanks to all the workers who generously shared their time and experiences during the survey data collection.

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Photo: Grace Forrest.

Chapter 1.

Measurement framework

The ILO has produced global estimates of forced labour at three occasions in the past, in 2005,[1] 2012,[2] and 2017.[3] The methodology used in the first two editions was based on capture-recapture sampling of reported cases of forced labour. The capture-recapture methodology used for global and regional estimation of forced labour and its underlying assumptions have been reviewed extensively and the numerical results quoted widely. The third ILO global estimation of forced labour was carried out in collaboration with Walk Free and the International Organization for Migration (IOM). The scope was extended to cover forced marriage, but the results on forced labour were presented separately.

As in the previous editions, the Global Estimates of Modern Slavery in this new edition are based on a combined methodology that uses diverse data sources for the various forms of modern slavery, as no single source provides suitable data on all the different types of forced labour and forced marriage. This edition of the Global Estimates of Modern Slavery includes the first global estimation of forced labour since the *ILO Guidelines concerning the measurement of forced labour* were endorsed by the 20th International Conference of Labour Statisticians (ICLS) in 2018.[4] It also benefits from comments received at the occasion of two virtual meetings of experts on 1 October 2021 and 6 December 2021, as well as on suggestions made as part of an independent review of the methodology used in the 2017 global estimation of forced labour and forced marriage commissioned by Walk Free.[5]

The central element of global estimation remains the use of specially designed nationally representative surveys for measuring forced labour exploitation of the adult population and forced marriage. Measurement of forced commercial sexual exploitation, forced labour exploitation of children, and state-imposed forced labour was undertaken through alternative methods described below, as measurement through national surveys continued to be insufficient in capturing these forms of forced labour.

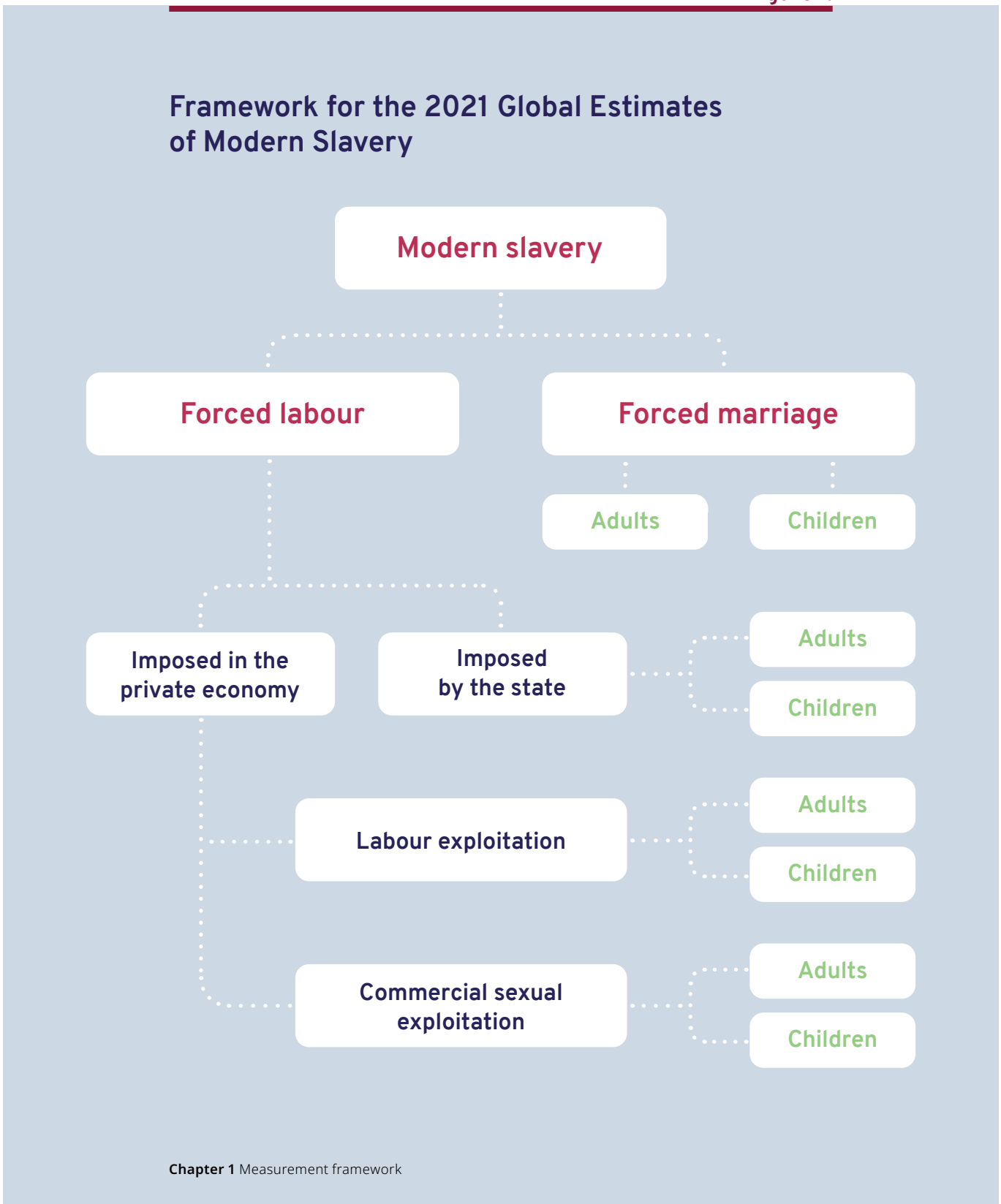
Forced commercial sexual exploitation of adults and children were measured using the Counter Trafficking Data Collaborative (CTDC) anonymised case dataset on trafficked persons collected by IOM and its partners in the process of providing protection and assistance services to trafficked persons. The data were used to construct models expressing the relationship between forced commercial sexual exploitation of adults and children relative to forced labour exploitation of adults. The most appropriate model was then used to estimate forced commercial sexual exploitation of adults and children on the basis of the results of the national surveys on forced labour exploitation of the adult population.

A similar approach using the CTDC dataset was adopted for estimating the relationship between the odds ratio of forced labour exploitation of children based on the corresponding estimates for forced labour exploitation of adults.

The measurement of state-imposed forced labour was based on data from a wide variety of sources. Cases of forced labour were first identified through a systematic review of the comments of the Committee of Experts on the Application of Conventions and Recommendations (CEACR) relating to violations of one of the provisions of the Forced Labour Convention, 1930 (No.29) and the Abolition of Forced Labour Convention, 1957 (No. 105). Based on this initial list of cases, a wide variety of secondary sources were then reviewed to gather further information. These sources include reports from the ILO, other UN agencies, specialised non-governmental organizations, academia, and the media.

The measurement framework reflects the diversity of the underlying methods and data sources used for measuring the two sub-components of modern slavery presented in the *2021 Global Estimates of Modern Slavery: Forced Labour and Forced Marriage*: an estimate of forced labour and an estimate of forced marriage (Figure 1).

Figure 1.



Ethical considerations

Forced labour and forced marriage are sensitive topics, particularly for those who have experienced them or know someone who has. The following ethical considerations were made to ensure the safety of participants, victim-survivors, and those involved in implementing the research.

National surveys on forced labour and forced marriage are conducted through the Gallup World Poll. Gallup protects respondent anonymity and confidentiality through data collection, data storage, and data transfer in accordance with several ethical codes of practices, among them the Code of Professional Ethics and Practices of the Worldwide Association of Public Opinion Research and the American Statistical Association.

The survey questionnaire and research protocol were submitted to Gallup's in-house Institutional Review Board (IRB) which ensures that research protocols and questionnaires collect informed consent, minimise risks to respondents, and ensure any risks present are justified by the expected benefits of the research.

Additionally, Gallup excludes from the sampling frame areas where the safety of interviewing staff is threatened.

Survey data are delivered to the project team de-identified through a dedicated secure platform. The project team maintains secure data storage via encrypted, password-protected software, and ensures access is strictly limited to authorised project team members. All data are securely exchanged between project team members.

The Counter-Trafficking Data Collaborative (CTDC) is the first global repository of primary case data on human trafficking with data contributed by organizations around the world. CTDC provides a platform for front-line organizations to publish their data safely and in a standardized format, so they can contribute to the evidence base. Current partners include IOM, Polaris, RecollectiV, A21 and the Portuguese Observatory on Trafficking in Human Beings (OTSH). An unprecedented achievement in the field of trafficking in persons data, CTDC currently combines some of the largest human trafficking case data sets in the world.

The data at the source of CTDC are sensitive because they contain detailed information about individuals who have been subjected to human trafficking, including their personal experiences and the crimes committed against them. The management and sharing of such data raise privacy and security concerns, especially with regards to the risk of identifying data subjects and the severe consequences that could follow. To mitigate these risks, CTDC data undergo a rigorous de-identification process to protect the privacy and safety of the individuals involved before data are shared with IOM and before the publication of the datasets.

This comprehensive approach ensures that CTDC data can be used for research and analysis to support counter-trafficking efforts while upholding the highest standards of data protection and confidentiality. IOM is bound by its Data Protection Principles[6], which are designed to safeguard the rights and privacy of individuals represented in the data and with which CTDC is compliant.

For the purposes of this report, only the variables that were strictly necessary for the analysis were retained. The analysis was then run, and made available on the CTDC website,[7] so that no sensitive data were published or shared.

How to read this report

The rest of this report is organized as follows:

- **Chapter 2** presents the concepts and definitions of forced labour in line with the *ILO Guidelines concerning the measurement of forced labour*.[8] It also describes the distinction between stock and flow of forced labour, and their relationship with duration in forced labour.
- **Chapter 3** describes in detail the methodology used for the measurement of forced labour exploitation of the adult population based on national surveys.
- **Chapters 4 and 5** describe the methodology used for estimating forced commercial sexual exploitation and forced labour exploitation of children based on a combination of the CTDC dataset and the national surveys.
- **Chapter 6** documents the methodology used for measuring state-imposed forced labour.
- **Chapter 7** documents the methodology used for measuring forced marriage.
- **Chapter 8** evaluates the results using various quality indicators and examines the impact of the COVID-19 pandemic on data collection and on forced labour.

Photo: Kazi Salahuddin Razu/NurPhoto via Getty Images.

Chapter 2.

Forced labour

This chapter presents the basic concepts and definitions of forced labour in line with the *ILO Guidelines concerning the statistics of forced labour*, and describes the distinction between the stock and flow of forced labour and their relationship with duration in forced labour.

Concepts and definitions

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."[9] 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."[10] 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 himself 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 workers. 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) 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 or, once the child 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 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 5 to 17 years, where age is measured as the number of completed years at the child's last birthday.[11] Forced labour of children refers in the present context to all persons in the age group 5 to 17 years at the time of measurement who were forced to work during the five-year reference period. Similarly, forced labour of adults refers to all persons 18 years old and over at the time of measurement who have been in forced labour at any time during the five-year reference period.

The *ILO Guidelines concerning statistics of forced labour* further specify that:

- "The *reference period* may be short such as last week, last month or last season, or long such as the past year, the past two years, the past five years or lifetime."
- "Work is defined in line with the international standards concerning statistics of work, employment and labour underutilization, adopted by the 19th International Conference of Labour Statisticians, 2013." The guidelines recognize that "In certain circumstances, the scope of work for the measurement of forced labour may be broadened to include activities such as child begging for third parties that go beyond the scope of production of goods and services covered by the general production boundary of the System of National Accounts (SNA)."
- "*Threat and menace of any penalty* are the means of coercion used to impose work on a worker against a person's will. Elements of coercion may include, *inter alia*, threats or violence against workers or workers' families and relatives, or close associates; restrictions on workers' movement; debt bondage or manipulation of debt; withholding of wages or other promised benefits; withholding of valuable documents (such as identity documents or residence permits); and abuse of workers' vulnerability through the denial of rights or privileges, threats of dismissal or deportation."
- "*Involuntary work* refers to any work taking place without the free and informed consent of the worker. Circumstances that may give rise to involuntary work, when undertaken under deception or uninformed, include, *inter alia*, unfree recruitment at birth or through transaction such as slavery or bonded labour; situations in which the worker must perform a job of different nature from that specified during recruitment without a person's consent; abusive requirements for overtime or on-call work that were not previously agreed with the employer; work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment; work with very low or no wages; in degrading living conditions imposed by the employer, recruiter, or other third-party; work for other employers than agreed; work for longer period of time than agreed; work with no or limited freedom to terminate work contract."

The Guidelines also define duration in forced labour as the total number of days or months a person was in forced labour during the specified reference period.

(a) Duration in forced labour may concern one or multiple spells of forced labour that occurred in the reference period.

(b) The complete spell of forced labour experienced by a person may have started before the specified reference period and may continue after the end of the specified reference period.

Data on duration in forced labour serve to harmonize national statistics derived on the basis of reference periods of different lengths. Duration in forced labour is also by itself an important indicator of forced labour, as it provides information that is relevant to assessing the degree of exposure to forced labour.

The Global Estimates of Forced Labour and Trafficking in Persons

The terms trafficking in persons and forced labour are often used interchangeably, but despite significant overlap in cases, they have distinct definitions in international law.

In international law, forced labour is defined as per ILO Forced Labour Convention, 1930 (No. 29) as discussed in the "Concepts and definitions" section of this report.

Trafficking in persons is defined by the United Nations Convention against Transnational Organized Crime Supplementary Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children (also known as the Palermo Protocol) which was adopted in 2000. It defines trafficking as:

"The recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation. Exploitation shall include, at a minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude or the removal of organs" (A/RES/55/25).

This definition understands trafficking of adults as comprising three distinct parts: the **act**, the **means**, and the **purpose**.

The purpose criterion is that the act and means are undertaken with the intention to exploit, which means that exploitation need not have taken place for an act to be considered an act of trafficking. This is why trafficking in persons is commonly understood as a means of delivering a victim into a situation of exploitation.

In cases of trafficking of children, the means component is not required for a situation to be considered human trafficking. A child, defined in the Palermo Protocol (article 3(d)) as anyone under the age of 18 years, is considered trafficked if an act is committed for the purpose of exploiting the child.

While trafficking in persons is not explicitly measured in these Global Estimates, as a delivery mechanism for exploitation, trafficking in persons is closely related to the phenomena measured in these Global Estimates.

Two of the types of exploitation that persons may be trafficked for that are specifically enumerated by the protocol (above) are "forced labour[12]" and "slavery and practices similar to slavery," which covers forced marriage through referencing the 1956 Supplementary Convention on the Abolition of Slavery, the Slave Trade, and Institutions and Practices Similar to Slavery. For this reason, there is some overlap between people who have been trafficked and those who have been subjected to forced labour or forced marriage (these latter two populations are measured in the 2021 Global Estimates of Modern Slavery). However, the extent of this overlap is still unknown, given the lack of comparable global estimates of the prevalence of trafficking in persons. There are also many victims of trafficking who have not been subjected to forced labour or forced marriage. It is also possible for someone to be subjected to forced marriage or forced labour without having been trafficked into this situation.

On the statistical front, in 2018 the ICLS adopted Guidelines determining statistically what constitutes forced labour; these are used in these Global Estimates. The Guidelines have also called for further work on the statistical definition of trafficking for forced labour, allowing the identification of the overlap between the two phenomena. Currently, at the UN level, ILO, United Nations Office on Drugs and Crime (UNODC) and IOM are working towards comprehensive guidelines on the measurement of trafficking in persons, including for forced labour purposes. The project team aims to submit this framework for endorsement by the UN Statistical Commission.

Stock, flow, and duration

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 in forced labour *during a period of time*. To better understand the differences, consider a hypothetical population consisting of 12 persons whose forced labour status has been measured over five points in time. The following table presents a numerical example:

Table 1.

Forced labour status of a hypothetical population of 12 persons over 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	1	1	0	2
7	0	0	0	0	1	1
8	1	1	0	1	1	4
9	0	0	0	0	0	0
10	0	0	0	0	0	0
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 labelled t_1, t_2, t_3, t_4 and t_5 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 in forced labour at that time. The last line of the table counts the number of persons who were in forced labour at the given time.

In this example, seven persons were not in 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. 6 in forced labour at time t_3 and t_4; person no. 7 in forced labour at a single time t_5; person no. 8, in forced labour twice, each for a duration of two points of time, t_1, t_2 and t_4, t_5; person no. 11, in forced labour once for a duration of three points of time, t_1, t_2, and t_3; and person no. 12, in forced labour at all five points of time.

The bottom row of the table indicates 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 people in forced labour at any given point of time: persons no. 8, 11, and 12 at time t_1 and t_2; persons no. 6, 11, and 12 at time t_3; persons no. 6, 8, and 12 at time t_4; and persons no. 7, 8, and 12 at time t_5.

We say that the total flow count of forced labour in this numerical example was five and the average stock was three. The flow count, five, refers to the total number of persons who were in forced labour during the time period. The stock count, three, refers to the average number of persons who were in forced labour at any given 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 numerical example, the average duration in forced labour may be calculated from the corresponding column in Table 1:

- 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 expressed as fraction of total duration (0.6).

The Global Estimates of Modern Slavery calculate both average stock and total flow estimates of the different components of forced labour. Forced labour and forced marriage being statistically rare events, the survey questionnaire was designed to capture the flow of people in forced labour over five years in order to get enough cases for analysis.

Photo: ILO / Marcel Crozet.

Chapter 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 in the country of residence with indirect information collected on country of exploitation.

National surveys at country of residence

The core datasets for global estimation were derived from the national surveys conducted in 68 countries during the period from 2017 to 2020. In one country (Cambodia), the survey was conducted more than once, in 2017 and again in 2019. All surveys were implemented by Gallup, Inc. in conjunction with its annual World Poll.[13] The national surveys were household-based interviews with a sample of individuals at their places of residence and collecting data on forced labour and forced marriage regarding themselves and their immediate family members. Surveys conducted in 2017 and 2019 used face-to-face interviewing, but those conducted in 2020, after the emergence of the COVID-19 pandemic, were carried out by telephone interviewing. The survey countries, together with their sample size and year of implementation, are listed in Annex 2.

Sample design

With some exceptions, all surveys were based on probability samples representing the resident civilian, non-institutional population 15 years old and over. The scope of the survey was the entire geographical 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 the interviewing staff may be threatened, and remote areas that interviewers could reach only by foot, animal, or small boat. Typically, 1,000 to 1,200 interviews were conducted in each survey country, except for Bangladesh (n=2,072), Cambodia (n=2,600), Indonesia (n=2,192), Myanmar (n=1,600), Nepal (n=2,095), the Russian Federation (n=2,168), and Thailand (n=2,000). Altogether, the national surveys used for global estimation of forced labour and forced marriage included a total sample size of 77,914 individuals. Sample selection was based on a multi-stage stratified sample design as follows.

In the first stage of sampling, an area sample of about 100 to 150 primary sampling units (clusters) was selected with probabilities proportional to size where population data were available in the sampling frame, otherwise by simple random sampling where population data were not available in the sampling frame. Prior to area sampling, the clusters were stratified by population size and or geographic location 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 interview the sample unit. To increase the likelihood of contact and survey completion, the interviewers were instructed to make attempts at different times of the day and, where possible, on different days. If an interviewer could not obtain an interview at the initial sample household, a sample substitution procedure could be followed.

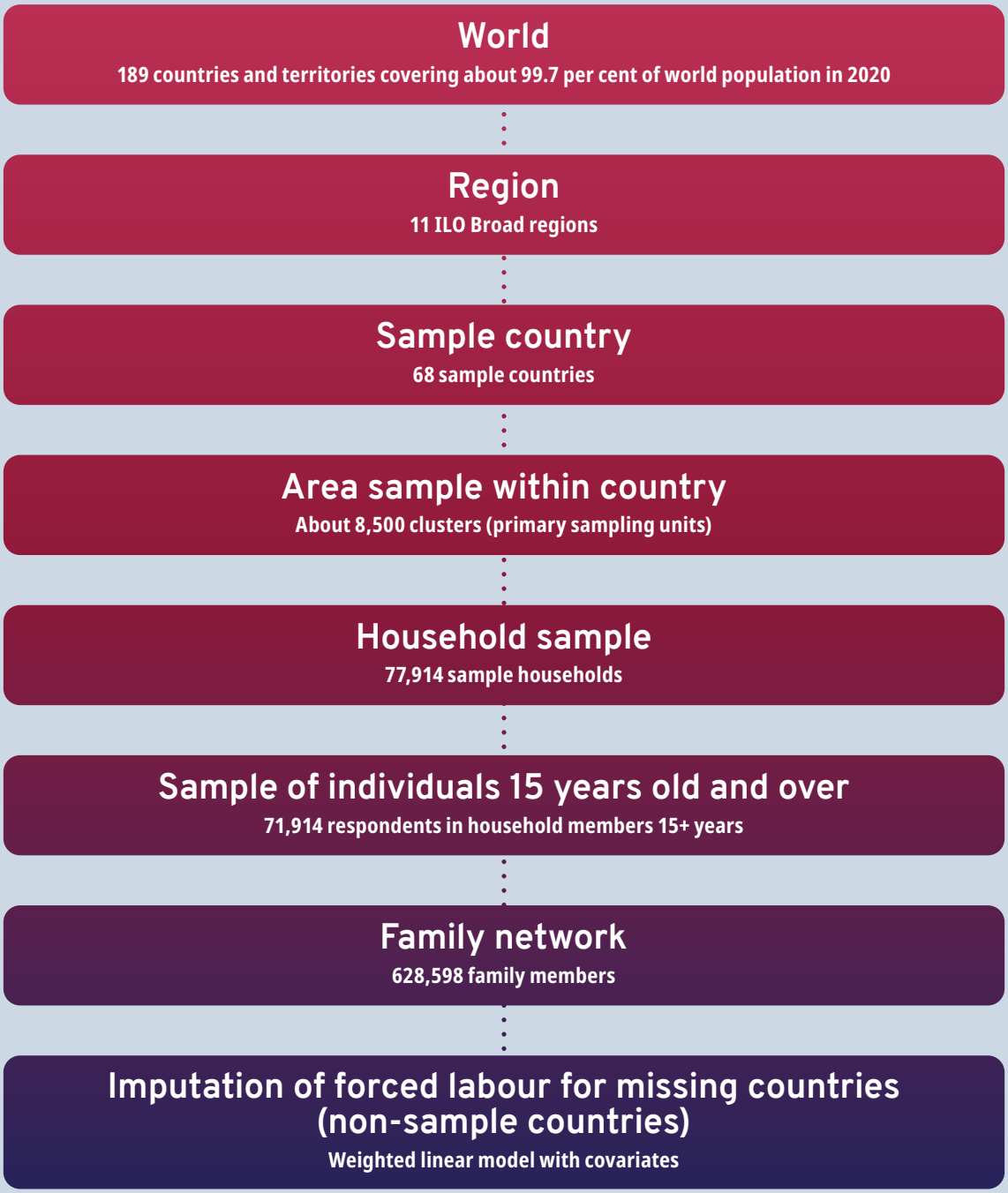
In the third stage of sampling, individual respondents were randomly selected within the sample households. Interviewers listed all eligible household members and recorded their ages and birthdays. The sample respondent was then selected from among the household members 15 years old and over using the Kish grid, a widely used method of randomly selecting members within a household. The method is based on a pre-assigned table of random numbers. The interviewer was not supposed to inform the person who answered the door of the selection criteria until after the sample respondent had been identified. In the 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 survey questions in relation to both their own experience and members of their immediate family. The family network included the respondent, his or her living spouse or partner, and other immediate family members, namely, parents (living biological mother or 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).

A total of 68 national representative surveys were conducted with harmonized questions for global estimation of forced labour. The aggregate size of the family network of the 77,914 sample respondents included a total of 628,598 persons, corresponding to an average family network size of about eight. While eligibility criteria for primary respondents included a minimum age of 15 years, children under 15 years were introduced to the sample through the family network. The family network may have included members living outside the country from which the sample respondent was selected, as well 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 are schematically presented in hierarchal order in Figure 2. The last element of the figure refers to the statistical treatment of the missing countries, that is countries in which national surveys were not conducted. This element of the sample structure is described in the section on imputation for missing countries on p. 29.

Figure 2.

Sample scheme for the global estimate of forced labour



Questionnaire design and counting rules

The questionnaire used for the national surveys conducted in the 2017-2021 period was built on experience gained by the ILO and Walk Free in past surveys on forced labour and forced marriage. National surveys used a common set of questions on forced labour and forced marriage, with a few exceptions where a question was deemed not relevant in the country. It was understood that "work" refers to any activity performed by persons of any sex and age to produce goods or to provide services for their own use or for pay or profit, in line with the international standards on the topic.[14] In the present context, "begging" was also considered as "work."

The forced labour and forced marriage questions were administered as a special module attached to the core questionnaire of the Gallup World Poll. Some questions of the Gallup core questionnaire were also used for the estimation and disaggregation of forced labour and forced marriage (variable names starting with "wp"). An outline of the questionnaire on forced labour and forced marriage is shown in Table 2.

Table 2.

Outline of questionnaire of the national surveys on forced labour conducted as part of Gallup World Poll surveys, 2017-2021

Questions	Description/answer categories
P1-P4, wp1223	Identification of immediate family network
P5-P7	Inquiry on involuntary work experience by anyone among immediate family (P5A made to work against will by employer or recruiter; P5B made to work against will for an employer other than the one initially agreed for; P5C offered one kind of work but made to do some other kind work against will; P5D made to work overtime, on call, or more than agreed hours against will; P5E made to work against will in hazardous, unsafe, or dangerous conditions for which there was prior agreement; P5F made to work against will for very low or no wages; P5G made to work against will by employer, recruiter or third party that provided them with bad living conditions, conditions such as cramped or dirty lodging, or food that was insufficient, spoiled, dirty, or made them sick; P5H made to work against will with no or limited freedom to change employer; P6 made to work to repay a debt with employer or recruiter against will; P7A made to work for a master or as a slave; P7B work in order to help another family who was made to work against will by an employer; P7C made to work against will for employer so that another person would receive a job, land, money or other resources).
P8-P10	Who in the immediate family was in a situation of involuntary work, sex and age
P11	(1) When last happened (Less than 6 months ago; (2) 6 months to less than 1 year ago; (3) 1 year to less than 5 years ago; (4) 5 years to less than 10 years ago; (5) 10 or more years ago; Don't know; Refused).
P11i	Total duration of reported experience during last 5 years; Don't know; Refused.
P12	Country in which last spell happened; Don't know; Refused.
P13	Type of activity (Verbatim response coded by the interviewer and edited by ILO/WF) 1 Agriculture, forestry; 2 Fishing; 3 Mining and quarrying; 4 Manufacturing; 5 Construction; 6 Wholesale and retail trade, repair of motor vehicles and motorcycles; 7 Accommodation and food service activities; 8 Military; 9 Arts, entertainment and recreation; 10 Prostitution/Commercial sexual exploitation; 11 Drug production/Drug sales/Trafficking; 12 Begging; 13 Personal services (e.g. massage parlours, beauty parlours); 14 Domestic labour; 96 Other; 98 Don't know; 99 Refused).
P14	Coercion (Verbatim response coded by the interviewer and edited by ILO/WF): 1 Physical violence against person; 2 Sexual violence against person; 3 Threats of violence against person; 4 Threats of or actual violence against family; 5 Threats of or actual confinement in work or living quarters; 7 Threats of or actual punishment through deprivation of food, sleep, etc.; 8 Threats of or actual fines or financial penalties; 9 Threats of deportation or legal action; 10 Withholding of valuable documents such as passport, identity document, residence permit, travel documents, etc.; 11 Manipulation of debt owed/changed amount owed so it kept rising/wasn't paid down; 12 Threats of or actual nonpayment of wages or other promised benefits; 13 Isolated and dependent on employer to leave work/living place; 14 Threats or dismissal; 95 Other penalties; 96 No penalty; 98 Don't know; 99 Refused.
P14_1 (COVID-19)	Currently being forced to work by employer or recruiter
P14_2 (COVID-19)	Forced work was stopped before or after coronavirus restrictions started
P14_3 (COVID-19)	Situation that kept you/family member from quitting work stayed the same, improved, or got worse
P14_4 (COVID-19)	Main reason situation that kept you/family member from quitting work improved
P14_5 (COVID-19)	Main reason situation that kept you/family member from quitting work got worse
P14_6 (COVID-19)	Main reason situation involving force work was stopped
P14_7 (COVID-19)	Was coronavirus one of the reasons why the situation stopped
P14_8 (COVID-19)	Was coronavirus one of the reasons your forced labour situation stopped (Verbatim response)
WP5	Country of current residence
WP4657, WP9048	Native or foreign born; Country of birth

It is important to mention that for the question P14 on coercion and question P13 on branch of economic activity, respondents were asked to describe in their own words the type of work they were forced to perform and how they were prevented from leaving their work or forced to accept conditions of work that they did not consent to. The interviewer would record the responses verbatim and then code the first response in column 1 of the questionnaire, and any additional responses (up to 5) in columns 2 to 5 of the questionnaire. The verbatim responses played a crucial role in understanding the forced labour phenomenon and in editing the response codes of question P14 on coercion as well as question 13 on branch of economic activity.

In the 2020 surveys, eight additional questions (P14_1 to P14_8) were included in the survey questionnaire for collecting data on the impact of the COVID-19 pandemic. The survey results on the COVID-19 questions are separately analysed in Chapter 8.

The final results of the national surveys were processed and the estimation of adults in forced labour were compiled according to a precise counting rule in line with the guidelines concerning statistics of forced labour cited earlier. The counting rule is expressed in terms of five criteria set out in Table 3. For a person to be identified as an adult in forced labour exploitation in the past five years, all five criteria must be satisfied simultaneously.

Table 3.

Counting rule for identifying an adult in forced labour exploitation in the past five years

	Criterion	Answer categories to survey questionnaire
1	Adult	P10 >= 18 years old
2	Involuntary work	At least a "Yes" or "Refused" in P5-P7; "Don't know" not admitted
3	Menace of penalty	P14 = 1 to 14 or 99 "Refused"; "Don't know" not admitted
4	Labour exploitation	P13 = 1 to 7; 9; 11 to 14; 96, 98, and 99
5	In last 5 years	P11 = (1) or (2) or (3)

Among adults in forced labour exploitation in the last five years, those in debt bondage were separately identified through the counting rule with two criteria shown in Table 4. For an adult in forced labour exploitation in the last five years to be identified as in "debt bondage," one of the two following criteria should be satisfied:

Table 4.

Counting rule for identifying adults in forced labour exploitation in "debt bondage" in the past five years

	Criterion	Answer categories to survey questionnaire or derived variables
1	Made to work to repay a debt with employer or recruiter against will and under threat of penalty	P6 = 1 and Penalty = 1
2	Work against will in situation of debt manipulation or changing of amount owed	Involuntary = 1 and P14 = 11

Other counting rules were developed for identifying other categories of persons. In particular, the counting rule used for identifying foreign-born and native-born people in forced labour is shown in Table 5.

Table 5.

Counting rule for identifying "foreign born" and "native born" adults in forced labour exploitation in the past five years

	Derived variable	Answer categories to survey questionnaire
1	Country of birth = wpbirth	wpbirth = wp5 (country of residence) if wp4657=1 (native-born in country of residence), or wpbirth = wp9048 (country of birth) if wp4657=2 (foreign-born in country of residence)
2	Foreign-born in country of exploitation	wpbirth ≠ p12 (country of exploitation)
3	Native-born in country of exploitation	wpbirth = p12 (country of exploitation)
4	Unknown foreign-born or native-born	wpbirth = unknown or p12 = unknown

Treatment of particular issues

This section describes the particular issues that were encountered in the analysis of the survey responses and the special treatments that were applied in data processing. The particular issues concern the verbatim responses, the refusals and other non-responses to the key survey questions, the effect of memory lapses on survey responses, and the impact of proxy response as opposed to self-response.

Verbatim responses

As mentioned earlier, all verbatim responses to the question on coercion (P14) menace of any penalty and the question on branch of economic activity (P13) were answered with verbatims, coded by the interviewers during the interview and independently reviewed during data cleaning. 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 the question P14. Three types of cases were subject to special statistical treatment:

- If the answer to P14 was coded by the interviewer as "96 other, no penalty," that is not in forced labour, an effort was made to identify whether it could be codified among the pre-coded forced labour categories in line with ILO Convention No. 29 and counted as a case of forced labour.
- If the answer to P14 was coded by the interviewer as "95 other, penalty" or "98 Don't know" or 99 "Refused," that is in forced labour, an effort was made to identify whether it could be codified among the forced labour pre-coded categories in line with ILO Convention No. 29. This does not change the number of cases in forced labour but increases the level of information on the type of coercion.
- If the answer to P14 was coded by the interviewer in one of the forced labour pre-coded categories in line with ILO Convention No. 29, an effort was made to verify whether the coding was correct. Some cases were recoded as not in forced labour (code 96).

Because of the crucial role that the question P14 plays in the counting rule of forced labour, extra precaution was taken in this review process. Changes to the original survey coding were made only in cases where the verbatim response clearly contradicted the allocated code, indicating a mistake. In the review process, the verbatim responses were first examined and coded by two independent coders (say, c1 and c2). If the two codes agreed (c1=c2), the common code was regarded as correct and was maintained. If, on the other hand, the codes differed (c1≠c2), then the two coders jointly reviewed the conflict and discussed the reasons. This often led to a resolution on the coding and one of the two codes (c1 or c2) was regarded as the correct code. If no agreement could be reached, a third party would be consulted, and a final code would be assigned (which could be c1, c2 or still a third code c3).

Some of the most frequently occurring situations that led to the recoding of P14 based on the verbatim responses are listed in Table 6.

Table 6.

Main cases of recoding of the question on coercion (P14) based on the verbatim responses

Verbatim	Recode	Note
Overtime work without specific mention of a menace of penalty, or threat of dismissal or payment of wages below the minimum level	96 (no penalty)	According to the International Labour Conference, 96th Session (2007), overtime is not an infringement of ILO Convention No. 29 so long as it is within the limits permitted by national legislation or collective agreements. However, the Committee of Experts on the Application of Conventions and Recommendations (CEACR) has considered that, in cases in which work or service is imposed by exploiting the worker's vulnerability, under the menace of a penalty, dismissal or payment of wages below the minimum level, such exploitation ceases to be merely a matter of poor conditions of employment and becomes one of imposing work under the menace of a penalty and calls for the protection of the Convention.
Late payment without specific mention that it was a means of coercion	96 (no penalty)	Without further information, it was not possible to distinguish between a delayed payment by the employer due to cash-flow problem of the enterprise or a delayed payment as a means of coercion.
Being taken advantage	96 (no penalty)	Without further information, it was not possible to check for the existence of an abuse of vulnerability.
Higher wages or more pay	96 (no penalty)	Without further information, it was not possible to distinguish between the need for higher wages by the work and a false promise of higher wages by the employer that never came.
Poverty, out of necessity, not enough food to survive	96 (no penalty)	Poor living and working conditions were not considered to be enough elements to infer abuse of vulnerability.
Fired or the employer would have employed another person	14 (threat of dismissal)	This is assumed to be associated with the threat of dismissal in case of abuse of vulnerability by the employer. The interpretation of this answer is linked to the question that asks: "how does the employer or recruiter keep you/family member from quitting that work?"
Threats in general, without specified type of violence	95 (Other penalty)	Recoded from original survey code 3 (threat of violence against the person).
Bad evaluation from the employer, if used to threaten the worker of dismissal or impede the worker to find a new job	95 (Other penalty)	But, if the text permitted to infer that "bad evaluation from employer" was part of a "normal" employer-employee relationship, P14 was recoded as 96 (no penalty).
Any text that can infer a verbal or psychological or economic violence	3 (Threat of violence against the person)	This approach explains the many cases reported under code 3.

Verbatim responses were also used in response to question P13 on branch of economic activity. Responses were recoded by the interviewers in standard International Standard Industrial Classification (ISIC) categories and reviewed by ILO and Walk Free, particularly when the code in P13 was "Other." For example, if the verbatim response referred to "driver," P13 was recoded as 18 (Transportation and storage), or where it referred to "sewing" or "slaughter" or "stacker," P13 was recoded as 4 (Manufacturing). Depending on the context, references to "gardener" or "security guard" or "cleaning services" were sometimes used to recode P13 as 14 (Domestic labour).

The survey questionnaire provided for reporting "refused" or "don't know" as an answer to the key questions on forced labour. Table 7 shows the "refused" rate and "don't know" rate for the questions used for deriving the two criteria of forced labour exploitation, namely "involuntary work" and "coercion."

Table 7.

Refusal and other non-response rates on questions on "involuntary work" and "coercion"

	Survey question	Refusal	Don't know
P5A	made to work against will by an employer or recruiter	0.2%	1.3%
P5B	made to work against will for employer other than one initially agreed	0.2%	1.4%
P5C	offered one kind of work but made to do other kind work against will	0.2%	1.5%
P5D	made to work overtime, on call, or more than agreed hours against will	0.2%	1.9%
P5E	made to work against will in hazardous, unsafe, or dangerous conditions for which there was prior agreement	0.2%	1.6%
P5F	made to work against will for very low or no wages	0.2%	1.7%
P5G	made to work against will by employer, recruiter or third-party that provided them with bad living conditions	0.2%	1.6%
P5H	made to work against will with no or limited freedom to change employer	0.2%	1.7%
P6	made to work to repay a debt with employer or recruiter against will	0.2%	1.4%
P7A	made to work for a master or as a slave	0.3%	1.5%
P7B	work to help other family member who was made to work against will by employer	0.2%	1.4%
P7C	made to work against will for employer, so that another person would receive a job, land, money or other resources	0.2%	1.4%
P14	coercion (menace of any penalty)	6.1%	18.7%

The questions on "involuntary work" (P5A-G, P6, P7A-C) were formulated in terms of "Yes" or "No" answers with the additional possibility of reporting "Don't know" and "Refused." The "refused" rates for these questions are in all cases about 0.2 per cent, except for the question on "master or slave," which is slightly higher at 0.3 per cent. The "don't know" rates are generally higher, but never exceed 2 per cent. By contrast, the rates were much larger for the question on "menace of penalty," with a "refused" rate of about 6.2 per cent and "don't know" rate of about 18.7 per cent. This question was addressed only to those for whom a "yes" answer had been recorded in at least one of the questions on "involuntary work." As mentioned earlier, the question was formulated as an open-question and the verbatim responses were coded in one of the answer categories by the interviewer. When the interviewer could not match the verbatim response with one of the pre-coded answer categories and it was found to be a "penalty," the last "other" code (95) would be available for coding. The rate of coding "other" was about 9.8 per cent.

Refusals on the key questions on "involuntary work" and "coercion" were considered to be indicative of forced labour experience 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 recorded as forced labour exploitation in the data processing of the national surveys. "Don't know" answers, however, were considered as lack of knowledge of the respondent and not necessarily indicative of forced labour experience.

One implication of refusal to answer the filter questions on "involuntary work" is that the follow-up questions on demographic characteristics of the person and on the timing of forced labour, place, type of work, and kind of coercion were not administered and therefore responses to these questions were missing. In data processing, only the missing values on the country of exploitation (P12) were imputed. Refused, don't know or blank value in P12 was imputed as country of current residence (P12=WP5).

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.[15] Memory error due to forgetting an episode entirely is called "omission." Memory error when an event is remembered as occurring more recently than it actually did is called "telescoping." In the context of forced labour, an omission error occurs when the respondent fails to remember an event considered as forced labour in the survey. Omissions tend to be rare when the respondent is reporting about his or her own experience. But when reporting about family members, the rate of omissions tends to be relatively higher because the respondent may simply not know or vaguely knew about that the experience of the family member. Where the respondent remembers a forced labour experience but cannot accurately recall the timing of its occurrence, the tendency is to bring time forward and report as 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 8 presents the survey data on the reported cases of adult forced labour exploitation in terms of the timing of their last occurrences and by type of response (self-response versus proxy response). It can be observed that the number of reported cases within the last six months is almost equal to the

number of cases reported to have occurred six to 12 months ago. The frequency of reported cases, however, considerably decreases for timings beyond one year. This suggests substantial memory failures in responses. This is true for proxy responses as well as for self-responses. But for proxy responses, there is the additional memory failure of remembering the timing of events. The relative frequency of "unknown" for proxy responses (8.4 per cent) is more than double the corresponding frequency for self-responses (3.8 per cent).

Table 8.

Adults in forced labour exploitation by reported time of last episode and type of response

Time of last episode of forced labour experience	Total adults in forced labour	Self-response	Proxy response
Total	**4,108**	**1,629**	**2,479**
Less than 6 months ago	1,169	461	708
6 to 12 months ago	1,107	439	668
1 to 5 years ago	714	317	397
5 to 10 years ago	649	274	375
10 years or more ago	198	76	122
Unknown	271	62	209

One could argue that people who reported incidents of forced labour exploitation over the previous 12 months have among them fewer memory errors and therefore the true number of adults in forced labour exploitation in last five years could be obtained by simply multiplying the total for the most recent year by five, that is (1169+1107)*5=11380. 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.

Self-response versus proxy response

The analysis of the survey results revealed that, in general, respondents were able to provide more ample information on their own forced labour experience than on that of their family members. Table 9 shows the total number of adults in forced labour at any time during the last five years identified in the national surveys by type of response. Altogether, the surveys identified 2,990 adult persons who have experienced forced labour exploitation – either themselves or a family member – in the past five years, representing a prevalence rate of 4.8 per thousand. The prevalence rate was 15.6 per thousand for self-respondents (those who reported on their own forced labour experience), almost double the rate for proxy response on experience of spouse or partners (8.0 per thousand), and significantly higher than the rate for proxy response on parents (3.9 per thousand), or on siblings (3.1 per thousand), or on children (1.6 per thousand).

Table 9.

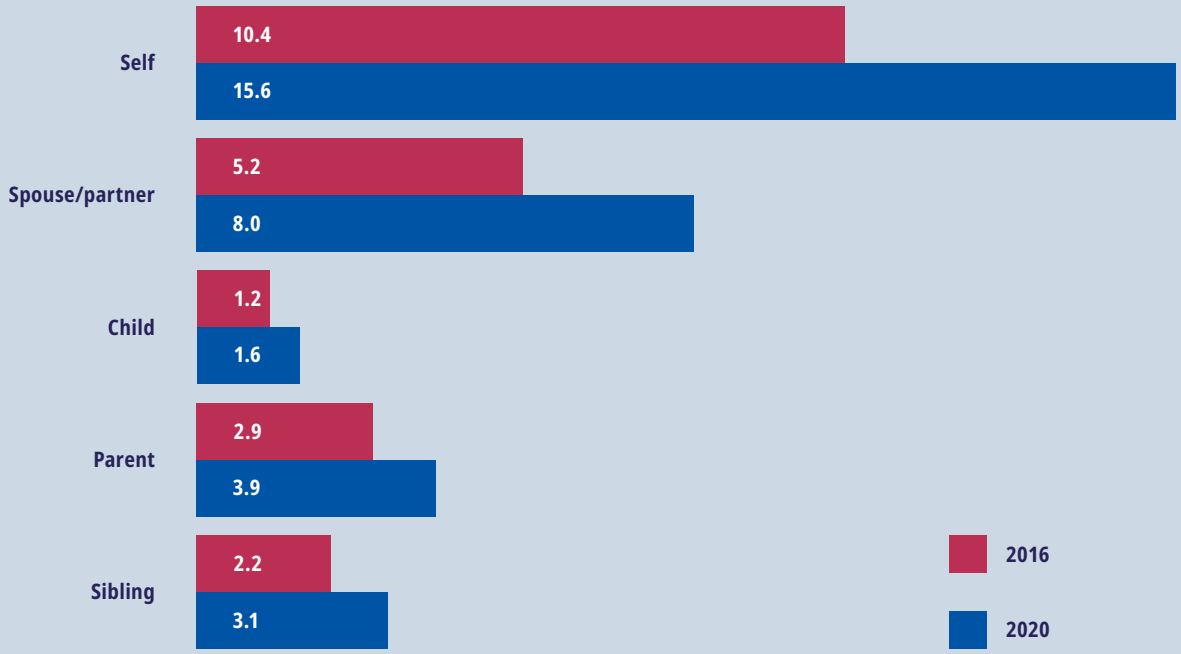
Prevalence of forced labour in the last five years by type of response (Not weighted)

Self-response versus proxy response on family members	Total number in family network	Adult in forced labour at any time in last 5 years	Rate per '000
Total	**628,598**	**2,990**	**4.8**
Self	77,914	1,217	15.6
Spouse/partner	41,489	330	8.0
Child	143,044	231	1.6
Parent	87,842	339	3.9
Sibling	278,309	866	3.1
Other (Don't know or Refused)	—	7	—

The higher reported prevalence for self-response has been consistently observed for forced labour experience reported to have occurred within the last six months, the last 12 months, the last five years, the last 10 years, or at any time in the past. A similar pattern has also been observed in the national surveys used in the previous edition of global estimation (see Figure 3).

Figure 3.

Prevalence rate of forced labour per thousand by type of response (Not weighted) 2016 versus 2020



This phenomenon could be because respondents tend to know more about their own experience than about those of their family members, and therefore are more likely to respond affirmatively to the survey questions about themselves. However, it could also be 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 adult forced labour would still be higher for self-responses relative to proxy responses. The lower rate of proxy respondents is treated by means of giving more weights to responses obtained from self-responses than to proxy responses. This weight adjustment is implemented as part of the extrapolation of the survey data described in the next section.

Extrapolation weights

The survey results were expanded first to national estimates and then the national estimates were used to impute values for countries in which national surveys were not conducted.

Extrapolation to national estimates

Expansion to national estimates was obtained by applying survey weights to the sample results calculated according to the sample design of the survey and adjusted for proxy response for each survey, separately.

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 who is at least 15 years old. The selected household member and all his or her immediate family form the ultimate sample units of the survey. The survey weight may thus be derived from the principle of multiplicity sampling and may be expressed as,

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

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 as part of the Gallup World Poll methodology and given as,

$$w_{(k)_j} = \text{projwt}$$

It takes into account any unit non-response and is calibrated to population totals obtained from external sources.

The denominator $netsize_k$ is the size of the family network of sample person *k* restricted to those who are 15 years old and over. 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. To correctly account for this double possibility of selection, the survey weight is divided by the multiplicity factor $netsize_k$. 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 or partners 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 the ratio, *projwt/netwt*, where *netwt* is the network weight provided as part of the Gallup World Poll datasets.

Adjustment for proxy response. 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 were combined to produce the final extrapolation weights. These combined survey weights were obtained by computing a weighted average of the two sampling weights after deducting the self-respondent from the network size in the denominator of the network weight as follows,

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

The parameter α may be evaluated based on the following consideration. Let m be the true value of national forced labour and b_{self} the bias from the overestimation based on self-reporting and b_{proxy} the bias from the underestimation based on proxy responses. Straightforward calculations imply that the overall bias is equal to zero if

$$\alpha \times b_{\text{self}} = (1 - \alpha) \times b_{\text{proxy}}$$

This result indicates that if self-response is assumed to be unbiased then α must be chosen to be equal to 1. Thus, 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, that is $b_{self}=b_{proxy}$, then α must be equal to $1-\alpha$. This in turn means $\alpha=0.5$ and the arithmetic average of the weights of self-response and proxy response should be used for extrapolation. In practice, there is no reason to assume that the biases due to self-response and proxy response cancel each other. The choice used in the present context was set at α=0.75, halfway between 0.5 and 1. This is based on the argument that to give more importance to self-responses relative to proxy responses, the averaging parameter α should be at least 0.5, that is in the range from 0.5 to 1, or at around the mid-point of the range which is 0.75.

Imputation for missing countries

In the previous edition of the global estimates, the countries with national surveys were considered to "mimic" a random sample. The countries were selected such that the total set of national surveys included at least two countries per ILO broad subregion and represented a substantial part of the subregion population. 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 subregions and the random selection scheme is probability proportional to size 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 subregions except the Northern America subregion where no national surveys could be conducted. Also, in certain other subregions, substitution had to be made as the consent of some selected countries could not be obtained in time for the preparation of the fieldwork.

In this edition, we attempt to re-express the inference problem in line with theories of non-probability samples. The increasing use of non-probability samples in web-based surveys and the advent of "big data" have led to the search for theoretical grounds for the analysis of data from non-probability samples. Two basic models of inference for non-probability samples are quasi-randomization and super-population modelling.[16] In quasi-randomization, it is assumed that the non-probability sample actually does have an underlying probability sample mechanism and the goal is to estimate the unknown probability of selection based on covariates available for sample and non-sample units. In the super-population model, the non-sample units are in effect treated as missing and the goal is to impute their values or to predict the unknown part of the statistics of interest. For this edition of the global estimates of forced labour, such a super-population model was adopted.

Linear model

Let y_j be the number of adults in forced labour exploitation in country *j*. In a world with *N* countries, *j=1,...,N*, the global number of adults in forced labour may be expressed as

$$t = \sum_{j=1}^{N} y_j$$

which may be decomposed in two parts,

$$t = \sum_{j \in s} y_j + \sum_{j \notin s} y_j$$

where the first part is the total obtained from the survey countries, *s*, and the second part is the unknown total for the missing countries. Under the super-population approach, it is assumed that the number of adults in forced labour

exploitation for the missing countries may be estimated using some covariates that are known for all countries. In the simplest model, the relationship between the vector of covariates *(x$_j$)* and forced labour *(y$_j$)* is expressed as a linear model,

$$y_j = x'_j\beta + e_j$$

where *b* is a vector of unknown parameters and e_j is an error term representing the deviation of the model from the data. The parameter *b* may be estimated by the least-squares method that minimizes the squared deviations, leading to the following expression,

$$\hat{\beta} = (X'_s X_s)^{-1} X'_s y_s$$

where X_s is the matrix of covariates for the survey countries and y_s is the corresponding vector of number of adults in forced labour exploitation in the survey countries. Using $\hat{\beta}$, we impute the values of y_i for the missing countries and obtain the global estimate of adult forced labour exploitation as follows,

$$\hat{t} = \sum_{j \in s} y_j + (t_x - t_{xs})'\hat{\beta}$$

where t_x is the vector of covariates summed over all countries and t_{xs} is the corresponding vector of covariates summed only over the survey countries.

Weighted linear model

To account for the difference in population sizes of countries, it is more appropriate, in practice, to relate the covariates with the prevalence rate of forced labour rather than absolute number. Thus, the linear model is replaced with a weighted linear model, where y_j=prevalence rate of forced labour in country *j*, and

$$\hat{t} = \sum_{j \in s} w_j y_j + (t_x - t_{xs})'\hat{\beta}$$

where w_j is the adult population in country *j*, and

$$\hat{\beta} = (X'_s W_s X_s)^{-1} X'_s W_s y_s$$

in which W_s is a diagonal matrix with the weights w_j as diagonal elements, and t_x and t_{xs} are, respectively, the weighted sum of the covariates over all countries and over the survey countries only.

Logit model

An alternative would be to relate the covariates with the logarithm of the odds ratio of falling in forced labour exploitation rather than with the prevalence rate. The resulting logit model would lead to the global estimate,

$$\hat{t} = \sum_{j \in s} w_j y_j + \sum_{j \notin s} w_j \frac{\exp(x_j' \hat{\beta})}{1 + \exp(x_j' \hat{\beta})}$$

where the estimated vector of parameters $\hat{\beta}$ is obtained by fitting the logit model to the data of the survey countries.

Choice of covariates

In the application of the imputation approach to global estimation of adult forced labour exploitation, a range of covariates were examined, in particular, variables describing the geographic area of the country, the percentage of international migrant workers, and the income level of the country. The geographical variable was defined in terms of 11 dummy variables representing the 11 regions of the ILO regional grouping of countries, namely, Northern Africa; Sub-Saharan Africa; Latin America and the Caribbean; Northern America; Arab States; Eastern Asia; South-Eastern Asia and the Pacific; Southern Asia; Eastern Europe; Northern, Southern and Western Europe; and Central and Western Asia. Because no country in the Northern America subregion was among those where Gallup national surveys were conducted on forced labour and forced marriage, that subregion was assimilated with Northern, Southern, and Western Europe in the imputation process.

The dataset on international migrant workers was obtained from the underlying data used in the recent ILO Global Estimates on International Migrant Workers (2021).[17] This dataset included unpublished country level estimates by sex and broad age group for all the 189 countries covered in the present global estimation.

The income variables used as covariates for the imputation models of adult forced labour exploitation were of two types: (a) income level of countries defined by the World Bank and (b) Gross Domestic Product (GDP) per capita at purchasing power parity in current prices published by the World Bank. The income level of countries was incorporated as a covariate in the models using four dummy variables: low income, lower-middle income, upper-middle income, and high income.

Model selection

In total, 22 models (weighted linear models and logit models) using all combinations of the covariates were fitted to the data. Among them, the weighted model and the logit model producing statistically significant coefficients and lowest AIC values were selected for imputation of countries with missing values. Model selection based on AIC, or Akaike Information Criterion, was because AIC measures how well a model predicts on new data, rather than how well a model explains the observed data, measured by R2.

Among both the weighted linear models and the logit models, the best fitting model was the one that used the geographic and the international migrant workers variables. The income variables were not found to be always statistically significant. This perhaps reflects the fact that forced labour has a lower correlation with the income level of the country of residence than it has with the income level of the country of exploitation.

The final model retained for imputation of countries with missing data was the weighted linear model with the geographic and the international migrant workers variables.[18] By contrast with the logit models, linear models have the property of producing weights, called g-weights here, that depend only on the covariates and can be used for disaggregation of the imputed country estimates by sex, age group, and other relevant variables. The *g-weight* of a given country *j* may be calculated from the expression,

$$gweight_j = 1 + (t_x - t_{xs})'(X_s' W_s X_s)^{-1} x_j$$

From country of residence to country of exploitation

The country-level estimates obtained from the national surveys and the imputation model described above refer to the number of adults in forced labour exploitation in the country of residence at the time of the survey. At the global level, there is, of course, no difference between place of residence and place of exploitation. The difference comes at the regional level. Accordingly, to obtain regional estimates of adult forced labour exploitation at country of exploitation, a matrix was constructed relating the country of residence and the country of exploitation using the information provided by the national surveys. The resulting matrix estimates the proportion of adults in forced labour in a country of region X who were exploited in a country of region Y. The matrix is then used to derive the regional estimates at country of exploitation from the data on the country of residence.

Table 10 shows the full country-level matrix in which the rows represent the countries of residence and the columns the countries of exploitation. The first cell y_{11} at the top-left corner of the table denotes the number of adults in forced labour exploitation in country 1 who have been exploited in their country of residence (i.e., country of residence is the same as country of exploitation). The second cell in that row y_{12} represents the number of adults in forced labour exploitation in country 1, reported to have been last exploited in country 2, and so on for the other cells of the table.

The last column of the table gives the country-level estimates of adult forced labour exploitation obtained from the national surveys or from the imputation procedure described earlier. The aim is to obtain estimates of the number of adults in forced labour by country of exploitation; that is, estimates of the totals shown in the last row of the table. To calculate these, we need to know the country of exploitation of the adults in forced labour exploitation. The values can be estimated on the basis of question on country of exploitation (P12) of the national surveys for the countries of residence in which the surveys were conducted. For the other countries, they need to be imputed, and the imputation may be complicated as it would involve new models designed for the purpose.

Table 10.

Matrix of number of adults in forced labour exploitation by country of residence and country of exploitation

Country of residence	Country of exploitation: 1	2	...	j'	...	N	Total
1	y_{11}	y_{12}	...	$y_{1j'}$	...	y_{1N}	y_1
2	y_{21}	y_{22}	...	$y_{2j'}$	...	y_{2N}	y_2
...	...	...	...	...	...	...	...
J	y_{j1}	y_{j2}	...	$y_{jj'}$	...	y_{jN}	y_j
...	...	...	...	...	...	...	...
N	y_{N1}	y_{N2}	...	y_{Nj}	...	v_{NN}	y_N
Total	$\sum_{j=1}^{N} y_{j1}$	$\sum_{j=1}^{N} y_{j2}$	...	$\sum_{j=1}^{N} y_{jj'}$	...	$\sum_{j=1}^{N} y_{jN}$	$\hat{t}$

An alternative procedure is to aggregate the matrix in terms of regions as shown in Table 11 and distribute the last column according to the frequencies of adults in forced labour exploitation by region of exploitation obtained by pooling the samples of all national surveys in the same region of residence. The regional values in the last column are obtained by aggregating the country-level estimates in the last column of Table 10.

Table 11.

Matrix of estimate of adults in forced labour exploitation by region of country of residence and region of country of exploitation

		Region of country of exploitation					
		1	2	3	4	5	Total
Region of country of residence	1	r_{11}	r_{12}	r_{13}	r_{14}	r_{15}	r_{1}
	2	r_{21}	r_{22}	r_{23}	r_{24}	r_{25}	r_{2}
	3	r_{31}	r_{32}	r_{33}	r_{34}	r_{35}	r_{3}
	4	r_{41}	r_{42}	r_{43}	r_{44}	r_{45}	r_{4}
	5	r_{51}	r_{52}	r_{53}	r_{54}	r_{55}	r_{5}
Total		$\hat{t}_1$	$\hat{t}_2$	$\hat{t}_3$	$\hat{t}_4$	$\hat{t}_5$	$\hat{t}$

Essentially the same results are found by directly applying the g-weights described earlier to the sample data obtained from the national surveys. Thus, the regional estimate of the number of adults in forced labour exploitation in a given region *h* would be obtained from,

$$\hat{t}_h = \sum_{j' \in h} gweight_{j'} t_{j'}$$

where *h* is the set of all countries (*j'*) in region *h*, and $t_{j'}$ is the sample number of adults in forced labour exploitation reported to have been exploited in country *j'* (*P12=j'*). As mentioned earlier, the g-weights are meant to avoid the need to impute on every variable of countries not covered by national surveys. The g-weights applied to the data on countries covered by national surveys give approximate global estimates covering all countries, including those not covered by national surveys.

Photo: coldsnowstorm.

Chapter 4.

Forced commercial sexual exploitation of adults

The use of national surveys to obtain reliable data on forced sexual exploitation of adults and children and on forced labour exploitation of children proved to be difficult because the surveys did not capture an adequate number of cases for estimation. This reflects the lower age limit of 15 years of the target sample, chosen for ethical reasons, as well as general underreporting of sexual exploitation in household surveys due to the sensitive nature of the issue. Thus, a different approach was adopted for these components of forced labour. This section details the methodology used to estimate forced commercial sexual exploitation of adults. Chapter 5 details the methodology used to estimate forced labour of children, including commercial sexual exploitation of children.

Data sources

The basic idea for measuring forced commercial sexual exploitation is to first establish a relationship between the odds of being subjected to forced commercial sexual exploitation relative to forced labour exploitation, and then to use that relationship for estimating the number of people in forced commercial sexual exploitation on the basis of the estimates previously obtained on people in forced labour exploitation using survey data. The procedure is meant to be simple and ensure consistency between the estimates of the two main forms of forced labour.

The odds ratio was calculated using data from the Counter-Trafficking Data Collaborative (CTDC). The CTDC dataset is an anonymised case dataset on victims of trafficking collected by IOM and its partners in the process of providing protection and assistance services to trafficked persons, covering both trafficking for commercial sexual exploitation and for labour exploitation.[19] The CTDC data contributing partners are IOM, Polaris, Recollectiv (formerly Liberty Shared), A21 and the Portuguese Observatory on Trafficking in Human Beings (Observatório do Tráfico de Seres Humanos, or OTSH). The CTDC dataset comprises cases of trafficking for both commercial sexual exploitation and labour exploitation (as well as trafficking for other reasons such as organ removal, forced marriage, and forced military service) and includes information on the profile of trafficked persons and on the trafficking situation (e.g., year of registration, country of exploitation, means of control).

The CTDC dataset in its entirety included 156,330 records, of which 101,629 concerned trafficking for either commercial sexual or labour exploitation. Among these, 42,613 records had year of first contact in the reference period of the global estimate, 2017-2021, and non-missing information on sex (male or female), age group (child or adult), and country of exploitation within the scope of ILO countries and territories for global estimation.

The resulting dataset of 42,613 records formed the base for estimating the odds ratios of forced commercial sexual exploitation relative to forced labour exploitation. The 17 variables extracted from the CTDC dataset and additional derived and auxiliary variables constructed for this report are listed in Table 13.

Table 13.

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

Variable no.	Variable name	Variable categories
1	Id (col A)	Identification code
2	data_source (col B)	A21; IOM; LS; POL
3	gender (col F)	0=Male; 1 = Female
4	age (col G)	Age at first contact: 0—8; 9—11; 12—14; 15—17; 18—20; 21—23; 24—26; 27—29; 30—32; 33—35; 36—38; 39—47; 48—56; 57—65; 66+ and -99
5	branch of economic activity L (cols BC-BO) (col BP) S (cols BQ-BT) (col BU)	Agriculture; Begging; Construction; Domestic work; Factory work; Fishing; Low level crime; Mining; Prostitution/Commercial sexual exploitation; Hospitality; Small street commerce; Education; Trade; Transport; Other; Unemployed; Unknown; Not applicable
6	form_fl (cols. AT-BA) (col BB)	Type of exploitation: 1 Labour exploitation; 2 Commercial sexual exploitation
7	means-of-control (cols. AA-AR) (col AS)	Debt bondage; Takes/withholds earnings; Restricts access to finances; Threats to individual or others; Psychological abuse; Physical abuse; Sexual abuse; False promises/deception; Use of psychoactive substances; Denied freedom of movement/kept in isolation; Limits/restricts medical services; Excessive working hours; Restricts access to/manipulates children; Threat of action by law enforcement; Withholds/denies basic necessities; Withholds/destroys important documents; Other
8	date_reg	Age at time of first contact
9	date_entry (col D)	Age at time of entry into trafficking process
10	duration (col CA)	Number of months in forced labour: difference between date_entry and date_reg
11	majoritystatus (col I)	Minor; Adult
12	age_fl	Age at date of entry into forced labour
13	child_fl	1 if age_fl < 18; 0 otherwise
14-15	country_expl_ILO_code	Country of exploitation (ILO spelling of name of country and ILO code)
16-17	country_citizen_ILO_code	Country of citizenship (ILO spelling of name of country and ILO code)

The auxiliary variables on geographical region of country of exploitation and geographical region of country of citizenship were obtained from the ILO standard regional groupings of countries and territories developed by the ILO Department of Statistics (Annex 1).

Odds ratio

Let *p* denote the proportion of people in forced commercial sexual exploitation among the total number of people in forced commercial sexual and labour exploitation. Then the odds of being subjected to forced commercial sexual exploitation relative to forced labour exploitation would be obtained by the ratio,

$$\text{odds ratio} = \frac{p}{1-p}$$

The odds ratio was estimated for different demographic and social characteristics of the population based on CTDC dataset. The data were fitted to alternative model specifications, and the most appropriate was chosen to estimate the odds ratio, *p/(1-p)*, and to serve as base for estimating the number of people in forced commercial 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 people in forced commercial sexual exploitation with socio-demographic characteristics *x*, LEA_x is the corresponding estimate of forced labour exploitation of adults derived from the national surveys described earlier, and $\hat{p}_x/(1-\hat{p}_x)$ is the estimated odds ratio derived from the model. The methodology in effect calibrates the data on forced commercial sexual exploitation from IOM and partners to the global estimates of forced labour exploitation of adults. The data source and model selection are described in more detail below.

Model selection

The models examined for estimation of the odds ratios were specified as logit regressions for binary outcomes (forced commercial sexual exploitation versus forced labour exploitation) with two variables, sex (male, female) and majority status (child, adult), and their interaction sex*majority status. In its most general form, the parameters of the model were made dependent on the region of exploitation with random effects on country of exploitation with region at the intercept,

$$\ln\left(\frac{p}{1-p}\right) = \alpha_r + \beta_r \text{sex} + \gamma_r \text{majoritystatus} + \delta_r \text{sex} \times \text{majoritystatus}$$

where the subscript *r* of the parameters refers to the geographical region of the country of exploitation of the person in forced commercial sexual exploitation or in forced labour exploitation as the case may be. The intercept was formulated as a random effect depending on the country of exploitation within the region of exploitation. In the notation of random effect models $\alpha_r = (1|country\ of\ exploitation)_r$.

After a series of model testing, we decided to use the simplest model where the parameters are global (do not depend on regions) and the intercept has a fixed effect (not a random effect). The choice was made on the basis of a number of considerations, in particular, (a) the CTDC data on Northern America region were mostly concentrated in a single country, thus a random effect model would not be applicable for that region; (b) the CTDC data on victims of forced labour exploitation in Latin America and the Caribbean region were very sparse (only about 50 cases) which made the estimation of the parameters for that region extremely fragile; and (c) the specification of a fixed effect model with parameters constant for all regions would maintain consistency with the model used in the previous edition of global estimation.

The simple logit model was fitted to the CTDC dataset as a whole as well as to its source components separately and in different combinations. The model applied to the combined datasets of IOM, RecollectiV (formerly Liberty Shared) and A21 was finally retained for global estimation. The estimated parameters and their standard errors are given in Table 14.

Table 14.

Estimates and standard errors of the parameters of the logit model

Variable	Parameter	Estimate	Standard error
Intercept	a	0.2025	0.0718
Sex	b	0.1040	0.1208
Majoritystatus	g	-0.4658	0.0773
sex*majoritystatus	d	-2.8531	0.1498

It can be observed that the intercept, the majority status, and interaction of sex and majority status are highly significant variables in the model, with very small relative standard errors defined as the ratio of standard error to the estimate. The overall measure of fit of the model expressed in terms of the residual deviance is 9,784.6 on 9,441 degrees of freedom, as compared with the null deviance of 11,844.0 on 9,444 degrees of freedom. The prediction error of the model, measured by AIC (Akaike Information Criterion), is 9,792.6.

Estimation

In the next step of estimation, the estimated parameters of the logit model were used to calculate the odds ratios of falling in forced commercial sexual exploitation relative to forced labour exploitation. The calculation process is shown in Table 15.

Table 15.

Calculation of odds ratios from the parameters of the logit model

Sex	Majority status	a (1)	b (2)	c (3)	d (4)	ln(p/(-p)) (5)=(1)+(2)+(3)+(4)	Odds ratio (6)=exp(5)
Female	Child	0.2025	0	0	0	0.2025	1.2244
Female	Adult	0.2025	0	-0.4658	0	-0.2633	0.7685
Male	Child	0.2025	0.1040	0	0	0.3065	1.3587
Male	Adult	0.2025	0.1040	-0.4658	-2.8531	-3.0124	0.0492

The results depict an instructive pattern. The odds ratios in the last column of the table are greater than 1 for children and smaller than 1 for adults. This means that children, boys or girls, are more likely to be subjected to forced commercial sexual exploitation than forced labour exploitation. By contrast, adults, particularly men, are more likely to be subjected to forced labour exploitation than forced commercial sexual exploitation.

In numerical terms, the odds ratios in Table 15 can be understood as follows:

- For females under 18 years of age, the odds that they were in forced commercial sexual exploitation is more than 1.22 of the odds that they were in forced labour exploitation. This means that: for every 100 girls who were in forced labour exploitation, it is likely that there were about 122 others who were in forced commercial sexual exploitation.
- The second line indicates that for every 100 women 18 years old or over who were in forced labour exploitation, there were about 77 others who were in forced commercial sexual exploitation.
- Similarly, the third line indicates that for every 100 boys under 18 years of age who were in forced labour exploitation, there were about 135 others who were in forced commercial sexual exploitation.
- Finally, the fourth line indicates that for every 100 men 18 years old or over who were in forced labour exploitation, there were only about five others who were in forced commercial sexual exploitation.

In the final step of estimation, the odds ratios calculated in Table 15 were used for estimating the number of adults in forced commercial sexual exploitation based on the corresponding estimates of adults in forced labour exploitation obtained from the national surveys. Table 16 shows the calculation process by sex. The first two columns of the table reproduce the estimates of adults in forced labour exploitation obtained from the national surveys. The next two columns are the odds ratios of falling in forced commercial sexual exploitation relative to forced labour exploitation of adults obtained from the logit model (Table 16). Finally, the last two columns are the estimates of the forced commercial sexual exploitation of adults obtained by multiplying the estimates of the forced labour exploitation of adults with the corresponding odds ratio. For example, the global estimate of the number of female adults in forced commercial sexual exploitation (4,120,000) is obtained by multiplying the corresponding odds ratio (0.7685) with the global estimate of the number of female adults in forced labour exploitation (5,361,000).

Table 16.

Estimation of global forced commercial sexual exploitation of adults by sex

	Forced labour exploitation of adults '000	Odds ratio of adults	Rate per '000
Global	**16,017**	**—**	**4,644**
Male	10,656	0.0492	524
Female	5,361	0.7685	4,120

It should be noted that the odds ratios are applied to the stock estimates of forced labour exploitation of adults, without adjustment for the difference in the average duration of forced commercial sexual exploitation relative to that of forced labour exploitation. No duration adjustment was made in order to keep the model as simple as possible and maintain consistency with the methodology used in the *2017 Global Estimates of Modern Slavery*.[20]

Photo: James Morgan.

Chapter 5.

Forced labour of children

The application of the logit model (Table 15) to derive estimates of forced commercial sexual exploitation of children requires corresponding survey estimates of the number of children in forced labour exploitation. That is, it was necessary to first have an estimate of children in forced labour exploitation before the estimate of children in forced commercial sexual exploitation could be calculated. But, as mentioned earlier, survey estimates of children in forced labour exploitation were found to be insufficiently reliable for global estimation. Therefore, an approach similar to that of estimation of forced commercial sexual exploitation of adults was adopted for obtaining estimates of forced labour exploitation of children on the basis of the odds ratio applied to the corresponding survey estimates of adults. 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 CTDC dataset for fitting logit models. But this time the logit function is defined in terms of forced labour exploitation of children, as opposed to forced labour exploitation of adults. The model estimates the odds ratio that a person in forced labour exploitation is a child relative to that of being an adult.

Let q_x denote the probability that a person in forced labour exploitation, with a specified set of characteristics x, is a child. Then the odds ratio is expressed as $q_x/(1-q_x)$ and its estimate may be 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 by applying the following equation,

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

where LEC_x is the estimated number of children in forced labour exploitation with socio-demographic characteristics x, LEA_x is the corresponding estimate of forced labour exploitation of adults derived from the national surveys described earlier and $\hat{q}_x/(1-\hat{q}_x)$ is the estimated odds ratio derived from the model.

A number of models were fitted to the CTDC data, but for the sake of simplicity, the logit model with only sex as the dependent variable was chosen,

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

The estimates of the parameters of the model and their standard errors are given in Table 17.

Table 17.

Estimates and standard errors of the parameters of the logit model on forced labour exploitation of children

Variable	Parameter	Estimate	Standard error
Intercept	a	-2.0932	0.0565
Sex	b	-0.7082	0.0946

Comparing the value of the standard error relative to that of the estimate, it can be noted that both intercept and sex are highly significant variables in the model. The corresponding calculations of the odds ratios of forced labour exploitation of children relative to adults, for females and males, are shown in Table 18.

Table 18.

Calculation of odds ratios from the parameters of the logit model on forced labour exploitation of children

Sex	a (1)	b (2)	ln(p/(-p)) (3)=(1)+(2)	Odds ratio (4)=exp(3)
Female=0	-2.0932	0	-2.0932	0.1233
Male=1	-2.0932	-0.7082	-2.8014	0.0607

It can be observed that the estimated odds ratio for females in the last column of the table is more than twice the corresponding odds ratio for males. This indicates that the odds that a female in forced labour exploitation is a child rather than an adult is more than twice the odds that a male in forced labour exploitation is a child. In numerical terms, the odds ratio may be interpreted as follows:

- For every 100 female adults in forced labour exploitation, it is likely that there were about 123 female children in forced labour exploitation.
- The second line indicates that for every 100 male adults in forced labour exploitation, it is likely that there were just about six male children in forced labour exploitation.

As in the case of forced commercial sexual exploitation of adults, the calculated odds ratios in Table 15 are used to derive estimates of the number of children in forced labour exploitation based on the corresponding estimates of adults in forced labour exploitation obtained from the national surveys. Table 19 shows the calculations by sex.

Table 19.

Estimation of global forced labour exploitation of children by sex

	Forced labour exploitation of adults '000	Odds ratio of child to adult forced labour exploitation	Forced labour exploitation of children '000
Global	**16,017**	**—**	**1,308**
Male	10,656	0.0607	647
Female	5,361	0.1233	661

For example, the global estimate of the number of male children in forced labour exploitation (647,000) is obtained by multiplying the male odds ratio (0.0607) with the survey estimate of the global number of male adults in forced labour exploitation (10,656,000).

Forced commercial 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 in the preceding step (Table 19) are used to derive the corresponding estimates of forced commercial sexual exploitation of children from the logit model (Table 15). The calculation by sex is shown in Table 20. The second column on forced labour exploitation of children is reproduced from the last column of Table 19. The third column of Table 20 on odds ratio of children is extracted from Table 15 and the last column is obtained by multiplication of the second column (forced labour exploitation of children) with the third column (odds ratios). For example, the global estimate of the number of female children in forced commercial sexual exploitation (809,000) is obtained by multiplying the female odds ratio (1.2244) with the global estimate of the number of female children in forced labour exploitation (661,000).

Table 20.

Estimation of global forced commercial sexual exploitation of children by sex

	Forced labour exploitation of children '000	Odds ratio of children	Forced commercial sexual exploitation of children '000
Global	**1,308**	**—**	**1,688**
Male	647	1.3587	879
Female	661	1.2244	809

For convenience, the global estimates of the various components of forced labour (except state-imposed forced labour) are pieced together in Table 21.

Table 21.

Estimates of global forced labour exploitation and forced commercial sexual exploitation of adults and children by sex (in thousands)

	Forced labour exploitation		Forced commercial sexual exploitation	
	Adults	Children	Adults	Children
Global	**16,017**	**1,308**	**4,644**	**1,688**
Male	10,656	647	524	879
Female	5,361	661	4,120	809

Photo: ILO / Marcel Crozet.

Chapter 6.

State-imposed forced labour

State-imposed forced labour is used in the global estimates to describe various forms of forced labour that are imposed by state authorities, agents acting on behalf of state authorities, and organizations with authority similar to the state. State-imposed forced labour is prohibited by ILO Convention Nos 29 and 105, subject to certain exceptions. The following section describes the methodology used for the estimation of state-imposed forced labour.

Categories and types of state-imposed forced labour included in the global estimates

For the purpose of the estimates, and with reference to 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), state-imposed forced labour was classified into three main categories: abuse of compulsory prison labour, abuse of conscription, and forced labour for economic development and abuse of the obligation to perform work beyond normal civic obligations or minor communal services. The specific types of state-imposed forced labour contained in each of the three categories are listed in Table 22.

Table 22.

Categories and types of state-imposed forced labour included in the global estimates

Category of state-imposed forced labour in global estimates	Type of state-imposed forced labour	Description	Reference
1. Abuse of compulsory prison labour	Compulsory prison labour of prisoners in remand, or administrative detention	Mandatory labour of prisoners in remand or administrative detention.	Article 2 (2) (c) of Convention No. 29.
	Compulsory prison labour exacted for the benefit of private individuals, companies or associations	Mandatory labour of prisoners in privatized prisons or prisoners in public prisons 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.
	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
2. Abuse of conscription	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:
3. Forced labour for economic development and abuse of the obligation to perform work beyond normal civic obligations or minor communal services	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
	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
	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
Not included in global estimates[a]	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.	Article 3 of the Worst Forms of Child Labour Convention, 1999 (No. 182)

Note: (a) While forced recruitment of children by governments or militia groups was part of the typology used for measurement, ultimately it was not possible to measure this type of forced labour.

Identification of cases

To build estimates for each of these three main categories of state-imposed forced labour, cases of forced labour were identified through a systematic review of the comments of the ILO Committee of Experts on the Application of Conventions and Recommendations (CEACR)[21, 22] followed by a review of secondary sources. These sources include reports from the ILO, other UN agencies, specialised non-governmental organizations, academia, and the media.

The CEACR comments were systematically reviewed to identify legislation and situations in violation of one of the provisions of the Forced Labour Convention, 1930 (No. 29) and the Abolition of Forced Labour Convention, 1957 (No. 105). Based on this initial list of cases, a wide variety of secondary sources were reviewed to establish if the legislation had been applied in practice and to gather further information on each case.

To qualify for inclusion in the sample, a case had to, at a minimum, contain details on the following two dimensions:

- labour situation (work or service) that constitutes forced labour, and which could be classified according to the typology presented above;
- date or time period within the reference period of 2017-2021 during which this form of forced labour occurred.

For each case, both the number of people in forced labour per year and the length of the work imposed by the state authorities were used to calculate global estimates.

Validation procedures were developed for each type of state-imposed forced labour to systematically assess cases and check whether they met the required criteria to be counted as state-imposed forced labour. Each source was cross-validated with at least one other source, where other sources were available.

Estimation

The global estimate was obtained by compiling the state-imposed forced labour cases for each of the three categories of state-imposed forced labour. The assumption behind this method was that the data collected were representative at the global level of violations of Convention Nos 29 and 105 by state authorities.

Unlike privately imposed forced labour, where global figures were extrapolated from national surveys to regional and then global levels, for state-imposed forced labour only a global estimate was obtained. The methodology for estimating state-imposed forced labour was not designed for and did not permit representative estimates at the country and regional levels.

For some types of state-imposed forced labour for which sex disaggregation was not available, such as communal services, a sex share was imputed based on other available sources related to the specific population.

Photo: IOM Sibylle Desjardins.

Chapter 7.
Forced marriage

The methodology for estimating prevalence of forced marriage is aligned with that applied to estimating forced labour insofar as it is relevant. Specifically, sampling, weighting, treatment of refusals, and imputation for non-sample countries are as described earlier for forced labour. The key difference was that the weighted linear model used to impute prevalence values for the missing countries consisted only of geographic variables as covariates. The approach for estimating forced marriage is set out below.

Concepts and definitions of forced marriage

Forced marriage refers to situations where a person has been forced to marry without giving their full and free consent to the marriage.[23] A forced marriage might occur under physical, emotional, or financial duress as a result of deception by family members, the spouse, or others, or by the use of force or threats or severe pressure. These marriages are prohibited by several international conventions,[24] including those that prohibit slavery and slavery-like practices, including servile marriage. Other forms of exploitation can also occur within the context of a forced marriage, such as human trafficking and forced labour.[25] Importantly, the practice of arranged marriage is present in many cultures and is distinguished from forced marriage by the presence of consent of both parties to the marriage. However, where consent is present, coercion can still manifest in various forms, including exchange or trade-off marriages, servile marriages, and levirate[26] marriages.

As set out in the joint general recommendation of the UN's Committee on the Elimination of Discrimination against Women (CEDAW) and the Committee on the Rights of the Child (CRC), child marriage is considered a form of forced marriage, given that one and/or both parties cannot express full, free, and informed consent due to their age.[27] However, 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.

For the current estimates, the measurement of forced marriage is limited to marriages of both adults and children that respondents to the survey reported as having been forced without consent. As a result, 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.

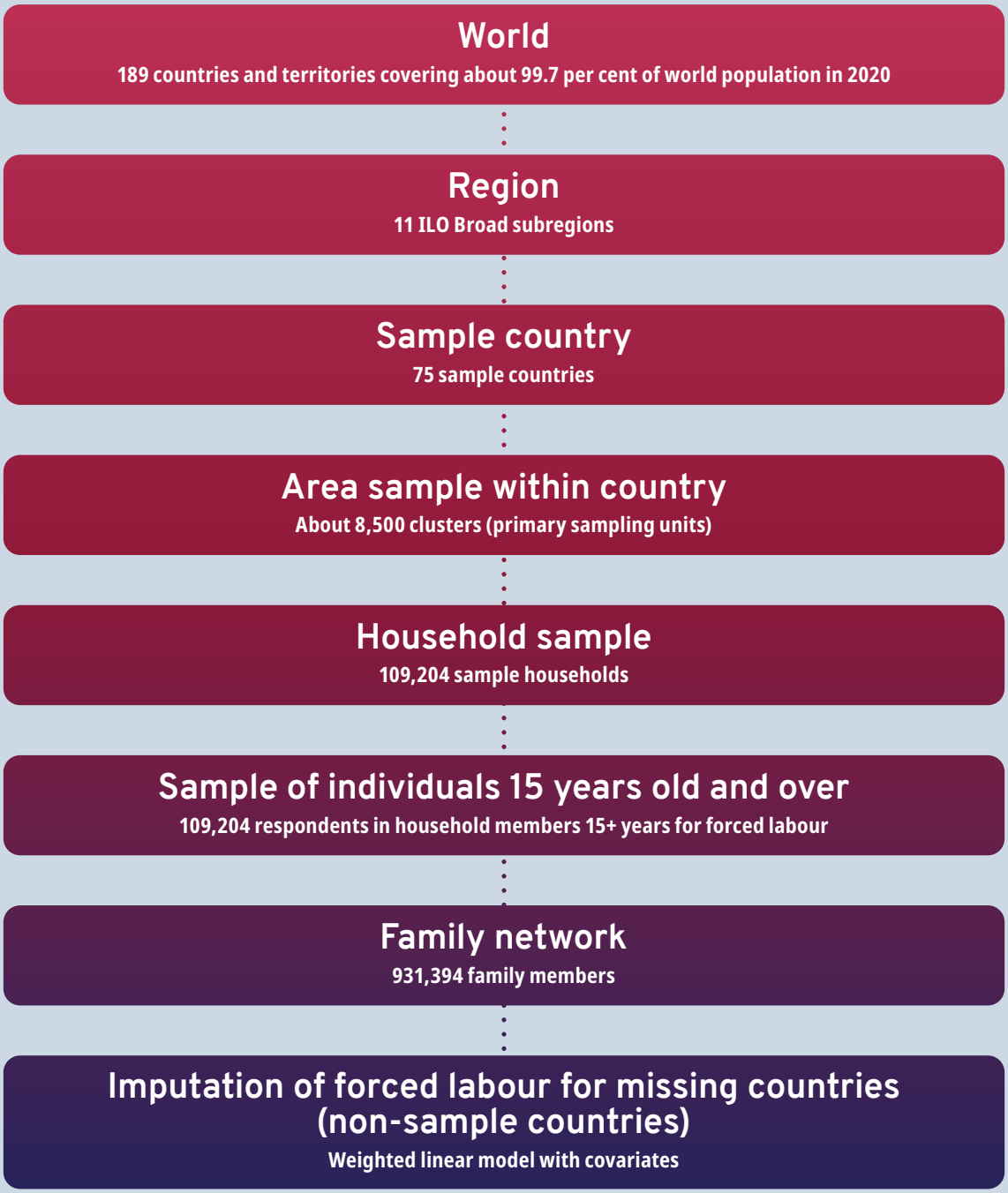
Nationally representative household surveys

The estimates of forced marriage are derived from nationally representative household surveys in 75 countries conducted during the 2017-2021 period, using a common set of questions on forced marriage. In addition to the 71 surveys conducted through the Gallup World Poll between 2017 and 2021, an additional four surveys were conducted in Kuwait, Qatar, Saudi Arabia, and United Arab Emirates in 2021 to address the absence of data collection on forced marriage in the Arab States region. Surveys conducted in 2017 and 2019 used face-to-face interviewing, but those conducted after the emergence of the COVID-19 pandemic were carried out by telephone interviewing.

A total of 109,204 respondents were interviewed across the 75 survey countries. The essential elements of the sample structure are schematically presented in hierarchal order in Figure 4. The survey respondents were asked questions about their own experiences of forced marriage and those of their immediate family network. The combined samples result in 931,394 persons sampled when family networks are included.

Figure 4.

Sample scheme for the global estimate of forced marriage



Questionnaire design and counting rules

The global estimates of forced marriage are based on those who reported having been forced to marry in the last five years, without their consent, and those who were forced to marry before that time but remain in the marriage. 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[28] of the original survey instrument and is important as it limits overcounting. While reducing the likelihood of capturing false positives is important, we may be excluding some cases of forced marriage as the concept of "consent" is complex and the current measures are quite blunt. A great deal more research is required to better understand the concept of "consent" and how to better capture this in survey research. Table 23 presents the survey items used to generate global forced marriage estimates.

Table 23.

Outline of questionnaire on forced marriage in the household surveys

Questions	Description
P1-P4, WP1223	Identification of immediate family network
WP5	Country of current residence
WP4657, WP9048	Native or foreign born; country of birth
WP1223	Marital status
WP1220	Current age
P15	Inquiry on forced marriage experience by anyone among immediate family
P17-P20	Who in the immediate family was forced to marry
P18	Sex of the person forced to marry
P19	Age of person now
P20	Age of person at time of marriage
P21	Whether consented to the marriage

Panel 1.

National surveys on forced marriage in the Arab States

A substantial lack of data on modern slavery in Gulf Cooperation Council countries led to a very low estimate for the Arab States subregion in the 2017 Global Estimates of Modern Slavery. This was partly due to the key populations of interest being hard to access and the high level of sensitivity of the subject matter. To close this gap and improve our understanding of forced marriage in this subregion, an alternative approach was adopted in this subregion.

Nationally representative telephone surveys on forced marriage were conducted in four Gulf Cooperation Council countries where significant data gaps on forced marriage exist: Saudi Arabia, United Arab Emirates, Kuwait, and Qatar. Sample selection was by Random Digit Dialling (RDD) of home and mobile telephones using the Computer-Assisted Telephone Interviewing (CATI) system to reach the target sample of 2,000 people per country. A Customer Relationship Management (CRM) system was used to automatically filter non-working numbers. Any busy signals, missed calls, or temporarily closed numbers were re-dialled to provide respondents a second chance to appear. National-level quotas for sex, age, and location based on the most recent national census data were used to increase representativeness of the sample. The target population was persons aged 18 years and older who reside in the survey country, regardless of nationality, providing they could speak Arabic. Respondents reported on their own experiences of forced marriage, as well as those of their immediate family network (parents, siblings, children, and spouse).

The target sample of 2,000 was achieved in Kuwait, Qatar, and United Arab Emirates, and a sample of 1,996 was achieved in Saudi Arabia. Individual-level weights of the full sample of respondents and their immediate family network were calibrated to population totals from the most recent national census to further improve representativeness of the sample. Questions on forced marriage mirrored those from the World Poll questionnaire module on forced marriage to allow the datasets to be combined for analysis.

To improve the precision of the weights, the number of landline and mobile telephones was imputed based on a subset of 300 persons in the sample who were followed-up by telephone and re-interviewed to gather additional information on their probability of selection and that of those in their immediate family network, including number of telephones and whether they were overseas at the time of interview. This information was also used to impute whether a sibling or child was overseas at the time of interview among the responses for which this was unknown. It should be noted that, while these approaches to weight adjustment were done to improve the accuracy of the estimates, imputing probability of selection for some members of the sample will likely have introduced some bias. Specifically, bias may have been introduced by inflating the chance of selection of some who may, in reality, have had no chance of selection because they were out of the country, or a smaller chance of selection because they had access to fewer telephones than were imputed. Equally, this approach may have decreased the probability of selection (in some cases to zero) for those who, in reality, were in the country or had access to a greater number of telephones than was imputed.

The counts of forced marriage for global estimation were identified according to a precise counting rule expressed in terms of three criteria:

(1) respondents who answered "yes" to the forced marriage question in relation to their own experience, or on behalf of a spouse, child, parent or sibling, AND

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

(3) the person was still in the marriage during the reference period, regardless of when the forced marriage took place.

The time period in which the forced marriage took place was calculated based on responses to current age and age at time of forced marriage. These criteria are set out in Table 24 below.

Table 24.

Counting rule for identifying a person living in a forced marriage in the past five years

	Criterion	Answer categories to survey questionnaire
1	Forced marriage within the family network	P15= "Yes" or "Refused"
2	Marriage without consent	P21 = "No" or "Refused", "Don't know" not admitted
3	Living in forced marriage in the 5-year reference period	WP1220 – P20 <= 5 if SELF OR P19 – P20 <= 5 if FAMILY MEMBER

The estimate of forced marriage is presented as a stock figure, representing all people living in a forced marriage in the reference period. Given the socio-cultural context of forced marriage, it was assumed that such marriages are likely to last for at least the five years of the reference period.

Treatment of particular issues

This section describes the particular issues that were encountered in the analysis of the survey responses and the special treatments that were applied in the data processing. These concern the treatment of refusals and other non-responses to the key survey questions, the effect of memory lapses on survey responses, and the impact of proxy response as opposed to self-response.

Refusals

Refusals were dealt with in a manner consistent to those found in the forced labour dataset. Two types of refusals were singled out for special statistical treatment:

1. refusal to answer the question "forced to marry?" (P15==4);
2. refusal to answer question "did you consent to the marriage?" (P21==4).

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.

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

Self-response versus proxy response

The analysis of the survey results revealed that, in general, respondents were able to provide more ample information on their own forced marriage experience than that of their family members. Table 25 shows the total number of adults in forced marriage at any time during the last five years identified in the national surveys by type of response. Altogether, the surveys identified 3,218 adult persons who have experienced forced marriage, representing a prevalence rate of 3.9 per thousand. The prevalence rate was 12.1 per thousand for self-respondents, almost five times the rate for proxy response on experience of spouse or partners (2.6 per thousand), and significantly higher than the rate for proxy response on siblings (2.7 per thousand), or on parents (1.6 per thousand) or children (1.0 per thousand).

Table 25.

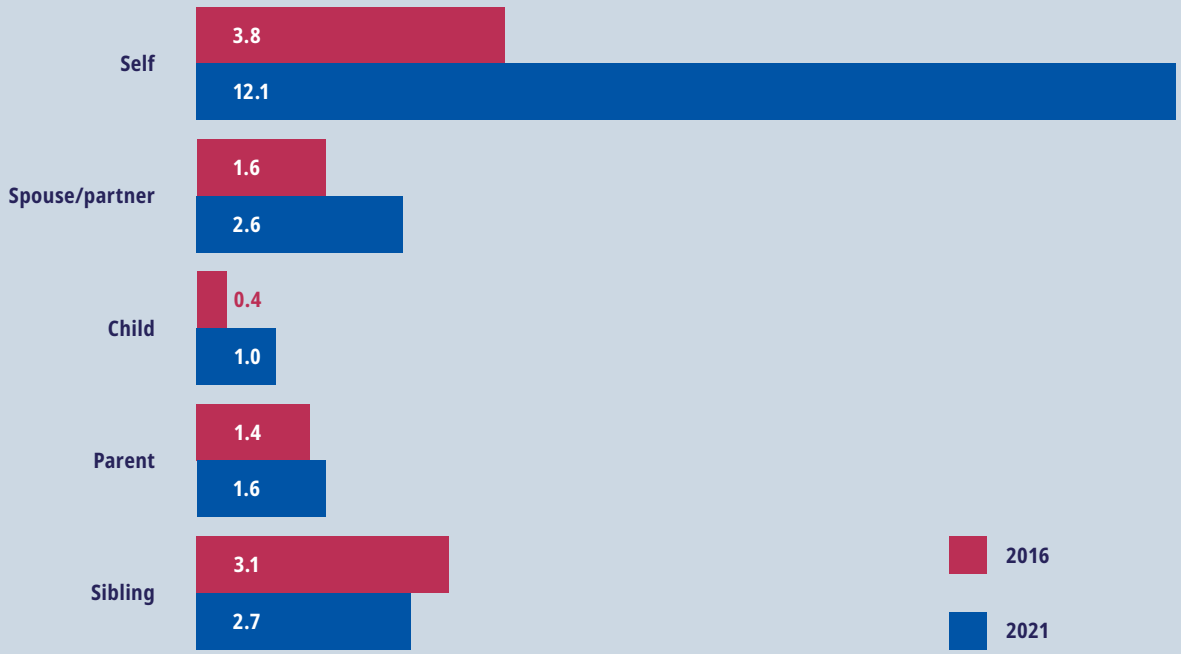
Prevalence of forced marriage by type of response (Not weighted)

Self-response versus proxy response on family members	Total number in family network	Persons living in forced marriage in last 5 years	Rate per '000
Total	**826,300**	**3,218**	**3.9**
Self	109,204	1,318	12.1
Spouse/partner	60,205	154	2.6
Child	182,080	174	1.0
Parent	115,305	188	1.6
Sibling	359,686	960	2.7
Other (Don't know or Refused)	—	424	—

The higher reported prevalence for self-response in the current global estimates of forced marriage is consistent with the pattern observed in the national surveys used in the *2017 Global Estimates of Modern Slavery* (see Figure 5).

Figure 5.

Prevalence of forced marriage in the last five years by type of response (Not weighted) 2016 versus 2021



This phenomenon could be because respondents tend to know more about their own experience than about those of their family members, and therefore are more likely to respond affirmatively to the survey questions about themselves. However, it can also be argued that respondents may have the tendency to exaggerate their own forced marriage experience while understating those of their family members, particularly where they may have played a role in bringing about the forced marriage. Either way, the reported prevalence rate of forced marriage would still be higher for self-responses relative to proxy responses. The lower rate of proxy respondents is treated by means of giving more weight to responses obtained from self-responses than to proxy responses.

Photo: NRECA International.

Chapter 8.
Evaluation of results

This final chapter evaluates the results of the global estimation of forced labour and forced marriage. It examines, in particular, the coverage of the underlying data and the standard errors of its core element, the global estimates of adult forced labour exploitation. It also examines the impact of the COVID-19 pandemic on the estimates and the comparability of the results with the 2017 edition of the Global Estimates of Modern Slavery.

Data limitations and comparability

One of the limitations of the 2017 edition of the Global Estimates of Modern Slavery was the treatment of the set of survey countries used to produce the Global Estimates as a random sample of the countries of the world, while in fact the survey countries were not selected randomly, but for specific reasons. In this edition of the Global Estimates of Modern Slavery, attempts were made to overcome the limitation by using methodologies designed for nonprobability samples and imputing values for the missing countries. The models involved in the imputation process are, of course, themselves subject to errors and, therefore, the resulting global estimates should not be considered as hard figures.

Another issue concerns the scope of the underlying data. While more countries with national surveys were conducted for this edition of global estimation than for the previous edition, certain ILO broad subregions remained uncovered or with limited coverage, in particular, Northern America and the Arab States. Also, no data were available for some of the most populated countries of the world, notably the People's Republic of China. For India and Pakistan, in which surveys were undertaken, the survey estimates could not be used due to the fragility of the underlying data, resulting most likely from the limitations of the field operations imposed by the COVID-19 pandemic. Also, as in the previous edition, surveys could not be conducted in countries experiencing profound and current conflicts. With the breakdown of the rule of law and loss of social supports, the risk of forced labour and forced marriage is likely to be higher in such countries, and therefore their omission is expected to understate the true global figures.

Coverage issues also arise from the sampling frame being limited to the non-institutionalised population. This means that those residing in institutions such as orphanages, mental health facilities, care homes, migrant detention centres, drug rehabilitation centres, and prisons do not have a chance of being sampled. While forced labour in prisons is accounted for in the methodology used to estimate state-imposed forced labour, and some instances of exploitation within institutions might be indirectly captured through survey respondents reporting on their family members' experiences, the institutionalised population remains underrepresented in the data. Additionally, temporary or informal settlements, such as displacement camps, are excluded from the sample. Yet we know that those impacted by humanitarian disasters face greater risks of some forms of modern slavery. By excluding them, the estimates based on these data may underestimate the size of the problem.

The COVID-19 pandemic no doubt affected the data obtained from all countries where data collection was conducted in 2020 and after. The surveys in these countries had to be conducted by telephone interviewing rather than face-to-face interviewing as in surveys conducted prior to the pandemic. Apart from the measurement aspect, because of its impact on the labour market and the movement of workers within and across countries, the COVID-19 pandemic must have also affected forced labour itself. These aspects are examined in more detail at the end of this chapter.

The available data show that most people in forced labour are exploited in their country of birth. The data also show that international migrants are more than three times more likely to be exploited for forced labour than non-migrants. However, the data do not allow for a similar statistic to be generated for internal migration for the Global Estimates and it is likely that internal migration presents some of the same risk factors that increase vulnerability to forced labour as international migration; particularly in the context of rapid urbanization. These may include, for example, engaging in labour markets with high transaction costs, including information asymmetries, high ex-ante fees, lack of support structures at destination, and reliance on unregulated recruitment intermediaries. Thus, data are needed not only on international migration, but also on internal migration.

Another issue concerns the estimates of forced commercial sexual exploitation and forced labour of children. These estimates were built on models of profiles of assisted victims of trafficking in persons in the CTDC dataset compiled by IOM and its partners. There are well-documented limitations in using such data.[29]

Because of the changes in some aspects of the methodology and the expansion of the data coverage, the global estimates on forced labour obtained in the present edition are not truly comparable with the estimates of the previous edition. The comparison is also impaired by the high variability of the estimates, especially at the ILO broad subregional level and for global and regional disaggregation. Forced labour and forced marriage are not only rare phenomena, difficult to capture in sample surveys and administrative sources, but also hard to measure through survey questionnaires and administrative reporting systems. The result is that the estimates have relatively high sampling errors and a low degree of replicability. Even without changes in methodology and data coverage, the estimates are likely to exhibit high variability, making comparison over time somewhat hazardous.

Coverage of national surveys

Forced labour

The national surveys on forced labour and forced marriage cover the resident population of the countries in which the surveys were conducted, and indirectly the countries of exploitation identified by the survey responses to the question on where forced labour exploitation last took place. Table 26 shows the population coverage of the national surveys of forced labour both in terms of the country of residence at the time of the survey and country of last exploitation. Accordingly, the resident population covered by the 68 national surveys for

the estimation of forced labour constituted about 37.4 per cent of the world population. The major regions of Africa, Americas, and Europe and Central Asia had the highest coverage rates, each at about 57 per cent. The absence of the People's Republic of China among the countries with national surveys and the discard of the survey data of India because of their fragility resulted in making Asia and the Pacific the region with the lowest coverage rate, 22.5 per cent. The region with the next lowest coverage rate was the Arab States with the coverage rate of about 34.0 per cent.

Table 26.

Coverage of national surveys on forced labour by major region

	ILO Regional grouping Major region	Total number of countries and territories[1]	National surveys		Countries and territories of exploitation identified in national surveys [3]	
			Number of countries	Population coverage[2]	Number of countries	Population coverage [2]
	World[1]	**189**	**68**	**37.4%**	**129**	**95.6%**
1	Africa	54	18	57.6%	34	87.9%
2	Americas	33	12	57.4%	18	96.4%
3	Arab States	12	3	34.0%	11	97.0%
4	Asia and the Pacific	39	15	22.5%	25	98.4%
5	Europe and Central Asia	51	20	56.5%	41	92.6%

Notes: (1) *World* refers to the 189 countries and territories defined by the ILO Department of Statistics for statistical purposes, grouped here into five major groups according to the ILO regional groupings.

(2) UN population 2020, World Population Prospects: The 2021 Revision

(3) Some of the survey responses on country of exploitation were expressed in broad terms such as "Africa," "Arab countries," or "Islamic countries." There were also cases where the reported country of exploitation was not among the 189 ILO countries and territories, such as "Andorra." Finally, there were a few "don't know" or "refusals."

Table 26 shows that 129 countries of exploitation were identified in the 68 national surveys. The combined population of these countries formed about 95.6 per cent of the world population. In this sense, Asia and the Pacific had the highest population coverage at 98.4 per cent, followed by the Arab States at 97.0 per cent and the Americas at 96.4 per cent. The major regions with the lowest population coverage, measured in terms of the population of the countries of exploitation, were Africa at 87.9 per cent and Europe and Central Asia at 92.6 per cent.

Table 27.

Coverage of national surveys on forced marriage by major region

	ILO Regional grouping Major region	Total number of countries and territories	National surveys	
			Number of countries	Population coverage[2]
	World [1]	**189**	**75**	**56.5%**
1	Africa	54	18	60.2%
2	Americas	33	12	55.4%
3	Arab States	12	7	67.3%
4	Asia and the Pacific	39	17	55.5%
5	Europe and Central Asia	51	21	56.4%

Notes: (1) *World* refers to the 189 countries and territories defined by the ILO Department of Statistics for statistical purposes, grouped here into five major groups according to the ILO regional groupings.
(2) UN population 2020, World Population Prospects: The 2021 Revision

Forced marriage

Table 27 shows the population coverage of the national surveys of forced marriage. The resident population covered by the 75 national surveys for the estimation of forced marriage constituted about 56.5 per cent of the world population. The Arab States region had the highest coverage rate of 67.3 per cent, followed by Africa with 60.2 per cent. The lowest coverage rates were in Asia and the Pacific and the Americas, both with 55 per cent.

Cross-validation of the global estimates

In this section, first the validity of the trend of the global estimate in comparison with the past estimate is assessed using a matched-sample procedure, and the performance of the imputation model used in the calculation of the global estimate of forced labour is examined using leave-one-out cross-validation.

Matched-sample comparison

As mentioned earlier, due to the differences in methodology and coverage of survey countries, the global estimate of adults in forced labour exploitation and people in a forced marriage calculated in the present edition is not strictly comparable with the corresponding estimate obtained in the previous edition. To provide a sounder basis for comparison and validation of the trend, the global estimate was recalculated using the same methodology as in the previous edition using the same set of countries covered in that edition. This matched-sample estimate is shown in Table 28 along the corresponding global estimate of the previous edition. For the sake of completeness, the global estimate of adult forced labour exploitation based on the full sample and methodology used in the present edition is reproduced in the first row of the table. It can be observed from the second row of the table that the matched-sample estimate of the global number of adults in forced labour exploitation is about 15.232 million; that is, about 800,000 lower than the full-sample estimate but considerably higher than the comparable estimate in 2016.

Table 28.

Matched-sample[(1)] comparison of global estimates: 2020 versus 2016

	2020	2016
Forced labour		
Full-sample estimate	16,017,000	—
Matched-sample estimate	15,232,000	12,995,000[(2)]
Forced marriage		
Full-sample estimate	21,993,000	—
Matched-sample estimate	16,651,000	15,442,000[(3)]

Notes: (1) Global estimate of adult forced labour exploitation and global estimate of forced marriage calculated based on same methodology and sample countries covered in the 2016 edition.

(2) *Global Estimates of Modern Slavery: Forced Labour and Forced Marriage, Methodology*, ILO, Walk Free Foundation in partnership with IOM, Geneva, 2017, Table 1, p. 15.

(3) As above.

This result provides a measure of confidence that the positive trend of adult forced labour exploitation found in 2020 when compared with 2016 may be valid at the global level. In fact, the global estimate for 2020 obtained using the current methodology but applied to the matched sample of countries covered in the previous edition is 15,754,000. Combining this result with those of the table, we may decompose the difference between the 2020 global estimate (16,017,000) with the 2016 global estimate (12,995,000) into three components: 522,000 attributable to the change of methodology (15,754,000 – 15,232,000); 263,000 attributable to the increase in coverage of countries (16,017,000-15,754,000); and 2,737,000 attributable to *real* change (15,232,000 – 12,995,000) or, more precisely, the trend controlled for the change in methodology and increased coverage of the survey countries.

Similar results were obtained for estimates of forced marriage. The matched-sample analysis indicates that the positive trend in 2020 when compared to 2016 is valid at the global level. While the methodology for estimating forced marriage did not change substantially between editions, the number of countries surveyed increased. The estimate obtained using the current methodology but applied to the matched sample of countries covered in the previous edition is 16,651,000. This controls for the increased coverage of survey countries in 2020 and points to a *real* change of 1,209,515 (16,651,000 – 15,441,000).

Leave-one-out cross-validation

The main change in the methodology of the present edition of global estimation compared with the previous methodology is the imputation procedure used for the statistical treatment of the countries in which national surveys were not conducted. To evaluate the performance of the imputation model and assess the impact of the change, a series of calculations was made according to which, at each round, a country with a national survey was left out of the calculation and its imputed value was compared with the actual country estimate. The differences between the predicted and actual values were then averaged in the form of the mean squared error or leave-one-out cross-validation (LOOCV),

$$LOOCV_y = \frac{1}{n}\sum_{j=1}^{n}(y_j - \hat{y}_{[j]})^2$$

where n refers to the number of countries with national surveys; y_j is the survey estimate for country j; and $\hat{y}_{[j]}$ the predicted value under the imputation model in which country j is left out of the calculation. The leave-one-out cross-validation thus measures how well the predictions made by the model match the survey estimates. The square-root of $LOOCV_y$ measures the average deviation between the imputed values and the national estimates.

Similarly, one may measure the performance of the imputation model on the global estimate by repeated comparison of the global estimates obtained by leaving one survey country out of the calculation at a time. The global cross-validation may be expressed as,

$$LOOCV_t = \frac{1}{n}\sum_{j=1}^{n}(\hat{t} - \hat{t}_{[j]})^2$$

where $\hat{t}$ is the global estimate obtained with the full set of survey countries and $\hat{t}_{[j]}$ refers to the global estimate obtained by leaving out the survey country *j*. The square root of $LOOCV_t$ thus measures the average deviation between the global estimate and the global estimate obtained by imputing all missing countries as well as an additional country with national survey.

The results are shown in Table 29. The value in the first cell of the table indicates that an average estimate of the number of adults in forced labour exploitation is about 105,400 per survey country. The next cell in the top row indicates that the average deviation of an imputed value from the survey estimate is about 99,300. This is a very high figure, indicating that the deviation of the imputed value has almost the same order of magnitude as the estimate itself (94.3 per cent).

Table 29.

Cross-validation of estimates of adult forced labour exploitation

	Average Estimate	root LOOCV	Per cent
Forced labour			
Country estimate	105,400	99,300	94.3
Global estimate	16,016,900	198,300	1.2

The bottom row of the table indicates that the average deviation of the global estimates obtained by replacing a survey estimate with its imputed value is about 198,300, roughly about 1.2 per cent of the global estimate obtained from the full sample of survey countries. These results suggest that the performance of the imputation models is reasonably adequate for global estimation, but highly inaccurate for country estimation. In other words, one may say that the imputation models produce highly volatile estimates at the country level, but relatively stable estimates at the global level.

Standard errors of the global estimates of adult forced labour exploitation and forced marriage

The global estimates of adult forced labour exploitation and forced marriage are derived from national surveys and an imputation model for countries with no national surveys. The national surveys are based on probability samples of the population residing in those countries. But, as the survey countries themselves are not necessarily a probability sample of the total number of countries and territories, the national surveys constitute, in fact, a non-probability sample of countries and territories. Thus, there are two sources of variation in the global estimates, the variation introduced by the probability samples of the national surveys, and the variation introduced by the imputation model used for covering the countries without national surveys. The variation due to the probability samples of the survey countries are measured by the sampling errors of the national surveys. The variation due to the imputation model is harder to measure. Elliott and Valliant, cited earlier, discuss the measurement of variance in non-probability samples.[30] Here, the variance is measured by comparing the global estimates that would be obtained if different sets of survey countries were used as the underlying datasets.

A simple way to cover both sources of variation is to take the existing national surveys and delete one for calculating the global estimates. This gives a different sample from the original full sample of countries and results in a different value of the global estimate. Carrying on a similar process by omitting one country from the calculation each time, a different set of global estimates is obtained. The standard error of these values is then considered to be the variation of the global estimate. The method is essentially the same as the leave-one-out cross-validation described earlier and corresponds to the jack-knife method (iii) mentioned in Elliott and Valliant.[31] The results are shown in Table 30.

Table 30.

Standard errors of global estimates of adult forced labour exploitation

	Estimate	Standard error	Coefficient of variation	Confidence interval[1] Lower	Confidence interval[1] Upper
Forced labour					
Aggregate number in '000	16,017	198	1.2%	15,629	16,405
Prevalence rate per '000[2]	2.95	0.04	—	2.87	3.02
Forced marriage					
Aggregate number in '000	21,993	521	2.4%	19,094	24,893
Prevalence rate per '000[3]	2.82	0.07	—	2.45	3.20

Notes: (1) The confidence intervals are calculated at the 95 per cent level.
(2) Prevalence rate calculated in relation to total adult population.
(3) Prevalence rate calculated in relation to total population.

According to these results, the global estimate of adult forced labour exploitation (16.017 million) has a standard error of about 198,000 and could vary, with 95 per cent confidence, between about 15.629 and 16.405 million, depending on the set of the underlying national surveys. The coefficient of variation of the global estimate, calculated as the ratio of the standard error to the estimate, is 1.2 per cent. The standard error of the global prevalence rates is shown in the second line of the table. The prevalence rate is calculated as the number of adults in forced labour exploitation per one thousand adult persons. The population figure used for the calculation is assumed to be fixed with no sampling errors. According to the results presented in Table 30, the confidence interval of the prevalence rate is rather narrow with a lower bound of 2.87 per thousand and upper bound of 3.02 per thousand.

The global estimate of forced marriage (22 million) has a standard error of about 521,000 and could vary, with 95 per cent confidence, between about 19.1 and 24.9 million. The coefficient of variation of the global estimate is 2.4 per cent. The confidence interval of the prevalence rate is rather narrow with a lower bound of 2.45 per thousand and upper bound of 3.2 per thousand.

The purpose of Table 30 is to indicate that the global estimates of adult forced labour exploitation and forced marriage are imprecise, subject to errors due

to the choice of the underlying sample countries and the values obtained. The relatively low standard errors shown in the tables may be giving a false sense of precision. The standard errors are calculated assuming that the imputation model is correctly specified and the observed variations have a zero expected value. Also, the reported standard errors do not account for the sampling errors of the national estimates themselves.

Actual number of observations

The global estimates of adult forced labour exploitation and the various other components and sub-components of forced labour and forced marriage may also be assessed in terms of the actual number of observations on which they are based. Aside from state-imposed forced labour, the estimates of the various forms were calculated on the basis of the sample observations identified from the national surveys as adults in forced labour exploitation and adults and children in forced marriage, and 9,439 cases of trafficking in persons registered by IOM and its partners in the CTDC database between 2017 and 2021. The total and its breakdown are shown in Table 31 and compared with the corresponding numbers used in the previous edition of global estimation (2016).

Table 31.

Number of records in the global estimates of modern slavery

	Number of records		
	2020	2016	Source
Forced labour exploitation	**9,405**	**6,899**	
1. Adults	2,990	1,987	Survey observations
2. Adults	5,885	4,232	(CTDC in 2020, IOM in 2016)
3. Children	530	680	(CTDC in 2020, IOM in 2016)
Forced commercial sexual exploitation	**3,024**	**935**	
1. Adults	2,343	761	CTDC registered cases
2. Children	681	174	CTDC registered cases
Forced marriage	**3,218**	**1,073**	
1. Adults	1,985	739	Survey observations
2. Children	1,232	334	Survey observations
Total	**15,647**	**8,907**	

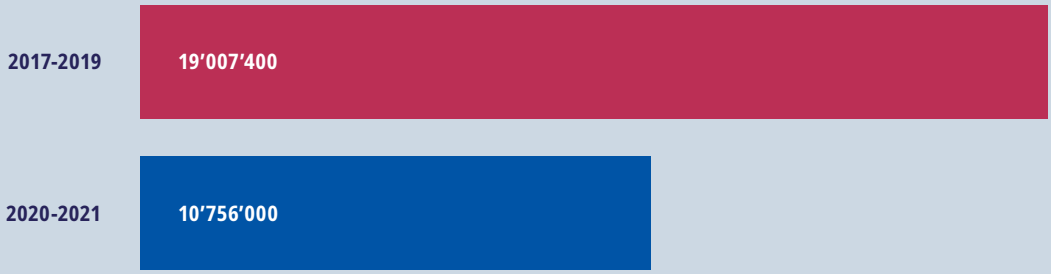
The table shows that the actual number of observations used in the present edition of global estimation (2020) are higher than those used in the previous edition (2016) for all sub-components of forced labour and forced marriage. The increase reflects in part the higher number and the wider coverage of the underlying surveys and administrative records, but also the increased prevalence of forced labour and forced marriage during the period.

Impact of the COVID-19 pandemic on forced labour exploitation of adults

The impact of the COVID-19 pandemic was assessed using three different methods. The first method calculated the global estimate of adult forced labour exploitation on the basis of the national surveys conducted before the start of the pandemic in 2020 and compared it with the corresponding estimate obtained on the basis of the national surveys conducted after the start of the pandemic. The results, shown in Figure 6, indicate that the global estimate of adult forced labour exploitation would have been about 19 million before the start of the pandemic but less than 11 million after the pandemic, representing a drop of about 43 per cent. It should be borne in mind that the national surveys used for the pre-pandemic global estimate are not the same as those used for the post-pandemic estimate.

Figure 6.

Comparison of global estimates of adult forced labour exploitation based on national surveys before and after the start of the COVID-19 pandemic in 2020



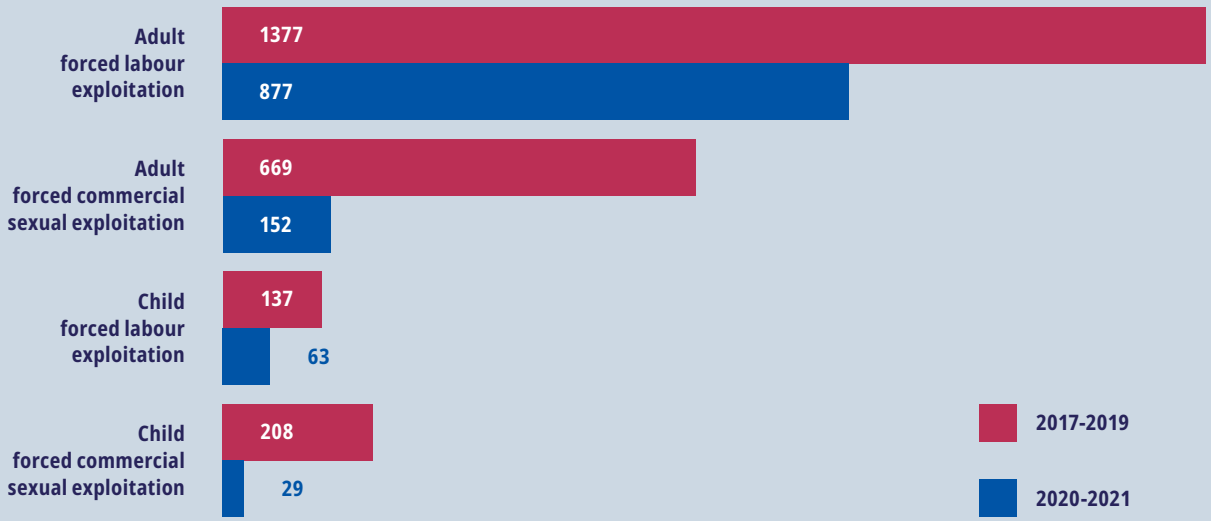
Given that the data collected in national surveys conducted after the start of the pandemic were based on telephone interviewing instead of face-to-face interviewing used in surveys before the pandemic, the drop of 43 per cent calculated above is likely to reflect both the effect of the mode of interviewing as well as the labour market effect of the pandemic on the cases of forced labour.

A second method was also used, based on the administrative sources. Figure 7 compares the average annual number of cases of trafficking for forced labour and commercial sexual exploitation registered by IOM and its partners in the CTDC database before and after the start of the COVID-19 pandemic in 2020. It can be observed that the number of cases registered is uniformly lower after the start of the pandemic than before it. There were on average 1,377 cases of adult forced labour exploitation registered per year before the start of the pandemic, compared with 877 after the pandemic, representing a drop of about 36 per cent. Likewise, there were on average 669 cases of adult forced commercial sexual exploitation registered per year before the start of the pandemic compared with 152 after the pandemic, representing a much larger drop of about 77 per cent. The changes in the number of registrations for children follow a similar pattern, about 54 per cent drop in the case of child forced labour exploitation and more than 86 per cent drop in the case of child forced commercial sexual exploitation.

The COVID-19 pandemic may have also affected the process of inspections and recording of cases in the administrative data. As to administrative sources of data, including CTDC, COVID caused disruptions in victim identification and protection operations in a range of different contexts. This likely led to a decrease in the number of administrative records created compared to the counter-factual situation where there was no pandemic. For instance, anti-trafficking actors' access to communities and cases of concern was hindered, reducing the opportunities for identification. The population's access to facilities and services were also impacted. Anti-trafficking actors also had to adapt protection programming to be undertaken remotely which also changes the availability, recording and processing of data on identified victims of trafficking. Thus, the observed drop in forced labour cases discussed above likely reflects both the impact of these dynamics on the number and completeness of administrative records collected and processed by IOM and CTDC partners, as well as the effect of the pandemic on forced labour cases.

Figure 7.

Comparison of average annual number of cases of trafficking for forced labour and commercial sexual exploitation registered by IOM and partners in the CTDC database before and after the start of the COVID-19 pandemic in 2020



A third method to assess the labour market impact of the pandemic on forced labour is based on the special data collected with questions on COVID-19 included in the national surveys conducted after the start of the pandemic in 2020. The questions have been listed earlier as part of the section on questionnaire design. Table 32 presents the main results. Here, the total number of adults in forced labour exploitation in the national surveys was 2,990, of whom 1,007 were identified in the national surveys conducted after the start of the pandemic in 2020. The special questions on COVID-19 could therefore be administered only to these persons. On the question concerning their current situation, 157 reported to be still in a situation of forced labour (or refused to reply or did not know), and 850 reported to not be any more in a situation of forced labour. Among these, 611 reported that their forced labour situation stopped before 2020 (or refused to reply or did not know), while 239 reported that their forced labour situation stopped in 2020, and among them 77 reported that the main reason for the change of situation was the COVID-19 pandemic. This means that about a third of the adults freed from forced labour exploitation in 2020 attributed their change of situation

to the COVID-19 pandemic. The other two-thirds attributed their change of situation due to end of contract (145), dismissal by the employer (110), or other reasons. This method indicates that forced labour situation stopped in 2020 due to the COVID-19 for a significant number of workers.

Table 32.

Reported role of COVID-19 in the national surveys

	Number	Per cent	Survey question
Total number of adults in forced labour exploitation in last 5 years identified in national surveys	2990	100%	counting rule
Number identified in national surveys before 2020	*1983*	*66%*	*year_wave*
Number identified in national surveys after 2020	*1007*	*34%*	
Number still in forced labour in 2020[(1)]	157	16%	covidp14_1
Number not any more in forced labour in 2020	850	84%	
Number stopped to be in forced labour before 2020[(1)]	*611*	*72%*	*covidp14_2*
Number stopped to be in forced labour after 2020	*239*	*28%*	
COVID-19 main reason stopped to be in forced labour	77	32%	covidp14_6
Other reasons stopped to be in forced labour after 2020[(1)]	162	68%	

Note: (1) Number includes persons for whom "Don't Know" or "Refused" is recorded in survey question.

The results obtained from the other special questions of the national surveys conducted in 2020 show that COVID-19 also impacted those who remained in forced labour exploitation during the pandemic. Some 111 persons reported that their situation improved when the pandemic started because of the industry shutdown (37 persons) or because of the greater bargaining power due to the labour shortage created by the pandemic (17 persons). Some reported that their situation worsened when the pandemic started (90 persons) because they were made to work harder due to labour shortage caused by the pandemic (14 persons) or had to continue to work while sick (11 persons).

In sum, the impact of COVID-19 on forced labour is complex and multifaceted. While the three methods provide valuable insights, the observed decline in cases likely reflects both actual reductions and changes in measurement methods and reporting mechanisms.

Photo: ILO / Marcel Crozet.

Annexes

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
1	Algeria	DZA	Africa	Northern Africa	Lower-middle
2	Egypt	EGY	Africa	Northern Africa	Lower-middle
3	Libya	LBY	Africa	Northern Africa	Upper-middle
4	Morocco	MAR	Africa	Northern Africa	Lower-middle
5	Sudan	SDN	Africa	Northern Africa	Low
6	Tunisia	TUN	Africa	Northern Africa	Lower-middle
7	Western Sahara	ESH	Africa	Northern Africa	Lower-middle
8	Angola	AGO	Africa	Sub-Saharan Africa	Lower-middle
9	Benin	BEN	Africa	Sub-Saharan Africa	Lower-middle
10	Botswana	BWA	Africa	Sub-Saharan Africa	Upper-middle
11	Burkina Faso	BFA	Africa	Sub-Saharan Africa	Low
12	Burundi	BDI	Africa	Sub-Saharan Africa	Low
13	Cameroon	CMR	Africa	Sub-Saharan Africa	Lower-middle
14	Cabo Verde	CPV	Africa	Sub-Saharan Africa	Lower-middle
15	Central African Republic	CAF	Africa	Sub-Saharan Africa	Low
16	Chad	TCD	Africa	Sub-Saharan Africa	Low
17	Comoros	COM	Africa	Sub-Saharan Africa	Lower-middle
18	Congo	COG	Africa	Sub-Saharan Africa	Lower-middle
19	Côte d'Ivoire	CIV	Africa	Sub-Saharan Africa	Lower-middle
20	Democratic Republic of the Congo	COD	Africa	Sub-Saharan Africa	Low
21	Djibouti	DJI	Africa	Sub-Saharan Africa	Lower-middle
22	Equatorial Guinea	GNQ	Africa	Sub-Saharan Africa	Upper-middle
23	Eritrea	ERI	Africa	Sub-Saharan Africa	Low
24	Eswatini	SWZ	Africa	Sub-Saharan Africa	Lower-middle
25	Ethiopia	ETH	Africa	Sub-Saharan Africa	Low
26	Gabon	GAB	Africa	Sub-Saharan Africa	Upper-middle
27	Gambia	GMB	Africa	Sub-Saharan Africa	Low

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
28	Ghana	GHA	Africa	Sub-Saharan Africa	Lower-middle
29	Guinea	GIN	Africa	Sub-Saharan Africa	Low
30	Guinea-Bissau	GNB	Africa	Sub-Saharan Africa	Low
31	Kenya	KEN	Africa	Sub-Saharan Africa	Lower-middle
32	Lesotho	LSO	Africa	Sub-Saharan Africa	Lower-middle
33	Liberia	LBR	Africa	Sub-Saharan Africa	Low
34	Madagascar	MDG	Africa	Sub-Saharan Africa	Low
35	Malawi	MWI	Africa	Sub-Saharan Africa	Low
36	Mali	MLI	Africa	Sub-Saharan Africa	Low
37	Mauritania	MRT	Africa	Sub-Saharan Africa	Lower-middle
38	Mauritius	MUS	Africa	Sub-Saharan Africa	High
39	Mozambique	MOZ	Africa	Sub-Saharan Africa	Low
40	Namibia	NAM	Africa	Sub-Saharan Africa	Upper-middle
41	Niger	NER	Africa	Sub-Saharan Africa	Low
42	Nigeria	NGA	Africa	Sub-Saharan Africa	Lower-middle
43	Rwanda	RWA	Africa	Sub-Saharan Africa	Low
44	Sao Tome and Principe	STP	Africa	Sub-Saharan Africa	Lower-middle
45	Senegal	SEN	Africa	Sub-Saharan Africa	Lower-middle
46	Sierra Leone	SLE	Africa	Sub-Saharan Africa	Low
47	Somalia	SOM	Africa	Sub-Saharan Africa	Low
48	South Africa	ZAF	Africa	Sub-Saharan Africa	Upper-middle
49	South Sudan	SSD	Africa	Sub-Saharan Africa	Low
50	Togo	TGO	Africa	Sub-Saharan Africa	Low
51	Uganda	UGA	Africa	Sub-Saharan Africa	Low
52	United Republic of Tanzania	TZA	Africa	Sub-Saharan Africa	Lower-middle
53	Zambia	ZMB	Africa	Sub-Saharan Africa	Lower-middle
54	Zimbabwe	ZWE	Africa	Sub-Saharan Africa	Lower-middle

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
55	Argentina	ARG	Americas	Latin America and the Caribbean	Upper-middle
56	Bahamas	BHS	Americas	Latin America and the Caribbean	High
57	Barbados	BRB	Americas	Latin America and the Caribbean	High
58	Belize	BLZ	Americas	Latin America and the Caribbean	Upper-middle
59	Bolivia, Plurinational State of	BOL	Americas	Latin America and the Caribbean	Lower-middle
60	Brazil	BRA	Americas	Latin America and the Caribbean	Upper-middle
61	Chile	CHL	Americas	Latin America and the Caribbean	High
62	Colombia	COL	Americas	Latin America and the Caribbean	Upper-middle
63	Costa Rica	CRI	Americas	Latin America and the Caribbean	Upper-middle
64	Cuba	CUB	Americas	Latin America and the Caribbean	Upper-middle
65	Dominican Republic	DOM	Americas	Latin America and the Caribbean	Upper-middle
66	Ecuador	ECU	Americas	Latin America and the Caribbean	Upper-middle
67	El Salvador	SLV	Americas	Latin America and the Caribbean	Lower-middle
68	Guatemala	GTM	Americas	Latin America and the Caribbean	Upper-middle
69	Guyana	GUY	Americas	Latin America and the Caribbean	Upper-middle
70	Haiti	HTI	Americas	Latin America and the Caribbean	Low
71	Honduras	HND	Americas	Latin America and the Caribbean	Lower-middle
72	Jamaica	JAM	Americas	Latin America and the Caribbean	Upper-middle
73	Mexico	MEX	Americas	Latin America and the Caribbean	Upper-middle
74	Nicaragua	NIC	Americas	Latin America and the Caribbean	Lower-middle
75	Panama	PAN	Americas	Latin America and the Caribbean	High
76	Paraguay	PRY	Americas	Latin America and the Caribbean	Upper-middle
77	Peru	PER	Americas	Latin America and the Caribbean	Upper-middle
78	Puerto Rico	PRI	Americas	Latin America and the Caribbean	High
79	Saint Lucia	LCA	Americas	Latin America and the Caribbean	Upper-middle
80	Saint Vincent and the Grenadines	VCT	Americas	Latin America and the Caribbean	Upper-middle

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
81	Suriname	SUR	Americas	Latin America and the Caribbean	Upper-middle
82	Trinidad and Tobago	TTO	Americas	Latin America and the Caribbean	High
83	United States Virgin Islands	VIR	Americas	Latin America and the Caribbean	High
84	Uruguay	URY	Americas	Latin America and the Caribbean	High
85	Venezuela, Bolivarian Republic of	VEN	Americas	Latin America and the Caribbean	Upper-middle
86	Canada	CAN	Americas	Northern America	High
87	United States of America	USA	Americas	Northern America	High
88	Bahrain	BHR	Arab States	Arab States	High
89	Iraq	IRQ	Arab States	Arab States	Upper-middle
90	Jordan	JOR	Arab States	Arab States	Upper-middle
91	Kuwait	KWT	Arab States	Arab States	High
92	Lebanon	LBN	Arab States	Arab States	Upper-middle
93	Occupied Palestinian Territory	PSE	Arab States	Arab States	Lower-middle
94	Oman	OMN	Arab States	Arab States	High
95	Qatar	QAT	Arab States	Arab States	High
96	Saudi Arabia	SAU	Arab States	Arab States	High
97	Syrian Arab Republic	SYR	Arab States	Arab States	Low
98	United Arab Emirates	ARE	Arab States	Arab States	High
99	Yemen	YEM	Arab States	Arab States	Low
100	China	CHN	Asia and the Pacific	Eastern Asia	Upper-middle
101	Hong Kong SAR, China	HKG	Asia and the Pacific	Eastern Asia	High
102	Macau SAR, ChinaJapan	MAC	Asia and the Pacific	Eastern Asia	High
103	Taiwan Province of the People's Republic of, China	TWN	Asia and the Pacific	Eastern Asia	High
104	Democratic People's Republic of Korea	PRK	Asia and the Pacific	Eastern Asia	Low

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
105	Japan	JPN	Asia and the Pacific	Eastern Asia	High
106	Mongolia	MNG	Asia and the Pacific	Eastern Asia	Lower-middle
107	Republic of Korea	KOR	Asia and the Pacific	Eastern Asia	High
108	Australia	AUS	Asia and the Pacific	South-Eastern Asia, Pacific	High
109	Brunei Darussalam	BRN	Asia and the Pacific	South-Eastern Asia, Pacific	High
110	Cambodia	KHM	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
111	Fiji	FJI	Asia and the Pacific	South-Eastern Asia, Pacific	Upper-middle
112	French Polynesia	PYF	Asia and the Pacific	South-Eastern Asia, Pacific	High
113	Guam	GUM	Asia and the Pacific	South-Eastern Asia, Pacific	High
114	Indonesia	IDN	Asia and the Pacific	South-Eastern Asia, Pacific	Upper-middle
115	Lao People's Democratic Republic	LAO	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
116	Malaysia	MYS	Asia and the Pacific	South-Eastern Asia, Pacific	Upper-middle
117	Myanmar	MMR	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
118	New Caledonia	NCL	Asia and the Pacific	South-Eastern Asia, Pacific	High
119	New Zealand	NZL	Asia and the Pacific	South-Eastern Asia, Pacific	High
120	Papua New Guinea	PNG	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
121	Philippines	PHL	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
122	Samoa	WSM	Asia and the Pacific	South-Eastern Asia, Pacific	Upper-middle
123	Singapore	SGP	Asia and the Pacific	South-Eastern Asia, Pacific	High
124	Solomon Islands	SLB	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
125	Thailand	THA	Asia and the Pacific	South-Eastern Asia, Pacific	Upper-middle
126	Timor-Leste	TLS	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
127	Tonga	TON	Asia and the Pacific	South-Eastern Asia, Pacific	Upper-middle
128	Vanuatu	VUT	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
129	Viet Nam	VNM	Asia and the Pacific	South-Eastern Asia, Pacific	Lower-middle
130	Afghanistan	AFG	Asia and the Pacific	Southern Asia	Low

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
131	Bangladesh	BGD	Asia and the Pacific	Southern Asia	Lower-middle
132	Bhutan	BTN	Asia and the Pacific	Southern Asia	Lower-middle
133	India	IND	Asia and the Pacific	Southern Asia	Lower-middle
134	Iran, Islamic Republic of	IRN	Asia and the Pacific	Southern Asia	Upper-middle
135	Maldives	MDV	Asia and the Pacific	Southern Asia	Upper-middle
136	Nepal	NPL	Asia and the Pacific	Southern Asia	Lower-middle
137	Pakistan	PAK	Asia and the Pacific	Southern Asia	Lower-middle
138	Sri Lanka	LKA	Asia and the Pacific	Southern Asia	Lower-middle
139	Armenia	ARM	Europe and Central Asia	Central and Western Asia	Upper-middle
140	Azerbaijan	AZE	Europe and Central Asia	Central and Western Asia	Upper-middle
141	Cyprus	CYP	Europe and Central Asia	Central and Western Asia	High
142	Georgia	GEO	Europe and Central Asia	Central and Western Asia	Upper-middle
143	Israel	ISR	Europe and Central Asia	Central and Western Asia	High
144	Kazakhstan	KAZ	Europe and Central Asia	Central and Western Asia	Upper-middle
145	Kyrgyzstan	KGZ	Europe and Central Asia	Central and Western Asia	Lower-middle
146	Tajikistan	TJK	Europe and Central Asia	Central and Western Asia	Low
147	Türkiye	TUR	Europe and Central Asia	Central and Western Asia	Upper-middle
148	Turkmenistan	TKM	Europe and Central Asia	Central and Western Asia	Upper-middle
149	Uzbekistan	UZB	Europe and Central Asia	Central and Western Asia	Lower-middle
150	Belarus	BLR	Europe and Central Asia	Eastern Europe	Upper-middle
151	Bulgaria	BGR	Europe and Central Asia	Eastern Europe	Upper-middle
152	Czechia	CZE	Europe and Central Asia	Eastern Europe	High
153	Hungary	HUN	Europe and Central Asia	Eastern Europe	High
154	Poland	POL	Europe and Central Asia	Eastern Europe	High
155	Republic of Moldova	MDA	Europe and Central Asia	Eastern Europe	Lower-middle
156	Romania	ROU	Europe and Central Asia	Eastern Europe	High
157	Russian Federation	RUS	Europe and Central Asia	Eastern Europe	Upper-middle

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
158	Slovakia	SVK	Europe and Central Asia	Eastern Europe	High
159	Ukraine	UKR	Europe and Central Asia	Eastern Europe	Lower-middle
160	Albania	ALB	Europe and Central Asia	Northern, Southern, Western Europe	Upper-middle
161	Austria	AUT	Europe and Central Asia	Northern, Southern, Western Europe	High
162	Belgium	BEL	Europe and Central Asia	Northern, Southern, Western Europe	High
163	Bosnia and Herzegovina	BIH	Europe and Central Asia	Northern, Southern, Western Europe	Upper-middle
164	Channel Islands	CHA	Europe and Central Asia	Northern, Southern, Western Europe	High
165	Croatia	HRV	Europe and Central Asia	Northern, Southern, Western Europe	High
166	Denmark	DNK	Europe and Central Asia	Northern, Southern, Western Europe	High
167	Estonia	EST	Europe and Central Asia	Northern, Southern, Western Europe	High
168	Finland	FIN	Europe and Central Asia	Northern, Southern, Western Europe	High
169	France	FRA	Europe and Central Asia	Northern, Southern, Western Europe	High
170	Germany	DEU	Europe and Central Asia	Northern, Southern, Western Europe	High
171	Greece	GRC	Europe and Central Asia	Northern, Southern, Western Europe	High
172	Iceland	ISL	Europe and Central Asia	Northern, Southern, Western Europe	High
173	Ireland	IRL	Europe and Central Asia	Northern, Southern, Western Europe	High
174	Italy	ITA	Europe and Central Asia	Northern, Southern, Western Europe	High
175	Latvia	LVA	Europe and Central Asia	Northern, Southern, Western Europe	High
176	Lithuania	LTU	Europe and Central Asia	Northern, Southern, Western Europe	High

Annex 1.

World and regions composition[1]

	Country or, territory or area	ref_ area	Major region	Subregion – broad	Income-level of country
179	Montenegro	MNE	Europe and Central Asia	Northern, Southern, Western Europe	Upper-middle
180	Netherlands, Kingdom of the	NLD	Europe and Central Asia	Northern, Southern, Western Europe	High
181	North Macedonia	MKD	Europe and Central Asia	Northern, Southern, Western Europe	Upper-middle
182	Norway	NOR	Europe and Central Asia	Northern, Southern, Western Europe	High
183	Portugal	PRT	Europe and Central Asia	Northern, Southern, Western Europe	High
184	Serbia	SRB	Europe and Central Asia	Northern, Southern, Western Europe	Upper-middle
185	Slovenia	SVN	Europe and Central Asia	Northern, Southern, Western Europe	High
186	Spain	ESP	Europe and Central Asia	Northern, Southern, Western Europe	High
187	Sweden	SWE	Europe and Central Asia	Northern, Southern, Western Europe	High
188	Switzerland	CHE	Europe and Central Asia	Northern, Southern, Western Europe	High
189	United Kingdom of Great Britain and Northern Ireland	GBR	Europe and Central Asia	Northern, Southern, Western Europe	High

Note: (1) List of 189 countries and territories defined by the ILO Department of Statistical for statistical purposes and organized by alphabetical name in English within five major regions and 11 broad subregions according to the regional groupings of the ILO Department of Statistics.

ref_area = country three-letter ISO code.

World Bank country classification by income-level: Low; Lower-middle; Upper-middle; and High.
https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html

Annex 2.

List of survey countries

	Country or territory	Sample size
1	Afghanistan	1127
2	Albania	1000
3	Algeria	1038
4	Argentina	1060
5	Armenia	1080
6	Bangladesh	2072
7	Bolivia (Plurinational State of)	1000
8	Bosnia and Herzegovina	1001
9	Botswana	1114
10	Brazil	1080
11	Bulgaria	1004
12	Côte d'Ivoire	1020
13	Cambodia	2600
14	Cameroon	1000
15	Chile	1060
16	Colombia	1000
17	Congo	1000
18	Czechia	1004
19	Dominican Republic	1078
20	Ecuador	1002
21	Egypt	1070
22	Estonia	1000
23	Ethiopia	1121
24	Georgia	1080
25	Ghana	1010
26	Guatemala	1100
27	Honduras	1000

Annex 2.

List of survey countries

	Country or territory	Sample size
28	Hungary	1080
29	Indonesia	2192
30	Iraq	1006
31	Israel	1059
32	Italy	1000
33	Jordan	1001
34	Republic of Korea	1005
35	Lao People's Democratic Republic	1000
36	Latvia	1080
37	Lebanon	1040
38	Lithuania	1004
39	Malawi	1000
40	Malaysia	1004
41	Mauritania	1100
42	Mexico	1001
43	Republic of Moldova	1005
44	Mongolia	1070
45	Morocco	1015
46	Myanmar	1600
47	Namibia	1046
48	Nepal	2095
49	Nigeria	1000
50	Peru	1003
51	Philippines	1090
52	Poland	1080
53	Romania	1080
54	Russian Federation	2168

Annex 2.

List of survey countries

	Country or territory	Sample size
55	Senegal	1000
56	Serbia	1080
57	Singapore	1040
58	South Africa	1060
59	Sri Lanka	1083
60	Thailand	2000
61	Tunisia	1000
62	Türkiye	1000
63	Uganda	1000
64	Ukraine	1080
65	United Kingdom of Great Britain and Northern Ireland	1000
66	Venezuela (Bolivarian Republic of)	1020
67	Viet Nam	1002
68	Zimbabwe	1004
	Total	**77914**

Photo: Grace Forrest.

Endnotes

1 International Labour Office, *ILO Minimum Estimate of Forced Labour in the World*, ILO, Geneva, 2005.

2 International Labour Office, *ILO Global Estimate of Forced Labour. Results and Methodology*, ILO, Special Action Programme to Combat Forced Labour, Geneva, 2012.

3 International Labour Office (ILO) and Walk Free Foundation (WFF), in partnership with International Organization for Migration (IOM), *Global Estimates of Modern Slavery: Forced Labour and Forced Marriage, Methodology*, Geneva, 2017.

4 International Labour Organization, *Guidelines concerning the measurement of forced labour*, Twentieth International Conference of Labour Statisticians, Geneva, 2018.

5 Kyle Vincent, Statistical Consultant, "Global Estimates of Modern Slavery: A Review of the Methodology," preliminary and incomplete, April 10, 2019.

6 https://publications.iom.int/books/iom-data-protection-manual

7 https://www.ctdatacollaborative.org/story/gems2022

8 ILO, *Guidelines concerning the measurement of forced labour*, 20th International Conference of Labour Statisticians (20th ICLS), Geneva, 10-19 October 2018.

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

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

11 International Labour Organization, *Resolution concerning statistics of child labour*, 18th International Conference of Labour Statisticians, Geneva, 2008, and *Resolution to amend the 18th ICLS Resolution concerning statistics of child labour*, 20th International Conference of Labour Statisticians, Geneva, 2018.

12 The *travaux préparatoires* for the Protocol clarify that this is intended to refer to ILO C29

13 Gallup, *How does the Gallup Poll work?*, Gallup Inc.

14 International Labour Organization, *Resolution concerning statistics of work, employment and labour underutilisation*, Nineteenth International Conference of Labour Statisticians, Geneva, 2013, para. 6.

15 Seymor Sudman & Norman M. Bradburn, "Effects of Time and Memory Factors on Response in Surveys," *Journal of the American Statistical Association*, December 1973, Vol. 68, No. 344, pp. 805-815.

16 Michael R. Elliott & Richard Valliant, "Inference for Nonprobability Samples", Statistical Science, Vol. 32, No. 2 (2017): 249-264.

17 International Labour Office, *ILO Global Estimates on International Migrant Workers. Results and Methodology, Third edition*, Labour Migration Branch - Conditions of Work and Equality Department and Department of Statistics, ILO Geneva, 2021.

18 The weighted linear model with only the geographic variable corresponds to the implicit model used in the previous edition of global estimation. This model is used for comparison purposes as described in the section on matched sample in the final chapter of the present document.

19 Further information on the CTDC can be found here: https://www.ctdatacollaborative.org/story/gems2022

20 International Labour Office (ILO) and Walk Free Foundation (WFF), in partnership with International Organization for Migration (IOM), *Global Estimates of Modern Slavery: Forced Labour and Forced Marriage, Methodology*, Geneva, 2017.

21 Once a country has ratified an ILO Convention, it is required to report regularly to the CEARC on the measures it has taken for its implementation. CEARC was set up in 1926 to examine the government reports on ratified Conventions. Today it is composed of 20 eminent jurists appointed by the Governing Body for three-year terms. The experts come from different geographic regions, legal systems, and cultures. The role of the Committee of Experts is to provide an impartial and technical evaluation of the application of international labour standards in ILO member states. When examining the application of international labour standards, the Committee of Experts 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. These observations are published in the annual report of the Committee of Experts. Direct requests relate to more technical questions or requests for further information. They are not published in the report but are communicated directly to the governments concerned.

22 Other validated sources were utilized for the countries that are not ILO member states.

23 Article 16 of the Universal Declaration of Human Rights (1948) states that "marriage shall be entered into only with the free consent of the spouses."

24 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, UN General Assembly, Resolution 2200A (XXI), International Covenant on Civil and Political Rights, 1966, Article 8; UN General Assembly, resolution 71/480, Child, Early and Forced Marriage, A/RES/71/480 (2016); and UN General Assembly, Resolution 1763 A (XVII), Convention on Consent to Marriage, Minimum Age for Marriage and Registration of Marriages Resolution, 1962.

25 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 ....". UN General Assembly, Resolution 26/22, 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 (2014).

26 Levirate marriages refer to customary unions where a widow is coerced or otherwise forced to marry the brother of her deceased husband. Widow inheritance also refers to these forced marriages. For further information, refer to: The Loomba Foundation, *World Widows Report*, 2016, pp. 92-93.

27 According to the Committee on the Elimination of Discrimination against Women and the Committee on the Rights of the Child, "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." Source: UN Committee of the Elimination of Discrimination Against Women and UN Committee on the Rights of the Child, 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 (2014).

28 During testing, the language of both arranged and forced marriage was included to test understanding of the difference between the two. This revealed interesting cultural influences on understanding the concept of forced marriage. In countries where the practice of arranged 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 between the two concepts and defined both as marriages without the consent of the person being married.

29 IOM and UNODC, 2023. Making each case count: Leveraging Administrative Data on Trafficking in Persons.

30 Michael R. Elliott & Richard Valliant, "Inference for Nonprobability Samples", *Statistical Science*, Vol. 32, No. 2 (2017): 249-264.

31 Michael R. Elliott & Richard Valliant, "Inference for Nonprobability Samples", *Statistical Science*, Vol. 32, No. 2 (2017): 249-264.

ISBN 978-92-2-039862-3